

Costs and Financing of Early Child Development Programs

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Costs and Financing of Early Child Development Programs

W. Steven Barnett

How much do highly effective early child development (ECD) programs cost? How should ECD programs be financed? These are simple questions, but they do not have simple answers.

The selection of ECD programs and of options regarding cost and financing must be based on expected economic benefits of the programs as well as local cultural, political, and economic constraints. These local variables are complex, and no single best solution exists for every situation. The costs and benefits of the same ECD program will vary among places and times and with different political, social, and economic conditions.

In the preceding chapter, van der Gaag addresses the benefits and choices related to ECD and introduces the concept of benefit-cost analysis. Relating this concept to social indicators and productivity, he calls for a comprehensive approach to interventions for early childhood and for research that will define the benefits and costs of such investments. Many of the benefits have been documented in the research literature on early child development, as summarized in the chapters throughout this volume. The *economic* benefits, however, have not been assessed systematically nor have the economic costs of these programs been examined. A combined benefit-cost analysis would help governments decide on specific program strategies that meet their society's needs and characteristics.

This chapter provides a general approach for obtaining information on the costs and benefits of ECD programs and a framework for guiding decisions regarding the cost and financing of these programs. The chapter opens with a discussion of alternative ECD arrangements, highlighting the advantages of integrating childcare with other ECD services. The sections that follow describe steps for assessing cost and initiating a cost analysis, major determinants of cost, cost variations between formal and informal programs, indicators for evaluating program benefits, and public and private approaches to financing. Emphasizing the need for research, several approaches are recommended, including the resource cost model and experimental or quasi-experimental studies utilizing a randomized or regression-continuity design.

Alternative ECD Arrangements

ECD programs are investments in the well-being and development of children. A major goal of these programs in developing countries, and in many industrialized countries as well, is

to improve the development of children living in poverty. Considerable evidence indicates that poverty affects child development and that detrimental effects on child development increase as the depth and persistence of poverty increase. Moreover, the detrimental effects of poverty during early childhood are cumulative and long lasting.

Because the benefits from even modest ECD interventions can be substantial and permanent for poor children in developing countries (Grantham-McGregor and others 1994; McKay and others 1978; Pollin and others 1993), government policy regarding ECD programs can influence national economic progress as well as children's well-being and development. Governments may finance or provide ECD programs by investing nationally in child development that focuses on poor children or by investing nationally in systems of health care, nutritional support, early childcare and education, and child financial support (for example, child allowances) that serve all families.

ECD programs encompass a wide range of interventions and focus on all domains of development, physical, social, emotional, and cognitive. As described earlier in this volume, ECD services include early childcare and education, nutritional supplementation, health care, and parent education. Many ECD services can affect multiple domains. However, programs that address different domains of development or provide different services tend to be administered by different government agencies. Inevitably, this makes coordination difficult, and each agency tends to focus only on the services and benefits relevant to the agency's specific mission.

Research, evaluation, and planning of ECD programs must avoid the fragmented views that tend to be held by government agencies and must include consideration of all the potential benefits from ECD programs. For example, theory and research suggest that early education, nutrition, and health interact with and complement each other and that the effects of this interaction increase with the severity of poverty in which a child lives (Selowsky 1981; Grantham-McGregor and others 1994). Also, interactions and complementarities indicate significant economic advantages to designing programs that deliver multiple services.

ECD services can be delivered using a variety of strategies and in various settings, primarily a child's home, another home, or some type of center. Table 1 classifies alternative arrangements for delivering ECD services. These arrangements are described in greater detail in the preceding chapters. Important differences among the approaches include the setting; a child's relationship to service providers; the professional status and training of providers; the formal or informal nature of the ECD arrangement; and the inclusion or lack of childcare among the services provided. (Paraprofessionals may be included in all settings. These persons may be day-care home mothers or employees of home visiting programs, childcare centers, preschool programs, or other ECD organizations who receive training but do not have the formal qualifications of teachers, nurses, or other professionals.) All of the differences in setting, service, and caregivers affect cost and also may affect benefits.

Integrating Childcare with Other ECD Services

One of the most important program distinctions is whether or not a program delivers services in conjunction with childcare. This distinction overlaps substantially with the

Table 1. Alternative ECD Arrangements

| <i>Setting</i> | <i>Service</i> | <i>Caregiver status</i> |
|----------------|--|---|
| Own home | Home visits | Professional, paraprofessional |
| | Childcare and education | Parent, sibling, other kin, untrained neighbor, nanny, babysitter |
| Another Home | Part-time, full-day, part-day childcare, education, and other services | Kin, untrained neighbor, paraprofessional |
| Centers | Part-time, full-day, part-day childcare, education, and other services | Professional, paraprofessional, untrained |

distinction between home visiting and center-based programs, but is not exactly the same. For example, childcare can be provided in and around homes, and home visitors can work in family childcare homes and with other in-home caregivers.

Determining whether a program delivers services in conjunction with childcare is critical because providing childcare with ECD services may save on costs and generate added benefits. Integrating childcare with other services is relevant to policies for improving the lives of women and children, particularly as changes in family structure lead to the feminization of poverty (Evans 1994). The importance of nonparental childcare varies across and within countries, but with the need for childcare growing rapidly worldwide, nonparental childcare is a vital consideration in developing, planning, and evaluating ECD services (Leslie and Paolisso 1989).

Childcare is central to interactions among maternal employment and earnings, intrafamily resource allocation, fertility (number, timing, and spacing of births), and early education and development of children. Improvement in the quality of children's lives that enhances their development may be the most obvious and direct effect on children of providing free or subsidized high-quality childcare. Without such interventions, poor children will likely be in poor-quality environments that endanger their development, poor quality childcare, which may be the only alternative available, has negative effects (Lamb and Sternberg 1990). At least one study shows that children cared for by preteen siblings in a developing country had lower weight for height, even after adjusting for social and economic differences (Engle 1991).

Although evidence of the effects of length-of-day or service mode is sparse, high quality, full-day programs should produce more effects than part-day programs or programs that deliver services even less frequently (for example, in weekly home visits). Both quantity and quality affect efficacy. Cross-study comparisons suggest that centers are more effective than home visitors in improving child development (Barnett 1995; Boocock 1995). One exception is the parent education program studied by Kagitcibasi, which suggests that parent education in conjunction with home visiting or home visiting and childcare improves child development (see both Kagitcibasi and Lombard, this volume).

The indirect effects of childcare also may be quite substantial. Unfortunately, research on the effects of partially or fully subsidized high-quality childcare on maternal employment and productivity is lacking. Clearly, such programs would add to family income, contributing to improved child development. Studies show that maternal earnings increase the percentage of total family resources devoted to children's needs (Blumberg 1988; Engle, forthcoming). By adding to family income and increasing the share of family funds devoted to children's needs, partially or fully subsidized ECD programs could have a more than proportionate effect on child development and well-being (Pollack 1985).

In addition to increasing family income, childcare subsidies indirectly affect maternal fertility, which as it declines also increases a child's well-being by spreading funds among fewer children. Although the net effects of subsidies on fertility are unclear, subsidies increase maternal employment and decrease the frequency and extent of time out of the labor force. Experimental research is greatly needed on the effects of childcare on all aspects of maternal behavior. Interestingly, one home visiting program has affected fertility among low-income women in the United States, suggesting useful combinations of home visiting and childcare (Olds and Kitzman 1993).

Cost and Cost Analysis

Examining the cost of ECD programs involves several considerations. These include understanding the impact of the cost for developing countries, obtaining informative cost data, and adopting an appropriate methodology for estimating program costs. Each of these considerations is explored below.

Impact of Cost for Developing Countries

Cost affects the feasibility and desirability of ECD programs everywhere, but it especially limits widespread provision of ECD services in developing countries. In comparison with industrial economies, developing countries have lower incomes and a much larger percentage of their population in preschool years. The World Bank (1993) defines low income countries as those with per capita gross national product below \$635 in 1991 (all dollar amounts in this chapter are U.S. dollars). Many ECD model programs in high income countries cost 5-10 times this amount, and some are even more expensive (Barnett 1993; Barnett and Escobar 1990). Although operating such models in developing countries at lower costs may be possible because of lower labor costs, the total costs still may be prohibitively high.

Even among developing countries, what they can afford varies tremendously. Their per capita incomes vary by more than an order of magnitude, and the percentage of the population under age 5 varies from 10 to 20 percent. Poorer countries tend to have higher percentages of young children, making the percentage of the population to be served by ECD programs highest where the ability to pay for services is lowest.

Government-sponsored ECD programs of some developing countries, such as professionally staffed nursery schools and childcare centers, are far out of reach for other, lower-income

developing countries (Lira 1994). Even in the countries where they were developed as the primary ECD approach, the relatively high cost of such formal programs may prohibit their expansion to more than a small percentage of young children. Each country must carefully develop and implement ECD programs that are sufficiently low cost to be feasible on a large scale.

Need for Cost Data

In general, greater attention must be paid to obtaining cost data on ECD programs and to developing low-cost, highly effective model programs. These efforts require increased focus on cost analysis during ECD program research and evaluation. Researchers of ECD programs in developing countries rarely report program costs. Little information is available on the costs of alternative ECD approaches (see Lira 1994 for an exception), and virtually none of the cost information is accompanied by evidence of program effectiveness. Data are needed on income and wages, average and marginal costs, and number of children served.

Income and Wages

In providing cost data on ECD programs and models, information on local and national per capita income and average wages should be presented to put the cost data in perspective. Obviously, obtaining this information is difficult from communities where much of the work and many workers are not in the monetary sector of the economy or where underemployment is extensive. Nevertheless, in many circumstances the information can be obtained and would provide a rough way of indexing costs, enabling analysts and administrators in developing countries to assess the economic feasibility of alternative programs transferred to their own situation.

Average and Marginal Costs

Most often cost analysis involves average or marginal costs for each child rather than total costs of a program. Average cost for each child, sometimes referred to as unit cost or cost per child, is total cost divided by the number of children served. Marginal cost is the additional cost required to serve another child.

When national ECD efforts are relatively modest, marginal cost can be substantially lower than average cost because significant fixed costs can be divided among a larger number of children. Even with a single, small program marginal cost can be lower than average cost. For example, the costs of serving an additional child in each crèche or family day-care home might be lower than the average cost if a child were added without increasing the number of staff or the amount of space. Of course, whether such changes in adult-child ratios or square feet for each child are desirable depends on how both benefits and costs are affected.

Alternatively, if ECD programs are implemented first in the most densely populated or easily accessible areas with the greatest infrastructure, the marginal cost of expansion to more remote urban and rural areas may be higher than current average cost. For example,

the costs of one informal ECD program in the Federal District of Mexico were an estimated \$30 for each child, while the costs of extending the program to other areas of Mexico were an estimated \$76 to \$145 for each child (Lira 1994).

Number of Children Served

Focusing on average or marginal costs requires measuring another important variable, the number of children served. To obtain estimates of accurate costs for each child, accurate estimates are required of the number of children served. The number of children served must be estimated accurately whether the cost calculations are rough estimates for a nation, which are based on government expenditures and community contributions, or highly precise estimates for a pilot program, which are based on detailed observations.

Accurately estimating the number of children served is difficult for at least two reasons. First, programs and agencies have incentives to exaggerate the number of children served. For example, programs may receive funding on a per-child basis, and agencies may have goals for numbers of children served that they are expected to achieve by specific dates. Second, absences and turnover make the number of children served somewhat ambiguous. Program administrators must carefully specify what counts as a child served and how the number of children served is to be computed. Average daily attendance, which must be converted to full-time equivalents when some children attend part-day and others full-day, is the most relevant concept in estimating average and marginal costs for each child. A survey indicating that roughly 300,000 children were served by an informal ECD program that officially was reported to serve nearly 900,000 children (Lira 1994) illustrates the importance of these issues.

Other important measures for number of children served include the number of children ever served during a year; the number of children who attend for a full year; the average number of days that a child attends and the average number of absences; and the annual turnover rate. Also useful would be knowing whether children and families who leave a program are simply moving from one program to another and continuing to receive services or whether they cease to receive services when they leave. Another important question to consider is whether a minimum amount of participation is required for a program to be minimally effective. In an extreme case, a program could be filled to capacity every day without any child or family receiving enough service to significantly affect child development.

Estimating Program Costs: The Resource Cost Model

Estimating program costs is more than an exercise in accounting. A standard method of cost analysis is the ingredients, or resource cost, model (Levin 1983, Chambers and Parrish 1994). This method begins by identifying required resources and listing quantities necessary to produce a program. After identifying the resources required, the various costs associated with these resources must be measured and the organizations paying for the costs must be determined.

Identifying Required Resources

Table 2 illustrates the type of resources that should be included for several different elements of a possible ECD system. Identifying required resources must be followed by specifying amounts of each resource needed to serve a certain number of children and expected costs of each resource. With this information, any government or other agency can estimate the cost of a model or approach to ECD in specific circumstances.

The resource cost model should be quite detailed about identifying the ingredients that affect cost most; usually these ingredients will be the direct service staff, supplies, equipment, and facilities. Such details are especially critical when communicating with an international audience because homogeneity of the qualities for ingredients cannot be assumed, particularly qualifications of the direct service staff. For example, specifying that one teacher and one assistant teacher are required for every thirty children ages 3-5 years is not detailed enough. The training and qualifications of these caregivers also must be specified. Similarly, requiring one classroom for every thirty children is insufficient detail: the size of the classroom and its equipment and supplies also must be specified.

Table 2. Resource Cost Model Outline for National ECD System

| <i>Elements of national administration for early childhood investment</i> | <i>Elements of childcare center</i> |
|---|---|
| Director | Recurrent Costs |
| Deputy director for training and curriculum development | Personnel |
| Deputy director for health and nutrition | Director |
| Deputy director for evaluation | Curriculum specialist or trainer |
| Deputy director for planning and budgeting | Teachers |
| Regional assistant directors | Assistant teachers |
| Program inspectors or monitors | Parent volunteers |
| Technical support staff | Secretary |
| Clerical support staff | Health care professional (part-time) |
| Consultants Office supplies and equipment | Nonpersonnel |
| Communications | Office supplies |
| Publication of training and curriculum materials | Classroom supplies |
| Transportation | Food or nutritional supplements for children's meals |
| Utilities and facilities | Medicines or vaccines |
| <i>Elements of a family childcare home</i> | Telephone |
| Mother's time and effort | Postage |
| Training and planning materials for mother | Utilities |
| Educational materials and supplies | Insurance |
| Toys | Advertising |
| Food or nutritional supplements | Capital Costs |
| Additional wear and tear on home or home improvements needed | Classroom equipment |
| | Playground equipment |
| | Office equipment |
| | Building and land |

Measuring Resource Costs

Once all of the ingredients in the resource cost model have been identified, the cost of each ingredient must be measured. This cost, which economists refer to as the opportunity cost, is assessed as the value of a resource in its best alternative use. In a relatively well functioning market, the price of an ingredient purchased from the market economy provides a reasonable estimate of its opportunity cost. However, this equation will not always be the case.

For example, the market wage is too high when hired staff would otherwise be unemployed or underemployed. Also, when wage and benefit levels are set administratively, the paid wages and compensation may be too high or too low, such as when part of the compensation is access to privileges, goods and services, or opportunities that are not recognized formally as fringe benefits. Sometimes, program staff would not otherwise participate in the monetary economy, and no alternative wages are comparable. Some programs may even require substantial donations of time, effort, and materials from participating families. Again, even the travel time required to reach a day-care center is a cost that should not be neglected in planning and comparing alternatives.

When no ready market values exist for ingredients and making any inference from markets is difficult, sensitivity analysis can be useful. In a sensitivity analysis, the cost analyst proposes a range of reasonable low, medium, and high cost estimates for an ingredient and examines the effect on overall program cost.

In some cases the cost of an ingredient may have little effect on overall cost and can be considered irrelevant. In other cases, the effect on overall cost may be so great that the ECD program only makes sense if the ingredient's cost is assumed to be low. In this case, the program should only be implemented when there is reasonable certainty that the ingredient is low-cost. For example, ECD programs should only use parents on a rotating basis as unpaid caregiver assistants when the cost of the parents' time plus the costs of organizing and managing parent volunteers is lower than the costs of paid teacher assistants or when added benefits from using parents outweigh the added costs.

In addition to showing what ingredients or resources are required and their costs, a cost analysis model must show all costs, direct and indirect, initial as well as ongoing. Costs include those of administering, supporting, and starting up a program as well as the costs of providing the service. Capital costs, annual operating costs, and costs that are not paid for by the government or program sponsor also must be included in the model. For example, developing a national system of day-care centers and family day-care homes might require creating a national administration like the one outlined in table 2. Other requirements might include regional administrative units; a preservice and inservice training system for teachers and caregivers; developing curriculum and publishing curriculum materials; constructing and equipping new facilities; services from local health care providers that are accessible to childcare providers; and a research and development agency to facilitate program and policy improvement. Resource cost models may be developed for each of the different types of requirements and for each of the basic types of service delivery organizations.

Direct Costs. Because most costs result from direct services, the resources necessary to administer and support a program (infrastructure resources) must be separated from the resources necessary to provide services at a local or community level (direct service resources). In most ECD programs, resources necessary for delivering direct services, such as education, at the local level are distinguished as recurrent and capital costs by how long the cost is relevant (Tsang 1994). Recurrent costs are the ongoing operating costs of goods and services consumed in the current year. Capital costs are the costs of equipment, buildings, land, and anything else that lasts for more than a year. In most instances, for example, the costs of preservice and inservice training for administrators, teachers, and others are properly considered capital costs.

As shown in table 2, personnel costs are recurrent and usually account for the majority of program costs. They may be subdivided into administrative and support services, paid direct services, and parents and other volunteers. Further breakdown of personnel costs by type of activity may be useful if separate staff members have responsibility for nutrition, health, and educational or childcare activities. In developing countries where labor costs are relatively low and programs seek to improve nutrition, food can be a substantial part of direct costs, and close attention must be paid to the efficient purchase, preparation, and distribution of food and special supplements.

Examining the distribution of direct costs across categories increases understanding of program operation and of resource allocation to various types of activities. For example, evaluators frequently wish to know what percentage of costs goes to direct service staff, to facilities that provide direct services, to transportation, to administrators, and to support staff at all levels. No firm rules exist for how much should be allocated to each type of activity, but insight regarding the efficiency of allocations may be gained by looking at variations in the percentages over time and among programs and by making comparisons to other types of education and human service programs.

Generally, programs that are more efficient allocate a relatively large percentage of resources to direct services and provide services at low, average total costs. Of course, care must be exercised when making comparisons or imposing rules on resource allocations, such as ruling that no more than 10 percent of cost goes to administration. Misallocation of resources may result from failing to recognize important differences among programs, and quality may be inadvertently sacrificed in efforts to contain costs.

If programs cut administrative costs (which might include supervision, training, and evaluation) too much, quality may fall. Some programs may have hidden service costs (such as donated facilities or large quantities of unpaid labor) that result in inaccurate comparisons when comparing only government budgets. As another example, although the percentage of administrative costs might be relatively high for a program of family childcare homes that provides significant amounts of ongoing training to caregivers who are paid by parents, when compared with a program that uses preschool teachers with university degrees to provide services, the family home childcare program may be more efficient administratively and overall.

Indirect Costs. ECD programs also must consider indirect costs, although these may be more difficult to identify than direct costs. For example, in many countries, private sources contribute a substantial portion of the resources for primary education (Tsang 1994) and preprimary education, which is particularly supported by families of the participating children. Private costs may be direct (such as when fees are paid to cover the costs of resources employed by the program) or indirect (such as when costs imposed by participation are not resources provided by the program).

All too often indirect costs imposed on parents and children who participate in ECD programs are ignored. The most important of these indirect costs for parents tends to be travel cost, the cost of getting children to and from a program that is far from home or work. Location and hours of operation are highly important considerations in minimizing indirect costs to families as is the recognition that families may need care and education for several children of different ages. Access to the program by mass transit and colocation of infant, preschool, and school-age programs near homes might significantly lower indirect costs.

Other indirect costs result from withdrawing children from some other productive activity. In many cases, preschool children are not sufficiently productive in work at home or in the market to make this cost significant. However, older preschool children sometimes provide useful services for their families and others; they may be providing childcare for their younger siblings (although this might be considered costly rather than valuable from the perspective of society as a whole). ECD programs should take into account all direct and indirect costs to parents and children.

Initial Costs. Planning and budgeting for an ECD system also must include preparation for unusually high initial costs. One-time start-up costs and capital costs usually require large initial expenditures. Administrative, monitoring, and training costs may be relatively high at first because of the extra effort required to launch a new enterprise and figure out how to make it work. Once the enterprise is launched, knowledge and skills can become institutionalized and passed on at relatively low cost. Some investments in human capital, however, will continue to be necessary because of staff turnover and because skills and knowledge eventually need to be updated. Still, investments in staff development will be highest in the first several years.

The cost for new facilities can pose an initial financing problem for governments or other organizations that may already have high debt levels or high borrowing costs: Strategies for dealing with this problem include developing new facilities slowly, relying on communities to develop the facilities, and making use of existing community and family resources. Existing resources include religious organizations' buildings, businesses, markets, courtyards and other community spaces, and homes. Clearly, ECD programs can lower costs by using existing facilities that serve other purposes. Lack of specialized facilities should not hinder an ECD program from beginning.

Determining Public and Private Contributions

Along with identifying all costs, a cost analysis must distinguish between public and private costs (who pays) (Tsang 1994). In many cases, the government's share covers only part of the program's cost, and looking only at government costs can be misleading. Community contributions may be needed and indicate the value a community places on a program. In some circumstances an ECD program is feasible *only* if others share the costs with government. However, a program may still fail if the government requires more cost sharing than parents or communities can afford or more than is justified by perceptions of private benefits, which may be less than social benefits. When replicating a model developed elsewhere, recognizing the extent to which international organizations, businesses, community organizations, or families contributed to costs is critical. If these contributions are not replicated, government may have to pay more.

Major Determinants of Cost

Table 1 shows alternative arrangements for delivering ECD program services. These arrangements can be collapsed into three basic models: home visitor programs, family childcare homes, and center-based programs. The models differ in cost primarily because of differences in nine program characteristics that influence cost and are easily mandated or regulated. These nine program characteristics are described below: age at start, frequency, duration, ratio of children to staff, staff qualifications, supervision and administration, health and nutrition components, parental involvement, and community and family context.

Age at Start

This factor is the most obvious influence on cost because it determines how many children must be served and for how long. Generally, providing ECD services at an early age is relatively ineffective if the services are discontinued before school entry. For a given program configuration, serving children for 2 years beginning at age 3 costs twice as much as serving them for 1 year at age 4. Because of higher staff-child ratios necessary for infants and toddlers, childcare in centers from birth to age 3 may cost even more than twice as much as serving children from ages 3-6.

The relative cost advantage of home visitor programs over the other two models and of family childcare homes over center-based care is considerably higher at the youngest ages than for children ages 3-5. Because of changes in relative cost, changing the mode of delivering ECD services from one age to another may make the program more cost effective. Of course, no matter how services are provided, costs rise when the age at which ECD service begins is lowered.

Frequency

Frequency refers to the number of days each week or month that services are delivered. A home visitor program might entail meeting with children and their parents once a week or once a month. Children might attend a preschool program at a center or participate in a playgroup in their neighborhood for 2 or 3 days a week or every day. Many preschool education programs operate only 8 or 9 months of the year, but childcare programs tend to operate all 12 months. Also, some variations in scheduling may occur when mothers work outside the home only during certain seasons.

Duration

Duration is the length of each session in which children and parents participate. Home visits typically last between 1 and 2 hours. Center-based programs commonly last for one half day (2-2.5 hours), a whole school day (4-6 hours), or a whole work day (8-10 hours). Childcare programs sometimes provide services on a drop-in or as-needed basis, and the amount of care each child receives varies according to the parent's work schedule.

Ratio of Children to Staff

Another determinant is the number of children for each staff member. In a home visitor program this ratio is called caseload. Caseload is determined by the duration and frequency of home visits and the time required for travel, preparation of lessons and other activities, office work, and any other activities the home visitor must conduct. Increasing caseload is one way to decrease cost, but it may reduce quality and eventually does reduce either the duration or frequency of home visits.

In a home- or center-based program, the number of children in the home or center and the number of staff determine the ratio. Sometimes specifying ratios for various types of staff is useful. For example, ratios may be specified for teachers alone; teachers and their paid assistants; and teachers, paid assistants, and volunteers (including parents). When all staff members do not participate for a full day, ratios should be computed for full-time equivalent staff and the minimum number of staff members present at any time.

Staff Qualifications

Qualifications for staff members vary widely among ECD programs and can considerably affect cost. In general, cost is commensurate with the level of education of program staff. Professions may require certification, which limits entry to a field and raises their own compensation. The value of the staff's qualifications depends on their professional preparation, which should screen individuals for their aptitudes and inclinations and should provide knowledge and skills relevant to providing effective ECD services. Informal experience and short-term, highly specific training may substitute for formal preparation and certification.

Many ECD services can be provided by highly trained professionals, modestly trained professionals, trained paraprofessionals, or untrained nonprofessionals. How these levels of training affect quality is unclear, but some savings may be consumed by reduced efficiency or increased supervision and support for staff with lower qualifications. For example, Harkavy and Bond (1992) found a large variation in wages among home visitors in the United States that was associated with home visitor training and experience. However, less experienced home visitors made fewer visits each week than did more experienced home visitors, resulting in reduced productivity which offset much of the savings from the lower wages paid to the less experienced home visitors. Research is greatly needed on how staff qualifications influence program effectiveness and cost.

Supervision and Administration

Costs for supervisory and administrative tasks can account for 10 to 30 percent of the budget for an ECD program. In developing countries when the local community makes substantial in-kind contributions of labor and goods, supervision and administration can account for an even larger percentage of monetary costs to government. The difference between low and high costs for administration and supervision can make a program viable or out of reach.

Program advocates tend to assume that supervision levels in demonstration programs are not required on a large scale and that administrative costs can be borne by existing agencies with minimal increases in their resources. These propositions are untested by research, and history does not show that the administrative percentage of costs declines as the size and complexity of government increases.

Health and Nutrition Components

ECD programs in developing countries and in industrialized countries with a significant percentage of the population living in poverty should involve health and nutrition. Whenever possible, cost analysis should provide separate estimates for these components.

The effect of health and nutrition on overall program cost depends on the provision of medical care, meals, and nutritional supplements. Food, nutritional supplements, and priority for medical services (which reduces waiting when a sick child needs to be taken to a health clinic) have been used as nonmonetary incentives encouraging family childcare homes to participate in programs that would improve the quantity and quality of their services. Careful integration of nutrition and health care into ECD programs actually could reduce the overall cost of health care systems by improving child health, which would reduce demands on the system, and by improving use and delivery of health services (Fogel 1995; Hill 1995; Poleman 1995).

Research is required to give policymakers information on how well-specified alternative models will affect net costs. In the case of health and nutrition services, effects on cost must be assessed from total public sector and society-wide perspectives. For example, providing health services directly through an ECD program would reduce the need for health agencies

to provide these services. Improved access to subsidized health care can make family resources available for other needs. If an ECD program provides meals, families may reallocate their resources to provide more food to other family members, increasing the diversity and quality of the family diet, or they may shift resources to other family needs.

Parental Involvement

Various types of parental involvement affect program costs differently. Types of involvement include parental participation in governance to assure that programs address child and family priorities; parental contributions of volunteer labor and other resources; and parental education to improve parent-child interactions and parental delivery of education, health, and nutrition services to children. Clearly, parental involvement enables parents, rather than government, to bear much of the program costs.

However, parental involvement also has costs. Parental involvement entails direct costs by requiring program staff to secure regular participation of parents in activities. Indirect costs result from parents' using their time in activities other than receiving training or providing services to their children. Indirect costs will be lower when parents are underemployed or can combine childcare and education activities with other activities at home. Obviously, parents incur fewer costs if they can incorporate what they learn into ordinary interactions with their children rather than working in a center or setting aside additional time for special activities. Also, costs are offset to some extent if parents enjoy participating.

Community and Family Context

Context can greatly influence the design of effective ECD programs, total cost, and costs borne by parents and local communities. The needs of rural and urban communities differ, requiring different approaches to delivery of ECD services. Needs within these communities also will vary based on maternal employment, family structure, and ethnic and religious diversity (Thomas 1984; Yeoh and Huang 1955).

In rural sectors women may be involved in formal (paid) work, informal work, or small family farm work. Paid work may be permanent with a fixed workplace or irregular, requiring travel to different work sites. The most efficient ECD intervention, or the intervention with the lowest cost for a given level of benefits, probably will vary across the three different work arrangements, requiring multiple approaches. However, similarities also exist across rural contexts. For example, most women face seasonal increases in intensity and hours of their work. In urban sectors, women are classified as formal or informal sector workers. Within the formal sector, a distinction can be made between women who have relatively well-paying jobs with fringe and social benefits and women who do not.

Family structure varies within all sectors across communities and families. ECD programs should take into account the presence or absence of fathers (influenced by male migration for work, which may be seasonal); the availability of extended family to care for

children; and the extent that older children are the caregivers (especially during school years). Finally, ethnic and religious diversity may require programmatic diversity and affect cost (Yeoh and Huang 1995).

Costs of Formal and Informal Programs

Another important area for ECD intervention research is the relative merits of formal and informal programs. Formal programs provide ECD services in a center or school and are staffed by professional teachers and teacher assistants. They have relatively high costs. In many developing countries, formal programs may be too expensive for large-scale use. If they are used, they may consume such a large percentage of the public funds for ECD investment that only a small percentage of the population receives service, resulting in inefficient and inequitable allocation of ECD resources.

Informal programs operate in one of three ways. First, they may train community volunteers or others to educate parents, which improves parental efforts to foster the development of their own children. Second, informal programs may train staff to make home visits (typically weekly) and work directly with children. Third, they may train community women to care for children in their homes or in community facilities, often improving services already offered by women in such settings.

Informal programs have much lower costs than formal programs, and some evidence indicates that they can produce benefits equivalent to those of formal programs (Myers 1992). Many alternative models of ECD services might be developed and tested in the vast middle ground that exists between current formal and informal models.

Apparent Cost Advantages of Informal Programs

For both formal and informal models and those that lie between, application of the nine important program characteristics described earlier would be useful. In principle, informal ECD programs seem to have cost advantages. For example, from the perspective of government funding, which excludes parental costs, the cost comparison is most favorable toward informal programs. However, few data are available on parent and community costs for either type of program. Although cross-program and cross-country generalizations are risky because information is lacking on contributions of local conditions, customs, and cultures to program success, the magnitude of the differences between costs of formal and informal programs is so large that general comparisons seem useful despite their limitations.

Costs for formal, center-based programs for young children tend to be measured in thousands of dollars. For example, Lira (1994) reports unit costs of \$3,611 in 1994 for full-day programs and \$ 1,959 for half-day programs in Argentina. The World Bank (1992) shows a unit cost of \$1,406 in 1991 for full-day programs in Mexico.

Costs for informal programs tend to be an order of magnitude lower. For example, The cost to the government of an informal Colombian program of government-sponsored family

day-care homes, called Hogares Comunitarios de Bienestar (HCB), was reported in 1991 to be as low as \$130 each year, but the full social cost is more than twice that, \$298 (Lira 1994). Estimated costs for other informal programs, such as home visitor and family home childcare models, are about \$100 per child (World Bank 1992). Several programs, such as the Integrated Child Development Services in India, PROAPE (Programa de Alimentacao de Pre-escolar) in Brazil, PRONOEI (Programa No Formal de Educacion Inicial) in Peru, and Initial Education Project in Mexico, have estimated costs between \$25 and \$50 per child (Myers 1992; World Bank 1992).

Difficulties in Estimating Costs

Caution should be exercised when comparing formal and informal ECD programs based on the cost estimates given above. For example, cost estimates for informal education programs other than HCB also may include only government or cash costs, and costs to the community may be relatively difficult to estimate.

Previous reviews of cost estimates for early intervention programs indicate that costs are underestimated (see Barnett and Escobar 1990 for a review of problems encountered in the U.S. literature), and recent studies cited by Lira (1994) suggest that underestimation can be quite serious. Some costs actually may be omitted, and the number of children served may be overestimated, possibly a widespread problem for informal programs that are not subject to standard auditing and accountability procedures. In some cases, informal models may have been implemented first, in the least expensive circumstances, and expansion requires higher costs.

A conservative lower boundary for cost estimates of informal ECD models might be \$100 per child (at least in Latin America), and some informal models may cost several times this amount. The true figure could be lower, but a range of estimates should be used in sensitivity analyses for low-cost models to ensure that projects will be feasible or efficient even if costs are higher than expected. Even with costs higher than expected, informal programs are low cost compared with formal programs. Unfortunately, comparison of benefits is unclear among high-cost formal programs, somewhat lower-cost programs and very-low-cost informal programs.

Evaluating Program Benefits

Few evaluations of ECD programs have been conducted in developing countries, and most that have been conducted have serious methodological limitations. The strongest information on ECD programs in developing countries comes from the few studies using true experimental designs and longitudinal follow-up (McKay and others 1978; Powell and Grantham-McGregor 1989). Long-term follow-up of experimental studies of interventions for low-income populations in the United States remains an important source of additional information (Barnett 1995). However, these studies focus on higher-cost models.

Studies of low-cost, informal ECD programs in developing countries generally use weak, quasi-experimental designs, small samples, short follow-ups, and rudimentary (or no) statistical analyses (Myers 1992). Small samples limit statistical power to detect effects, which can be especially serious if effects vary with child and family characteristics and social context as predicted by the ecological theory of human development (Bronfenbrenner 1989). Short follow-ups leave unanswered questions about the persistence of effects and later consequences.

Selection Bias

The single greatest threat to the validity of these studies of high- and low-cost ECD models probably comes from selection bias (Campbell 1991; Moffit 1991). Without random assignment, participation in ECD programs (that is, selection by families of one ECD program over another) is influenced by family characteristics that also influence child growth and development. For example, families that are more intensely concerned about child development and education are more likely to enroll their children in ECD programs. Families with higher status, higher incomes, and better political connections (even within a generally poor community) are more likely to succeed in enrolling their children in programs that are in limited supply.

Such initial differences between program and no-program groups or between groups attending different programs tend to bias estimates of program effects. Because the bias results from self-selection, it is called selection bias. More generally, several selection processes may bias results. For example, selection bias also can result when programs select participants and when nonrandom attrition occurs. When measured after intervention, pre-existing differences that lead to selection (for example, maternal influence on family decisionmaking or parental concern for child development and education) may themselves be mistaken for program effects.

Incorporating Pretest Measures. At the very least, measures of child development and family characteristics likely to affect child development (parental education, attitudes, behavior, and family economic resources) should be measured before and after program participation. Although incorporating these control variables into statistical analyses does not guarantee unbiased estimation of program effects, and true experiments are preferred (especially when control variables are measured imperfectly), pretest measures at least allow researchers to check for some initial selection differences and attempt to control for them (Campbell 1991; Hausman and Wise 1985; Heckman and Robb 1985; Mullahy and Manning 1995).

Advantages of Experimental Research

Experimental studies are the primary means for assuring that research findings are valid and replicable. Two possibilities for ECD programs are “true” experiments utilizing random assignment of participants and quasi experiments utilizing the regression discontinuity design.

True Experiments with Random Assignment

Although common arguments claim that true experiments are difficult to conduct, they have been conducted successfully and are used commonly in other fields, such as health care research. Most people feel that program assignment by lottery is fair. When services cannot be provided to all the families who would benefit, experiments have the added advantage of distributing services more equitably than would occur without the experiments. Random assignment does not need to be made by individual child or family, but can be performed by city blocks, neighborhoods, villages, or other units; analyses should take this factor into account because independence within sampling units cannot be assumed.

Common arguments against true experiments also claim that attrition introduces the same problem as selection anyway. However, attrition can be kept low enough so that it has little influence on estimated effects, and the combination of selective participation and attrition only complicates statistical analyses. Experiments provide superior estimates of program effects, and they are relatively easy for public officials and the general public to understand. Using true experiments to compare two alternative ECD programs is beneficial because both programs are expected to have positive effects and only their relative cost-effectiveness is in question.

Quasi Experiments with Regression-Continuity Design

True experiments may be unnecessary or inappropriate, for example, when improvement is highly improbable without intervention, or when dire consequences are imminent for specific children, *and* the intervention is certain to have no negative consequences. In such cases, a strong alternative is the regression-discontinuity design, which admits children to the ECD program by intensity of their needs or severity of their conditions.

Using the regression-discontinuity design, if ECD services can be provided at no cost to 500 children in an area, children could be ranked according to degree of poverty or degree of malnutrition (for example, by weight for height), and the poorest or most malnourished 500 children could be accepted. The next 500 who rank higher on income or nutrition would be the comparison group. Health and nutrition programs that treat individuals in the poorest condition first parallel this design.

Because the rules used for assignment and cutoff between treatment and comparison groups are known, the effects of the ECD program can be estimated without selection bias. Compared with random assignment, the design's disadvantages include requiring a much larger sample size to yield the same statistical power, which is more costly, and the potential for having an interaction between the level of need (the selection criterion) and effects of the intervention, which creates doubt about producing unbiased results (Cook and Campbell 1979).

Potential Indicators of Benefit

The wide range of goals for ECD programs and the interaction among outcomes make specifying a concise list of benefit indicators difficult. Some indicators can be identified from

previous research findings. Others have not been observed but are suggested by theory or empirical research, which indicates that they are consequences of effects that have been observed. Benefits produced by the interaction of program elements will be especially complex. For example, programs that facilitate child development as well as maternal employment and productivity also may affect fertility patterns. As noted earlier, few studies reliably estimate the effects of free or subsidized childcare (as part of an ECD program) on maternal employment and earnings, but such effects clearly are to be expected (Gustafsson and Stafford 1992; Joshi and Davies 1992; Maume 1991).

Table 3 provides a comprehensive list of potential benefit indicators. In practice, the most important will be simple indicators of child health and development; child injury and maltreatment; school success and progress (age of entry, school completion or dropout rates, educational attainment, grade repetition, and test scores); parental employment and earnings; and family size and structure.

Financing

ECD programs can be financed through public and private arrangements and by international organizations.

Combining Public and Private Resources

Relying on a combination of public and private resources has important advantages. Public funds can support services directly with no charge to parents, can support subsidies that allow programs to lower prices, or can support subsidies that parents use to purchase services.

Table 3. Measurable Benefit Indicators from ECD Programs

| | |
|---|--|
| Maternal reports on child health and medical services | Achievement test scores |
| Maternal reports on child behavior | Disability and developmental delay |
| Maternal reports on child development | Involvement in crime and delinquency |
| Maternal reports on child injuries | Home literacy environment |
| Clinic records on health, services, and immunizations | Parental literacy |
| Hospitalization rates | Family health practices |
| Height and weight | Maternal report on stress |
| Anemia | Mother-child interaction |
| Condition of teeth | Child-mother interaction |
| Neonatal and infant mortality rates | Maternal health and nutritional status |
| Birthweight and gestation period | Maternal employment |
| Nutritional status | Maternal earnings |
| Grade level for age | Maternal role in family decisionmaking |
| Grade repetition | Family food budget and allocation |
| Age at school entry | Fertility rates |
| Dropout rate | Number, timing, and spacing of subsequent births |
| | Unwanted pregnancy and abortion |

Funding and services can be provided at any government level or combination of levels. Funds can be raised from taxes (payroll, income, sales, value-added, and property taxes) on individuals or businesses. Private funds include parents' payments and donations of labor and goods, employer contributions, and contributions from other community organizations including religious organizations, political parties, and charitable and service organizations.

To distribute the burden of funding ECD programs, most countries depend on funds from several levels of government (public) and from private sources. In the United States, local community agencies (mostly nongovernmental, but in some cases local school districts) operate federally funded Head Start programs. The federal government funds 80 percent of the Head Start program contingent on a 20 percent match from the community. The 20 percent community match is provided by many sources, but much comes from parents who donate time as volunteers in the program. These parents may acquire training and education that allows them to enter paid positions; about one-third of Head Start's teachers first encountered the program as parents. Facilities are another common donation from community organizations.

In Sweden, local governments provide ECD services with funds from the national government (49 percent), local government (41 percent), and parents (10 percent), who pay fees on a sliding scale that increases with income (Gustafsson and Stafford 1995). In Singapore, parents bear most of the cost although the government subsidizes monthly fees at government childcare centers for women who work outside the home and provides funds to help start childcare centers.

Politicians should decide which taxes or combination of taxes should be used, taking into consideration the feasibility and economic effects of alternative taxes in specific circumstances. Several important considerations can be specified. For example, some taxes may be favored because they are less conspicuous. Also, governments may favor using a wide range of taxes to support new programs so that no single tax is much affected and the increase will arouse less resistance from specific interest groups. Alternatively, taxes may be tied explicitly to program benefits to show to the public the connection between payment and benefits. For example, ECD programs that are part of a social security system tied to employment typically are financed by payroll taxes.

Gaining Business Participation

Businesses cannot be expected to lead financing for ECD programs, but they can be an important part of an overall approach to improve ECD services. They can be encouraged to provide ECD services or funds just as they are encouraged to provide health care benefits, through special tax incentives such as exempting ECD employee benefits from taxation. Also, businesses may be encouraged to adopt preventive interventions and improve the quality of health care because of potential savings from reduced medical expenses.

One key to gaining successful business participation would be specifying a well-defined set of reforms that businesses could adopt easily. For example, a study of health and health

care among employees and their dependents (8,000 including 900 children under age 5) at a privately owned mine in Peru showed high morbidity rates despite an annual expenditure of \$ 1.7 million for welfare and medical care (Foreit and others 1991). Infant mortality was 120 per 1,000 live births. The study showed a lack of well-baby care, low vaccination rates (less than 5 percent of children under age 5 were fully vaccinated), high incidence of care for diarrhea and respiratory infections, overmedication, and use of inappropriate medications. Children under age 5 accounted for 50 percent of all clinic use.

By hiring an additional physician and nurse to provide well-baby and maternal care (at an annual cost of about \$10 for each employee) and by following World Health Organization guidelines for treatment, the company was able to obtain substantial savings in pharmaceutical expenditures within the first 2 years. These savings were projected to exceed costs after several years. In addition, vaccination coverage exceeded 75 percent for children under age 5; 90 percent were enrolled in growth monitoring, and malnutrition rehabilitation was provided as necessary. Government can facilitate these types of improvements on a large scale by distributing a plan for businesses to follow that includes guidelines for well-baby and maternity care, treatment, and malnutrition rehabilitation.

Forms of Government and International Support

Government and international support for ECD programs can take a variety of forms short of full funding. For example, government can support local initiatives on either the supply or demand side of the market by:

- Matching funds for an organization or matching payments for each child served
- Matching government payments to private maternity savings associations or individual maternity and childcare accounts
- Paying more for programs that meet public or private standards of quality
- Paying child allowances to mothers
- Improving credit access for small businesses and cooperatives
- Offering technical assistance and training for ECD service providers
- Providing childcare homes and other informal programs with nutritional supplements, oral rehydration therapy (ORT), and other resources, including credit for renovations
- Passing legislation that requires employers to provide parental leave, childcare, and other ECD services
- Passing legislation that regulates ECD program quality
- Passing legislation that secures women's rights to land, other property, and income
- Sponsoring public information campaigns and parent education on water purification, food preparation, immunizations, breastfeeding, ORT, and injury prevention
- Sponsoring public information campaigns and parent education on the importance of quality adult-child interactions for infants and young children in childcare settings and at home

- Passing regulations for employers to facilitate women's efforts to breastfeed infants
- Coordinating public transportation schedules and routes with parents' needs for childcare
- Coordinating hours of school-age childcare and hours of childcare for younger children.

Some of these examples may be relatively ineffective or have negative consequences. For example, mandated, paid parental leave and ECD service benefits raise the cost of employees to business and government. This increased cost could result in (a) employment discrimination against women, if they are perceived as more likely than others to use such benefits; (b) decreased employment of low-skilled workers, especially in government agencies with fixed budgets and in the presence of a minimum wage; and (c) a decline in cash wages (Barnett and Musgrave 1991).

Innovative Efforts

Several developing countries show promising examples of innovative government efforts. In Colombia, the government improves family childcare homes by providing food supplies (food accounts for an estimated 40 percent of the cost) and credit for renovating the homes (Young 1996). In Brazil, as an incentive to participate in training, caregivers receive free milk and priority for services at health care clinics for children in their care (Thomas 1984). In Bolivia, an interactive radio program, *Jugando en el PIDI*, teaches children under age 6 who attend child development centers and improves child-teacher interactions (Young 1996). This effort suggests the possibility of using radio to broadcast daily programs of activities (for example, stories, songs, and games) for parents and their children and for informal programs, such as family childcare homes and courtyard or neighborhood cooperatives. Such broadcasts may improve the curriculum of informal programs, especially if accompanied by training from a network of supervisors or trainers who work with caregivers and prepare them for using the radio sessions. Television and video could be used similarly (at least for centers) where television sets are widely available. Evans and Kagitcibasi (this volume) highlight the media as a potent, virtually untapped resource for a national strategy on early child development.

Local Effects and Alternative Approaches

Advantages and disadvantages of alternative approaches to government support for ECD programs will vary depending on local conditions. For example, a number of industrial and developing countries have legislation that ties ECD benefits, such as maternity leave and childcare, to employment in the formal sector of the economy. Such a policy may be effective when labor markets are tight and a large percentage of women with children work in the formal labor market. This policy may be particularly effective if most women

work in the public sector where government can readily prevent discrimination against those who take time off during the first year of their child's life. However, in labor-surplus situations such policies may decrease employment of women and significantly lower their earnings.

Moreover in countries with legislation that ties ECD benefits to employment in the formal economy, when large percentages of the population are not in the formal economy, distribution of ECD services can be extremely inequitable and may be inefficient (for example, those with the greatest need receive nothing). Problems are exacerbated if government provides, or requires that others provide, ECD programs using expensive formal models whose cost may exceed wages paid to a typical worker in many communities.

Informal programs may have important advantages in addition to low cost. These include a high degree of parental involvement, comprehensive attention to all of a child's needs, sensitivity to each child's real needs, cultural appropriateness, and improved productive capacity of parents and communities.

However, because informal programs rely to a large extent on community and parent resources, they may have difficulty achieving the desired level of quality in some, or even many, communities. For example, low levels of education on the part of parents may make acquiring the knowledge and skills necessary for child development or parent education difficult. Lack of education may create difficulties in transmitting knowledge and abilities to older preschool children that would help them to succeed in school. In some cases, the nutritional, health care, and other physical resources contributed by a community also may be low quality. Quality becomes an especially serious problem when communities experience unusual stress from economic or political crises that reduce available resources to an even lower level. Similar difficulties have been noted when primary schools are highly dependent on community resources, as with harambee schools in Kenya (Bray 1994).

Systems to provide ECD programs also vary greatly from country to country, depending on social and economic conditions and prevailing attitudes and beliefs about the appropriate roles of government and the family, about women and their participation in the labor force, and about childrearing and education. The ethnic and religious diversity of a population also affects ECD systems; the more diverse a country is, the greater the need for a system that responds to different demands from groups and individuals.

Some countries emphasize full-day childcare programs that enable mothers to work, while other countries emphasize part-day programs and family subsidies that enable mothers (and in some cases fathers) to stay home with children. Such policies may vary by the ages of children. For example, Sweden provides an extensive public childcare system, but also offers parents paid leave for the first year of a child's life. Some countries offer universal public ECD programs; other countries provide free public programs only to low-income families. Some countries provide ECD services directly through the government; others offer parents subsidies to help purchase private services.

Conclusion

Analyzing the costs and benefits of ECD programs through rigorous, systematic benefit cost analysis will provide a framework for addressing how much should be invested in early child development and at what unit cost in specific circumstances. Governments, international agencies, and other organizations have limited resources. To make informed decisions, they must understand the tradeoffs of alternative national investments, including early child development, and of alternative ECD programs for improving the growth and development of young children.

The Need for Research

As investments, ECD programs must be judged by their payoffs in economic and human terms, recognizing that placing a monetary value on important ECD outcomes is not always possible. Research on economic returns of ECD investments might help reverse the tendency of many governments to underestimate the value of ECD programs (particularly for the poorest children) in relation to other expenditures. Research also would provide more definitive information about the critical elements of program delivery, such as which services or combination of services should begin at what ages and how they should be staffed, located, and financially supported.

Understanding the Benefits of ECD

Knowledge has been accumulating in recent years on the benefits of ECD programs in industrialized and developing countries. The preceding chapters in this volume summarize current knowledge on the health, nutrition, and cognitive benefits of these programs. A great deal of information, however, is still unknown. To enhance understanding of these benefits, either an experimental approach using randomized trials or a strong quasi-experimental design should be used for estimating costs and benefits. Low-income countries cannot risk their resources on ECD interventions without solid evidence of high returns.

Although sound estimates of ECD program costs are relatively easy and inexpensive to produce, they generally are not available, even for nutritional interventions that show relatively strong evidence of effectiveness. Sound estimates of benefits are more difficult to produce, but should be pursued to identify especially effective programs and thereby avoid costly, large-scale investments in inefficient programs or failure to invest in beneficial programs because of the lack of convincing evidence. In weighing the costs and benefits of alternative research strategies, it is important to remember that randomized trials produce the largest statistical power for a given sample size and, as a result, are relatively low in cost.

Weighing Costs and Benefits

Special research attention needs to be given to analyzing the costs and benefits of informal programs, which are more likely to be utilized in developing countries. Comprehensive

systems of services, including childcare, may be especially promising. To facilitate benefit-cost analysis, the resource cost model can be used to great advantage.

Informal Programs

For ECD programs to be feasible worldwide, options must be affordable for low-income countries with a large percentage of their population under age 5. Future research, therefore, on ECD programs should target promising informal models that claim to have low costs and should estimate their costs and benefits in contrast to more expensive formal models. For example, government costs may be kept low by investments to improve the quality of existing plaza or courtyard nurseries and family day-care homes. A research program should be developed to illuminate the tradeoffs between cost and quality faced by informal ECD programs. Informal programs are engaged in the difficult task of trying to transfer human capital and other resources to young children at low cost in environments where these resources are scarce.

Comprehensive Systems that Include Childcare

The complementary interactions among health, nutrition, education, and childcare needs of mothers imply that an efficient approach to investing in ECD will consist of a comprehensive, coherent system of services that provides continuity in services from the beginning of childcare through primary school. A single program that provides all these services may or may not be the most efficient approach. Specialization may offer advantages, and cross-program coordination will be necessary. To date the most neglected benefit from ECD appears to be childcare benefits for mothers. The potential is great for large economic benefits from joint, low-cost childcare and ECD programs, but no studies provide sound estimates.

An ECD system can consist of multiple programs involving policymakers and researchers who take a systemic view to planning, developing, and evaluating the programs and coordinating with schools, employers, and mass transit. However, the components of an efficient ECD system will vary from one country to another and even within countries in accordance with parent and child needs, resources, and costs. Nevertheless, researchers should be able to provide information about desirable alternatives for ECD programs and systems in various types of communities.

Resource Cost Model

To ensure that analysis results are useful to as many countries as possible, cost studies should utilize a resource cost model approach and should index costs to local wage rates or per capita income. In estimating unit cost, more attention must be given to accurately measuring the number of units of service provided. Estimating the number of children who enter a program in a year or the number of places provided is not enough. Research must accurately estimate the number of children who are served for a specific period of time, as well as

turnover and absentee rates for children, to enable estimation of the number of child-days of service and the number of children receiving a minimally adequate amount of service.

Benefit studies should not rely on existing data sets that have been designed for other purposes, such as public school records. Such data tend to be collected for annual cross sections (for example, all children in third grade) rather than for cohorts, making change over time difficult to track accurately. Moreover when data are used for accountability purposes, administrators, local authorities, and others may seek to manipulate the results. Data from school achievement tests have these serious problems. Data on school progress, such as school entry, dropout, and educational attainment rates may have less serious problems, but even these data should not be accepted without investigation. Long-term benefits will vary by socioeconomic status and within local contexts, such as the affordability of an adequate diet, employment situation, and quantity and quality of health and educational services.

Scaling Up Programs

As evidence accumulates on the costs and benefits of model programs or exemplary programs that have only been implemented in limited areas, more research on going to scale will be necessary. A small-scale program can lose many of its benefits when expanded into a large-scale government program, but research is unclear on the reason this occurs. One reason may be that governments underestimate costs and expand programs with much less funding for each child served than the model used. Some programs may expand easily into national efforts, and others may not. Strategies for building infrastructure, including administration and training, may facilitate successful expansion. Limiting program expansion to a manageable annual rate of growth may be advantageous. A study of these issues could reveal much about realizing the tremendous potential of investing in ECD programs.

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