

# **ECONOMIC ANALYSIS OF CRIME PREVENTION**

## **Applying Economic Analysis to Crime Prevention: Issues for a National Approach\***

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The purpose of this paper is to contribute to the development of a Canadian approach to assessing value for money of programs targeted at early prevention of delinquency and criminal behavior. Specifically, it aims to identify key issues that should be considered in the design of a model methodology for economic analysis of publicly-funded prevention programs. Its focus is on developmental crime prevention (Tremblay & Craig, 1995). Developmental crime prevention refers to interventions designed to prevent the development of criminal potential in individuals, especially those targeting risk and protective factors identified in studies of human development (Farrington, 1994).

Reviews of the literature that have focused on developmental crime prevention (Zigler, Taussig, & Black, 1992; Mulvey, Arthur, & Reppucci, 1993; Yoshikawa, 1994; Tremblay & Craig, 1995; Wasserman & Miller, 1998) demonstrate that this is a promising approach to reducing delinquency and criminal behavior. However, absent from most of these “effectiveness” reviews is any discussion of economic efficiency. Typically, evidence of effectiveness gets translated into claims of cost savings or cost-effectiveness (i.e., the program is effective, therefore, it must be economically efficient). This is not sufficient and can in some cases be misleading. Economic evaluation research is needed to assess the monetary value of programs and to help answer important questions facing policymakers such as, “Might government funds invested early in the lives of children yield compensating decreases in government expenditures?” (Greenwood, 1999, p. 1).

This paper is divided into three sections. The first section discusses the main techniques of economic analysis and the methodological framework for carrying out economic analyses. The second section summarizes economic analysis findings of leading developmental crime prevention programs. The third section identifies key issues in the design of a model methodology for economic analysis at a national level.

### **Economic Analysis Methods**

An economic analysis can be described as a tool that allows choices to be made between alternative uses of resources or alternative distributions of services (Knapp, 1997, p. 11). Many criteria are used in economic analyses. The most common is efficiency (achieving maxi-

mum outcomes from minimum inputs), which is the focus of the present paper. The specific focus on economic efficiency, however, is not meant to imply that prevention programs should only be continued if benefits outweigh costs. There are many important non-economic criteria on which these programs should be judged (e.g., access to services).

Benefit-cost analysis and cost-effectiveness analysis are the two most widely used techniques of economic analysis. Barnett and Escobar (1987, 1990) describe cost-effectiveness analysis as an incomplete benefit-cost analysis. This is because no attempt is made to estimate the monetary value of program effects produced (benefits), only resources used (costs). Benefit-cost analysis, by contrast, monetizes both costs and benefits and compares them. Cost-effectiveness analysis does, however, provide a point of comparison between program inputs or costs and outcomes (e.g.,  $x$  dollars produced  $y$  crimes prevented), hence permitting an assessment of which program represents the most desirable investment. Another way to think about how benefit-cost and cost-effectiveness analysis differ is that “cost-effectiveness analysis may help one decide among competing program models, but it cannot show that the total effect was worth the cost of the program” (Weinrott, Jones, & Howard, 1982, p. 179), unlike benefit-cost analysis.

An economic analysis is a step-by-step process that follows a standard set of procedures. Six main steps have been articulated: (1) define the scope of the analysis; (2) obtain estimates of program effects; (3) estimate the monetary value of costs and benefits; (4) calculate present value and assess profitability; (5) describe the distribution of costs and benefits (an assessment of who gains and who loses, e.g., program participant, government/taxpayer, crime victim); and (6) conduct sensitivity analyses (Barnett, 1993, pp. 143-48). Each of these steps is summarized below.<sup>1</sup> In the case of benefit-cost analysis, all of the six steps are carried out; for cost-effectiveness analysis, the estimation of the monetary value of benefits in step (3) is omitted and step (5) is consequently omitted.

### **Define the Scope of Analysis**

This step can be divided into two parts: first, defining the alternatives to be compared (e.g., participation in a program versus non-participation) and, second, identifying the limits of

the comparison (Barnett, 1993, p. 144). A determination is made at this stage about the perspective the economic analysis will take. The “public” (government/taxpayer and crime victim) and “society” (government/taxpayer, crime victim, and program participant) are the two most common perspectives used in economic analysis. The decision about which perspective to take has important implications for evaluating the program, particularly if it is being funded by public money. That is, if conclusions are to be drawn about the monetary benefits or costs of a program to the public, the benefits or costs must be those that the public will either receive or incur.

Another important element at this stage is the decision about what program outcomes are to be measured. Administrative issues (e.g., resources, time) or parameters of the study may limit the number of outcomes that can be measured. The best approach is to attempt to estimate all of the relevant outcomes and, later, to estimate their monetary value independently (see the step on estimating monetary value).

### **Estimate Program Effects**

Determining that a program prevented crimes requires an estimate of how many crimes would have been committed in the absence of the program, and a disentangling of program effects on crime from all the other possible influences on crime. Program effects can be measured in different ways and with differing degrees of statistical power.

In practical terms, an economic analysis of the efficiency of a program is an extension of an outcome evaluation, and is only as defensible as the evaluation upon which it is based. Weimer and Friedman (1979, p. 264) recommend that benefit-cost analyses be limited to programs that have been evaluated with an “experimental or strong quasi-experimental design.” The most convincing method of evaluating crime prevention programs is the randomized experiment (Farrington, 1983). The key feature of randomized experiments is that the experimental and control groups are equated before the experimental intervention on all possible extraneous variables. Hence, any subsequent differences between them must be attributable to the intervention.

The randomized experiment is only the most convincing method of evaluation if a suffi-

ciently large number of units is randomly assigned. As a rule of thumb, at least 50 units in each category are needed (Farrington, 1997). This number is relatively easy to achieve with individuals, but very difficult to achieve with larger units (e.g., communities, schools). For larger units such as communities, the best and most feasible design usually involves before-and-after measures in experimental and control communities, together with statistical control of extraneous variables. Non-randomized experiments and before-after designs without a control group are less convincing methods of evaluating crime prevention programs.

### **Estimate Monetary Value**

The estimation of the monetary value of program resources used (costs) and effects produced (benefits) is the most important step in an economic analysis. As described by Barnett (1993, p. 145), "This step makes it possible to put all program consequences on an equal footing, so program costs, various positive outcomes, and any negative outcomes can be aggregated to provide a single measure of the program's impact on society and on particular subgroups of society."

It is also the step that distinguishes a benefit-cost analysis from a cost-effectiveness analysis. Estimating the monetary value of costs is considered to be less complex than benefits, but no less important. Each is dealt with below.

The most crucial issue involved in carrying out benefit-cost analyses is deciding what program resources used and effects produced should have dollar figures attached. No prescribed formula exists for what to include (or exclude). Prest and Turvey (1965, p. 683) note that benefit-cost analysis "implies the enumeration and evaluation of all the relevant costs and benefits." Estimating the monetary value of program benefits requires a great deal of ingenuity on the part of the evaluator. Unlike program costs, which can most often be broken down into operating (e.g., overhead, administration) and capital (e.g., rental of facilities), program benefits are disparate and involve a number of assumptions in order to arrive at reasonable estimates of monetary value.

Another important issue that must be considered at this stage is the distinction between real and notional or putative monetary benefits. Often, crime prevention programs claim that

real monetary benefits were achieved. Real monetary benefits can only be achieved if the program results in a direct reduction in some real item of expenditure (e.g., personnel, equipment). For example, a small scale Head Start program will only produce real benefits after the point at which improvements in affected outcomes (e.g., educational achievement, parental social service usage) become large enough to permit the affected agencies to reduce the number of personnel, equipment, or some other expenditure item. This of course does not imply that notional benefits of crime prevention programs should be ignored altogether. Identifying real benefits is a task in itself, and notional benefits may have the effect instead of suppressing expenditures, which may facilitate the re-allocation of resources to other pressing needs.

An important and closely related issue is the distinction between marginal and average costs and benefits. In the context of program resources used, "Marginal costs describe how the total cost of an operation changes as the unit of activity changes by a small amount", while "[a]verage costs are derived by simply dividing total costs by total workload in a given period of time" (Aos, 1998, p. 13). The main limitation of average costs, as noted by Aos (1998, p. 13) is that "some of those costs ... are fixed and do not change when workload changes."

### **Calculate Present Value and Profitability**

Present value is concerned with making all monetary costs and benefits of a program comparable over time. The time value of money is best understood by the following: "A dollar today is worth more than a dollar next year because today's dollar can be invested to yield a dollar plus interest next year" (Barnett & Escobar, 1987, p. 390). If a program's costs and benefits are confined to one year then the calculation of present value is unnecessary.

Two separate steps must be carried out to adjust for differences in the value of money over time. First, the effect of inflation is removed by "translating nominal dollars from each year into dollars of equal purchasing power, or real dollars." This is achieved by the application of a price index to the nominal monetary units, which more or less cancels out the effect of inflation. Second, the time value of money is taken into account "by calculating the present value of real dollars from each year" (Barnett, 1993, p. 146, emphases in original). For this to be achieved, real monetary units from different years must be discounted using an inflation-adjusted discount

rate (e.g., between 3% and 7% per annum in the United States) to their “common value at the beginning of a program” (Barnett & Escobar, 1987, p. 390). One of the limitations of not calculating present value is that benefits will be slightly larger than they should be. This is because the calculation of present value very often reduces future benefits more than present costs.

Once present value has been calculated an assessment can be made of the program’s profitability or economic efficiency. From a benefit-cost analysis, economic efficiency can be reported in the form of a benefit-cost ratio (benefits divided by costs) or net value (benefits minus costs). Interpreting these measures is straightforward: a benefit-cost ratio greater than 1.0 and (for net value) a plus sign means the program is economically efficient.

### **Describe the Distribution**

Describing the distribution of program costs and benefits involves identifying who gained and who lost from the program; for example, program participant, funding agency, or taxpayer in general. This is an assessment of equity or fairness in the distribution of program costs and benefits. For a program that achieved a desirable benefit-cost ratio or net benefit, future funding may also depend on which parties received the benefits.

### **Conduct Sensitivity Analyses**

This step is used to check the validity and to test the effects of variations in assumptions made in an economic analysis. A typical sensitivity analysis involves the use of a range of discount rates in the calculation of present value. Barnett and Escobar (1987, p. 391) note that, “Sensitivity analysis can be used to indicate the range of values within which assumptions can be safely ignored or the specific conditions that must be found or produced if a policy or program is to yield the desired results.”

## **Economic Analysis Findings**

Discussions of the economic efficiency of crime prevention programs can be very persuasive and have gained wide appeal in political, policy, and, more recently, academic settings. However, because relatively little is known about the economic efficiency of developmental crime prevention or crime prevention in general (Welsh & Farrington, 2000b; Welsh, Farrington, & Sherman, 2000), there is a need for caution in making general claims of cost savings or cost-

effectiveness. The same situation faces other areas of social intervention such as child and adolescent mental health (Knapp, 1997) and substance abuse (Plotnick, 1994; Rajkumar & French, 1997; Bukoski & Evans, 1998).

This section summarizes findings of benefit-cost analyses of leading developmental crime prevention programs. The Elmira (New York) Prenatal/Early Infancy Project (Olds et al., 1997) and the Perry Preschool program (Schweinhart, Barnes, & Weikart, 1993) are two of the programs reviewed. These programs were chosen because they are the two most methodologically rigorous developmental prevention programs that have measured delinquency/crime outcomes and have assessed monetary costs and benefits. As well, they have both been the subject of external benefit-cost analyses conducted by the RAND Corporation (Karoly et al., 1998) and the Washington State Institute for Public Policy (Aos et al., 1999). This is a particularly rare feature in this area. A third high quality study, the Participate and Learn Skills program (Jones & Offord, 1989), the only known Canadian program meeting the criteria for inclusion, is also reviewed.

The Elmira program randomly allocated 400 disadvantaged mothers either to receive home visits from nurses during pregnancy, or to receive visits both during pregnancy and during their children's first two years of life (the program group), or to a control group that did not receive visits. Home visits provided advice about child health and development and improving the life course development of the mothers. One of the desirable findings thirteen years after the completion of the program was that fewer program group mothers, compared to their control counterparts, were identified as perpetrators of child abuse and neglect (Olds et al., 1997). Also, at age 15, children of the higher risk mothers in the program group reported fewer arrests than their control counterparts (Olds et al., 1998).

A benefit-cost analysis of the Elmira program by Olds and his colleagues (1993) two years after the program ended or when the children were four years of age, found that, for the higher risk mothers, program benefits slightly outweighed costs, for a benefit-cost ratio of 1.06. For the whole sample (higher and lower risk mothers), program costs exceeded benefits, resulting in an undesirable benefit-cost ratio of 0.51.



Karoly et al.'s benefit-cost analysis of the Elmira program at the most recent assessment of 13 years post-intervention, which measured program effects on children's delinquency and mothers' life course development, found a favorable benefit-cost ratio of 4.06 for the higher risk sample and an unfavorable ratio of 0.62 for the lower risk sample.<sup>2</sup> This analysis was limited to savings to government in the form of reduced criminal justice costs and health care and social service usage costs and increased tax revenue.

Aos et al.'s benefit-cost analysis of the Elmira program focused on the higher risk sample at 13 years post-intervention. Criminal justice system and crime victim benefits were found to cover program costs, for a benefit-cost ratio of 1.54. The difference between the benefit-cost findings of Karoly et al. and Aos et al. is largely attributed to the former including non-crime benefits, which made up the majority of the benefits of this program.

The Perry Preschool program allocated (approximately at random) 123 disadvantaged children, ages three to four, to experimental and control groups. The experimental children received active learning preschool programming administered by professional teachers for two years. Weekly home visits were also carried out by the teachers to provide parents with educational information and to encourage parents to take an active role in their child's early education. At the most recent assessment at age 27 or 22 years post-intervention, compared to the control group, experimental group members showed a number of benefits across a range of pro-social functioning indicators, including criminal behavior, education, and social service usage.

A benefit-cost analysis of the Perry Preschool program by Barnett (1993) at the most recent assessment, found that for every dollar spent on the program over seven dollars was saved to taxpayers and crime victims, for a benefit-cost ratio of 7.16. Karoly et al.'s benefit-cost analysis of Perry, when subjects were age 27, found that the program produced a desirable benefit-cost ratio; however, their calculated ratio of 2.09 was substantially less than the ratio of 7.16 calculated by Barnett. This was because Karoly and her colleagues examined benefits from the perspective of government only; savings to crime victims, which accounted for the majority of Perry's benefits in the benefit-cost analysis by Barnett, were not included. Aos et al.'s benefit-cost analysis of Perry, also at the age 27 follow-up, found that criminal justice sys-

tem and crime victim benefits covered program costs, for a benefit-cost ratio of 1.50. The exclusion of non-crime benefits and intangible victim costs avoided (e.g., pain, suffering, lost quality of life) reduced the measured economic efficiency of the Perry program.

The Participate and Learn Skills program was implemented in a public housing complex in Ottawa in the early 1980s. The program centered on non-school skills, both athletic (e.g., ice hockey) and non-athletic (e.g., music). The aim of developing skills was to increase self-esteem, to encourage children to use time constructively, and to provide desirable role models. The study employed an experimental-control design with before-after measures to assess the effects of the program. Children were distributed evenly over gender and over ages five to 15 years at both sites, and rates of participation in the program were high. The strongest program effect was found for juvenile delinquency.

A benefit-cost analysis produced a desirable benefit-cost ratio of 2.55. The calculation of monetary benefits included only those areas where significant differences were observed between the experimental and control complexes: fewer police charges against juveniles, reduced private security reports, and reduced calls for fire department service. Altogether, benefits were estimated for four publicly-funded agencies: police, housing authority, community center, and fire department.

Over the course of 48 months (the intervention and follow-up periods), program costs totaled \$258,694 and benefits were estimated at \$659,058 (in 1983 Canadian dollars). The city housing authority reaped the largest share of the benefits (84% or \$552,118), a result of the reduced demand for private security services in the experimental housing complex compared to the control complex. The next largest portion of the total benefits from the program were realized by the city fire department (13% or \$88,416). Monetary benefits accruing to the youth liaison section of the city police were relatively small (2% or \$11,758).

Aside from the findings, a number of key points can be distilled from these benefit-cost analyses. First, non-delinquency or so-called spin-off benefits can account for a substantial portion of a program's total benefits. Karoly et al.'s (1998) benefit-cost analysis of the higher risk sample of the Elmira program found that savings to the criminal justice system accounted

for just 20% of total benefits. Reduction in welfare costs (57%), reduction in health services (less than 1%), and taxes from increased employment (23%) made up the remaining benefits.

A second point is that benefits were estimated conservatively, while costs were often taken account in full. This has also been found to be the case in benefit-cost research on situational crime prevention (Welsh & Farrington, 1999) and correctional intervention (Welsh & Farrington, 2000a). It is likely that this has much to do with uncertainty researchers hold in monetizing certain outcomes, not to mention the perspective (e.g., government/taxpayer) they adopt in their benefit-cost analysis. A final point deserving of attention is that benefit-cost analyses of developmental crime prevention programs and crime prevention programs in general (Welsh & Farrington, 2000b) often do not assess intangible savings to crime victims (e.g., pain, suffering, lost quality of life). For successful programs, this has the effect of reducing significantly the benefits side of the equation and hence reducing overall program economic efficiency. The lack of existing estimates of intangible costs to crime victims, which first appeared in the published literature in Cohen (1988), and the doubts of many researchers about the validity of these costs and/or the underlying theory used in their calculation (Zimring & Hawkins, 1995, p. 138) has undoubtedly contributed to its omission in benefit-cost analyses.

### **Issues for the Design of a Model Methodology for Economic Analysis**

From the limited economic evaluation research on developmental crime prevention and crime prevention in general (Welsh & Farrington, 2000b), it should come as no surprise that few governments have set up any type of approach or methodology to assess value for money of publicly-funded programs. The United Kingdom (Dhiri & Brand, 1999) and the State of Washington (Aos et al., 1998, 1999) have recently developed models to assess the economic efficiency, both independent and comparative, of different crime prevention programs. Also, in the United States, at the national level, the Office of Juvenile Justice and Delinquency Prevention has initiated a program of research to develop a standard methodology for conducting benefit-cost analyses of juvenile offender treatment programs.<sup>3</sup> The UK and Washington State models and the above sections of this paper will be drawn upon to identify key issues that should be considered in the design of a model methodology for economic analysis of developmental crime

prevention programs in Canada.

### **Benefit-Cost or Cost-Effectiveness Analysis**

The desired outcome of the national model will largely dictate the type of economic analysis technique to be used. If the interest is in assessing if programs pay back costs (i.e., was the effect of the program worth the cost of the program), then a benefit-cost model needs to be employed. If, on the other hand, the interest is in assessing which program, among similar programs, produced the lowest cost per crime prevented, then a cost-effectiveness model can be employed.

The UK model employs a combination of benefit-cost and cost-effectiveness analysis: the contracted researchers perform cost-effectiveness analyses of the programs they are evaluating and then the Home Office performs benefit-cost analyses of the programs (Dhiri & Brand, 1999, p. 8). This allows for an assessment of the independent and comparative economic efficiency of the programs.

The Washington State model employs a benefit-cost model; however, this model differs substantially from the UK model. In the first place, the Washington State model uses published evaluation studies of crime prevention programs. It then applies a standard methodology to measure programs costs and benefits. Program costs are measured by choosing Washington State as a reference point. This allows for a detailed cost analysis to be conducted of the costs the state would incur to pay for the programs had the programs been implemented in the state (some programs are based in the state). Program benefits are then measured in a standard way, and in a similar way to how the UK model plans to measure benefits.<sup>4</sup> Benefits are limited to the outcome of crime in the form of financial costs (or savings) to Washington State taxpayers (e.g., from police arrests, court processing, prison) and tangible costs (or costs avoided) to victims of crime. The use of a standard methodology for assessing program costs and benefits allows for like-with-like comparisons of the economic efficiency of different crime prevention programs.

### **Methodological Rigor of Outcome Evaluation**

Perhaps the most important issue facing a national economic evaluation model is the

methodological quality of the research designs of the programs to be assessed under the model. This is because an economic analysis is only as convincing as the evaluation upon which it is based. In short, the stronger the research design of the outcome evaluation, the more confidence that can be placed in the findings of the economic analysis. As noted above, some researchers (e.g., Weimer & Friedman, 1979) recommend that the cut-off point for performing economic analyses be set at experimental or strong quasi-experimental designs. Anything less will reduce the confidence that can be held in the economic findings.

This is a particularly difficult issue, since the use of randomized controlled experiments or even the establishment of control groups may not be possible for a variety of reasons, including community or political resistance, a “treat all” approach of the intervention, methodological issues (e.g., small sample size, the likelihood of), and financial cost. Simple one-group (no control group) pre-post evaluation designs are better than nothing at all, but attributing reported claims of effects on crime, whether desirable, undesirable, or unchanged, to the program is confounded by many potential rival hypotheses. The addition of a control group, preferably one that is equivalent to the treatment group, increases substantially the ability to make a valid inference of cause and effect. The equivalent control group design — program group compared with comparable control group, measuring pre-post and experimental-control comparisons — has been recommended as the minimum research design for evaluating crime prevention programs (Sherman et al., 1997, 1998).

It is beyond the scope of this paper to discuss the many possible avenues for strengthening initially weak evaluation designs, but reference should be made to the important writings on research evaluation methodology in general (Campbell & Stanley, 1966; Cook and Campbell, 1979) and in the context of developmental interventions at the community level (Farrington, 1997; Sherman, 1997; Catalano et al., 1998). Just focusing, however, on the establishment of a control group when faced with, for example, a “treat all” approach, a number of options are available to the researcher, including the use of time-lag recruited no-treatment control groups or wait-list control groups in which the full sample eventually receives the intervention (see e.g., Webster-Stratton & Hammond, 1999).

The approaches taken to evaluation research design in the Washington State and UK models are not overly helpful for the present purposes. In the case of Washington State, the benefit-cost model was applied to programs that had been evaluated with high quality research designs, typically randomized experimental designs. However, the use of high quality published evaluation studies differs greatly from dealing with “real-life” community-level programs where the commitment to methodological rigor may not be so great. In the case of the UK model, the guidance document (Dhiri & Brand, 1999) prepared to assist researchers in performing cost-effectiveness analyses of crime prevention programs offers researchers with the following on evaluation design: “evaluations need to be conducted to a sufficient standard to ensure that the cost-effectiveness information ... can support strategic decisions” (p. 7).

### **Unit Monetary Costs of Crimes**

Another key issue to be addressed in the design of a model methodology for economic analysis is the development of unit monetary costs of the major property and violent crimes (e.g., burglary, robbery, child abuse, sexual assault). Without unit costs of the different crime types that will be measured in evaluations of crime prevention programs, there will be no way to value crimes saved or prevented. For the purpose of comparing different crime prevention programs, these unit costs will need to be uniform.

In the U.S., Miler, Cohen, and Wiersema (1996) developed estimates of the unit monetary costs of the major property and violent crimes, based on average losses to crime victims. Their estimates include tangible or direct losses due to property damage and loss, medical care (e.g., treatment, emergency transport), mental health care (e.g., services provided by psychiatrists, psychologists, and social workers), victim and social services (e.g., shelters), productivity (e.g., lost wages), and police services (i.e., initial response and follow-up investigation) (Miller et al., 1996, pp. 10-14). Intangible or non-out-of-pocket losses such as pain, suffering, and lost quality of life, were also included in their estimates. Their estimates did not, however, include the full costs associated with society’s response to victimization; for example, expenses to courts and corrections agencies for processing and punishing offenders and costs incurred by the public for private security such as alarm systems were not included.

What categories of losses to include or not to include in the development of estimates of unit monetary costs of crimes will depend on the perspective (e.g., government/taxpayer, crime victim) to be adopted in the economic analysis. One of the more controversial issues of economic analysis is the inclusion of intangible victim costs. This is at least in part because of the large estimates that have been produced for victim costs (Cohen, 1988, 1998; Miller et al., 1993, 1996; Cohen, Miller, & Rossman, 1994), but especially because of the methodology used (Zimring & Hawkins, 1995, Chapt. 7). In developing estimates of the costs of different crimes, it will be important to weigh the evidence on the opposing sides of this issue.

### **Standard List of Costs and Benefits**

A standard list of costs and benefits would greatly facilitate comparisons of the benefit-cost findings of different types of crime prevention programs. The need for such a list is perhaps more relevant to the evaluation planning stage than to the development of an overall framework for economic analysis. But, as with the development of estimates of the unit monetary costs of different crimes — for the purpose of being able to value the potential benefits of crimes saved — there is a need to plan for a similar program of research to develop estimates of other potential program effects, as well as for standard estimates of program resource used (costs).

For program costs, both operating and capital costs should be included (although not all programs have capital expenditures). For operating costs, all of the human and physical resources consumed in administering and running the program should be assessed. These typically include staff salaries and benefits, overhead, supplies, and transportation. For capital costs, all of the resources consumed by fixed items should be assessed. These typically include program facilities and technical hardware. Where applicable, payments on capital expenditures and debt charges on loans also need to be included.

On the benefits side, at minimum, program effects on delinquency and later offending should be measured. An assessment of crime benefits should focus on affected agencies within the criminal justice system (e.g., police, courts, corrections) and crime victims and their families. Other key outcome variables that should be measured include substance abuse,

education, employment, health, and family factors. In the case of education, for example, benefits should be assessed for schooling expenses (e.g., remedial classes, support services) and educational output (e.g., high school completion, enrollment in college or university). Other outcome variables such as conduct problems in early childhood should also be measured.

### **Prospective or Retrospective Economic Analysis**

Prospective economic analyses have many advantages over retrospective ones. The most important advantages of carrying out economic analyses prospectively are: first, the ability to establish with participating agencies procedures for collecting program costs (collecting thorough cost data after-the-fact can be very difficult) and, second, the ability to plan ahead of time data collection needs for the monetization of program effects (for benefit-cost analyses). To the former point, Dhiri and Brand (1999, p. 8) add: “A failure to capture the full costs of intervention has partly been the result of a tendency to estimate the cost of inputs retrospectively ... rather than by routinely collecting data during the implementation period.” The best way to ensure economic analyses are carried out prospectively is to include, as part of the original research design of the program, provision for an economic analysis.

### **Issues for a Guidance Document**

The above issues are important to address in the design of an overall methodological framework for a program of economic evaluation research. Many other important issues face economic evaluation research, such as the decision to use marginal or average costs and benefits, the level of discount rate to be used, how to value capital expenditures of a program, and so on. But these issues become more relevant at the evaluation planning stage. A guidance document like the one prepared to assist researchers in assessing the cost-effectiveness of crime prevention programs under the UK’s “Crime Reduction Programme” (Dhiri & Brand, 1999) will be critical to establishing a standard methodology (so different programs can be compared) and will be helpful to evaluators unfamiliar with economic evaluation methodology.



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## **Notes**

1. For more information on these steps, see Barnett (1993, 1996) and Barnett and Escobar (1987, 1990), as applied in the context of early developmental prevention programs. As well, for methodological features of benefit-cost analysis in general, see the excellent text by Layard and Glaister (1994) and article by Prest and Turvey (1965).
2. Karoly et al. (1998) reported on analyses of higher (unmarried and low SES) and lower (two-parent or higher SES) risk samples, while Olds et al. (1993) reported on analyses of the higher risk sample and the sample as a whole (higher plus lower risk).
3. At the time of writing, no information on the findings of this program were known to have been published.
4. At the time of writing, no program was known to have been the subject of a benefit-cost analysis under the UK model.