

Early Child Development: An Economic Perspective

Jacques van der Gaag

Early child development (ECD) is a powerful investment in the future, both socially and economically. Stimulating children's development and helping them reach their full potential are beneficial not only to children and their families, but also to societies and the entire global community. Well-developed children become successful, productive adults who are better able to contribute to a society's economy and to instigate a cycle of positive effects as they become parents, and grandparents, of the generations that follow.

The preceding chapters in this volume have well stated the short-and long-term benefits of improved nutrition, health, and education for children and families participating in ECD programs. In describing these benefits, the authors have emphasized the interrelationship and synergistic effects of nutrition, health, and cognitive stimulation. They also have documented the substantial negative effects for these children and their families of not intervening early in life against poor health, malnutrition, and unstimulating environments. These effects are synergistic as well and, if allowed to continue, can undermine entire societies and countries; these are not steady-state situations and can proceed in a downward negative spiral across generations.

Positive action can take different forms, as indicated by the various conceptual frameworks presented in this volume. Many options for promoting early child development are available and have been utilized by different countries throughout the world. With sufficient will, this knowledge, which already exists, can be examined closely and exploited to good advantage.

The will to take action often involves having the means to take action. The purposes of this chapter are to substantiate that ECD programs are a good investment *economically* and to suggest a broad general framework for addressing the economics of early child development.

Early Child Development: Benefits and Choices

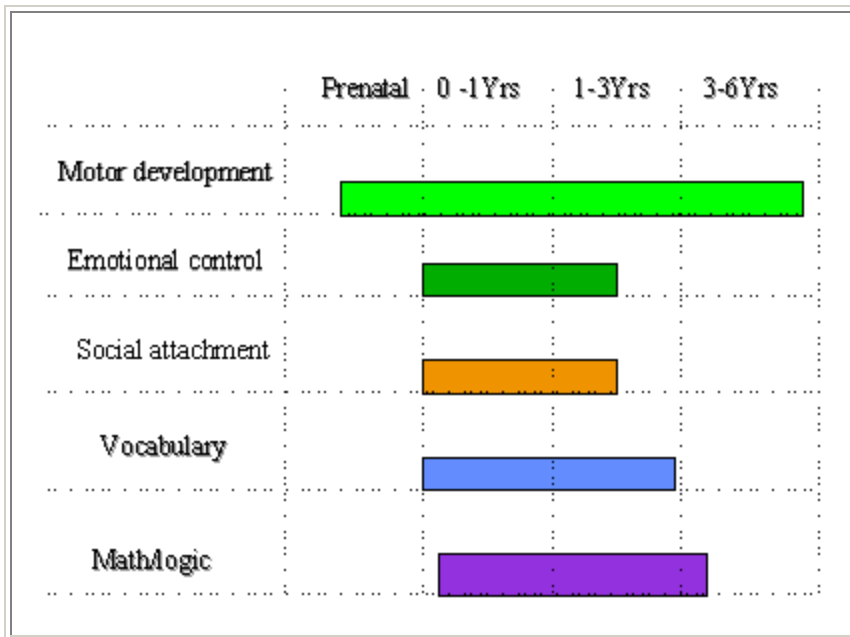
Two immediate questions for policymakers and government administrators are: Why worry about the economics of early child development? Why talk about ECD as "an investment"? The answer is simple: The success and inventiveness of researchers and the lessons learned from their studies of early child development have resulted in many effective ECD strategies and programs that have been shown to benefit children. Interventions in nutrition, health care, preschool and primary education, and related areas (for example, water and sanitation) have all been shown in various settings, using different delivery mechanisms, to improve children's health, nutrition status, growth, and cognitive and behavioral development.

Some of these interventions focus on a single area (for example, education or health), whereas others are combined as complementary programs (for example, nutrition and education) or serve as alternative approaches (for example, home-based or center-based preschool education). To select a strategy and the programs that implement the strategy requires consideration of two key questions: Given limited resources, how can government maximize the number of children who will benefit from a program? How can government utilize the lessons learned to form coherent public policies for young children?

Some choices are easy; some strategies and programs work, others do not. Other choices are constrained; some programs are effective at certain ages, others are not. Researchers, for example, continue to accumulate evidence of "windows of opportunity" for the development of children's abilities; when a window is closed, interventions in the area of interest may not succeed or be effective. Figure 1 summarizes the known windows of opportunity for five abilities. These windows are the critical periods in a child's development when the capability for physical, emotional, social, and cognitive (verbal and spatial) functioning is established. The figure shows that these five capabilities are established between the prenatal period and 6 years of age.

Other choices are more difficult; some interventions yield greater benefit when combined horizontally as integrated programs for a specific age group, others are more effective when organized vertically for a range of ages. Additional questions to ask are: Should all programs be available universally, or should some programs be targeted to children at high risk? Are programs always more effective in formal settings with trained caregivers, or can programs in informal settings without trained caregivers be equally or

Figure 1: Windows of Opportunity



even more effective? These additional questions are especially difficult to resolve for interventions with multiple objectives, as is often the case with ECD programs.

Yet, even if an intervention's objective is seemingly simple, such as achieving good nutrition, the choices can be complex. For example, can good nutrition be provided best by assuring adequate food distribution, or by providing food stamps or making food-for-work programs available? Are school feeding programs preferable, or would mothers' education programs, which are not directly linked to food, be more effective in promoting good nutrition?

All of these questions, which guide the selection of strategies and programs, need to be addressed. The choice of a particular strategy or program will reflect the amount of resources available and the objectives to be achieved.

As a first step toward addressing these questions, the effectiveness of existing strategies and programs must be evaluated rigorously for different groups and settings. Subsequently, an intervention, or set of interventions, that is optimal for a given situation must be selected from among the options available. A useful tool for conducting this rational examination of ECD programs is benefit-cost analysis.

Benefit-Cost Analysis

Policymakers and government administrators will utilize economic criteria for forming coherent public policies regarding children and making decisions on ECD

strategies and programs. To ensure that these policies and decisions are "optimal," the criteria need to be expressed in terms of benefits and costs.

Applying economic criteria to programs that benefit a child's health, nutrition, and development may appear unnecessary but can be illuminating and serve to document potential returns on investment, thereby encouraging public and private action. Cost-benefit analysis has been used, for example, to document economic returns on investment for education, leading to major national and global initiatives in this field. An example of the type of analysis that would be useful for ECD programs is given below for education.

In this example, a young girl grows up healthy, well nourished, and without damage to her cognitive and behavioral development. She stays at home until age 12 and then starts working. She may work with her parents in the fields, with a family member in the household, or with others in a local store. The girl has not attended school and cannot read, write, or perform basic mathematical calculations. During her first year of work, her productivity is low but she learns from experience. Her productivity (and her income) increases during her early years of work but, lacking education, she soon reaches her maximum productivity level. She retires at age 55.

Figure 2 shows the pattern of this woman's productivity over her lifetime. This productivity pattern is called her "age-earnings profile."

Now consider the same young girl again in a different scenario. This time she attends school from age 6 to age 12. When she enters the work force at age 12, she can read sufficiently well to comprehend instructions and labels and can operate a cash register. Her productivity, with schooling, is higher initially than it would be without schooling *and* she will maintain this higher productivity for *the rest of her work life*. Again, she retires at age 55.

Figure 3 shows this woman's productivity, or age-earnings profile, with schooling in comparison with her profile without schooling. By comparing the increase in her lifetime productivity (P on figure 3) to the cost of her education (1), the economic returns of education can be calculated, as is done for any other investment.

In fact, the returns to schooling are very high (table 1). The literature on the benefit-cost of education shows that. I extra year of primary education increases a person's future

Figure 2: Age-earning Profile Without Schooling

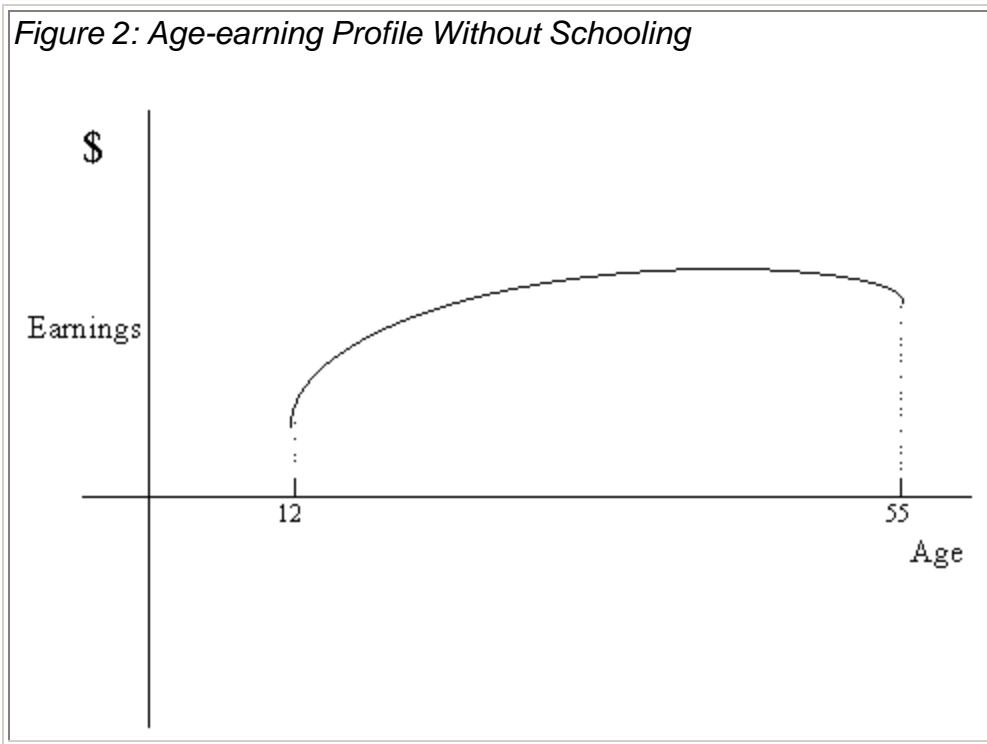


Figure 3: Age-earning Profile With and Without Schooling

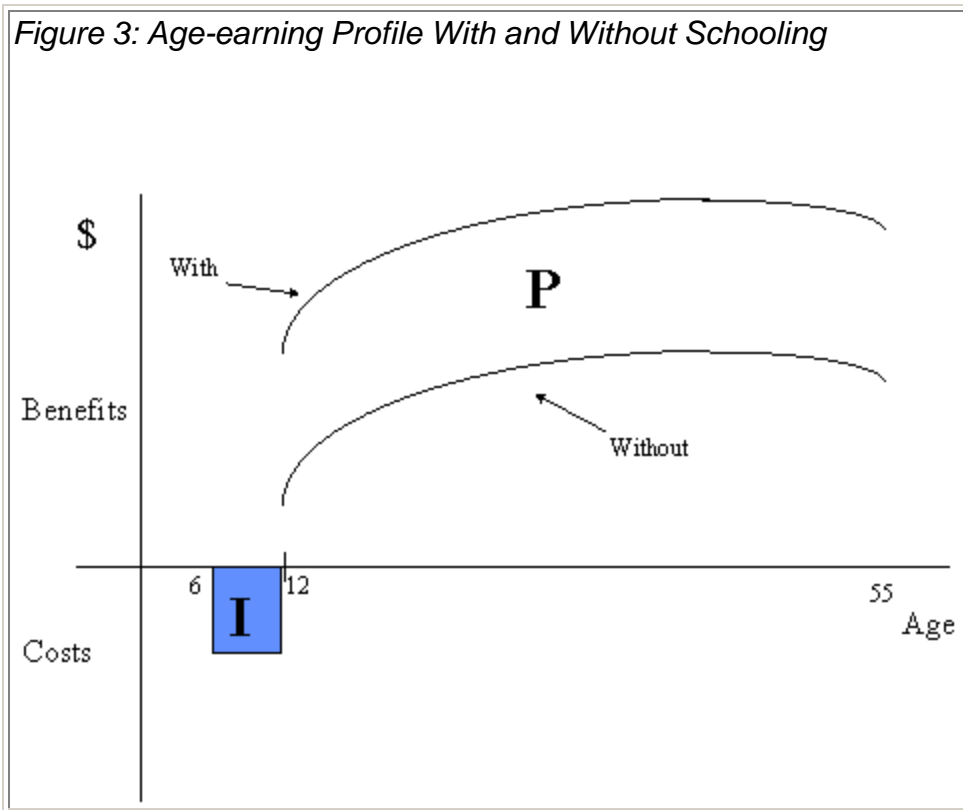


Table 1. Economic Returns to Investments (Percent Increase in Future Productivity) of 1 Extra Year of Primary Education

Argentina	10.0	Nigeria	30.0
Bolivia	9.8	Pakistan	20.0
Brazil	9.7	Philippines	18.3
Cyprus	15.4	Spain	31.6
Ethiopia	35.0	Yemen	10.0
India	19.8	Zimbabwe	16.6

Source: Psacharopoulos (1994)

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productivity (that is, hourly wage rate) by 10 to 30 percent (Psacharopoulos 1994). These high economic returns are among the main reasons why the global development community is urging "Education for All." Economic analysis has shown that education is the surest way out of poverty because education has a very high rate of economic return.

Social Indicators and Productivity

In the first example described above, the young girl lacks schooling but is healthy, well nourished, and cognitively and behaviorally well developed. She is ready to learn. If she is able to enter school, the benefits to her and her family are high. Unfortunately, the situation for most children in many developing countries is much grimmer and programs are needed to break the cycle of poverty and its associated effects.

The Developing World. Grim Statistics

Despite tremendous progress made during the past 3 decades, the struggle for survival continues for young children in low-income countries and in poor, remote areas of middle-income countries. In twenty-five of forty low-income countries, the infant mortality rate (IMR) still exceeds 100. International efforts are needed to complete this unfinished agenda of increasing child survival and lowering the IMR in all low-income countries. The knowledge is available to accomplish this.

But mere survival is not enough. Many children who survive today often suffer from malnutrition as a result of insufficient dietary intake of protein or essential micronutrients. The damage from malnutrition is often irreversible, as noted by Martorell in this volume.

Also, despite major advances in extending education to children in all parts of the world, the rates of enrollment in p school in some countries are less than 6.0 percent and even lower for girls. Many of those who enroll repeat grades or drop out before they graduate, remaining functionally illiterate and unable to function fully and productively within their communities and society. Table 2 shows typical levels of social indicators pertaining to children in low-income countries and poor regions of middle-income countries.

How do all of these statistics relate to early child development? The answer: They indicate the severity of the health, nutritional, and educational needs of young children in

Table 2. Typical Levels of Social Indicators in Lowincome Countries and Poor Regions of Middle-income Countries

Indicator	Value
Infant mortality rate	150 deaths per 1,000 live births
Child mortality	50 deaths per 1,000 children
Malnutrition	50% of all children
Enrollment in primary school	60% of children in the appropriate age group for primary school
Average late enrollment in primary school	2 years
School dropout rate	30% of all schoolchildren
Grade repetition rate	30% of all schoolchildren

many countries throughout the world. Perhaps the best way of illustrating the severity of this situation is to consider a hypothetical cohort of 100 children from a low-income country. In this country, with the social indicators shown in table 2, more than half of the 1000 children in the cohort will never have a chance to reach their full potential. Some will die, although most will survive. Of those who survive, many will become subsistence farmers, inhabitants of shanty towns, and illiterate and ill-prepared parents.

Sound public policies need to be designed for the children that survive to protect them from malnutrition and disease and to provide the health care, early childcare, and education that will enable them to reach their full potential. Without appropriate intervention, the vicious cycle of poverty that entraps them will continue and will be passed on to the next generation and generations thereafter.

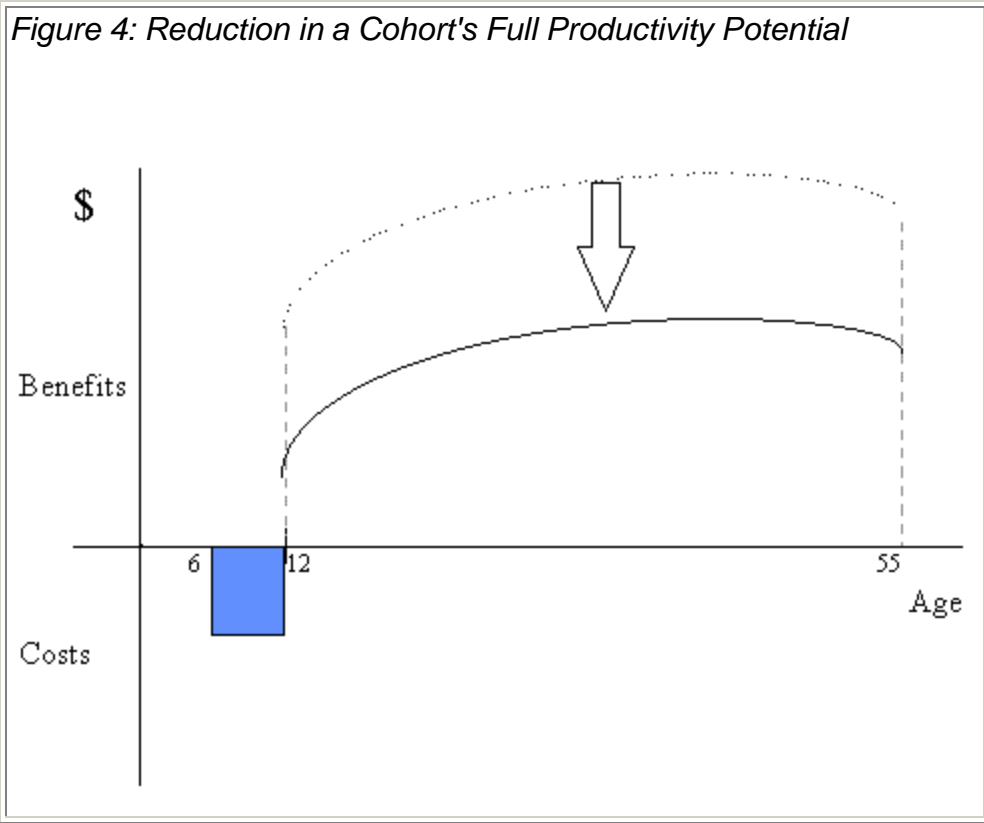
Breaking the Cycle

ECD policies and programs can break this cycle and help these children achieve a fulfilling and productive life. Adopting the schema used in figure 3 to explain a young girl's loss of productivity potential without schooling, figure 4 depicts the loss of the entire cohort's productivity potential. Losing part of this cohort to malnutrition and disease reduces the potential for the entire cohort. Failing to enroll part of the cohort in school at ages 6-8 results in additional loss to the cohort [age 6 is used arbitrarily in the figures to signify the age when children enter primary school]. Allowing children to drop out and others to complete school, and yet remain functionally illiterate, further reduces the cohort's full potential.

Any efforts to mitigate the loss of future productivity shown in figure 4 will increase the overall cohort's chance of success, adding children to the number who will survive well as productive adults. For each child that is added back, an entire family benefits, and so does the community and overall society.

Intervention: A Comprehensive Approach

The knowledge exists for breaking the terrible cycle of poverty. Consider a cohort of newborns. As much as 60 percent may be at risk in some countries, and yet their primary



needs are known: shelter, food, health care, stimulation. Programs are available to assure their survival, reduce malnutrition and illness, and foster development. If these programs are implemented broadly, with a focus on 'infants at high risk, the cohort can proceed healthy, well nourished, and active into the next stage of life.

The needs of the young children at ages 1-3 also are known, and programs are available to assure that these needs are met. By implementing these programs broadly, favorable outcomes can be obtained and the children can enter their preschool years with vigor. Figure 5 summarizes the needs and areas of intervention for children at these three stages: 0-1 years, 1-3 years, and 3-6 years.

As indicated by figure 5, the needs and interventions for one age group are related to those for the other age groups. Because they are related, intervention strategies and programs need to be comprehensive and integrated horizontally as well as vertically. The aim at each stage of life is to decrease the likelihood of irreparable damage and to increase the likelihood of successful transition to the next stage.

Arguably, programs for even earlier stages (prenatal care, mothers' health care, safe birthing practices) and later stages (high-quality secondary school education) should be included as part of an integrated, comprehensive approach. The first step, however, is to offer children ages 0-8 a solid foundation on which to build. This age range accommodates the different ages around the world when children enter primary school.

ECD programs can provide the foundation needed. Returning to the cohort of 100 children whose productivity potential was reduced (see figure 4), figure 6 depicts the gains to be made in this cohort? potential by investing in ECD programs for children aged 0-8. As figure 6 suggests, the costs of this investment in the early years yield a substantial return on investment, in regained productivity, for the *entire cohort across the lifespan*.

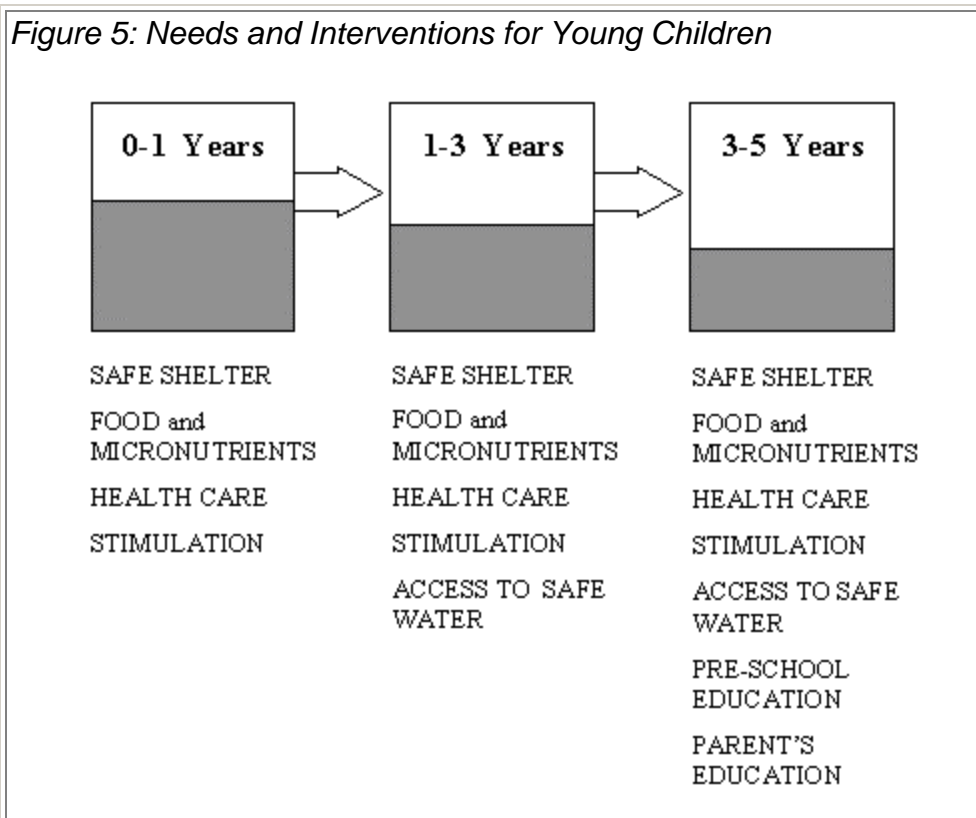
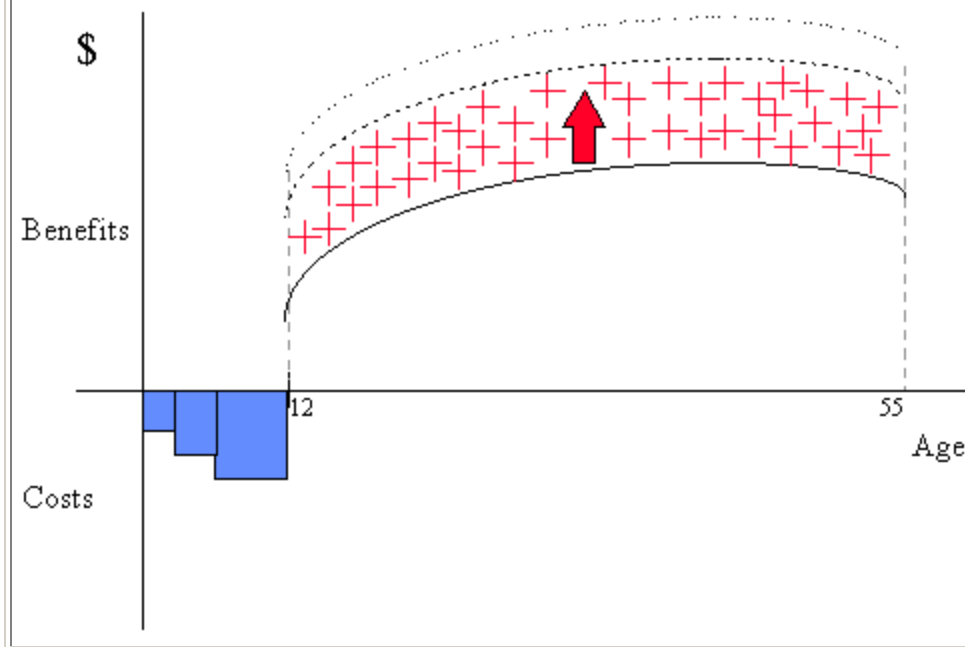


Figure 6: Regaining the Lost Productivity Potential



Conclusion

Productivity potential is a useful concept for understanding the benefits of ECD programs. Already applied to education, this concept enables policymakers to estimate the overall effect of a policy and helps administrators -select the most cost-effective and appropriate interventions from among the many strategies already proven to be effective.

An increase in productivity potential, however, is an important but not the only benefit of ECD programs. Children who participate in these programs are likely to become more responsible citizens and better parents. They also will influence their siblings as they become better role models. ECD programs enable older siblings to pursue their own developmental directions in school and work by releasing them from the responsibility of providing daily childcare for their younger brothers and sisters.

Parent involvement is a key aspect of many ECD programs. By their participation in these programs, parents acquire knowledge about good nutrition, health risks and healthy behaviors, learning and cognition, parent-child interactions and family relationships, and other subjects related to early childcare and development. Their new knowledge and awareness benefit not only them but also the entire family. With improved self-esteem, these parents also may become more active in community activities. While their young children are

attending an ECD program, parents, and particularly mothers, have more time for these activities and other productive endeavors.

All of these benefits must be counted in any analysis of ECD programs although they may be difficult to quantify economically. A rigorous effort is needed to delineate both the benefits and costs of available ECD strategies and programs. A framework for addressing the broad range of considerations that will be required in such benefit-cost analyses is suggested by Barnett in the next chapter.

By applying benefit-cost analysis to early child development, researchers can rationally document anticipated future returns of investment from ECD strategies and programs. Such documentation can be expected to stimulate design and implementation of ECD policies and programs that will address concerns about the well-being of the world's children.

References

Psacharopoulos, George. 1994. Returns to Investment in Education: A Global Update. *World Development* 22(9):1325-43.