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## Delinquency Best Treatments: How to Divert Youths from Violence While Saving Lives and Detention Costs

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**Youth development and violence prevention are two sides of the same public policy. The focus of much theoretical and empirical effort is identifying delinquency risks and intervening. Given the great costs of homicide and the historically high nationwide prison population, new policies must address increasing violence and rising expenses. Treatments of prenatal care, home visitation, bullying prevention, alcohol-substance abuse education, alternative thinking promotion, mentoring, life skills training, rewards for graduation and employment, functional family and multi-systemic therapy, and multi-dimensional foster care are effective, because they ameliorate age-specific risks for delinquency. At present, these interventions only yield a 10–40% diversion from crime however. Returns on investment (ROIs) vary from \$1 to \$98. Targeting empirical treatments to those determined to be most at risk, based on statistical models or actuarial testing, and using electronic surveillance for non-violent prisoners significantly diverted youth from violence, improving ROI, while simultaneously saving costs. Copyright © 2013 John Wiley & Sons, Ltd.**

Consistently, crime levels, schools, and taxation rates are among the greatest concerns of citizen voters. Today, 9.8% of roughly 12,000 homicides are committed by juveniles each year. Another pressing national issue within the criminal justice system is the rising population of prisoners, parolees, and probationers. Currently, these nearly four million jailed and monitored detainees cost the U.S. an estimated \$30 billion every year. The expense of building new jails and maintaining old ones takes up to 30% of government budgets. This diverts precious resources from other pressing needs. The policy implications of predicting and preventing juvenile crime are crucial to the future of the U.S., of great concern for public safety and important in keeping expenses down.

Public policy in this regard must take these rising costs into consideration, but also improve the safety of citizens, many of whom “perceive” cities filled with violence. Given that over a million citizens have died from homicide, as compared with less than a million soldiers killed on the battlefields since 1776, this perception of U.S.

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metropolitan areas is not far from accurate (Zagar, Zagar, Bartikowski, & Busch, 2009). Meanwhile, decision-makers are scrambling to meet the basic needs of their communities while coping with the expenses. There are limited resources to expand the criminal justice system, and what is available must be used cost-effectively. The goal of this review is to determine what works in delinquency prevention programs, and what options are available to leaders to lower crime rates, save money, and perhaps improve the lives of some youths by diverting them from delinquency and crime.

As with any age-specific problem, one must estimate the effects of treatments to prevent delinquency challenging. It takes years for the influences of interventions to become obvious. Treatment effects during infancy may not be evident until childhood. Childhood intervention effects may not be apparent until adolescence. Effects of intervention applied in the teen years may not be demonstrated until adulthood. Meta-analysis and cost-benefit analysis are two approaches for measuring the effectiveness of age-specific programs.

### **Meta-analysis and Effect Size**

In meta-analysis, the effect size is measured objectively. Effect size is defined as the difference between treatment and control group means on recidivism. It is expressed in standard units. This standardized unit, the mean difference effect size, is commonly used in presenting findings across studies.

### **Cost-benefit Analysis, Direct and Indirect Costs, and Return on Investment**

In cost-benefit analysis, the expense of implementing a program is compared with the reduction of future crimes and associated expenses. Comparing cost-effectiveness of alternative crime prevention strategies requires decisions about the benefits or savings to be considered. Some analyses only consider direct savings in the criminal justice system. Others access savings no matter where they occur. This latter approach includes the benefits of reduced crime to potential victims. In fact, the direct costs of the criminal justice system are a small share of the total expense to victims imposed by crimes.

Estimates of monetized, lost quality of life due to death are between \$3 and \$5 million dollars, based on the average amount spent to reduce the risk of death (Viscusi, 1993) along with discount rates, which one must pay to borrow money at low versus high ends of reasonable ranges (Viscusi & Moore, 1989; Viscusi, 1993). From this perspective, the annual cost of juvenile homicides alone is over \$1 billion.

Economists argue about how to put a value on the "quality of life." Some use jury awards to estimate total costs to victims of various crimes. One of the standard ways to measure the cost-benefit of a program is return on investment (ROI). ROI is the estimated expense of crimes reduced by implementing a particular program, minus the cost of implementing the program. This figure is then divided by the cost of implementing the program. In this review, both direct and indirect costs will be used along with ROI as a simplified metric to evaluate the cost benefit.

## FOCUSING ON THOSE WHO ARE MOST AT RISK

Most delinquent and criminal offenses are committed by a small group of individuals, estimated at 5% of the population (Sellin & Wolfgang, 1968). This 5% of the population includes alcohol and substance abusers, career offenders, school dropouts, homicidal or homicidal-prone, and those determined to be psychotic, some of whom become violent. Targeting this 5% most-at-risk individuals is the best way to mitigate risks and lower costs. Effective interventions can divert an at-risk youth's life trajectory away from delinquency, crime, and violence to be sober and "straight," attend school, stay out of jail, not commit violent acts, and take medication.

Helping these individuals to become taxpaying workers can improve both the bottom line and their quality of life, while simultaneously safeguarding the community. Reducing the number of offenses and their costs can be best achieved by using treatments that have been shown to work empirically over time, in various geographic areas with high levels of violent crime and homicide.

Another way of referring to those most at risk is the often-used terms trauma-informed care and trauma-focused services. Trauma-informed care is the use of services implemented in such a fashion as to identify. Trauma-focused services are offered when providers realize the impact of violence and trauma, and recognize the need to address these impacts and respond with the means to aid recovery (Listenbee & Torre, 2012).

### Using Actuarial Statistical Instruments

Those most at risk for alcohol and substance abuse can be empirically identified using a simple test like the Substance Abuse and Subtle Screening Inventory (SASSI), which is both over 90% sensitive and over 90% specific (Miller & Lazowski, 1999, 2001). Another approach is to use actuarial statistical tools, historically based since 1928 on probation parole decision-making tests, such as the Standard Predictor, a limited set of risks for homicide and other violent crimes with a receiver operating characteristic curve of 0.91 to 0.99 (Zagar & Grove, 2010). This test is similar to the Violence Risk Appraisal Guide with its area under the curve of 0.75 (Quinsey, Harris, Rice, & Cormier, 1998).

A proven, valuable, objective method for assessing psychosis and other psychiatric disorders is the Minnesota Multiphasic Personality Inventory (MMPI), both second (MMPI-2) and adolescent (MMPI-A) editions, with over 19,000 empirical studies and 250 appellate court cases attesting to its sensitivity and specificity and coming with a computerized report (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989; Butcher et al., 1992).

## META-ANALYTIC STUDIES OF TREATMENTS

In literally hundreds of studies, researchers have assessed the effects of various delinquency treatments. These studies differ in many respects. As a result, determining which treatments were effective, and why, was impossible before the use of meta-analysis. Mark Lipsey (Lipsey, 1999, 2009; Lipsey, Howell, Kelly, Chapman, & Carver, 2010) has published several meta-analyses that have identified the types of intervention that are effective and the aspects of the treatments, participants, and design that explain this effectiveness. These meta-analyses are briefly reviewed with quantitative results of more than 548 studies from

1958 to 2002. Included were the subjects' characteristics, treatment and program variables, and outcome effect sizes in terms of behavioral changes for serious offenders.

Most youths in these studies were males with mixed ethnicity and race and multiple offenses, including aggression and property crimes. In all cases, treatment compliance with therapists was mandatory. Treatment lasted 10–30 weeks with less than 10 hours of weekly contact. Lipsey used the overall mean reduction in the expected 50th percentile. The recidivism rate was about 12% for treated delinquents. Figures 1 and 2 show a mean improvement over no intervention for each treatment modality. The weakest interventions were peer counseling or family therapies. The strongest were group counseling and employment. This makes common sense given the adage, “A boy with a good home, school, and job does not go to jail.”

Wilson and Lipsey (2007) demonstrated that, typically, successive increases in treatment dose were associated with decreases in reoffending. The most effective treatments are multi-modal, carefully monitored, and closely supervised by researchers. These interventions consisted of 100 or more contact hours that last six months or longer. Among youths, the best treatment with good implementation for over six months reduced recidivism by 32% (Lipsey, 1999) as compared with the above-mentioned and expected

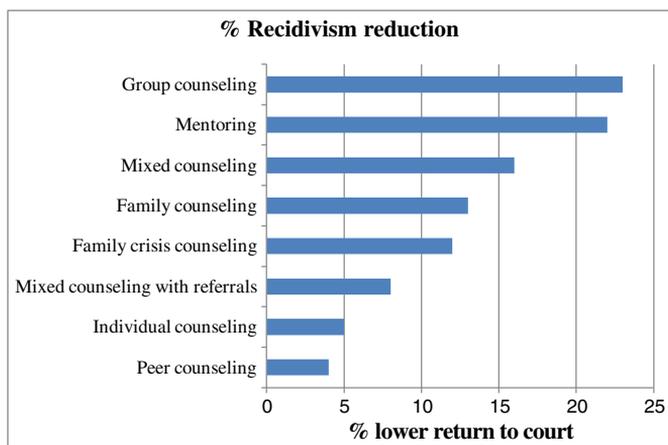


Figure 1. Mean percent recidivism reduction as a result of generic counseling programs (adapted from Lipsey *et al.*, 2010).

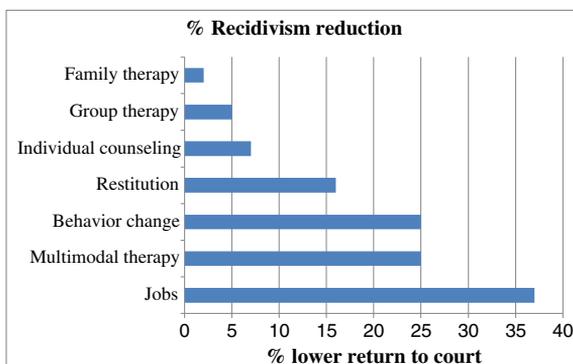


Figure 2. Mean percent recidivism reduction from generic counseling programs (adapted from Lipsey, 1999).

50th percentile with no treatment (Quinsey et al., 1998). An 18% reduction in delinquency was disappointing.

However, it could be that the whole approach leaves out the most crucial element of treatment: targeted application over the age-specific course for the 5% who are most at risk. Targeting those most at risk ensures that the application is directed to those most in need. Across all 548 studies, the mean intervention effect was significantly positive.

The mean effect size for the one-year, re-arrest rate was 6%. At the 75th percentile, the effect size was 24%, while at the 19th percentile the effect size was 40%. In practical terms, one will generally achieve more delinquency reduction benefits from intervention dollars by focusing on the 5% who are most at risk. More effective programs target improving constructive behavior, regardless of age. Success was ensured by monitoring the fidelity of implementation.

When one looks at 399 school-based studies (Wilson & Lipsey, 2007), a variety of effects upon a range of outcomes become evident. Figure 3 shows the effect sizes of school-based programs on various behaviors. The best results were obtained for working with social skills. Treating aggression was considerably less effective.

### COST-EFFECTIVENESS OF TREATMENT

The current challenge in assessing the true effectiveness of various interventions is to empirically establish evidence of the fidelity of implementation and the cost benefit. Greenwood, Model, Rydell, and Chiesa (1998) estimated that globally applied graduation incentives and parent training interventions reduce crime in California by 22%, with an annual cost of \$1 billion, much less than the cost of associated with California’s “Three Strikes Law.”

Projecting this 22% reduction on the one million crimes committed in California each year would result in 220,000 fewer offenses. If one used statistical modeling or tests

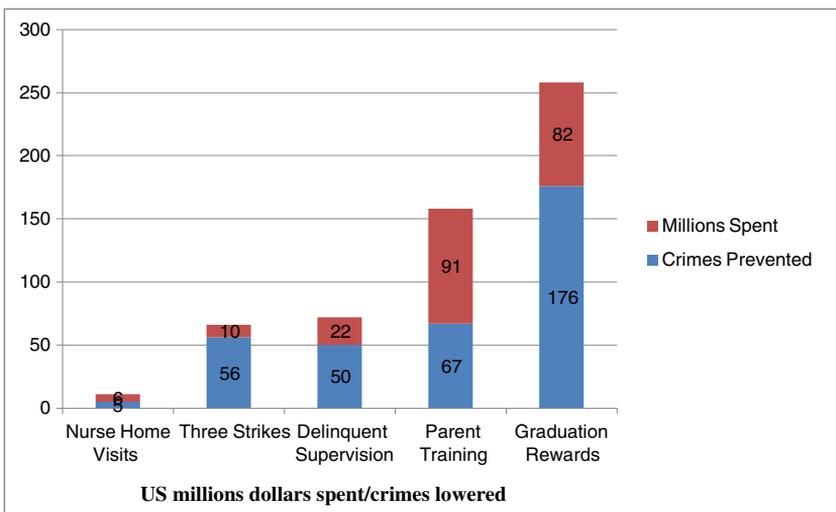


Figure 3. Cost-effective treatments for delinquency reduction with number of crimes prevented per million dollars spent (adapted from Karoly et al., 1998).

to target empirical treatments to the 5% who are most at risk (Greenwood *et al.*, 1998), better results would be predicted, with a significant improvement in quality of life and at lower costs to taxpayers. Additionally, the expenditures associated with these interventions would be far lower because expensive treatments would be focused on those most likely to commit crimes.

Every year in the United States, one violent crime occurs for every 130 people. Most public money on crime prevention is spent on incarceration, with fewer resources spent on diversion programs. This does not make economic sense, when the ROI is higher for other approaches. Greenwood *et al.* (1994, 1998); Washington State Policy Institute (1999), and Karoly *et al.* (1998) reviewed the cost-effectiveness of various interventions (see Figure 4).

Crime rate estimates for youths were compared with the population as a whole, and expressed as serious crimes prevented per \$1 million spent, for nurse home visits, California's "Three Strikes Law" incarceration, delinquent supervision, parent training, and graduation rewards.

Discount rates are calculated at an annual rate of 4% to reflect the lower present value of future dollars. The discounted costs are summed over all program years to calculate the net present value of total program costs per participant. The benefits or effectiveness associated with a program are measured in numbers of serious crimes prevented per program participant. Program effectiveness was operationally defined as the reduction in the number of serious crimes that an average program participant would commit in a lifetime. The number of crimes expected in the cohort's lifetime is derived from this number.

Some interventions are conducted at young ages, so benefits greatly lag costs. For example, California's "Three Strikes Law" may reduce crime by 21%, while high school graduation rewards will reduce subsequent incidents by 15%. Delinquent supervision, parent training, and high school graduation rewards reduce the number of career offenders, each of whom costs society up to \$2 million. Thus, the ROI can be significant.

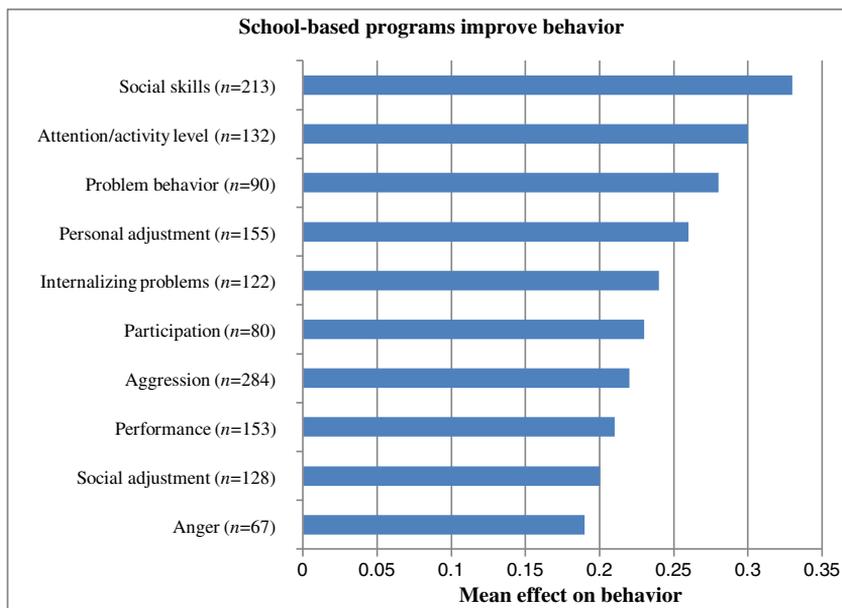


Figure 4. Weighted means and effects of school-based programs on each outcome behavior (adapted from Wilson & Lipsey, 2007).

Table 1 lists the Washington State Policy Institute (2006) evidence-based options to reduce future prison construction, criminal justice cost, and crime rates. In these prevention programs, the best ROI was pre-kindergarten, low-income interventions for three to four year-olds, with \$20.57 in savings for every dollar spent. For juvenile offenders, the best ROI was inter-agency coordination programs, with \$25.03 in savings for every dollar spent. For adult offenders, the best ROI was in-class, cognitive behavior therapy, with \$98.09 in savings for every dollar spent.

Given that most adult offenders were also juvenile delinquents, the attractiveness of the prevention and juvenile programs cannot be underestimated. By implementing such interventions, it was estimated that the state of Washington could save millions. This suggests that billions could be saved nationwide if a more rational and objective approach were used instead of “arresting ourselves out of homicides and crime and jailing the convicted offenders.”

## TARGETING EMPIRICAL TREATMENTS: CHICAGO'S CULTURE OF CALM

In 2009, the U.S. Department of Justice (DOJ) funded a trial intervention called “Culture of Calm” (Saulny, 2009; Shelton & Banchemo, 2009). It provided a statistical prediction of criminal careers, thereby identifying the 5% most-at-risk youths; empirically

Table 1. Benefits, costs and return on investment (ROI) with evidenced-based prevention, juvenile, and adult intervention: what works (adapted from Washington State Policy Institute, 2006)

	Benefits	Costs	Return on investment
<b>Prevention programs</b>			
Pre-kindergarten, low-income education for 3–4 year-olds	\$12,196	\$593	\$20.57
Nurse family partnership children training	\$12,822	\$733	\$17.49
Nurse family partnership parent training	\$14,283	\$5,409	\$2.64
<b>Juvenile offender programs</b>			
Inter-agency coordination programs	\$5,186	\$205	\$25.03
Adolescent diversion program	\$40,623	\$1,913	\$21.24
Aggression replacement training	\$14,660	\$897	\$16.34
Functional family therapy on probation	\$31,821	\$2,325	\$13.69
Multidimensional treatment foster care vs. regular group care	\$77,798	\$6,945	\$11.20
Teen courts	\$9,208	\$936	\$9.83
Restorative justice for low-risk offenders	\$7,067	\$880	\$8.03
Multi-systematic therapy	\$18,213	\$4,264	\$4.27
Family integrated transitions	\$40,545	\$9,665	\$4.20
Juvenile drug courts	\$4,622	\$2,777	\$1.66
<b>Adult offender programs</b>			
Cognitive behavior therapy in prison or community	\$10,299	\$105	\$98.09
Prison correctional industries (job)	\$9,439	\$417	\$22.64
Community drug treatment	\$10,054	\$574	\$17.92
Prison vocational education	\$13,738	\$1,182	\$11.62
Prison basic secondary general education	\$10,669	\$962	\$11.09
Community job and training	\$4,359	\$400	\$10.90
Prison drug treatment	\$7,835	\$1,604	\$4.88
Treatment-oriented intensive supervision	\$11,563	\$7,124	\$1.62
Adult drug courts	\$4,767	\$4,333	\$1.10

supported interventions to stave off criminal careers; and cost savings attributable to applying the empirically supported interventions to the 5% most-at-risk youths.

First, one must identify the 5% most-at-risk population, those most likely to commit homicide. Next, one must use the best empirically supported treatments. An example of a 5% most-at-risk population is alcohol abusing youths. Estimates across studies suggest that each alcohol-abusing youth costs society \$718,000–\$1,200,000 over his or her lifetime (Cohen, 1995; Zagar, Busch, Grove, & Hughes, 2009 adding the Consumer Price Index (U.S. Bureau of Labor Statistics, 2012). Employing the best empirically supported treatments could save that expense.

What cost savings are achievable, if risk is detected early and effective interventions are used to lessen that risk? Miller, Cohen, and Wiersema (1996) and Cohen (1993) demonstrate that intercepting school dropouts, alcohol and substance abusers, and serious career delinquents-criminals can save \$665,000–\$965,000 per individual.

In his summary of the value of treating a most-at-risk youth, Cohen (1993) estimates the added cost to society of a heavy alcohol-substance abuser to be \$718,000–\$1,240,000, a serious career delinquent criminal to be \$1,410,000–\$1,670,000, and a high school dropout to be \$665,000–\$965,000. The total range of costs is from \$400,000–\$4,400,000.

The theory of direct statistical interest is the application of discount rates. Money loses value over time (Cohen, 1988, 1995, 1998; Cohen & Miller, 1994; Cohen, Miller, & Rossman, 1994; Cohen & Piquero, 2007; Miller *et al.*, 1996; Russell, 2008).

### **Using an Actuarial Model to Identify Most-at-risk Youths**

An age-specific model that focused particular risks was presented to Midwestern, urban decision-makers (mayor and staff) with specific predictions for infants, children, teens, and adults. The model is based on evidence that statistical predictions can be used to identify the 5% of individuals most at risk. Employing this model, interventions were focused on the 5% juveniles identified as most at risk, applying one or more of the empirically supported treatments discussed earlier.

High schools are targeted because of the higher incidence of shootings and homicides at these locations. A former school CEO received regular encouragement to pursue this issue from the mayor of Chicago as a result of studying 500 shooting incidents in and around high schools. The logistic regression of these shootings (Ahmed, 2010; Chandler, Levitt, & List, 2011; Chicago Board of Education, 2010; Harris, 2009; Rossi, 2010; Saulny, 2009; Shelton & Banchemo, 2009) were consistent with previous findings (Zagar *et al.*, 2009c; Zagar *et al.*, 2009d; Zagar & Grove, 2010).

The characteristics of shooters included truant, maladaptive-behaving, previously arrested, and low-test-performing students with poor grades. These were the targeted most-at-risk high school students who received empirically supported interventions.

### **Applying Empirically Supported Interventions to Targeted Populations**

A subsequent study began in six Chicago high schools within high-crime areas for 250 most-at-risk students based on the receipt of: (1) employment (Schochet, Burghardt, & Glazerman, 2001); (2) behavior therapy (anger management; Alexander, Sexton, & Robbins, 2000; Larson, 2005); and (3) multimodal therapy (adult mentoring; Henggeler, Schoenwald, Borduin, Rowland, & Cunningham, 1998).

After one year, there was a 32% reduction in homicides (O’Flaherty & Sethi, 2010), a 46% reduction in shootings, and 77% fewer assaults (Ahmed, 2010; Rossi, 2010). Jobs, anger management, and mentoring were expanded to 38 high schools with 1,700 students in 2010, to the same number of high schools and students in 2011, and to 32 high schools with 1,200 students in 2012 (Ahmed-Ullah, 2011; Harris, 2009; Ritram, 2011; Vevea, 2011).

### Measurement of Outcomes and Cost-effectiveness

The above expanded trials resulted in an estimated 52 lives and \$297 million costs saved over a four-year period. The ROI was \$3.88 in savings for every dollar expended. Variables contributing to these calculations are as follows: (a) youth murders [murder rate (FBI, 2012; U.S. Bureau of Justice Statistics, 2006) × 9.8% youth murders]; (b) youth murders reduced by “Culture of Calm” (number of students enrolled 32% reduction of shootings converted to homicides); (c) youth murder costs saved (\$3,915,433 per homicide avoided; Zagar et al., 2009); (d) youth school assaults with injury reduced; (e) youth school assault costs reduced (cost at \$29,002 per assault at a 77% decline, totaling \$140,717,704); (f) murder and assault costs reduced; (g) U.S. Justice Department funds expended yearly on “Culture of Calm” (totaling \$76.6 million); and (11) ROI (averaging 3.88).

## DIVERTING JUVENILE AND ADULT OFFENDERS

In the fall of 2011, the senior author (R.J.Z.) provided the Cook County (Chicago Illinois) Board President with *Predicting and Preventing Homicide: a Cost Effective Empirical Approach from Infancy to Adulthood* (Zagar, Busch, Grove, & Hughes, 2009) and estimates on jail costs versus electronic surveillance expenses summarized in Figure 5 for Illinois.

There were significant savings per prisoner when the \$18,500 annual jail expense was compared with the \$2,500 cost of electronic surveillance. Given the current

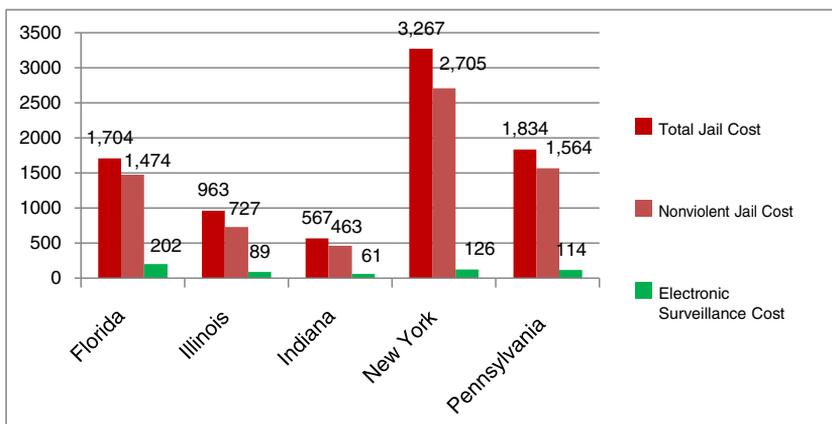


Figure 5. Jail versus electronic surveillance costs in millions of dollars.

financial pressure on local government, there was considerable economic incentive to change policy based on cost, while still preserving community safety. Also, for non-violent prisoners there was an improved quality of life of being at home with electronic surveillance versus living in jail.

Based on these facts, in the fall of 2011, a majority of new, Cook County, non-violent offenders were diverted to electronic surveillance instead of jail. Simultaneously, the Juvenile Detention Center population dropped from its maximum of 1,500 to 275. The daily cost of \$616 with an annual expense of \$224,840 per juvenile inmate was saved by this reduction in the juvenile jail population in Cook County.

This situation is consistent with the old saying: “It costs more to go to jail, than Yale (University).” Diverting non-violent prisoners to electronic surveillance is a reasonable way for governments to save up to 30% of their budgets without jeopardizing community safety (Rogers, 2012). The savings to Cook County in adult and juvenile prison expenditures was \$325M U.S. dollars in the first year alone.

## DISCUSSION

The twin challenges of diverting youth from crime while saving detention costs are complicated by apathy and lack of education about these empirical, actuarial, and statistically objective options available to policy- and decision-makers. The traditional incarceration in combination with a formidable prison industry lobby can make change difficult.

In this case study of a large Midwestern metropolitan area, there was a combination of good mathematical modeling, a political opportunity born of a powerful, urban mayor with a sophisticated, energetic, and dedicated staff, a dynamic CEO of the city’s schools, who worked well with the police department and understood crime and its impact upon schools, a new President in Washington, D.C., and a perceptive president of Cook County, savvy about lowering costs to taxpaying citizens tired of rising expenses.

### **Cost Savings of Electronic Surveillance Increases its Use**

It should be noted that the chief motivation for the above policy change was the lack of incoming tax revenues. This same constraint burdens county and state policymakers today, a reason why the Washington State Policy Institute was funded to study and to publish the ROI on various juvenile and adult criminal diversion programs. The day after these same facts were presented before the United States House of Representatives Judiciary Subcommittee on Crime, Terrorism, and Homeland Security in a Hearing on 24 July 2012, the U.S. President echoed the same policy suggestions to the nation in a speech.

### **Savings in Lives and Expenditures Will Drive Improvements for Violent Prone Individuals with Severe Mental Illness**

Thirty percent of state and county budgets are allocated to prisons and more to police and crime diversion programs. Incidents such as those of Columbine, Virginia Tech, Northern Illinois, Tucson, Arizona, Oak Creek and Wauwatosa, Wisconsin, and Newtown, Connecticut, resonate with citizen-voters concerned about crime, schools, and taxes.

It is elementary epidemiology that 1% of any population is psychotic. Applying that 1% to the U.S. population of over 300 million is equivalent to some three million seriously mentally ill persons. Of these three million, there are 75,000–100,000 violence-prone individuals with severe mental illness. Then add to this the 500,000 U.S. young adult veterans coming home from Iraq and Afghanistan suffering from post-traumatic stress and depression, 60% of whom have substance-abuse disorders.

Currently one active duty soldier, 18 veterans and one public safety officer commit suicide daily. There are also significant mental health issues among our airline, nuclear power, petroleum and infrastructure workers, which can all be addressed with better assessment and monitoring treatment.

### **What Is the Common Good? Protecting Civil Rights, Confidentiality and Privacy: Society vs. the Individual**

The above facts are consistent with a need to focus on making mental health and school systems more responsive to the safety, civil rights, and lives of citizens. The issue of constitutional and civil rights is often brought up as an excuse for not dealing with this sensitive issue of violent, seriously mentally ill people in society. Presently, individuals have a right to confidentiality and privacy of information, shielding critical and crucial data from family members. In the case of a citizen without mental illness, this makes perfect logical sense. Moving court and legal proceeding forward to share information quickly and efficiently is critical to treatment, self interest, and the safety of both the patient and the community thus lowering chance of harm. A change is needed. Court and legal proceedings move forward to share information that is critical not only in the treatment, self-interest and safety of the patient but also to protect the community from being harmed. This takes time and money that the government does not have. Federal and state use-based laws that are practical can be enacted swiftly to ensure the safety of the community first.

Having a part-time hearing officer readily available at large hospitals to deal with these mental illness issues is one solution. Appointing public guardians for those severely mentally ill persons abandoned by their family or without family members is another often-employed approach.

Currently it takes a court order to force a violence-prone seriously mentally ill individual who is a danger to themselves or others to take medication and treatment. Given the numbers of these individuals and the havoc they can do in harming communities, is this the correct approach?

### **More Psychiatric Patients in Jail than in Hospitals, while 95% Live in Communities with Often Fallible Assessments Lacking Real-time Monitoring of Medication Compliance**

Since the 1960s, with the advent of the widespread use of anti-psychotic medications, the number of beds allocated for the mentally ill and the funds set aside for psychiatric patients decreased significantly. In 2005 there were 17 public hospital beds for the mentally ill for every 100,000 people, compared with 340 per 100,000 in 1955. This is a 95% decrease in beds for psychiatric patients. These services are no longer available (Torrey, Entsminger, Geller, Stanley, & Jaffe, 2008). Added to this is the fact that the number of incarcerated mentally ill people is 300% higher than those in psychiatric

facilities. Sixteen percent of those in jail have a diagnosed mental illness (Torrey, Kennard, Eslinger, Lamb, & Pavile, 2010). The result of this diminution of mental health services is a greater number of individuals with severe mental illness living in the community, some of whom are violent and commit fatal acts.

It is well known within the assessment literature that clinical judgment is more fallible than actuarial statistical approaches. Also, according to pharmacological research, patient compliance with medication is 50% at best. So presently we face the challenge of millions of mentally ill people, potentially incorrectly evaluated and probably non-compliant with antipsychotic medication, a portion of whom are violent.

Where these mentally ill people live at home, their family members face the issue of how to accurately diagnose, treat, and manage these challenging individuals, some of whom have significant problems related to their aggressive and uncontrollable tendencies. This is the silent, oft-ignored issue in each of these tragic national massacres. How does society better appraise and manage this significant risk, the incorrectly diagnosed psychotic, who is non-compliant with medication, sometimes aggressive and violent and living in the community or in jail?

Structured psychiatric interviews, psychological tests, pharmaceutical management and treatments, and computers can all help us to deal with these challenges in a cost-effective manner. It is economically feasible to diagnose and treat the 1% who are seriously mentally ill at approximately \$1,000 a year rather than pay \$2,500 annually for electronic surveillance, or \$18,500–40,000 per year to keep them in prison or in institutions for the seriously mentally ill.

### **Mathematical Targeting of Empirical Treatments Will Go Up**

Cost-benefit analysis should drive corporate and government policy and decision leaders toward the mathematically driven targeting of the 5% most-at-risk youth in high crime areas. The same economics should move organizations to use actuarial measures of alcohol-substance abuse, abuse and violence potential tests modeled on the original probation-parole decision-making tests, and objective measures such as the MMPI or structured psychiatric interviews.

These instruments can be used to identify the most-at-risk psychotic individuals, especially those who are violent, more quickly and effectively. This will allow the prediction and prevention of homicides. The cost savings of electronic surveillance versus annual prison rates will lower the prison population, freeing up funds for other needs (see Figure 5), such as more police on the streets, guards in schools, and education about the accurate diagnosis, medication compliance, and treatment of serious mentally ill for the most-at-risk families.

### **Jobs Lower Murder Rates Significantly from Six to Two per 100,000**

The use of jobs to reduce murder rates is also an effective option. Only twice in the 20th century did homicide rates decrease significantly. The first was during the economic boom after World War II, and the second was during the Clinton Presidency dot.com era job explosion (see Figure 6). Reducing crime and diverting youths from violence will be driven by the economics of balancing revenues with expenditures while at the same time improving the lives of those diverted from crime. These results can be easily

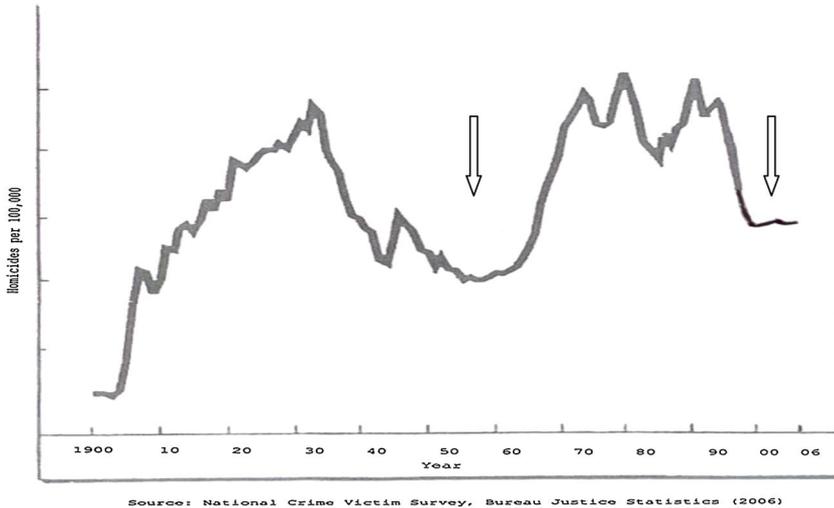


Figure 6. U.S. homicide rates over a century. Violence is low when employment is high in the economic booms after World War II, and during the Clinton Presidency dot.com era.

summarized in two old sayings, “The child treats the world the way the world treats the child” and “Give thugs a job, and they won’t have the time to be violent and kill.”

## CONCLUSIONS AND IMPLICATIONS

There are actuarial methods to identify the 5% who are most at risk. There is an array of interventions with varying amounts of empirical support to lessen delinquent and criminal behavior that are both empirically efficient and cost-effective. Combined into a unified policy, there are solid, cost-effective, targeted interventions for the 5% who are most at risk. The impetus for such a change is upon us now.

There was a 300% rise in overall annual U.S. homicide rates from 1900 to 2010, from two to six per 100,000. This is identical to prevalence in the European Union, despite its more stringent gun control laws. At a time of decreasing tax revenues, there was also a 375% rise in the U.S. prison population, from 175 to 510 per 100,000, between 1980 and 2007. This does not include the parolees and probationers, who number two million, doubling that percentage from 375% to 750%.

Safeguarding citizens, lowering violence, and decreasing costs are possible, as has been summarized in this case study set in a large Midwestern city, where the 5% most-at-risk high school students were targeted using a mathematical model and given employment, anger management and mentoring. This had the result of decreasing homicides by 32%, shootings by 46%, and assaults by 77%, saving 52 lives and \$297 million, and also diverting non-violent prisoners from jail to less expensive electronic surveillance, while simultaneously safeguarding the community.

Addressing the issue of incorrectly diagnosed and medication non-compliant, severely mentally ill persons, some of whom are violent in the community, to reduce both homicides and tragic mass murders is a challenge of applying structured psychiatric interviews and psychological tests, empirically validated medications and treatments, and widespread education about the usefulness of such an approach to the families with psychotic individuals.

A presidential initiative much like those in past U.S. history would speed up this process. It is important to educate the public about mental health, accurate diagnosis, and empirical pharmaceuticals and treatments that work. Families can, and will, oversee their seriously mentally ill relatives who are precisely evaluated with computerized internet interviews and tests. Households can monitor those who in real time assess empirical pharmaceutical and treatments applied. Finally, the costs of this approach are lower than the alternatives: electronic surveillance, jail, mental institutionalization, or, in the small outlier, fatal acts. Prediction and prevention of violence offer corporations and governments a way to save lives, improve the quality of life for citizens, keep costs down when resources are limited, and improve the safety of the community. This approach offers hope for the future for children and families.

## ACKNOWLEDGMENTS

Authors wish to express their gratitude to Professor Michael Marasco, the Robert Farley Entrepreneurship Center, McCormick School of Engineering, Kellogg Graduate School of Business at Northwestern University, President Dan Lowery, Professors Alan Brown, Terry Ferrari, Michael Genova, Joseph Kovach of the Calumet College of St. Joseph, and Steve Trubow of Olympia Labs.

## REFERENCES

- Ahmed, A. (2010). Chicago Public Schools anti-violence program takes off slowly. *Chicago Tribune*, June 3, section 2, p. 1. <http://www.chicagotribune.com/2010-06-03/news/ct-met-violence-plan-update-20100603-youth-violence-anti-violence-chicago-public-schools/>
- Ahmed-Ullah, N. (2011). Anti-violence programs a funding priority. *Chicago Tribune*, August 3, section 2, p. 1. <http://www.articles.chicagotribune.com/2011-08-03/news/ct-met-cps-safe-passage-20110803-1-antiviolence-cps-funding>
- Alexander, J., Sexton, T. L., & Robbins, M. S. (2000). The developmental status of family therapy in family psychology intervention science. In H. Liddle, D. Santisteban, R. Leavant, & J. Bray (Eds.), *Family psychology intervention science*. Washington, D.C.: American Psychological Association.
- Butcher, J. N., Dahlstrom, W. G., Graham, J. R., Tellegen, A., & Kaemmer, B. (1989). *Minnesota Multiphasic Personality Inventory Second Edition manual for administration and scoring*. Minneapolis, MN: University of Minnesota Press.
- Butcher, J., Williams, C. L., Graham, J. R., Archer, R. P., Tellegen, A., Ben-Porath, Y. S., & Kaemmer, B. (1992). *Minnesota Multiphasic Personality Inventory Adolescent Edition manual for administration and scoring*. Minneapolis, MN: University of Minnesota Press.
- Chandler, D., Levitt, S. D., & List, J. A. (2011). Predicting and preventing shootings among at-risk youth. *American Economic Review*, 101, 288–292
- Chicago Board of Education (2010). *Four pilot school summary: third quarter year over year*. Chicago, IL: Chicago Board of Education.
- Cohen, M. A. (1988). Pain, suffering, and jury awards: a study of the cost of crime to victims. *Law and Society Review*, 22, 537–555.
- Cohen, M. A. (1995). The monetary value of saving a high-risk youth. Washington, D.C.: National Institute of Justice.
- Cohen, M. A. (1998). The monetary value of saving a high-risk youth. *Journal of Quantitative Criminology*, 14, 5–33.
- Cohen, M. A., & Miller, T. R. (1994). Pain and suffering of crime victims: evidence from jury verdicts. Working paper. Vanderbilt University.
- Cohen, M. A., & Piquero, A. R. (2007). New evidence and the monetary value of saving high risk youth. *Vanderbilt Law and Economics Research Paper*. No. 08–07. December.
- Cohen, M. A., Miller, T. R., & Rossman, S. B. (1994). The costs and consequences of violent behavior in the United States. In A. J. Reiss, Jr., & J. A. Roth (Eds.) *Understanding and preventing violence: consequences and control of violence*. Washington, D.C.: National Academy Press, 4, 67–166.
- Greenwood, P. W., Model, K. E., Rydell, C. P., & Chiesa, J. (1998). *Diverting children from a life of crime*. Santa Monica, CA: Rand.

- Greenwood, P. W., Rydell, C. P., Abrahamse, A. F., Caulkins, J. P., Chiesa, J., Model, K. E., & Klein, S. P. (1994). Three strikes and you're out estimated. Santa Monica, CA: Rand.
- Harris, M. (2009). CEO Ron Huberman will need help from corporate partners to make anti-violence effort work. *Chicago Tribune*, November 29, section 2, p. 1, p. 3. <http://www.chicagotribune.com/business/chism-confidential-1129nov29,0,3006844.column>
- Henggeler, S. W., Schoenwald, S. K., Borduin, C. M., Rowland, M. D., & Cunningham, P. B. (1998). Multi-systemic treatment of antisocial behavior in children and adolescents. New York: Guilford.
- Karoly, L. A., Greenwood, P. W., Everingham, S. S., Hoube, J., Kilburn, M., Rydell, C. P., . . . Chiesa, J. (1998). Investing in our children: What we know and don't know about the costs and benefits of early childhood interventions. Santa Monica, CA: Rand.
- Larson, J. (2005). Think first, New York: Guilford Press.
- Lipsey, M. W. (1999). Can interventions rehabilitate serious delinquents. *The Annals of the American Academy of Political and Social Science*, 564, 142–1666.
- Lipsey, M. W. (2009). The primary factors that characterize effective interventions with juvenile offenders: A meta-analytic overview. *Victims and Offenders*, 4, 124–147.
- Lipsey, M. W., Howell, J. C., Kelly, M. R., Chapman, G., & Carver, D. (2010). Improving the effectiveness of juvenile programs. Washington, D.C.: Center for Juvenile Justice Reform, Georgetown Public Policy Institute.
- Listenbee, R., & Torre, J. (2012). Defending childhood: protect, heal thrive. A report of the Attorney General's National Task Force on Children Exposed to Violence. Washington, D.C.
- Miller, G. A. & Lazowski, L. E. (1999). *Adult Subtle Abuse Substance Screening Inventory (SASSI-3) Manual-Third Edition*. Springville, IN: The SASSI Institute.
- Miller, F. G. & Lazowski, L. E. (2001). *The Adolescent Subtle Abuse Substance Screening Inventory (SASSI-2) Manual-Second Edition*. Springville, IN: The SASSI Institute.
- Miller, T. R., Cohen, M. A., & Wiersma, B. (1996). Victim costs and consequences: A new look. National Institute of Justice Research Report. (NCJ-155282, Feb.) Washington, DC: U.S. Department of Justice.
- O'Flaherty, B., & Sethi, R. (2010). Peaceable kingdoms and war zones: preemption, ballistics and murder in Newark. In R. DiTella, S. Edwards, & E. Schargrodsky (Eds.) *The economics of crime: Lessons from Latin America*. Cambridge, MA: National Bureau of Economic Research.
- Quinsey, V. L., Harris, G. T., Rice, M. E., & Cormier, C. A. (1998). Violent offenders: appraising and managing risk. Washington, D.C.: American Psychological Association.
- Ritram, S. (2011). Chicago Public School awarded grants to transform 4 schools. *Chicago Catalyst*, May 27, section 2, p. 1. <http://www.catalyst.chicago.org/notebook.2011/05/27/20213cps-awarded-grants-transform-four-high-schools>
- Rogers, L. R. (2012). Judge Evans praises judges' newest juvenile initiative. *Current News*, 19–21. Accessed 9/26/12: <http://www.larryrogersjr.com/media/current-news/>
- Rossi, R. (2010). Behavior issues drop at 6 schools. *Chicago Sun Times*, Feb. 1, section 1, p. 1. <http://www.suntimes.com/news/education/232122,cst-news-calm27.article>
- Russell, J. (2008). New evidence on the monetary value of saving a high risk youth. *Youth Today*, October, 7, section 1, p. 1.
- Saulny, S. (2009). Focus in Chicago: students at risk of violence. *New York Times*, October 7, p.1, p. 15. [http://www.nytimes.com/2009/10/07/US/07chicago.html?\\_r=0&pagewanted=print](http://www.nytimes.com/2009/10/07/US/07chicago.html?_r=0&pagewanted=print)
- Schochet, P. Z., Burghardt, J., & Glazer, S. (2001). National Job Corps study. Princeton, N.J.: Mathematical Policy Research.
- Sellin, T., & Wolfgang, M. E. (1968). Measurement of delinquency. New York: Wiley.
- Shelton, D. L., & Banchemo, S. (2009). Seeking safe passage: curing a public epidemic. *Chicago Tribune*, October 7, p. 1. <http://www.chicagotribune.com/news/chi-youth-violence07,0.7180296.stroy>
- Torrey, E. F., Entsminger, K. Geller, J., Stanley, J., & Jaffe, D. J. (2008). The shortage of public hospital beds for mentally ill persons. Arlington, VA: Treatment Advocacy Center.
- Torrey, E. F., Kennard, A. D., Eslinger, D., Lamb, R., & Pavile, J. (2010). More mentally ill persons are in jails and prisons than hospitals. A survey of states. Arlington, VA: Treatment Advocacy Center.
- U.S. Bureau of Justice Statistics (2006). U.S. Census of Fatal Occupational Injuries. Washington, D.C.: U.S. Printing Office. <http://www.nytimes.com/2011/05/08cncalm.html?pagewanted=all>
- U.S. Bureau of Labor Statistics (2012). Consumer Price Index: 2006–2011. Washington, D.C.: U.S. Printing Office.
- Vevea, R. (2011). Culture of calm is threatened by budget cuts. *New York Times*, May 8.
- Viscusi, W. K. (1993). The value of risks to life and health. *Journal of Economic Literature*, 31, 1912–1946.
- Viscusi, W. K., & Moore, M. J. (1989). Rates of time preference and valuations of durations of life. *Journal of Public Economics*, 38, 297–317.
- Washington State Policy Institute (1999). Cost-benefit analysis of delinquency prevention programs, Seattle, WA: Washington State University Press.
- Washington State Policy Institute (2006). Evidence based, public policy options to reduce future prison construction, criminal justice costs, and crime rate. Seattle, WA: Washington State University Press.

- Wilson, S. J., & Lipsey, M. W. (2007). School based interventions for aggressive and disruptive behavior. Update of a meta-analysis. *American Journal of Preventive Medicine*, 33, 130–143.
- Zagar, R. J., & Grove, W. M. (2010). Violence risk appraisal of male and female youth, adults, and individuals. *Psychological Reports*, 107, 3, 983–1009.
- Zagar, R. J., Zagar, A. K., Bartikowski, B., & Busch, K. G. (2009a). Cost comparisons of raising a child from birth to 17 years among samples of abused, delinquent, violent, and homicidal youth using victimization and justice system estimates. *Psychological Reports*, 104, 309–338.
- Zagar, R. J., Zagar, A. K., Busch, K. G., Grove, W. M., Hughes, J. R., Arbit, J., Isbell, S. A., Bartikowski, R., Bussell, R. B., & Stark, R. (2009b). Predicting and preventing homicide: A cost effective empirical approach from infancy to adulthood. *Psychological Reports*, 104, 1–377.
- Zagar, R. J., Busch, K. G., Grove, W. M., & Hughes, J. R. (2009c). Summary of studies of abused infant and children, later homicidal, and homicidal assaulting, later homicidal, and sexual homicidal youth and adults. *Psychological Reports*, 104, 17–46.
- Zagar, R. J., Busch, K. G., Grove, W. M., & Hughes, J. R. (2009d). Can violent (re)offense be predicted? A review of the role of the clinician and use of actuarial tests in light of new data. *Psychological Reports*, 104, 247–277.