

Spreading the Pain: The Social Cost of Incarcerating Parents

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Introduction

This paper sets out to itemize and estimate the social costs and benefits incurred by the incarceration of parents who have minor children. We do so by assembling and integrating a diverse set of studies addressing the cost-benefit analysis (CBA) of social service programs, cost-of-illness studies of drug and alcohol abuse, cost of crime studies, and a very small set of studies of the costs of incarceration itself. Few authors have previously attempted a comprehensive, societal approach and none have systematically itemized costs and benefits for incarceration.

In the first section we examine the definition of social cost and the debate about “external” versus “internal” cost. Based on studies of the social costs of drug abuse and crime we then provide an inventory of the elements of social cost and benefit and motivate per-offender estimates of these amounts for incarcerated drug offenders in New York State. We summarize the total internal and external costs and benefits for the cohort of drug offenders released from New York State prisons during 2005 and compare these costs and benefits with the alternative of community-based drug treatment. In a separate, supporting study (Ziebert 2006) we examine the literature that attempts to relate parental incarceration to various effects in their children.

Context

Adults with minor children are currently the majority of inmates held in state prison in the United States. The last national profile of incarcerated parents was based on the 1997 Survey of Inmates. That study found that 56% of all state prisoners were parents of minor children, and state prisoners constitute the vast majority of incarcerated adults (Mumola 2000: 2).

The concept of social cost

Gray (1979: 21) defined social cost as “Any resource-using activity which reduces aggregate well-being or welfare in a society ... The magnitude of such costs, is, then, the valuation of the aggregate welfare foregone.” (See also Cohen 2000.) They are therefore considered “opportunity costs” (i.e., opportunity foregone) and specifically include destroyed resources, additional needs generated by an action, and foregone benefits to society that would have been experienced had the action not taken place (Piehl, Useem, and DiIulio 1999).

Social costs are incurred when activity is displaced from a normal or expected state of affairs into an alternative, usually less-desired state of affairs. Social cost is in this sense a normative concept.¹ Drug abuse diverts the drug abuser from productive work and activities into a life style

¹ Social cost is also normative in a second, distinct sense, as Cohen (2000) argues. Namely, what gets counted as a social cost by some analysts is determined by the moral status of the actor (i.e., whether the activity is condemned by society). See discussion of external and internal costs, below.

that involves less productivity at work and at home, expenditures for illegal drugs, criminal acts, victimization of others, criminal justice system responses, exposure to disease (e.g., hepatitis), additional health costs, possible costs of drug treatment, and a lower quality of life. All of these elements (and more) must be included in a comprehensive account of the social cost of drug abuse (see Harwood et al. 1998 for a comprehensive inventory).

Similarly, when a person is arrested and ultimately incarcerated many resources are redirected and overall welfare is reduced in a variety of ways. Such decrements include criminal justice system costs (arrest to conviction), presentence assessment and investigation, private and public costs of legal defense, the costs of building and operating a prison bed, the lost productivity of the prisoner, lost quality of life of the prisoner and members of the prisoner's family, lost value of parental child care, lost companionship, costs of increased use of social services by the prisoner's family, post-incarceration loss in earning power, and reduced economic strength of the neighborhood in which the prisoner lived and to which the prisoner returns.

Direct and Indirect costs

As these examples imply some of the opportunity costs are immediately entrained with the course of action. Crimes committed to acquire drugs impose costs on victims and on the criminal justice system as police, prosecutors, and the courts attempt to respond. Similarly, incarceration of a parent requires expenditures for detention after arrest and costs to create and operate a prison bed. Such direct costs are almost invariably the foundation of analysis in early attempts to compare the costs and benefits of incarceration (Zedlewski 1984, DiIulio 1990).

Other consequences occur downstream from the activity in question with various time lags and intervening mechanisms. Dependence on drugs has been shown to reduce employment and productivity while on the job (e.g., hours worked), particularly for men (Bray et al. 2000). Incarceration eliminates the productivity of the inmate both at home and at work. The enumeration and magnitude of such indirect costs is much debated. Some elements are the subject of general agreement whereas other elements are commonly ignored (see below).

History of Cost-Benefit Analysis of Crime

Economic analysis of crime and incarceration has its origins in cost-of-illness studies which have evolved over the course of the past 40 years (see Harwood et al. 1998 for a review). Considerable standardization of the approach was achieved by the promulgation of standards for cost-of-illness studies by the Public Health Service (Hodgson and Meiners 1979, 1982). Methods initially developed to estimate the costs of major illnesses and community problems (e.g., road crashes) were subsequently applied to gauge the costs of drug and alcohol abuse and from there were extended to estimate the costs of crime (Gray 1979, Harwood et al. 1984, Cohen 1988). Applying cost-benefit analysis to crime-related social policies, such as "three strikes" laws, is relatively recent (Greenwood et al. 1994). Such work lays the foundation for analysis of the social costs of incarceration.

The utility of economic (cost-benefit) analysis: Advantages and disadvantages

Economic analysis framed in terms of cost-benefit methodology enables direct comparison of very different effects. The enormous energy and creativity invested by economists and sociologists in monetizing effects ranging from reduced future earnings to fear of crime permits all these outcomes to be stated in a common language, namely, in terms of dollars spent or invested. Cost-benefit analysis, carried to completion, provides dollars to dollars comparisons for a very wide range of social outcomes of vastly different magnitude.

However, the simplicity of the final output of cost-benefit analysis is deceptive and may also be appreciated as a weakness of the approach. The final dollars to dollars comparison conceals the elaborate conceptual machinery that conspires to produce this outcome. Specifically, economic analysis is highly sensitive to underlying assumptions. The more indirect the social costs estimated, the greater the number of assumptions involved. The uncertainties of the sequence of assumptions compound each other with the result that estimates of costs and benefits often express very wide ranges of dollar values. This effect limits the value of cost-benefit analysis to such a degree that, in some cases, it is useful primarily to compare results that differ in orders of magnitude, rather than in more familiar ratios.

It is worthwhile asking, as some critics do, whether it is appropriate to monetize every valued or devalued social act or principle (Kelman 1981). If we are able by clever calculation to attach a cost to a principle as elusive and ineluctable as free speech, are we merely fooling ourselves with the power of the approach (i.e., given enough assumptions anything can be monetized)? The ability to monetize effects is directly a function of the analyst's willingness to make assumptions about what available data can be understood to represent. The plausibility of a proposal for monetizing an indirect or intangible effect turns more on the meaning assigned to the underlying data than it does on whether the analyst chooses a high or low figure as representative of that data. The simplicity and apparent directness of dollars to dollars comparisons, coupled with sometimes arcane calculations relegated to complex appendices, lead many audiences to accept cost-benefit comparisons as direct statements of fact, rather than as the complex product of interpretation that they truly are.

That being said, cost-benefit analysis can also be a powerful tool if the underlying assumptions are fully expressed and carefully defended. Furthermore, over time, as more analysis of particular subject areas has appeared (e.g., the costs of crime), consensus has emerged about methods, and, in some cases, estimates based on different data sources and approaches have converged. More confidence attaches to such findings. Thus, our confidence in the outputs of CBA has grown over time in proportion to the analytical effort invested. In the long run, efforts to monetize costs, even when based on tenuous assumptions, probably contribute to the increasing accuracy and reliability of CBA estimates.

The scope of CBA varies among analysts. Some adepts, such as the Washington State Institute for Public Policy (WSIPP), limit CBA to tangible costs (e.g., to taxpayers and victims) in the interest of establishing a cost floor (Aos, Barnoski, & Lieb 1998, Aos et al. 2001, WSIPP 2003).²

² WSIPP sometimes includes an added calculation of victim pain and suffering for comparison with the work of other analysts.

Others tally a variety of direct and indirect costs to taxpayers, victims, offenders, and the families of offenders but omit estimating pain and suffering or quality of life changes (Harwood et al. 1998). Some attempt to be exhaustive in their repertoire of costs including costs of all imaginable intangibles (Cohen 2000). These differences in scope make the final cost-benefit findings of different analysts incommensurable, even when they attempt to address the same fundamental issue, such as the cost of crime.³

External versus internal costs

We also find a range of opinion regarding whose costs and benefits should be included. Though related to the scope issue this refers primarily to the moral dimension of social cost. Most analysts distinguish external costs *imposed* on a person or society from internal costs that accrue to the actor or initiator (Cohen 1998, 2000, French, Rachal, and Hubbard 1991, Swaray, Bowles, and Pradiptyo 2005). Cohen (2000) argues forcefully that we should limit our calculation of costs to external costs and simultaneously ignore those that fall on the offender himself. The distinction is material to our effort to estimate the social cost of incarceration.

The concept of individual, personal responsibility is the foundation of the distinction between external and internal (or private) cost. To the degree that two or more parties share responsibility for an outcome, the distinction evaporates. If an offender's family enables or supports his criminality then the family impacts of the offender's arrest and ultimate incarceration are not wholly imposed on the family from without. Rather the costs are the partial consequence of risks the family members assumed. If the victims of a confidence scheme seek extraordinary material advantage (e.g., a rate of return far in excess of the market) they take a risk and to some degree share responsibility for their own losses with the perpetrator of the scheme. Moreover, if neighborhood and social conditions, such as the local lack of legal employment opportunities, contribute to the commission of a crime (see Freeman 1992, Hagan 1993) then in principle internal costs impacting the offender cannot be cleanly separated from external costs imposed on victims and on society by the offender's criminal act. In such circumstances the offender identified and held responsible by the criminal justice system is, in effect, both a perpetrator and a victim.⁴

Imposed or external costs are not necessarily the result of illegal acts. Legal behavior such as drinking and smoking may also reduce the overall welfare of society and entail sometimes significant social costs (e.g., the costs of public health campaigns against smoking and drinking, the public share of medical costs from the health consequences of drinking and smoking). Furthermore even the crime prevention activities of citizens may impose external costs on society, as when the installation of home alarm systems results in increased police expenditures for responding to false alarms (Swaray, Bowles, and Pradiptyo 2005).

The concept of social cost is intended to capture all changes in societal well-being. As Cohen concedes, the offender is also part of society, and therefore changes in the offender's welfare

³ Nevertheless, to the degree that the analyst is specific about which costs are included and which are excluded, parts of the analysis (e.g., tangible costs to the victim, pain and suffering of the victim) may still be comparable.

⁴ Mills (2006) and Cohen, Miller, and Rossman (1994) cite evidence that victimization and offending overlap, i.e., that offenders are frequently victims and vice versa.

must be included in total social cost, just as changes in the offender's productivity are typically counted. The approach we adopt to assessing the social cost of incarceration is to tally separately the costs that apparently accrue to society (external), those that accrue to the offender's family (external), and those that accrue to the offender (internal). Added together they constitute the whole of social cost. Presented in this fashion, we can compare external, internal, or total social cost to the benefits of incarceration.

Previous explorations in the social cost of incarceration

Compared to the rich body of work described above very little attention has been given to identifying the social costs and benefits of incarceration. Much work by advocates equates social cost with social harm (Bernstein 2001; The Real Cost of Prisons Project). Within this tradition, Honderich (2003) attempts a listing of different types of costs for women and children but this is largely for rhetorical effect. She does not critically evaluate her sources or set forth her methodology for deriving national impact figures. Moreover, she fails to discuss the benefits of incarceration, for example in terms of crime avoided through incapacitation of offenders, the benefits to family members of removing a neglectful or abusive adult from a household, not to mention counter-intuitive results such as improvements in health, or in post-incarceration employment (e.g., Cho and LaLonde 2005).

Lynch (1994) sets forth an early review of the literature. He makes no attempt to monetize the social costs of incarceration other than the direct cost of a prison bed, nor to compare them to the benefits of incarceration. His discussion is rendered outdated by the significant body of work by French, Cohen, Zarkin, Harwood, Hubbard, Western, Greenwood and their collaborators, much of which has appeared in the interim (French, Rachal, and Hubbard 1991, French et al. 1993, French et al. 1996, French et al. 2002, Rajkumar and French 1997, Cohen 1988, 1998, 2000, Cohen, Miller, and Rossman 1994, Cohen et al. 2004, Miller, Cohen, and Rossman 1993, Miller, Cohen, and Wiersema 1996, Zarkin, Cates, and Bala 2000, Zarkin, Dunlap, and Homsy 2004, Zarkin, Dunlap, Belenko, and Dynia 2005, Zarkin, Dunlap, Hicks, and Mamo 2005, Harwood 2005, Harwood, Fountain, and Livermore 1998, Harwood et al. 1988, Hubbard et al. 1982, Western 2002, Western and Pettit 2005, Western, Kling, and Weiman 2001, Pager and Western 2005, Pettit and Western 2004, Greenwood 2002, Greenwood et al. 1994, Greenwood et al. 1996, Greenwood et al. 2003).

Aos and colleagues at the WSIPP have taken a closer look (WSIPP 2003). They trace the costs and benefits of incarceration in Washington State as incarceration rates have increased since the 1980s. They estimate that the "taxpayer and other social collateral costs of imprisonment" are about double the capital and operating costs of a prison bed. Their justification is instructive:

The assumed multiplier [2x] for the collateral cost of imprisonment is a rough estimate since there are few estimates of the magnitude of these costs in the research literature. A recent report identifies collateral costs as including: lost current and future employment, earnings, and taxes; other social service costs of broken families; lost voting rights; and other community costs [citing Tonry and Petersilia 1999]. (WSIPP 2003: table 3)

This truncated list is not further defined nor are costs estimated for the individual elements mentioned. It is therefore timely to attempt a preliminary integration of many of the elements of social cost and benefit developed by the diverse community of economists and cost-benefit analysts.

An inventory of the elements of social cost

We will lay out social costs in their approximate developmental sequence, more or less in the chronological order they are incurred. Our formal calculations appear in Appendixes 1 and 2.

Criminal justice processing: Arrest to sentencing

The path leading to incarceration almost invariably begins with a crime which often, but not always, entails costs to victims. Victim costs are part of the cost of *crime*, not necessarily the costs of incarceration.⁵ The costs of incarceration begin with the costs of the criminal justice system expended once the responsible offender has been identified. These costs include arrest, pretrial detention, and the expenses of police, prosecutors, and the courts in prosecuting the offender to the point of sentencing.

Harwood et al. (1988), dividing total police expenditures by total arrests, estimate average police costs per arrest in 1979 at \$1,700 per arrest. In 2001 Bouchery and Harwood reestimated the economic costs of drug abuse in the U.S., indicating *legal adjudication costs per drug arrest* in 1996 of \$1,600 (2001: tables B-7, B-9). George and LaLonde report per person arrest-to-conviction costs of \$31,000 for women at the Cook County jail (2002). However, they offer no itemization and no detail to support this passing reference (which they refer to as a “back of the envelope” calculation). It is not clear whether the cost they cite includes pre-sentence assessment and investigation. Finally, Cohen, Miller, and Rossman report data from the criminal justice tracking system of the Metropolitan Dade County Department of Justice Assistance that provide a fine-grained breakout of the various stages of the criminal justice process. The average processing cost for all felonies in 1987, following the elements of cost from investigation and arrest, through “screening and pre-filing”, to trial, culminating in sentencing, amounted to \$33,945 (1994: table 16). The relatively high dollar figures cited by George and LaLonde and Cohen and colleagues are likely due to the fact that the costs are averaged across all arrests, including murder, rape, aggravated assault, robbery and other highly contested and costly crimes.

Aos et al. (2001) explore costs for criminal justice system response in considerable detail for defendants in Washington State for a variety of crimes. Their findings for two violent and two non-violent crimes appear in table 1.

From the Washington data we can appreciate that non-violent crime costs the CJS considerably less than violent crime in the arrest to conviction process. Also, the net per offender cost to the public is significantly determined by the amount of time the offender spends in detention. Detention costs are low for property and drug arrestees. In fact, Aos and colleagues report 0.19 years (69 days) as the average length of stay in jail, prior to prison, for drug and property offenders (2001: table IV-G). Applied to the adult jail cost given in table 1 this indicates an

⁵ The cost of crime is, however, relevant to understanding the *benefits* of incarceration, since the primary benefit of incarceration is from crime averted.

average pre-incarceration jail cost of \$3,240 for drug and property offenders in Washington State in 1995. It is worth noting that some portion of these arrest-to-conviction costs will also be incurred by offenders who are ultimately diverted to treatment and community supervision, for example, by drug courts, and should therefore be included in the social costs of alternatives to incarceration, such as drug treatment.

Table 1: Washington State Criminal Justice System Operating Costs

	Costs Per Unit By Type of Crime				
	Units Used	Rape	Aggravated Assault	Property	Drug
Police and Sheriff's Office	\$ per arrest	\$12,551	\$12,551	\$1,890	\$1,890
Superior Courts & County Prosecutors	\$ per conviction	\$18,399	\$18,399	\$1,675	\$1,675
Adult jail, with local sentence	Annual \$ per ADP	\$17,047	\$17,047	\$17,047	\$17,047
Adult Community Supervision, Local Sentence	Annual \$ per ADP	\$2,688	\$2,688	\$2,688	\$2,688

Source: Aos et al. 2001: table IV-D. 1995 data, except Adult Community Supervision (1994). Jail and supervision costs in table are average costs, police and court are marginal costs. ADP=Average Daily Population

We have learned from repeated studies of drug offenders (Goldstein 1985, Anglin and Hser 1987, Anglin and Speckart 1988, Nurco et al. 1988) and from assessments of the national costs of drug abuse (Harwood et al. 1998) that drug offenders primarily commit acquisitive property crime and "victimless" crime (e.g., drug use, sale of drugs, prostitution) in their criminal careers. Therefore, the costs implicated in their arrest and conviction are best represented by the Property and Drug columns of table 1.

Even more on point, Zarkin, Dunlap, Belenko, and Dynia (2005) estimated CJS processing costs for participants and controls in the Drug Treatment Alternative to Prison (DTAP) program operating in Kings County (Brooklyn), and provided the following breakdown:

Table 2
Unit Cost Estimates for Justice System Processes in Kings County (Brooklyn)

Activity	Cost Per Person
Arrest and appearance	\$594
Felony hearing	\$1,492
Other hearings (motion, misdemeanor)	\$509
Sentencing hearing	\$826
Total Court Processing Costs	\$3,421

Source: Zarkin, Dunlap, Belenko, and Dynia 2005: table 3. Stated in 2001 dollars.

In 2005 dollars processing costs amount to \$3,773. Zarkin and colleagues also report jail costs in Brooklyn of \$187 per day, and an average stay in detention of 34.5 days for drug offenders, for a net detention cost of \$6,451.50, or \$7,115 adjusted to 2005 dollars. However, Department of Correctional Services data for drug offenders released in 2005 show mean jail time served (in addition to prison) of 6.1 months (186 days). This implies a much higher detention cost of \$38,222 per drug offender (2005 dollars). Zarkin's per day jail costs in the New York City area are likely higher than the average cost statewide so this may overstate average detention costs.

We adopt the estimates provided by Zarkin and colleagues as these are both the most recent and they present estimates from within New York State.

Private (and public) legal costs of the defendant

Arrested offenders who end up convicted of drug offenses incur legal costs in their own defense. Some of these costs are redistributed to taxpayers because some defendants acquire public defenders. Bouchery and Harwood provide data that indicate private legal defense spending in 1997 of \$232 per drug-related arrest (2001: tables IV-25, B-9), or \$282 in 2005 dollars. Spangenberg et al. (1986) found that 48% of all felony cases engaged a public defender and thereby public costs. Cohen, Miller, and Rossman (1994) believe the costs of indigent defense are likely to be less than private legal defense. We split these costs in accordance with Spangenberg's finding, allotting \$147 as the private cost of the offender and \$135 as borne by the public.

Efforts to avoid incarceration

French, Rachal, and Hubbard (1991) point out that "Defensive or averting expenditures to mitigate the adverse consequences of illness is one important category of tangible costs that is not typically addressed in cost-of-illness studies. ... The social cost model should identify and characterize the types of averting behaviors undertaken by different populations ..." In line with this advice, Cohen (2000) counts as a cost of crime "detection avoidance by offenders." The efforts of offenders facing incarceration, apart from their legitimate legal defense, may include actions to mitigate the apparent seriousness or impact of their offense, establish a false social pedigree (i.e., to feed pre-sentence investigation reports), bribe or influence those who may testify for or against them at sentencing, assemble sympathetic testimonials, "get religion", demonstrate remorse or social consciousness (e.g., through volunteering), and even acquire training in skills and manner inconsistent with those of a criminal. These actions burn resources in efforts to avoid or limit the duration of incarceration and are properly counted as a social cost. However, we have no estimates of the magnitude of such costs.

Presentence investigation and assessment

Presentence investigation and assessment is customarily performed by probation agents who make recommendations to the court. Aos and colleagues (2001) are the best source on CJS costs through conviction, but they do not discuss this as a separate element. Since we have not found studies that separate this cost from the other adjudication costs we assume it is included in the above cited costs for arrest to sentencing.

Cost of the prison bed

The capital and operating costs of the prison bed are the most obvious, direct costs of incarcerating a person. Some authorities (e.g., Aos et al. 2001) argue that the marginal operating cost (the cost for adding one prisoner to the system without building additional beds) is the most appropriate measure, while others advocate using the average cost, which includes the depreciated capital costs of construction in addition to operating costs.

We use average costs (capital plus operating cost) in our calculation. According to the New York Department of Correctional Services the annual average cost of a prison bed in New York State for the year ending March 31, 2005 was \$46,731.⁶

Value of child care

The incarceration of a parent with one or more minor children means that the parent is no longer available to provide necessary adult supervision to the child. Since the parent's incarceration also means in many cases a loss of earnings for the family the economic status of the prisoner's family typically declines (Hagan and Dinovitzer 1999). Phillips demonstrates that families experience "economic strain" as a direct result of the incarceration of a parent (Phillips et al. forthcoming). This circumstance requires the partner to seek public assistance, help from family and friends, to take up employment or seek additional employment. Parental absence and loss of earnings conspire to require that additional supervision be provided to at least one child. Economists agree that the market cost of a service is the best measure of its value. We therefore assume that the yearly market cost of day care for one child is part of the social cost of incarcerating a parent with minor children.⁷

The New York State Child Care Coordinating Council (CCCC) recently commissioned a study of the economic impact of day care in the state (Cornell University 2004). They estimated that a working parent with a school-age child would require 40 weeks of part-time ("Part Day") care, and 12 weeks of full-time day care. A working parent with a pre-school age child would require 52 weeks of full-time day care (Cornell University 2004: table 21).⁸ The State annually samples day care rates throughout the state and publishes the results to assist social services districts in setting reimbursement (Mahoney 2005). Using these rates from October 2005 and applying the two type cases identified by the CCCC we can calculate a blended average rate for day care for one child, and also the average co-payment required from the family. We extrapolated from the State market rates weekly state averages for day care centers and for "Registered Family Care" for children of all age categories and averaged these two levels of care. The weekly average for full-time care was \$180.28 per week. The state-wide average for part-day care across these two levels and all ages was \$28.65 per day, or \$143.25 per week. These rates imply costs of \$9,375 for a pre-school age child during 52 weeks of full-time care, and \$7,893 for a school-age child in

⁶ As of August 2006 New York State had a surplus of prison beds, according the Public Information Office of the New York Department of Correctional Services. Thus, it might be more appropriate to use the marginal operating cost in this case. New York State capital costs per prison bed were \$2,814, indicating operating costs of \$46,731 - \$2,814 = \$43,917.

⁷ The increased costs of child care as a reflex of incarceration are the analog of the neonatal effects of alcohol use by the mother during pregnancy (i.e., FAS/FAE), estimated by Harwood (2005).

⁸ One factor that leads to this result is the rule applied by many day care centers in New York State that limits time out of care to two weeks per year for children in full-time care. The CCCC also found that many working parents keep their children in care when the parent takes vacation (Michelle Sandoz-Dennis, personal communication).

part-day care (40 weeks) and full-time care (12 weeks).⁹ Averaging these two type situations yields a yearly estimate of \$8,634 for day care for one child. In February 2006 the CCCC separately calculated the average co-pay per parent for every county in New York State for the type case of a family of three with gross income of \$32,180, i.e., at 200% of the federal poverty level (Michelle Sandoz-Dennis, personal communication [2006]).¹⁰ The average across all counties was \$4,257, implying an average state subsidy of \$4,427. Assuming the families of incarcerated parents have gross income of about 200% of FPL this yields a net present value of day care expenses of \$10,773 for the state and \$10,358 for the family.

Foster care for children of the prisoner

Chris Mumola, analyzing the 1997 Survey of Inmates data for parents held in state prisons, found that 9.6% of the children of incarcerated mothers and 1.8% of the children of incarcerated fathers were in foster care (Mumola 2000: table 4). Hungerford (1996) reports a similar percentage (10% of children) for women in her study. Ehrensaft et al. (2003) found that 10% of incarcerated mothers in their New York City study had children in foster care and most of these placements occurred in the year following incarceration. Marilyn Brown (2003), in her cross-sectional study of 240 female parolees in Hawai'i, reports that 7.3% of their 576 children were in foster care at the time of their sentencing. Others have reported rates as high as 26% (Johnston 1995).

Some of these placements were the result of family conditions and parental behavior that predated incarceration. For example, George and LaLonde (2002) conclude that Illinois women in their study experienced a downward spiral in the year prior to their imprisonment and that a portion of their children would have been placed regardless of their conviction and incarceration.

The average prisoner-parent has 2.07 children, of whom 2.4% were reported to be in foster care, agency, or institutional placement (Mumola 2000). Therefore, the average prisoner parent has $2.07 \times 2.4\% = .0497$ children in foster care. We assume that half of these children were there as a direct result of parental incarceration (2.48%). We spread the costs for foster care of 2.48% of children across the cohort of New York drug felons.

The costs of foster care vary considerably across New York State by level of care, provider agency, and by city and county. Foster care rates consist of an administrative rate, based on the ratio of the agency's expenses against the census of children in its care, and a daily reimbursement or stipend to the family. Regular foster care is considerably cheaper than treatment foster care, which in turn is less expensive than placement in a group home.¹¹ The current (2006) per diem stipend for standard foster boarding homes in New York City is \$26 - \$28 (Tim Ross, personal communication), while it is \$14.42 with a private agency in Buffalo

⁹ 40 weeks of part-day care costs \$5,730 and 12 weeks of full-time care costs \$2,163.

¹⁰ This assumption is important since counties apply multiples of the FPL in determining the threshold that triggers a parent's required co-pay. Counties in New York State set thresholds between 100% and 200% of FPL. Above these gross income levels, the parent's co-pay amounts to between 10% and 30% of the amount of gross income above the threshold.

¹¹ At a private, non-profit social service agency in White Plains the current (2006) rate for treatment foster care is \$112 per day (\$45 stipend, \$67 administrative), and the rate for group homes is \$152 per day. In New York City the stipend for treatment foster care is about \$55 per day, and congregate (group home) care ranges from \$120 to over \$200 per day.

(Kevin Burke, personal communication), and \$45 for treatment foster care through a private agency in White Plains (James Kaufman, personal communication). Administrative costs are \$30 to \$70 per day at private agencies and may be more at public agencies. We use the New York City stipend and the lower estimate of administrative costs to generate our estimate for regular foster care of about \$60 per day. The net present value of regular foster care over the course of the average 29.8 month drug offender sentence is \$53,291 per child in care. For 2.48% of the children of offenders this averages to \$1,325 per offender.

This is almost certainly an underestimate since some of the children placed in foster care will spend time in more expensive treatment foster homes and group homes. Furthermore, Mumola (2000: table 4) found that about 20% of the children of incarcerated parents resided with grandparents or other relatives (not other parent). In New York State these children are eligible for kinship care payments that are parallel to foster care payments, and are also eligible for “preventive service” dollars. Neither of these costs to society is included in our above estimate.

Post-release supervision (probation/parole)

Releasees typically undergo a period of supervision by probation or parole agents. The period varies, but two years for a drug offender seems to be common. In Colorado, for example, drug offenders convicted of distribution or intent to sell (Class 3, Extraordinary Risk) receive a mandatory parole period of five years, whereas those convicted of sale of materials for drug manufacture (Class 6, Extraordinary Risk) receive two years mandatory parole (Lowden et al. 2005). In Washington State the average length of community supervision for released drug and property offenders is one year (Aos et al. 2001: table IV-G).

Colorado reports the following daily costs for probation and parole (table 3):

Table 3: Costs of Probation and Parole in Colorado

Type of Supervision	Cost per day	Cost per year	Report year
Regular probation	\$2.16	\$788.40	2005
Intensive Supervision Probation	\$8.10	\$2,956.50	2005
Parole	\$9.10	\$3,321.50	2003
Intensive Supervision Parole	\$19.03	\$6,946.95	2003

Source: Lowden et al. 2005: tables 3.10, 3.12

The WSIPP reports adult community supervision (probation) and post-prison supervision (parole) costs as having the same estimated value in 1994 of \$2,688 per year for both drug and property offenders (Aos 2001: table IV-D). These costs are comparable, when corrected for inflation, to the 2003-2005 Colorado costs for Intensive Supervision Probation and regular parole. Finally, Zarkin, Dunlap, Belenko, and Dynia (2005) found that parole in Kings County (Brooklyn) cost \$8 per day, and \$2,920 per year (2001 dollars), equivalent to \$3,219 in 2005 dollars.

Using the Kings County costs, we estimate assuming the average drug felon will spend 24 months on parole (months 31-54 following incarceration), using a 3% discount rate, and calculate a net present value of parole per offender of \$5,937.

Training of probation and parole agents

The probation and parole system is supported by a training and research apparatus that prepares new agents for their duties and provides continuing education for current professionals in the field. These costs are over and above the daily costs of probation and parole supervision reported by Colorado and Washington, above. Such costs are the analog of training and continuing education costs for new and continuing alcohol and drug abuse counselors. These costs were included as social costs of drug abuse by Harwood et al. (1998) in their documentation of the economic impact of drug abuse in the United States for 1992 and reiterated by Bouchery and Harwood (2001) in their update of the 1998 study. In the 1998 study Harwood and colleagues estimated training and continuing education costs of \$500 per person per year for existing drug and alcohol abuse counselors. Though the parallelism is clear we have found no estimates of the training and continuing education costs for probation and parole agents and so cannot include an amount in our calculation. It remains a real but unestimated social cost of incarceration.

Training of other professionals who provide services to ex-offenders

Similarly, Harwood et al. (1998) sought to estimate the cost and quantity of training provided to other professionals who work with drug abusers, including other mental health professionals not working in AODA programs and clinics, similarly situated health professionals, and law enforcement professionals. These workers also absorb training in drug abuse and drug abuse treatment though to a smaller extent than the specialists described above. The analogous social costs for incarceration are those entailed by the training and continuing education of professionals who work with offenders and re-entering offenders, such as social workers, trainers, and job placement specialists. We have no estimates for these costs.

Specialty services for drug felons in prison

In principle, support for specialty treatment of drug felons in prison (e.g., research and development of in-prison therapeutic communities) is a social cost of incarcerating drug felons. As Harwood and colleagues point out for the entirely parallel case of community-based drug treatment (Harwood et al. 1998: 4-5, table 3.1), support costs include training, research, and insurance administration. This is true to the degree that these costs are specific to in-prison specialty treatment for drug abuse, rather than to corrections and rehabilitation generally. Paraphrasing Harwood, without the incarceration of drug felons, these costs would not occur. Unfortunately, we again lack any estimate of these costs.

Costs of administration of welfare payments to families of prisoners

Economists treat the payment of welfare benefits and public assistance such as food stamps and unemployment insurance as “transfer payments” between one group of taxpayers and another group of taxpayers. In an intuitive sense these payments compensate one party for a loss of some kind (e.g., loss of earnings from employment) by transferring wealth from another party. There is therefore no net loss to society in this transaction, and no social cost.¹² However, the cost of *administering* these transfer payments is a legitimate social cost of incarceration. To the degree that the families of incarcerated parents avail themselves of a greater amount of public social

¹² Harwood et al. (1998) point out that double counting would result if we counted in total costs both the cost of the welfare program *and* the lost productivity (see below) that welfare is designed to replace.

benefits after the parent's incarceration—and there is circumstantial evidence that they do (see Cadora et al. 2003)—we should include the costs of administration of these benefits as a social cost of incarceration.¹³ As quoted by Harwood et al. (1998) the U.S. Public Health Service estimated that about 4.8% of total health expenditures in the U.S. in 1992 went to the administration of private and public insurance programs. Nevertheless, we have no estimate either of the increased amount of public assistance accessed by the families of incarcerated parents due to the incarceration, nor of the proportion of such transfers devoted to administration. This note serves as a “place holder” for this category of cost.

Costs to family of communication and support of inmate

Mumola (2000) informs us that the majority of state parent-prisoners remain incarcerated more than 100 miles from the residence of their families. We also learn from his report and from others that the vast majority (80%) of parent-prisoners receive contact from their families and a sizable proportion (43%) receive visits. The visits and phone calls, the latter often collect and at elevated rates, require families to expend resources and time that they would otherwise devote to more preferred activities. In addition, families typically provide money for in-prison amenities for their family member (television sets, personal hygiene products, cigarettes). Lamentably, we have no per-prisoner estimate of these very real social costs. Clearly, these external costs fall on the family of the prisoner.

Costs to family of providing housing to inmate's children and to parent upon release

Brown documents in her study of female parolees in Hawai'i the critical role played by family in caring for the incarcerated parent's children during incarceration and in housing the woman and her children upon release.

Most women (73.3%) are paroled to households rather than program or institutional settings, whether or not they have children. They live in their own apartments, with spouses or partners, with adult relatives, or with friends. However, very few of these women (2%) have the wherewithal to set up in their own places; most live with partners or other intimates. Although family bonds are often sufficiently flexible to absorb women after their incarceration (having cared for their children during this separation), material deprivation and lack of resources make a necessity of these family virtues. The economic costs of punishment are thus shifted to the families of former inmates in ways that often go unnoticed in calculations of the cost of prison expansion. The economic responsibilities associated with punishment are, in this way, shifted to non-state parties and the individuals themselves, just as theories of responsabilization predict (Brown 2003: 205).

Clear and Rose reinforce this finding (Clear, Rose, and Ryder 2001, Rose and Clear 1998) by showing how incarceration poses obstacles to finding housing for reentering offenders, and throws them back on their weakened social networks or on the streets. Simply put, the inmate's family typically bears the cost of caring for his child and then of absorbing the inmate upon release. As Clear and Rose note, for some portion of families these costs also include moving to a new neighborhood for a new start, to escape stigma, or to escape a criminal social network.

¹³ Some on-going but unpublished work questions whether increased use of public welfare actually occurs.

We have no estimates for these costs of “responsibilization”. They are nevertheless direct, external costs for the family.

Indirect social costs

Productive work is scarce for state prisoners and what does exist is rewarded at infinitesimal wage levels. For all practical purposes the productivity of an offender ceases upon incarceration. The most obvious indirect social cost of incarceration is therefore the lost value of the inmate’s productivity. The value of this productivity encompasses the market value of the inmate’s labor, but also the work contributed by the prisoner in the home (household productivity), as well as the value of fringe benefits (Harwood et al. 1998: Chapters 3 and 7; Cohen 2000).¹⁴

The market value of a worker’s productivity is typically measured by the person’s earnings, usually equated with mean or median wage. Cohen and colleagues (Cohen, Miller, and Rossman 1994, Cohen 2000) argue that the average productivity of an inmate should be adjusted downward, compared to workers who never experience incarceration, because the typical incarcerated offender is not as productive as the average person and also due to dated evidence that about 16% of received income came from sources other than legitimate earnings. Many other analysts apply mean wage as the standard measure (e.g., Harwood et al. 1998). Mumola (2000: 10) documents that 70.9% of parents in state prison were employed during the month before their arrest. We adopt this as the appropriate correction to mean wage and use this adjusted figure in all further calculations related to productivity and future earnings.

Cohen, Miller, and Rossman (1994: 106-07) offer estimates of household productivity based on work by Miller et al. (1989) that indicates household productivity amounts to about 20% to 30% of total productivity. We adopt Harwood and colleagues’ more conservative estimate of household productivity as 15% of total productivity (Harwood et al. 1998: 3-9, 7-4). Fringe benefit costs, including legally required benefits (Social Security, Medicare, etc.), employer costs for life, health, and disability insurance, paid leave, and retirement and savings benefits are derived from the Bureau of Labor Statistics National Compensation Survey. For the U.S. during 2005 fringe benefits averaged 42.2% of employee wages and salaries.¹⁵ This may be an underestimate since New York State employers may pay higher benefits than the national average (Public Policy Institute 2006).

The Bureau of Labor Statistics reports the average annual pay for New York State residents for 2005 (all industries, all establishment sizes) was \$51,940. Adjusted for the proportion of incarcerated parents who were working (70.9%) this yields an estimate of \$36,825 for the lost market productivity of the average offender. This figure predicts for each year of incarceration associated lost household productivity of \$6,500, and lost fringe benefits of \$15,540. Net present values for these losses over the course of the average 29.8 month sentence served are: \$89,611

¹⁴ Harwood et al. (1998: 3-9) explain the logic behind this. “Fringe benefits and taxes should be included because they are part of the contribution of labor’s productivity. To stay in business, employers have to recover these expenses from the productivity of workers.”

¹⁵ Cohen, Miller, and Rossman (1994) estimate fringe benefits at 19.7%, based on a 1990 study (Bush 1990). In June 2006 the fringe benefit rate had risen to 42.8% (NCS 2006). This may be an underestimate since New York State ranked first in the nation in 2004 in taxes per \$1,000 of personal income (Public Policy Institute 2006).

in wages, \$15,816 in household productivity, and \$37,816 in fringe benefits, or \$143,243 in productivity losses per drug offender. Wages and fringes are classified as external costs to society; household productivity represents a loss to the family.

Post-release decline in wages

A significant group of scholars over the years has addressed the effect of conviction or incarceration on future employment and earnings and a fair body of literature has emerged. A few studies find minimal negative effects of incarceration on post-incarceration employment (e.g., in number of weeks employed) or wages (Kling 1999, Needels 1996, Grogger 1995). Surprisingly, Cho and LaLonde (2005) find that prison has a small *positive* effect on the *employment* (but not earnings) of female prisoners in Illinois after their release. The clear majority of studies agree that incarceration seriously depresses earnings after release from prison (e.g., Lott 1992, Waldfogel 1994a, 1994b, Nagin and Waldfogel 1998, Western, Kling, and Weiman 2001, Western 2002, Pager 2003, Western and Pettit 2005). Western, Kling, and Weiman conclude their review of the literature as follows:

Based on our review of the recent literature, we find evidence from a variety of sources that serving time in prison can diminish an individual's earnings but not necessarily employment prospects ... What is more, these negative impacts appear to be greater for older individuals, especially those with white-collar occupations. Estimates from the survey and administrative data suggest that the earnings penalty of imprisonment ranges from 10% to 30% (2001: 424).

We assume a 20% reduction in earnings in the two-year period following release from prison and estimate on that basis. This reduction in earnings affects the reentering offender and thus may be considered an internal cost. There are also external reflexes for society in terms of fringe benefits, which, as noted previously, are part of the worker's productivity. As before, fringe benefits are valued at 42.2% of wages. In the 24 months following release (at month 30) the reentering offender loses earnings with a net present value of \$13,583. The public share of this in terms of lost fringe benefits has a net present value of \$4,585. If lost earning power continues beyond two years post-release—and the literature suggests that it does—then these estimates are a lower bound.

Disutility (pain and suffering) of the prisoner

Without question the incarcerated parent experiences a significant reduction in quality of life: There are no “country club” prisons or at least not for drug offenders. Indeed, for many policy makers and theorists punishment, along with deterrence and incapacitation, is one of the cardinal purposes of incarceration. The effect is compounded for parents, since this absolute loss of freedom entails enforced separation from one's partner and children not just from one's relatives and friends.

Calculation of pain and suffering or lost quality of life presents challenges to cost-benefit analysis. Cohen (1988) pioneered estimation of the value of pain and suffering with his study of jury awards, and this method has been the foundation for much subsequent work. Another major approach is the “willingness to pay” (WTP) method which measures the willingness of individuals to pay in order to avoid a risk, condition, or undesirable outcome. This is sometimes

explored through contingent valuation, a type of survey in which respondents are asked to rank a series of alternatives in terms of their desirability. Since then other methods have emerged, especially the concept of the Quality Adjusted Life Year (QALY). Application of this concept to health outcomes related to drug abuse was proposed by Michael French and colleagues (French et al. 1996). The flexibility of this approach renders it particularly apt for estimating the disutility of the incarcerated parent and the parent's family members. QALY methodology is also preferable to WTP since QALY estimates are not sensitive to the rater's wealth, and incarcerated parents as a group have less wealth than parents who have never experienced incarceration (Hammitt 2003).

The Quality Adjusted Life Year concept rests on the calculation of the value of a "statistical life year". Essentially, this derives from an economic estimate of the value of a human life, divided by a person's future life expectancy. Lost value is calculated by applying percentages taken from tables stating how much quality of life is reduced by various disabilities or adverse conditions, such as a disability that renders the person unable to work or go to school, blindness, or various learning disabilities. If a serious disability reduces a person's quality of life by 25% over four years, other things equal, the person loses one Quality Adjusted Life Year ($4 \times .25 = 1.00$).

Though originally developed in the context of cost-of-illness studies, and applied to the sequelae of drug abuse by French, this methodology is generally applicable to any changes in quality of life (QoL). The key to its application for the social costs of incarceration is a scale that compares reduction or loss of freedom to average (unincarcerated) quality of life. To our knowledge no such scale exists. Contingent valuation would be a logical approach for developing such ratings, but no studies of this type currently exist (Cohen, personal communication [2006]; Zarkin, personal communication [2006], Harwood, personal communication [2006]).

A variety of other scales do exist that characterize a variety of conditions involving health problems, mental health issues, disabilities, life stage (i.e., QoL for a particular age cohort), and restriction of movement. These include the Rosser/Kind Index of Health Status, the EuroQoL, and the Cost Effectiveness Analysis Registry Catalog of Preference Scores. These scales provide a score that compares one's quality of life under the specified condition with average or perfect health (i.e., with a score of 1.00). Harwood (1991: 47-48) compares the pain and suffering caused by drug abuse to that borne by patients with heart disease or cancer. This suggests that some of these ratings may serve to place incarceration in perspective in terms of lost quality of life (table 4). We have shaded cells in table 4 that show a range of values where incarceration might fall.

A second perspective emerges from the catalog of disease state preference scores originally assembled by the Harvard Center for Risk Analysis. This catalog summarizes the findings of many cost-effectiveness analyses that studied how changes in health states were valued by community members, patients, and clinicians. A selection of scores from this extensive, well-documented catalog appears in table 5.

Table 4
Rosser/Kind Index of Health Status

Disability	Distress			
	A None	B Mild	C Moderate	D Severe
I. No Disability	1.000	0.995	0.990	0.967
II Slight social disability	0.990	0.986	0.973	0.932
III. Severe social/work; no heavy tasks	0.980	0.972	0.956	0.912
IV. Work severely limited; light housework only; able to do shopping	0.964	0.956	0.942	0.870
V. Unable to work or go to school; elderly must be escorted; cannot do shopping; few simple household tasks.	0.946	0.935	0.900	0.700
VI. Confined to chair or wheelchair or able to move only with support from assistant.	0.875	0.845	0.680	0.000
VII. Confined to bed	0.677	0.564	0.000	-1.486
VII. Unconscious	-1.028	NA	NA	NA

Source: Rosser and Kind (1978)

Analogizing with the adverse conditions captured in these tables, a case can be made that the disutility resulting from incarceration falls in the range of health and disability states between 70% and 90% of average health (i.e., between .70 and .90 in preference scores). In other words, incarceration as a state probably involves *better* quality of life than blindness, profound deafness, being confined to a chair or wheelchair with moderate distress, or having a moderate developmental disability, as a lower bound. We suggest incarceration also entails *less* quality of life than a disability that forecloses performing heavy tasks (Rosser/Kind Stage III), being unable to go to work or school (with moderate distress), or being a substance abuser in maintenance treatment, as an upper bound. Rosser/Kind Stage V (moderate and severe)—being unable to go to work or school—is probably the closest analog and its ratings bracket our estimated range (.70 - .90). On this basis we propose that incarceration compares to health and disability states that represent losses of about 20% in quality of life compared to perfect or average health.

Note that incarcerated parents may not enjoy average or perfect health in the period immediately preceding incarceration. Indeed, for drug felons who are abusers and addicts a high proportion suffer the adverse health and work effects of their abuse that are amply documented in the robust literature on drug abuse. They nevertheless suffer a significant decline in quality of life and we therefore adopt the 20% relative decline documented in health and disability studies as a defensible first estimate.

Table 5
Health Preference Scores From Cost Effectiveness Studies

Health State	Preference Score	Range	Determined By	Source
Substance abuse, in maintenance treatment	.90		Author, author/clinician judgment	Catalog 1998-2001
General population aged 30-39	.86		Community, rating scale	Catalog 1976-1997
Average for disabling collision	.827		Community, rating scale	Catalog 1998-2001
General population aged 50-64	.82		Community, rating scale	Catalog 1976-1997
Injection drug user	.80		Author, author/clinician judgment	Catalog 1998-2001
Child, mild developmental disability	.80	.70 - .90	Authors, author/clinical judgment	Catalog 1976-1997
Reading disability	.77	.5 – 1.0	Clinicians, Rating Scale	Catalog 1976-1997
Blindness	.69		Author, author/clinical judgment	Catalog 1998-2001
Child, moderate developmental disability	.60	.40 - .80	Authors, author/clinical judgment	Catalog 1976-1997
Adult with profound deafness	.59		Community, patients	Catalog 1976-1997
Major depression	.59		Author, author/clinical judgment	Catalog 1998-2001

Sources: Center on the Evaluation of Value and Risk in Health 2006a, 2006b

Given a 20% estimate for the loss in quality of life and the mean time served by New York State drug felons who were released during 2005 (29.8 months), a simple undiscounted calculation suggests the magnitude of the effect:¹⁶

$$29.8 \text{ months}/12 \text{ months (2.48 years)} \times .20 \text{ reduction per QALY} = .497 \text{ QALYs}$$

¹⁶ Since future costs and benefits are valued less than present costs and benefits—for example, because money held today will earn interest and grow in succeeding years—benefits and costs that occur in the future must be discounted by a percentage that is generally equated with the prevailing interest rate. We use a 3% discount rate in our calculations.

In other words, the average sentence served by drug felons in New York State involves the net loss of a little less than one-half of a Quality Adjusted Life Year. French et al. (1996) defend an estimate of the value of a QALY of \$311,532 (\$387,777 in 2005 dollars), implying that the net cost of the parent's disutility over the course of the average sentence served is about \$194,000.¹⁷ The actual calculation of the "net present value" of this loss, which includes discounting the losses suffered in the second and third years of the offender's sentence by a percentage equivalent to inflation, yields a total for lost quality of life for the incarcerated parent of .4860 QALYs (Appendix 2). That generates the following calculation of the value of lost quality of life for the parent while incarcerated:

$$.4860 \times \$387,777 = \$188,460 \text{ (2005 dollars)}$$

Disutility (pain and suffering) of the prisoner's family, including children

Few will contest the claim that the children and partner of an incarcerated parent typically suffer from the parent's absence from their lives, though there may be exceptions for those who are abusive or disconnected. Mumola (2000) and others have documented that many incarcerated parents were employed and contributed to the support of their families prior to incarceration, that their families experience economic decline following incarceration as a result, and that most parents receive contact from their children during their imprisonment. These facts are sufficient to show strong connections between incarcerated parents and their families and provide the foundation for concluding that the children of an incarcerated parent experience a loss in quality of life.

Applying the same reasoning we used for estimating the reduction in quality of life for the prisoner, we suggest a reasonable estimate for children is a loss of about 10% (i.e., comparable to Rosser/Kind Level III-severe, or to a substance abuser in maintenance treatment). The mean age of children of incarcerated parents is eight years (Mumola 2000) and we use life probabilities for a child of this age in our calculations. That assumption generates a loss for one child of about .2433 QALYs over the course of the parent's imprisonment, and a net present value of \$94,348 (Appendix 2).

Since parents in state prisons have, on average, just over two minor children we must assess whether all children suffer equally from the parent's absence. Ziebert (2006), reanalyzing Mumola's data, documents that 79.6% of parents in state prison have some form of contact with their children. Therefore a significant fraction of these children (i.e., about 20%) might be weakly connected to their parents. However, even children who do not contact their parents during their period of incarceration may suffer quality of life losses. They will be subject to the stigma of having a parent in prison, they are subject to the same kinds of self-doubt (self-esteem losses) as connected children, and they will not be able to enjoy the parent's company, supervision, or protection even if they wished to reestablish the relationship. It is not even clear that lack of contact equates with lack of connection, since some caregivers block contact between parent and child out of anger and other motives (see Brown 2003). We conclude there is an insufficient foundation for reducing quality of life losses for the incarcerated parent's children. Thus, the external quality of life cost for one child must be multiplied, since

¹⁷ French et al. (1996) argue that this value is age-invariant and thus applies to all cohorts.

incarcerated parents have 2.07 minor children on average (Mumola 2000). This yields the following calculation:

$$.2433 \text{ QALYs} \times \$387,777/\text{QALY} \times 2.07 \text{ children/parent} = \$195,296 \text{ child QoL lost/parent}$$

Similar reasoning applies to the disutility of the partners of incarcerated parents though this must be reduced by some proportion to account for antagonistic, disrupted, or unalterably broken relationships. If we assume that half of incarcerated parents have valued relationships with partners that reduce the partner's quality of life by 10%, the net present value in lost quality of life for the average partner would be:

$$.24317 \text{ QALYs} \times \$387,777/\text{QALY} \times .50 \text{ partners/prisoner} = \$47,148 \text{ partner QoL lost/parent}$$

This is an external cost for the partner and family.

Depleted neighborhood economic strength and quality of life

Few studies of the costs of incarceration mention its impact on the community. Piehl, Useem, and DiIulio were among the first in their enumeration of social costs:

By "social costs" we mean any burdens on society in addition to the resources it takes to run a prison system. They include the lost labor-market productivity of inmates, the loss to families of having a member away from home, and the loss to communities of having a resident removed (1995: 3).

Little was made of this insight until the work of Dina Rose and Todd Clear began to appear in the late 1990s. In a series of papers Rose and Clear focused a spotlight on the effects of incarceration on neighborhoods. They established the theoretical foundations for predicting that heavy reliance on incarceration as a social control strategy would lead to the disorganization of the communities where its effects are concentrated (Rose and Clear 1998), they explored the role of "coercive mobility" (i.e., high rates of incarceration and reentry) in *increasing* crime rates at the neighborhood level (Clear et al. 2003), they studied how interpersonal networks were disrupted by concentrated incarceration (Clear, Rose, and Ryder 2001), and specifically probed the potential of offender reentry for both good and ill in the lives of their family members and children (Rose and Clear 2004). They coined the term "reentry cycling" to describe the close association of removal and reentry of offenders (i.e., in the same neighborhoods) and argued that:

the immediate impact of reentry cycling is a series of weakenings of the sources of informal social control that serve as the basis for public safety and community quality of life. ... high rates of incarceration and reentry, concentrated in poor places among people of color, serve to further weaken the community capacity of those places rather than to strengthen it (Clear et al. 2003).

To date no one has attempted to estimate the apparent costs to the community of this pattern, and it remains an important topic for future cost-benefit analysis.

Additional social, health, educational services required by family of the prisoner

It is intuitively appealing, given the findings of the Rose and Clear studies regarding the disorganizing effect of concentrated reentry cycling and the evidence of family economic strain, to presume that the families and children of incarcerated offenders may access and use more public services than they otherwise would. Eric Cadora and his colleagues used GIS mapping in Brooklyn to match the block-by-block rates of incarcerated residents against individuals on TANF (Cadora, et al. 2003). They found substantial overlap in the neighborhoods with the highest concentrations of these individuals, suggesting that they are the same populations. They also matched incarcerated parents against minor children receiving public assistance, finding an even more precise overlap. These overlapping mappings offer a circumstantial case but not proof for the increased use of public services. Further, ongoing work with women offenders in Illinois may challenge this assumption when it is finally published. We therefore treat this as a potential, but presently undemonstrated effect of a parent's incarceration.

Decreased future productivity of children of the prisoner

Increased delinquency and criminality of children of the prisoner

Decreased health of children

Decreased mental health of children

Our literature review reveals that the evidence for these potential effects is weak or equivocal and so we do not attempt to estimate their costs (Ziebert 2006).

An Inventory of the Elements of Social Benefit

The potential benefits of incarceration have three primary components: Deterrence, incapacitation, and retribution. However, there are also collateral benefits that are much less frequently mentioned in the literature and even more rarely estimated.

Deterrence occurs when commission of a crime is averted because the potential perpetrator fears the consequences. The effect of deterrence is greatest with property crimes that have relatively low social costs (Levitt 1998). Incapacitation occurs because an offender cannot commit (community) crime when in prison. Incapacitation effects are largest for violent crimes (Levitt 1998). Retribution is mentioned as a social purpose of incarceration but almost never further explored and no value has yet been attached (Piehl and DiIulio 1995; Cohen 2000; Lynch 1994; MacDougal et al. 2003). Most attention focuses on deterrence and incapacitation as the principal benefits of incarceration.

Savings/benefits from avoidance of crime

Levitt (1996) approached the estimation of the number of crimes avoided from putting offenders in prison by examining the increase in crime rates that followed the discharge of large numbers of offenders ordered by courts in the settlement of prison overcrowding litigation (changes known as "elasticities"). He concluded that each offender imprisoned averted the commission of 14.7 index crimes, approximating the median number (12) determined from prisoner self-reports (Piehl and DiIulio 1995). Levitt's estimate includes both deterrence and incapacitation effects. The WSIPP, like Levitt, examined prison-crime elasticities and concluded that 17.9 crimes were avoided in Washington State in 2001 by increasing the average daily prison population by one offender (2003, table 3). They also note that the number of crimes avoided per *drug offender*

incarcerated has declined from 137 in 1980, to 37 in 1990, to 4.9 in 2001. We adopt Levitt’s estimate of 15 crimes avoided per prisoner incarcerated as a consensus position, though Washington State’s data suggest this may be too high.

An impressive literature has developed focused on estimating the cost of various crimes, including many of the collateral costs of crime such as victim pain and suffering (Cohen 1988; Miller, Cohen, and Rossman 1993; Cohen, Miller, and Rossman 1994; Levitt 1996; Cohen et al. 2004). In 1994 the National Institute of Justice funded a thorough review of the costs of crime which has now become the standard reference work on the costs of various crimes (Miller, Cohen, and Wiersema 1996). Most important for our purposes are their estimates of the costs of property crimes, since these are, far and away, those most frequently committed by drug offenders. Table 6 summarizes some of their findings.

Table 6
Losses per Criminal Victimization

Crime type	Tangible Losses	Quality of Life	Total
Child abuse (physical)	9,000	57,500	67,000
Child neglect	1,800	7,900	9,700
Robbery	2,300	5,700	8,000
Larceny (or attempt)	370	0	370
Burglary (or attempt)	1,100	300	1,400
Motor Vehicle Theft (or attempt)	3,500	300	3,700

Source: Miller, Cohen, and Wiersema 1996, table 2. Stated in 1993 dollars.

The major property crimes—larceny (theft), burglary, and motor vehicle theft—average \$1,823 (1993 dollars), or \$2,464 in 2005 dollars. Assuming that incarceration of drug offenders reduces the commission of such crimes by 15 for each year of incarceration this yields savings of \$89,938 in net present value from the incarceration of one of these offenders.

Reduced cost of insurance

Increased value of property

Increased economic activity

Lowered cost of personal security

Lynch alludes to these collateral benefits of incarceration:

... many hidden benefits also may be associated with increased incarceration, particularly if increased incarceration can be shown to reduce crime. For example, insurance premiums in high crime areas may begin to fall, resources spent on personal security may be freed for more desired allocations if the threat of victimization is reduced. The difference in the value of the consumption of security-related goods and the value of a more preferred set of goods would itself be a hidden benefit associated with reductions in crime rates (1994: 4).

However, Clear and colleagues (Clear, Waring, and Scully 2005, Clear et al. 2003) demonstrate the paradoxical result that high levels of incarceration in particular

neighborhoods actually increase crime and recidivism and exacerbate poverty, calling into question the causal chain:

incarceration => reduction in crime => increased economic activity.

Though there are studies of the relationship between property values and crime rates, we have not found in the literature specific cost estimates of these effects. Improved property value remains as an unestimated but real potential benefit of incarceration.

Savings from suppression of negative behavior

Removal of harmful influence and behavior in the home

A balanced assessment of the impact of a parent's incarceration on their family members must at least acknowledge the possibility that it may have some beneficial effects. This is rarely explored in research and advocacy about incarcerated parents and their children. Watts and Nightingale (1996: 4) frame the issue squarely:

... removing a negative influence from the home could yield positive effects. If a person who has been disruptive, offensive, or irresponsible at home is incarcerated, remaining family members may stabilize. Adults may feel more able to pursue education, employment, and other productive activity that could improve their own human capital. Similarly, children may improve psychologically and perform better in school, which should, in the long run, increase their human capital. There is at least anecdotal information from a study of teen parent programs that some young mothers making noticeable progress in education, training, and employment experience a setback when their male partners are released from the justice system (Cohen 1992).

We have not found studies that systematically assess such potential positive impacts. The estimates of Miller and colleagues regarding the very high social cost of child abuse and the relatively high cost of child neglect (table 6) suggest that savings could be significant, depending on the frequency of these events. However, we lack solid information about the prevalence of child abuse and neglect committed by incarcerated parents.

Removal of harmful role model and behavior in the neighborhood

To our knowledge, there have been no estimates of this effect. It nevertheless constitutes a real potential savings from the incarceration of offenders. Balancing this, Clear and colleagues (Rose and Clear 2004; Clear, Rose, and Ryder 2001) make the case that reentering offenders can be valuable male role models and can make real contributions to their neighborhoods' social fabric. It stands to reason that they are also capable of this role prior to their arrest and incarceration.

Improvements in offender health and human capital

LaLonde and George (personal communication [2003]) describe improvements in personal health and apparent increases in human capital for female offenders incarcerated in their Illinois study. Their study participants were in very poor condition upon incarceration and the circumstance of incarceration, with the implied absence of drug and alcohol abuse and the behaviors necessary to sustain such habits, provided the opportunity for some recovery both in terms of health, in terms of addiction, and also in terms of skills. Therefore, improvements in health and human capital are potential benefits for the offender and for society due to

incarceration if opportunities for rehabilitation are sincere, available, and used by the offender. We nevertheless have no estimates of these effects.

Estimation of social costs and benefits for a cohort of prisoners: New York State drug felons

We summarize the itemization of social costs and benefits of incarceration in tables 7 and 8. Cost calculations are based on the mean sentence served by drug felons in New York State who were released during 2005 (29.8 months).

A number of items we identified as costs and benefits of incarceration currently lack estimates. For some costs, such as training for probation and parole agents, we can guess at the magnitude by analogizing with the costs of training for other professionals (e.g., alcohol and drug abuse counselors). Other costs to society that are incurred only for some fraction of the families of offenders, such as the administration of welfare payments, are likely to be small when averaged across the cohort of prisoners.¹⁸ The costs associated with the economic and social effect of concentrated reentry cycling on neighborhoods are potentially large, as are those that may accrue from the increased use of social and health services by the families of incarcerated offenders. Our preliminary estimate of the external societal cost of incarcerating a drug offender with minor children is therefore low.

The unestimated costs to families are those they bear by caring for the offender's children and by absorbing the offender post-release. These may be significant, from the family's point of view, and their absence from our calculations suggests that family costs may be an underestimate. The only offender cost left unestimated is that associated with the offender's effort to avoid or reduce incarceration. These costs are simply unknown, since such avoidance strategies are documented only anecdotally and, to our knowledge, have never been systematically studied.

On the benefit side, reduced insurance cost, increased property values, lowered cost of security, and increased economic activity are likely to be small on a per-offender basis. Removing a harmful role model, including averting some instances of child abuse and neglect, could have an impact on the estimate of social benefits. However, only a small fraction of offenders would commit child abuse or neglect their children were they free, and a fraction of children of incarcerated parents will also be abused or neglected by their substitute caregivers due in part to the prisoner's absence. These effects probably cancel each other out. In addition, the prisoner may function as a *positive* role model in the family and neighborhood to some degree, as Clear and Rose suggest, and the social *benefit* derived from removing him is therefore at least partly offset by the societal *cost* from his loss. There is no estimate for the social value of retribution, though conceivably contingent valuation studies might be capable of exploring this or it could be derived from penalty assessments in civil trials. Regardless, retribution would have to be worth at least double the value of avoided crime to bring societal benefits into alignment with societal costs. The value of avoided crime might be considered an absolute upper bound on the value of retribution.

¹⁸ If 40% of the families received \$10,000 in welfare payments over the course of the parent's sentence, and administrative costs were 4%, the net present value would be on the order of \$150.

Table 7
Social Costs of Incarceration Per Parent Drug Offender

Net Present Value for Average NYS Parent
Drug Offender

Social Costs	Society (external)	Family (external)	Offender (internal)	Total Social Cost
CJS Processing	\$3,773			\$3,773
Private legal defense			\$147	\$147
Public legal defense	\$135			\$135
Efforts to avoid prison			n.d.	\$0
Presentence investigation	(included)			\$0
Preincarceration detention	\$38,222			\$38,222
Prison bed	\$113,715			\$113,715
Child care	\$10,773	\$10,358		\$21,131
Foster care for children	\$1,322			\$1,322
Parole supervision	\$5,937			\$5,937
Training of parole agents	n.d.			\$0
Training of other providers	n.d.			\$0
Specialty services	n.d.			\$0
Admin. of welfare	n.d.			\$0
Family support of inmate		n.d.		\$0
Family provision of housing		n.d.		\$0
Lost productivity	\$89,611			\$89,611
Lost fringe benefits	\$37,816			\$37,816
Lost household productivity		\$15,816		\$15,816
Post-release decline in wages			\$13,583	\$13,583
Taxes on foregone wages	\$4,585			\$4,585
Pain & suffering-prisoner			\$188,458	\$188,458
Pain & suffering-children		\$195,300		\$195,300
Pain & suffering-partner		\$47,148		\$47,148
Depleted neighborhood economy, QoL	n.d.			\$0
Additional social services used	n.d.			\$0
Totals	\$305,888	\$268,623	\$202,187	\$776,698

n.d. = no data

Table 8
Social Benefits of Incarceration Per Parent Drug Offender

Net Present Value for Average NYS Drug
Offender

Social Benefits	Society (external)	Family (external)	Offender (internal)	Total Social Benefit
Avoided crime	\$89,938			\$89,938
Value of retribution	n.d.			\$0
Reduced insurance cost	n.d.			\$0
Increased property values	n.d.			\$0
Increased economic activity	n.d.			\$0
Lowered cost of security	n.d.			\$0
Reduced negative behavior		n.d.		\$0
Removal of harmful influence		n.d.		\$0
Removal of harmful role model	n.d.			\$0
Increased health			n.d.	\$0
Increased human capital			n.d.	\$0
Totals	\$89,938	\$0	0	\$89,938
Costs less benefits	\$215,950	\$268,623	\$202,187	\$686,760
Cost-benefit ratio	3.40	--	--	8.64

n.d. = no data

One weakness of our estimates is that several elements, such as legal defense costs, are based on averages derived from national data rather than New York data. However, these costs are miniscule compared to the other variables. We also use national estimates for the costs of crime and the value of a statistical life. However, the use of large, aggregate national data to derive these estimates is the source of their validity, and has become standard practice in cost-benefit analysis.

In brief, this comparison shows that New York State is losing \$3.40 for every dollar of benefit derived from incarcerating drug offenders, limited only to the *public* costs and benefits of incarceration. If the family's external costs are added to the account the loss climbs to \$6.31 for every dollar of benefit. And if we consider total social cost, which includes those losses experienced by the offender himself, the ratio is \$8.64 in cost for every dollar of benefit or a net loss of \$687,000 in 2005 dollars per average parent drug offender. Just as clear as the magnitude of these losses is the conclusion that the largest share of costs for the incarceration of drug offenders with minor children (40%) is borne by society, not by the offender or the offender's family.

Net Costs and Benefits to New York State

The Department of Correctional Services of New York State reported in their Legislative Briefing Book that 6,584 drug felons were released to parole supervision in 2005 after serving an average sentence of 29.8 months. 56% of these offenders had minor children (Mumola 2000). Applying this proportion to the population of drug felons and multiplying by the per-parent costs from table 7 generates our estimate of the cost for incarcerating the cohort of parent-prisoners. A parallel estimate can be made of the costs of incarcerating *non-parent* offenders (44% of the cohort), by removing all family costs from the calculation and deleting the societal estimates for day care and foster care. This yields the following totals for parent-offenders, non-parent offenders and grand total for all incarcerated drug offenders (table 9).¹⁹

Table 9
Total Costs and Benefits for Incarcerating NYS Drug Offenders

Parents	Society (external)	Family (external)	Offender (internal)	Total Social Cost
Total Cost	\$1,127,820,726	\$990,423,472	\$745,472,810	\$2,863,717,008
Total Benefit	\$331,605,495	\$0	\$0	\$331,605,495
Net Cost	\$796,215,231	\$990,423,472	\$745,472,810	\$2,532,111,513
Non-parents				
Total Cost	\$851,106,985	\$0	\$585,728,636	\$1,436,835,621
Total Benefit	\$260,547,174	\$0	\$0	\$260,547,174
Net Cost	\$590,559,810	\$0	\$585,728,636	\$1,176,288,447
All offenders				
Total Cost	\$1,978,927,710	\$990,423,472	\$1,331,201,446	\$4,300,552,629
Total Benefit	\$592,152,669	\$0	\$0	\$592,152,669
Net Cost	\$1,386,775,041	\$990,423,472	\$1,331,201,446	\$3,708,399,960

The net result for the state is a loss of about \$1.4 billion on the purely societal costs of incarcerating this cohort of offenders, and a total loss of \$3.7 billion when all social costs are summed. The comparison shows that it costs about 4% more to incarcerate a parent vis-à-vis a non-parent considering only external societal costs, but about 96% more if the external costs to family and children are factored in.²⁰ Adding the offender's costs to the equation leaves the differential between parents and non-parents, because it adds about \$202,000 to the costs for incarcerating a non-parent, resulting in about 57% greater social costs for parent-offenders.

¹⁹ The estimated net present value of the societal cost for incarcerating a non-parent in this cohort is \$293,392.

²⁰ The calculation for external societal costs is $\$305,486/\$293,392 = 1.04$. The calculation for societal plus family costs is $(\$305,486 + \$268,623)/(\$293,392 + \$0) = 1.96$.

Alternatives to incarceration of drug offenders

In New York State 61% of the total of 6,584 drug offenders released in 2005 were incarcerated for drug sale, while the remaining 39% were imprisoned for drug possession. 28% of the cohort was incarcerated under a Class A felony and the rest fell under Class B through E felonies. Since many drug abusers and addicts finance their habits by selling drugs it is reasonable to suppose that the crimes of some of those arrested for sale were in fact driven by abuse or addiction rather than strictly by profit motive. This profile and reasoning suggest that drug abuse treatment may be an appropriate alternative to incarceration for a large proportion of this population. Various incapacitation strategies that seek to prepare and place offenders in economically rewarding occupations may be appropriate for a good share of the rest.

Zarkin and colleagues (Zarkin, Dunlap, Belenko, and Dynia 2005) have conducted a careful cost-benefit analysis of the Drug Treatment Alternative to Prison (DTAP) program which has been operating in Kings County (Brooklyn, NY) since 1990. This program diverts nonviolent felony drug offenders from prison to community-based residential drug treatment programs based on a therapeutic community model for 15 to 24 months. By coincidence, this length of treatment approaches the average sentence served by the New York State cohort of drug offenders. Zarkin and colleagues calculated the costs of operating the residential drug treatment, the costs to the criminal justice system for initial processing of the participants, as well as the costs of subsequent arrests and incarceration for those who failed to complete the program, or relapsed into drug use or crime after graduating. Their observations and calculations extend over six years, and we present their findings for the first three years that coincide approximately with the average 30 month sentence served by New York State drug offenders (table 10).

Table 10
DTAP Program and CJS Costs (Net Present Value)

		Year 1		Year 2		Year 3		
	N	DTAP Costs	CJS Costs	DTAP Costs	CJS Costs	DTAP Costs	CJS Costs	Total for 3 years
DTAP All	149	\$25,830	\$4,775	\$12,798	\$8,079	\$1,910	\$8,924	\$62,316
Completers	87	\$29,390	\$577	\$19,419	\$210	\$1,927	\$1,599	\$53,122
Non-completers	62	\$20,836	\$10,667	\$3,507	\$19,121	\$1,887	\$19,204	\$75,222

Source: Zarkin, Dunlap, Belenko, and Dynia 2005, table 6. Stated in 2001 dollars, 3% discount rate.

Residential treatment of this type is probably the most expensive form of drug treatment. Yet, the total treatment and CJS costs of this intervention over three years (\$68,720 in 2005 dollars) are about 22% of the *societal* share of incarcerating a parent drug abuser, about 12% of the total external costs (society plus family) and just under 9% of total social costs. Assuming that half of the incarcerated drug offenders are suitable candidates for treatment, the potential savings for treating versus incarcerating them can be calculated (table 11).

Table 11

Savings from Treatment of 50% of NYS Drug Offenders

	Societal Savings	Societal + Family Savings*	Total Social Cost Savings
Per Parent	\$237,168	\$505,791	\$707,978
Per Non-parent	\$225,073	\$225,073	\$427,260
50% of Parents	\$437,223,668	\$932,435,405	\$1,305,171,810
50% of Non-parents	\$326,013,947	\$326,013,947	\$618,878,265
50% of All Offenders	\$763,237,615	\$1,258,449,351	\$1,924,050,075
*Includes amounts counted as Societal Savings (column B).			

The likely savings from treating half of this cohort are significant. The State would realize about \$760 million in savings considering only the societal fraction of costs, and would avoid about \$1.9 billion in expenses if all social costs are taken into consideration. And, of course, society and the drug abusers would benefit substantially from the improved condition of those who succeed in treatment.

Conclusions and implications

The extent of the costs implicated in incarcerating parents is hidden from view because, like some diseases, these costs hide in many corners of the body politic and they reemerge at different times after the initial crisis. The full inventory of both costs and benefits is probably more robust than what we have inventoried here. Future research will clarify whether some of the proposed effects, such as long term consequences for children, in fact occur, and will also quantify some of the known effects that exist but remain unestimated, such as the impact on neighborhoods of concentrated incarceration and reentry. As such studies unfold the amounts of money counted on both the cost and benefit side will rise.

The shape of the equation for society is nevertheless clear. Incarceration is an immensely costly form of social control. We can now appreciate that these costs do not devolve primarily on the punished person, even when the value of their loss of freedom (i.e., quality of life) is considered. Instead, about four-tenths (40%) the total social cost of placing a parent behind bars is the *public's* loss, while the losses borne directly by the offender are considerably smaller (26%). The major elements of this loss to the public are CJS and prison costs, on the one hand, and lost productivity and its reflexes, on the other. Families, as expected, also suffer significant costs, primarily in terms of reduced quality of life and secondarily in terms of lost productivity. The incarceration of a parent must therefore be thought of as a very substantial public investment in a linked series of actions and people. It is somewhat like investing \$775,000 in a dramatic production—a documentary actually—centering on the offender and his family, but also drawing in as supporting actors law enforcement, court personnel, lawyers, prison staff, day care

providers, foster parents, and a host of others. It is a large cast, and, in ultimate economic and social terms, everyone must be paid. The currency used is the public welfare.

New York State, perhaps without fully realizing it, sponsored about 6,600 of these extravagant semi-public dramas when it incarcerated the cohort of drug offenders who left prison in 2005. It amounts to a spillway draining the reservoir of New York State tax dollars to the tune of \$4.1 million per day for every day of the average drug offender's time served (= total social cost/894 days).

The question, of course, is whether that investment is worth it. A glance at the costs of different types of crimes makes clear that the benefits of imprisonment will only approach the costs if incapacitation and deterrence prevent the commission of very costly crimes. Indeed, if the primary benefit of incarceration is incapacitation and deterrence, as most seem to agree, the value of crimes averted per drug offender in New York *in one year* would have to total about \$319,000 for benefits to match total social costs over the course of an average sentence or \$125,500 in one year just to match the external, societal fraction.

We also know that some types of offenders, such as drug offenders and property offenders, largely commit crimes that have very low social costs, such as property and drug offenses. Therefore, in terms of cost-benefit economics, prison is a stratified economic space, consisting of tiers of inmates who potentially impose different costs on society for their imprisonment (e.g., parents vs. non-parents, women vs. men), but who also have vastly different social benefit profiles, depending of the value of the crimes averted via their imprisonment. The public loses the most on offenders who tend to commit low cost crimes such as drug use and theft, it experiences a somewhat better return on auto thieves, still better for robbers, and so on. It also loses more on parents as opposed to non-parents, and women as opposed to men. When the effects of such cross-cutting distinctions are compounded the prison population can be arrayed from those with the lowest benefit-highest cost profile at one end (e.g., female drug offenders with a partner and minor children) to those with the highest benefit and lowest cost at the other (e.g., men without children or partners who murder). It makes little sense to speak of the "average" prisoner. Public policy on crime would be wise to take this into account.

It is not as though we lack alternatives for some of these tiers of offenders. A wide variety of studies of various modalities of drug treatment have shown that some types of treatment succeed in reducing or eliminating drug use for a good portion of participants, and can lower the rate at which participants subsequently commit crime, get arrested, and go to prison. The most expensive of these modalities in New York costs about one-eleventh of what the public invests in the prison drama of one offender. Gary Zarkin's comments provide appropriate punctuation to this discussion:

Social concern about substance abuse has put policymakers in a bind. On the one hand, many taxpayers prefer to see substance abusers arrested, prosecuted, and jailed for violating drug laws. On the other hand, these policies have resulted in substantial jail and prison expenses, overloaded court dockets, a need for more jail and prison space, and a growing recognition that incarceration per se does not

address an offender's underlying drug problem (Zarkin, Dunlap, Belenko, and Dynia 2005: 20).

We can hope that, with refinement, the economic analysis of incarceration such as that offered here will feed the development of intentional and intelligent public policy and generate a distribution of public resources and investments that makes economic and social sense.

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Appendix 1
Calculations of Net Present Value

Calculations are based on the average sentence served by New York State drug felons who were released in 2005 (29.8 months), using a discount rate of 3%.

Item	Item Cost	Discount Rate	Discounted value
Prison bed			
Year One	\$46,731	0.0000	\$46,731
Year Two	\$46,731	0.0300	\$45,370
Year Three (5.8 months)	\$22,585	0.0145	\$21,614
Total Net Present Value			\$113,715

Wages			
Year One	\$36,825	0	\$36,825
Year Two	\$36,825	0.03	\$35,753
Year Three (5.8 months)	\$17,798	0.0145	\$17,032
Total Net Present Value			\$89,611

Fringes			
Year One	\$15,540	0	\$15,540
Year Two	\$15,540	0.03	\$15,088
Year Three (5.8 months)	\$7,511	0.0145	\$7,188
Total Net Present Value			\$37,816

Household Productivity			
Year One	\$6,500	0	\$6,500
Year Two	\$6,500	0.03	\$6,310
Year Three (5.8 months)	\$3,141	0.0145	\$3,006
Total Net Present Value			\$15,816

Cost of Parole			
Year One	\$0		
Year Two	\$0	0.03	
25-30 months (5.8 mos)	\$0	0.0145	
31-36 months (6.2 mos)	\$1,610	0.0155	\$1,539
37-48 months	\$3,219	0.03	\$2,946
49-54 months (5.8 mos)	\$1,610	0.0145	\$1,452
Total Net Present Value			\$5,937

Item	Item Cost	Discount Rate	Discounted value
Lost earning power			
Year One	\$0		
Year Two	\$0	0.03	
25-30 months (5.8 mos)	\$0	0.0145	
31-36 months (6.2 mos)	\$3,683	0.0155	\$3,521
37-48 months	\$7,365	0.03	\$6,740
49-54 months (5.8 mos)	\$3,683	0.0145	\$3,322
Total Net Present Value			\$13,583

Lost fringes on lost earnings

Year One	\$0		
Year Two	\$0	0.03	
25-30 months (5.8 mos)	\$0	0.0145	
31-36 months (6.2 mos)	\$1,554	0.0155	\$1,486
37-48 months	\$2,268	0.03	\$2,076
49-54 months (5.8 mos)	\$1,134	0.0145	\$1,023
Total Net Present Value			\$4,585

Value of crimes avoided

Year One	\$36,960	0	\$36,960
Year Two	\$36,960	0.03	\$35,883
Year Three (5.8 months)	\$17,863	0.0145	\$17,095
Total Net Present Value			\$89,938

Cost of foster care/child

Year One	\$21,900	0	\$21,900
Year Two	\$21,900	0.03	\$21,262
Year Three (5.8 months)	\$10,584	0.0145	\$10,129
Total Net Present Value			\$53,291

Cost of day care-parent

Year One	\$4,257	0	\$4,257
Year Two	\$4,257	0.03	\$4,133
Year Three (5.8 months)	\$2,057	0.0145	\$1,969
Total Net Present Value			\$10,358

Item	Item Cost	Discount Rate	Discounted value
Cost of day care-state			
Year One	\$4,427	0	\$4,427
Year Two	\$4,427	0.03	\$4,298
Year Three (5.8 months)	\$2,140	0.0145	\$2,048
Total Net Present Value			\$10,773

Appendix 2 Calculation of Disutility

Source of method: French, Michael T., Josephine A. Mauskopf, Jacqueline L. Teague, and E. Joyce Roland. 1996. Estimating the dollar value of health outcomes from drug-abuse interventions. *Medical Care* 34 (9): 890-910.

QALY: Quality Adjusted Life Year

$$\text{Discounted QALYs lost} = \sum_{i=n}^D \frac{\text{Relative Utility Decline}}{(1+r)^{i-n}} \times \text{Prob}(A_i|A_{i-1})$$

i ranges across the time period of the period of disutility, in months or years, in this case the period of incarceration.

r is the discount rate.

$\text{Prob}(A_i|A_{i-1})$ is the probability of being alive at year i given being alive at age $i - 1$.

Assumptions

$A_i|A_{i-1}$ is taken from United States Life Tables (2003), published by the CDC (Arias 2006).

We use .03 (3%) as the discount rate.

Discounted QALYs lost x Value of one statistical life year = Total \$ value of disutility

Value of one statistical life year = \$377,777 in 2005 dollars (based on French et al. 1996).

Average sentence served for NY drug felons released during 2005 was 29.8 months (2.48 years).

Year	Age	Prob. Of Dying	Prob $A_i A_{i-1}$	Lost QoL (%)	Discount Rate	QALYs lost	Value @ \$387,777
1	white male, 32	0.001387	0.998613	0.2	0	0.19972	\$77,448
2	white male, 33	0.001385	0.998615	0.2	0.03	0.19391	\$75,192
3	white male, 34	0.00148	0.99852	0.09666	0.0145	0.09237	\$35,818
	Total					0.48599	\$188,458
1	white female, 32	0.000622	0.999378	0.1	0	0.09994	\$38,754
2	white female, 33	0.00072	0.99928	0.1	0.03	0.09702	\$37,621
3	white female, 34	0.000741	0.999259	0.04833	0.0145	0.04622	\$17,922
	Total					0.24317	\$94,297
1	white male, 8	0.000147	0.999853	0.1	0	0.09999	\$38,772
2	white male, 9	0.00013	0.99987	0.1	0.03	0.09707	\$37,643
3	white male, 10	0.000164	0.999836	0.04833	0.0145	0.04624	\$17,932
	Total					0.24330	\$94,348