AUSTRALIAN INSTITUTE OF CRIMINOLOGY

trends & issues

in crime and criminal justice

No. 147

Benefit-Cost Analysis and Crime Prevention

John Chisholm

Governments have long used cost-benefit analysis and related techniques to determine whether infrastructure such as roads or dams should be constructed. Cost-benefit analysis in crime prevention is a relatively new field—it has rarely been used even though crime costs the Australian community approximately $18 billion per year; that is, 4 per cent of Gross Domestic Product (GDP).

This paper outlines techniques of cost-benefit analysis and gives some evaluated examples in crime prevention. These are mostly overseas examples, as Australian analysis is in its infancy. It may be the case that a dollar spent on early childhood development will yield a greater net benefit than the same dollar spent on an additional prison cell.

Not all early intervention programs are necessarily cost effective. This paper cites the (American) Perry Preschool Program which, for every dollar spent on the program, the community gained roughly $7 work of benefits in crime reduction and improvement of life opportunities. It also cites the Hawaii Healthy Start Program which, for every dollar spent, yielded a benefit of only 38 cents.

In situational crime prevention, the measurements are easier and more direct. In the (British) Kirkholt housing estate, every £1 spent on a burglary reduction program yielded £5 in savings, while in an Australian study, every dollar spent by the Victorian Totalizator Agency Board (TAB) yielded a $1.70 benefit in reduced robberies.

As crime imposes considerable costs on society in terms of financial, emotional, and opportunities forgone, identifying and investing in effective programs is a winning strategy.

Adam Graycar
Director

The Australian Institute of Criminology has estimated that the annual costs of criminal events for 1996 in Australia were between $11 billion and $13 billion. Given the difficulty in attaching dollar values to the intangibles, this figure is most likely to be an underestimate. Nevertheless, it still represents a considerable loss to society, in the order of 2.5 per cent of Gross Domestic Product (GDP). When the money spent on intervention and prevention, including criminal justice and security industry activities, the above figure is increased by a further $8 billion dollars a year (Walker 1996).

The bottom line is that crime and the methods used to prevent it are costly. What is important for society as a whole, and policy makers in particular, is to ensure that scarce tax dollars, that could be used for a host of competing alternatives, are efficiently allocated to effective programs or policies. This does not necessarily mean that resources should be allocated to those crime prevention initiatives that are most effective in reducing the level of crime, but that additional tax dollars be allocated in such a way to maximise the return (lower crime) per dollar spent. A relevant technique, developed by economists in the 1930s, used to determine the efficient allocation of resources is benefit-cost or cost-benefit analysis (CBA).

What is Benefit-Cost Analysis?

In its strictest form, social benefit-cost analysis represents a conceptual framework for evaluating and comparing various investment projects within the government sector, for example more prison beds or more nurses for prenatal home visits. Benefit-cost analysis and

February 2000

ISSN 0817-8542
ISBN 0 642 24139 2

Australian Institute
of Criminology
GPO Box 2944
Canberra ACT 2601
Australia

Tel: 02 6260 9221
Fax: 02 6260 9201

For a complete list and the full text of the papers in the Trends and Issues in Crime and Criminal Justice series, visit the AIC web site at:

http://www.aic.gov.au

closely related techniques such as cost-effectiveness analysis can be used:

- to find the greatest benefit for a given budget,
- to determine the optimal amount to be spent on a project, and
- as a guide to project selection or maintenance.

There are two major types of cost-benefit analyses that can help government in resource allocation decisions. Ex-ante CBA, the common form of CBA, has a direct and immediate impact for assisting governments in making decisions about the allocation of scarce resources. Ex-post CBA analysis is undertaken after a program is up and running. This type of CBA can not directly and immediately inform governments about resource decisions, because costs are already sunk. However, they are particularly useful, especially in the area of crime prevention, because the effectiveness of a program can be better gauged and subsequent benefits can be more readily calculated. The feasibility, or otherwise, of replicating the program elsewhere, may also be more apparent.

Benefit-Cost Analysis in Practice and the Importance of Evaluation

Very few crime prevention programs, practices, or policies have used benefit-cost analysis. The main reason for this is because of a lack of rigorous program evaluation, which provides the necessary foundation for benefit-cost analysis. In order to determine the monetary benefits that stem from a reduction in crime, a program must provide estimates of its effectiveness in reducing the level of crime. Although before and after comparisons can be useful, for most programs the only truly effective method of determining a program's overall effectiveness is via an experimental or quasi-experimental research design (Ekblom & Pease 1995). Essentially, all benefit-cost analyses of crime prevention programs and practices are only as good as the underlying evaluation they are based upon.

If an adequate evaluation is available, and evaluations should be designed to provide the relevant information for benefit-cost analyses, then what are the steps in carrying out a benefit-cost analysis? These steps are listed below (Barnett 1993).

It is important to emphasise that while this list, together with the examples provided below, may make benefit-cost analysis appear simple, this is certainly not the case. Issues such as what the appropriate value of the social discount rate should be (for instance, what the cumulative discounted savings and costs over time should be), how to quantify the values of life and limb, and what benefits to include, all combine to make the actual task of evaluating a crime prevention program using benefit-cost analysis extremely difficult. As one author put it "there are everywhere pitfalls for the unwary" (Mishan 1971, p. 1). Or, as another analyst put it: "Estimating the social costs and benefits of competing transportation or environmental polices is no analytical picnic. But estimating them for imprisonment and other sentencing [or crime prevention] options is a certain analytical migraine" (DiIulio & Piehl 1995). The next section turns to some real-world examples of crime prevention programs that have been evaluated using benefit-cost analysis.

Benefit-Cost Analyses of Crime Prevention Programs

Crime prevention can be construed as a time continuum, with pre-natal intervention at one extreme and incarceration at the other. In between these extremes lie an array of social and developmental programs for early childhood, juvenile (both delinquent and non-delinquent), and adult offenders. Moreover, there are the many situational programs that can either be directly targeted at specific offenders (by offence type

Standard Procedures for Conducting a Cost-Benefit Analysis

Define the scope of the analysis.
Establish the range of benefits to compare and identify the limits of the comparison.

↓

Obtain estimates of program effects (comparing control and treatment groups before and after).
The benefits of a program are obtained from the effectiveness of the program.

↓

Estimate the monetary value of all costs and benefits.
The central tenet of any cost-benefit analysis is the estimation of the monetary value of program effects.

↓

Calculate the present value and assess profitability.
Account for inflation and the time value of money by discounting the stream of all costs and benefits over time using the social discount rate.

↓

Describe and incorporate the distribution of costs and benefits.
Although a positive net present value tells us that the program was profitable for society as a whole, it reveals nothing about who actually gains and loses.

↓

Conduct sensitivity analysis.
Estimating the costs and benefits of a crime prevention program relies upon certain assumptions, for example the effectiveness of the program and the cost of crime. Sensitivity analysis alters these assumptions and tests whether or not the program is still cost-beneficial.

or age) or targeted more generally at reducing crime rates.

Examples of Cost-/Benefit-Analysis in Crime Prevention

Early Childhood Programs

The recent release of a report to the Minister of Justice and Customs, published by the National Crime Prevention (1999), has confirmed Australia's commitment to the international trend towards increased reliance upon early childhood programs as an effective means of crime prevention. There are at least two important points with respect to this movement. First, the success of the early childhood programs that have formed the basis for the current resurgence; for instance, the Perry Preschool Program and the Elmira Early Infancy Project (Schweinhart et al. 1993, Olds et al. 1997) were not primarily designed to prevent crime. Rather, they were established as a way of increasing the life chances of socio-economically disadvantaged children, via better health, education, and employment. Second, the effectiveness of these programs does not tell us anything about their relative efficiency in terms of reducing crime in a cost-effective manner.

In response to the first of these points, it should be made clear that, by definition, a social benefit-cost analysis should consider *all* the social costs and benefits of a proposed program. Subsequently, if an early childhood program produces ancillary benefits beyond a reduction in criminal involvement, then these should be incorporated into the analysis. If the results from a benefit-cost analysis are fully transparent, future researchers will be able to recalculate the original results and be able to estimate benefit-cost ratios for specific benefits, for example, a reduction in criminal involvement or lower school dropout rates.

Both the Perry Preschool Enrichment Program and the Elmira Nurse Home Visitation Program have been well evaluated. Moreover, both have been analysed rigorously using benefit-cost analysis. *The results from these studies were both positive, in other words, the quantified benefits outweighed the costs of the program.* However, the study by Olds et al. (1997) indicated that the project was only cost-beneficial for high-risk families. Those factors considered as characterising a family at high risk included mother being younger than 19 years, unmarried, and / or of low socio-economic status.

The results from these studies showed that society can obtain positive social and financial gains from well-implemented early intervention programs. However, other early childhood programs have not always been so cost-effective. Among the less successful programs was the Hawaii Healthy Start Program (Earl 1995). This illustrates the importance of applying benefit-cost analysis, since not all early childhood programs are effective and / or efficient.

The Hawaii Healthy Start program consisted of home visits by nurses for mothers prior and post birth. It offered a range of services, assistance, and support for disadvantaged families. The benefit-cost ratio in terms of reduced child abuse and neglect was found to be 0.38. Thus, for every dollar spent on the program, only 38 cents worth of benefits were gained.

Perry Preschool is a two year pre-school enrichment program for children in poverty, it involves weekly home visits by a teacher. Its most recent evaluation (Schweinhart et al. 1993) estimated the costs and benefits of the life outcomes of participants at age 27.

Measuring a range of benefits stemming from both a reduction in crime and a general improvement in life opportunities*, the program was found to be cost-beneficial. The benefit-cost ratio was estimated to be 7.16. Thus, for every dollar spent on the program, society and / or program participants gained roughly $7 worth of benefits.*

An economic evaluation (Aos et al. 1998) of the benefits of the Perry Program in terms of criminal justice and victim costs avoided *revealed a benefit-cost ratio of 2.16. Thus, for every tax dollar spent on the program, it is estimated that society and potential victims of crime will save approximately $2 in future avoided costs.*

The Prenatal / Early Infancy Project (PEIP), commonly referred to as the Elmira program, involved both prenatal and postnatal visits by nurses to economically disadvantaged first-time mothers and their children in semi-rural homes around Elmira, New York. The program targeted those women considered to be at high risk for poor child and family outcomes. These were further disaggregated into high and low risk.

Approximately ten separate papers have reviewed different measurable outcomes from the program, including maternal welfare dependence, criminality, child abuse and neglect, and substance abuse. Some of these have contained a cost-benefit analysis. In particular Olds et al (1997) found that benefit-cost ratios was 0.51 for all families, and 1.06 for low-income families. The bulk of savings came from decreased reliance upon welfare payments.

The RAND study by Greenwood et al. (1996) found that the cost-savings to governments from the Elmira program for high-risk families ranged between 0.62 and 4.05. Thus, under certain circumstances, for each dollar invested by governments in the program, it saved them over $4.00 down the track.

Juvenile Offender Programs

Juvenile offender programs are designed to "treat" offenders who are already in the criminal justice system. These programs have the clear objective of reducing further delinquent and / or criminal behaviour. Unlike many other crime prevention programs that have a range of measurable outcomes, juvenile offender programs are primarily concerned with the gains from reductions in just one outcome, that is, the future criminal justice costs and / or victim costs. Of course, this does not preclude the possibility of measuring and including ancillary benefits, but to date studies have not generally done so.

Lipsey (1984) was among the first to apply cost-benefit analysis to juvenile delinquency programs. Rather than targeting one program, he developed a model to determine the benefit-cost

ratios across a collective range of delinquency programs in Los Angeles County. In arriving at these estimates, he obtained information on delinquency risk factors, the success rate of various programs, and the cost differential between these programs and the criminal justice system. Lipsey obtains estimates of the average cost of a juvenile offence in terms of both criminal justice costs and victim costs. Lipsey suggests that this information can be used by governments to estimate potential savings to potential victims or the criminal justice system, or both.

The Los Angeles County delinquency prevention program consisted of 13 joint regional projects. In 1984, these programs treated roughly 10,000 youths per year. Generally, treatment consisted of a 10-week family counselling service provided by a range of community services.

Lipsey (1984) estimates a range of collective cost-benefit ratios for these programs. These range from 0.17 to 8.79. However, the most likely range for the benefit-cost ratio is between 0.82 and 1.40. Thus, taking the average of these two likely estimates the cost-benefit ratio is 1.11. Thus, for every dollar the government invests in delinquency prevention programs, they will save $1.11 in reduced criminal justice and victim costs.

The Washington State Institute of Public Policy has recently completed an in-depth economic analysis with particular emphasis upon the cost-savings to taxpayers and crime victims (Aos et al. 1998). This report found that Functional Family Therapy (Alexander & Parsons 1973) and Aggression Replacement Training (Goldstein et al. 1998) were among the most cost-effective programs. Based on this evidence, the Washington State Juvenile Courts chose these two programs to be implemented on a large scale towards the end of 1998. Some of the reasons why these programs represent a promising means of reducing crime and delinquency include:

- These programs usually begin with a clear objective prior to implementation.
- Because the timing of this intervention allows offenders to be readily identified, problems that plague early intervention, such as decay and targeting, are not so detrimental.
- The nature of the intervention is conducive to a strong research design that facilitates rigorous evaluation.

Family Functional Therapy is a family intervention program which aims to change the maladaptive behaviours of high-risk youth and families by reducing personal, societal, and economic hardship.

An economic evaluation (Aos et al. 1998) of the benefits of the Family Functional Therapy program in terms of criminal justice costs and victim costs avoided revealed a benefit-cost ratio of 10.99. Thus, for each dollar spent on the program, society gained around $11 in benefits.

Non-Juvenile Offender Programs

Non-juvenile offender based programs, like the Quantum Opportunities Program (Hahn 1994), Big Brothers / Big Sisters of America (McGill 1998), and Job Corps (Long et al. 1981), typically try to alter a diverse range of behaviours including substance abuse, teenage pregnancy, academic performance, and employability. Adolescent programs have also sought to measure their effectiveness in reducing delinquent and anti-social behaviour. It is important to note, however, that adolescent programs do not specify a reduction in crime and delinquency as the primary objective of the program. Nevertheless, like both the Perry Preschool and Elmira programs, these *three non-juvenile offender-based programs were shown to be cost-beneficial*. In terms of their effectiveness in preventing crime, it should be recognised that, in contrast to preschool enrichment and nurse home visit programs, the beneficial result of adolescent programs often accrue within just a few years of the program's implementation.

Based on cost-benefit / effectiveness and economic analyses, adolescent programs (both juvenile and non-juvenile), particularly those targeted at high-risk youth, can be financially sound investments. This observation does not necessarily imply that they should represent substitute programs for early intervention, but rather that they should act as a complimentary program. To this end, where there are problems associated with decay and targeting, adolescent programs can be used as a "booster shot" for an equally important phase of development and transition point, that is, the onset of adolescence.

The Quantum Opportunities Program consisted of a four-year intervention program for disadvantaged high-school youth. Initiatives included mentoring, tutoring, life skills, and financial incentives (Hahn 1994).

The program was found to be cost-beneficial with a ratio of 3.04, suggesting that for each dollar spent on the program, society and the individual gained roughly $3 worth of benefits.

Situational Crime Prevention

Situational crime prevention initiatives lend themselves more readily to benefit-cost analysis than any other type of crime prevention strategy. The reasons for this include the comparative ease by which cost-estimates of the program's hardware and labour can be obtained, the crime specific target of many programs, and the reliance on a comparatively inexpensive before and after evaluation method.

Two examples of situational crime prevention programs are the Kirkholt Burglary Prevention Project (Forrester et al. 1990) and the cash reduction and robbery prevention in the Victorian TAB (Clarke & McGrath 1990). *Both were shown to return a net benefit, that is, the financial outlays were less than the financial gains in terms of reduced burglaries and robberies*. However, it is important to recognise that if such factors as displacement (for example, offenders may target areas not covered by the program) were accounted for, these net benefits would almost certainly be reduced.

The Kirkholt housing estate (2,280 dwellings) near Rochdale in the UK experienced a high level of burglary during the mid-1980s. To counter this problem a multi-prevention approach, involving two phases of mainly situational crime prevention initiatives, was implemented. The first phase adopted a range of victim-focused prevention initiatives, for example, target hardening and target removal. The second phase adopted a range of offender and community based crime prevention initiatives, for example, a neighbourhood watch system.

Forrester et al. (1990) carried out a cost-benefit analysis of the Kirkholt Project. It was shown that the program would lead to considerable cost savings from reduced burglary victimisation. The estimated cost-benefit ratio was 5:04. Thus, for every pound spent on the program, it would lead to a saving of around 5 pounds in reduced burglary costs.

Beginning in the early 1980s, the Victorian TABs introduced an array of target hardening measures, for example, main safes fitted with time locks. The purpose of this situational crime prevention measure was to reduce the increasing level of robbery. A benefit-cost analysis (Clarke and McGrath 1990) revealed a ratio of 1.71, for instance, for every dollar spent on cash reducing hardware, the TABs saved $1.70 from reduced robberies.

Correctional Intervention and Prevention

In the absence of an effective early intervention, juvenile, or situational crime prevention program, society can turn to correctional programs. Two areas where correctional programs are commonly used are in treating drug dependent users and sex offenders. Caulkins et al. (1997) have analysed the effectiveness of certain facets of a "zero tolerance" approach including law enforcement and longer sentences, for cocaine abuse in the US. Their findings suggested that, *for each additional $1 million spent, imposing longer sentences would reduce drug consumption by only half as much as conventional enforcement and sentencing, and only one-eighth as much as treatment of heavy users*. These finding are supported by the benefit-cost studies of the California Drug Treatment Program (Gerstien et al. 1994). This drug treatment program provided various forms of substance abuse treatment to 3,055 adults. Although the program's experimental design was quite weak, as it was based on a before and after comparison, it nevertheless, produced a large number of benefits. These included cost savings from reduced criminal activity—both victim expenses and criminal justice system expenses, increased employment earnings, and improved public health care. The program primarily provided treatment to persons in their 30s for a period of approximately 3 months. The follow up of 15 months revealed a cost-benefit ratio of 7.14 (Gerstein et al. 1994).

The California Drug and Alcohol Treatment Assessment represents a real life drug treatment program. It provided various forms of substance abuse treatment to 3,055 adults.

Gernstien (1994) applied a cost-benefit analysis to this program, which accounted for a number of benefits. After taking into consideration the program costs, a cost-benefit ratio of 7.14 was estimated. Thus, for every dollar invested in the program, society and the treated individual gained around $7 worth of benefits.

Cost-benefit analysis of sex offender treatment programs has been limited. The sole Australian study (Donato & Shanahan 1999) found that even with conservative assumptions, for example a single victim, *a sex offender treatment program based upon a cognitive behavioural therapy with relapse prevention was cost-beneficial*. This is supported by the findings from Prentky and Burgess (1990) who also found sex offender treatment programs to be cost-beneficial.

Donato and Shanahan (1999) investigated the costs and benefits of a representative, rather than a single "real life" sex-offender treatment program. This consisted of a combination of cognitive behavioural therapy with relapse prevention. The results from this study, based upon the assumption of one victim, indicated that the program was cost-beneficial. Best estimates of the level of effectiveness, in terms of reduced recidivism, resulted in a benefit-cost ratio of 7.47. Thus, for each dollar spent on the program, society would gain roughly $7.5 dollars worth of benefits.

Conclusion

To date, the application of benefit-cost analysis to crime prevention has been limited. However, given its importance as a guide for financial accountability, its application is likely to increase. There are a number of suggestions regarding this increased future application that should be made. Primarily, there is a growing need to investigate the current procedures being used for allocating scarce tax dollars to crime prevention programs, practices, and policies. If funds were allocated on an ad hoc basis, then there would be a stronger case for using benefit-cost analysis as guidance for the funding decisions. Whilst reliable benefit-cost analysis can be used to determine which programs give the "biggest bang for the buck", it is just as important to be aware of the many hidden dangers that accompany bottom line benefit-cost ratios. To ensure accountability on behalf of those program practitioners who use benefit-cost analysis, it is imperative that the results from any benefit-cost analysis be fully transparent. By this, it is meant that all results should be able to be subjected to ex-post examination to check their validity. Given the important role that the underlying program evaluation plays in carrying out benefit-cost analysis, it is also recommended that some sort of combined scale for ranking alternative crime prevention programs should be developed. Possible components of this scale would include the benefit-cost ratio itself, together with specific information about the program, including sample size, attrition rates, follow-up period and, most importantly, the type of experimental research design that was used to determine the effectiveness of the program. Even when all these factors are taken into account, it still remains important to scrutinise the implementation process of a crime prevention program. Just as a benefit-cost analysis of the efficiency of a program is only as good as its

underlying evaluation, an evaluation of the effectiveness of a program is only as good as its underlying implementation. The age-old adage that something is only as good as its weakest link also applies for benefit-cost analysis.

Cost-efficient crime prevention involves spending on those projects that are either more effective at reducing crime for a given expenditure or provide benefits in excess of their costs. Having said this, governments and policy makers need to be aware of two important issues. First, they should avoid putting all of their eggs into one basket, and chose a more diversified crime prevention portfolio. Second, they must accept that, for certain types of programs, the benefits may be realised beyond their term of office. Indeed, benefit-cost analysis can serve as a useful tool for governments facing elections, as well as for alternative governments. In the first instance, it can be used to show a future commitment towards accountability. For those in power, it can be used to justify expenditure on various forms of crime prevention. Governments who have funded various long-term crime prevention programs in previous terms of office can also point to benefit-cost analysis to show the public that it was money well spent. The bottom line is that for something as important and costly as crime, all types of governments should be guided by the long-term social costs and benefits of alternative crime prevention programs.

Acknowledgement

This paper was based on research funded in part by the National Crime Prevention, Commonwealth Attorney-General's Department.

References

Aos, S.R., Barnoski, M. & Leib, R. 1998, "Preventing Programs for Young Offenders: Effective and Cost-Effective", *Overcrowded Times,* vol. 9, no. 2, pp. 1, 7-11.

Alexander, J.F. & Parsons, B.V. 1982, *Functional Family Therapy: Principles and Procedures.* Carmel, Brooks & Cole, California.

Barnett, S.W. 1993, "Chapter 7: Cost-Benefit Analysis", in Schweinhart, L.J., Barnes, H.V. & Weikart, D. P. 1993, *Significant Benefits: The High / Scope Perry Preschool Study Through Age 27*, High / Scope Press, Ypsilanti, Michigan.

Caulkins, J.P., Rydell P.R., Schwabe W. & Chiesa J.1997, *Mandatory Minimum Drug Sentences: Throwing Away the Key or the Taxpayers' Money?*, RAND, Santa Monica, California.

Clarke, R.V. & McGrath G. 1990, "Cash Reduction and Robbery Prevention in Australian Betting Shops", *Security Journal*, vol. 1, pp. 160-63.

DiIulio, Jr., J.J. & Piehl, A.M. 1995, "Does Prison Pay?", *Brookings Review*, no. 13.

Donato R. & Shanahan, M. 1999, "The Economics of Implementing Intensive In-prison Sex-offender Treatment Programs", *Trends and Issues in Crime and Criminal Justice*, no. 134, Australian Institute of Criminology, Canberra.

Earl, R.B. 1995, "Helping Prevent Child Abuse and Future Consequences: Hawaii Healthy Start", *Program Focus*, October, National Institute of Justice, U.S. Department of Justice, Washington D.C.

Ekblom, P. & Pease, K. 1995, "Evaluating Crime Prevention", in M. Tonry & D.P. Farrington (eds) 1995, "Building a Safer Society: Strategic Approaches to Crime Prevention", *Crime and Justice: A Review of Research*, The University of Chicago Press, Chicago.

Forrester, D., Frenz, S., O'Connell, M. & Pease, K. 1990, *The Kirkholt Burglary Prevention Project: Phase 2*, Crime Prevention Unit Paper no. 23, Home Office, London.

Gerstein, D. R., Johnson, R.A., Harwood, H.J., Fountain, D., Suter, N. & Malloy, K. 1994, *Evaluating Recovery Services: The California Drug and Alcohol Treatment Assessment (CALDATA),* Department of Alcohol and Drug Programs, State of California, Sacramento, California.

Greenwood, P.W., Model, K.E., Rydell C. P. & Chesa, J. 1996, *Diverting Children from a Life of Crime: Measuring the Costs and Benefits*, RAND Santa Monica, California.

Goldstein, A.P. Glick, B & Gibbs, J.C., 1998, *Aggression Replacement Training: A Comprehensive Intervention for Aggressive Youth*, Research Press, Champaign Illinois.

Hahn, A. 1994 *Evaluation of the Quantum Opportunities Program (QOP): Did the Program Work?,* Center for Human Resources, Heller Graduate School, Brandeis University, Waltham, Massachusetts.

Lipsey, M.W. 1984, "Is Delinquency Prevention a Cost-Effective Strategy? A California Perspective", *Journal of Research in Crime and Delinquency,* vol. 21, pp. 279-302.

Long, D.A., Mallar, C.D. & Thorton, C.V.D. 1981, "Evaluating the Benefits and Costs of the Job Corps", *Journal of Policy Analysis and Management,* vol. 1, pp. 55-76.

McGill, D.E. 1998, *Blueprints for Violence Prevention: Book Two Big Brother Big Sisters of America*, C&M Press, Colarado.

Mishan, E.J. 1971, *Cost-Benefit Analysis: An Informal Introduction*, George Allen Unwin Ltd, England.

National Crime Prevention 1999, *Pathways to Prevention: Developmental and Early Intervention Approaches to Crime in Australia*, National Crime Prevention, Commonwealth Attorney-General's Department, Canberra.

Olds, D.L., Henderson, C.R., Cole, R., Eckenrode, J., Kitzman, H., Luckey, D., Pettitt, L. M., Sidora, K., Morris, P. & Powers, J. 1997, "Long-Term Effects of Home Visitation on Maternal Life Course and Child Abuse and Neglect: Fifteen-Year Follow-Up of a Randomized Trial", *Journal of the American Medical Association,* vol. 278, pp. 637-43.

Painter, K.A. & Farrington, D.P., forthcoming, "Improved Street Lighting: Crime Reducing Effects and Cost-Benefit Analyses", *Security Journal*, vol. 12.

Prentky, R. & Burgess, A.W. 1990, "Rehabilitation of Child Molesters: A Cost-Benefit Analysis", *American Journal of Orthopsychiatry*, vol, 60, pp. 108-17.

Schweinhart, L.J., Barnes, H.V. & Weikart, D. P. 1993, *Significant Benefits: The High / Scope Perry Preschool Study Through Age 27*, High / Scope Press, Ypsilanti, Michigan.

Walker, J. 1996, "Estimates of the Costs of Crime in Australia", *Trends and Issues in Crime and Criminal Justice*, no. 72, Australian Institute of Criminology, Canberra.

John Chisholm is a Research Analyst at the Australian Institute of Criminology.

General Editor, Trends and Issues in Crime and Criminal Justice series:
Dr Adam Graycar, Director
Australian Institute of Criminology
GPO Box 2944
Canberra ACT 2601 Australia

Note: Trends and Issues in Crime and Criminal Justice are refereed papers.