

Before We Get Started

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- We will begin promptly at 10:30 am PST.
- Direct communication between participants and panelists is not permitted due to the size of the webinar, however, your questions can be submitted **anytime** via the “Questions” function during this broadcast.
- If you have audio/technology concerns please use the “Chat” function to contact the host for alternate solutions.
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Introduction to Cost-Benefit Analysis in Justice Policy



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Feature Presenter



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Goals of Presentation

- High level overview of cost-benefit methodology in the criminal justice system
- Show how cost-benefit analysis can be used to inform criminal justice policy
- Show what data is needed to do cost-benefit analysis in your jurisdiction

What is cost-benefit analysis?

- An approach to policymaking
- A systematic tool for evaluating public policy
- A method to weigh options
- A way to determine what will achieve the greatest results at the lowest cost

Why use cost-benefit analysis?

Strengths:

- Inform policy
- Efficient use of resources
- Common measurement

Limitations:

- Accuracy
- Dependent on assumptions

Costs of Crime

Crime Estimates



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Table 1: Cost of Crime

Taxpayer and Victimization Costs of Crime in 2011 Inflation Adjusted Dollars						
	Taxpayer Costs					
	Homicide	Sex	Robbery	Aggravated Assault	Property	Other
Arrest (per arrest)	\$701	\$701	\$701	\$701	\$701	\$701
Conviction (per conviction)	\$159,340	\$19,628	\$10,316	\$5,100	\$210	\$210
Probation (annual cost)	\$2,570	\$2,570	\$2,570	\$2,570	\$2,570	\$2,570
Post-Prison Supervision (annual cost)	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139
Dept. of Corrections (annual cost)	\$14,235	\$14,235	\$14,235	\$14,235	\$14,235	\$14,235
Jail (annual cost)	\$15,697	\$15,697	\$15,697	\$15,697	\$15,697	\$15,697
	Victimization Costs					
Out of Pocket (per victimization)	\$768,347	\$5,788	\$3,437	\$9,064	\$2,002	n/a
Quality of Life (per victimization)	\$8,794,894	\$206,498	\$5,184	\$13,997	\$0	n/a

Costs by Crime Type

- Murder/manslaughter
- Sex offense
- Robbery
- Assault
- Property
- Drug
- Other
- Misdemeanor

Resource Use: Taxpayer Costs

- Police
- Courts
- Juvenile detention state
- Juvenile detention county
- Juvenile probation
- Juvenile parole
- Juvenile county supervision
- Adult probation
- Adult jail (county)
- Adult prison
- Adult post prison supervision

Victimization Costs

- How can we estimate costs to victims?
- Victimization estimates:
 - National Institute of Justice, *Victim Costs and Consequences: A New Look* (1996)
 - K. E. McCollister, M. T. French, & H. Fang (2010). The Cost of Crime to Society: New Crime-Specific Estimates for Policy and Program Evaluation. *Drug and Alcohol Dependence*, 108(1), 98-109.
- Tangible and intangible losses
- Loss estimates

Costs of Crime Probabilities



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Figure 1: Probability of Arrest, Conviction and Incarceration

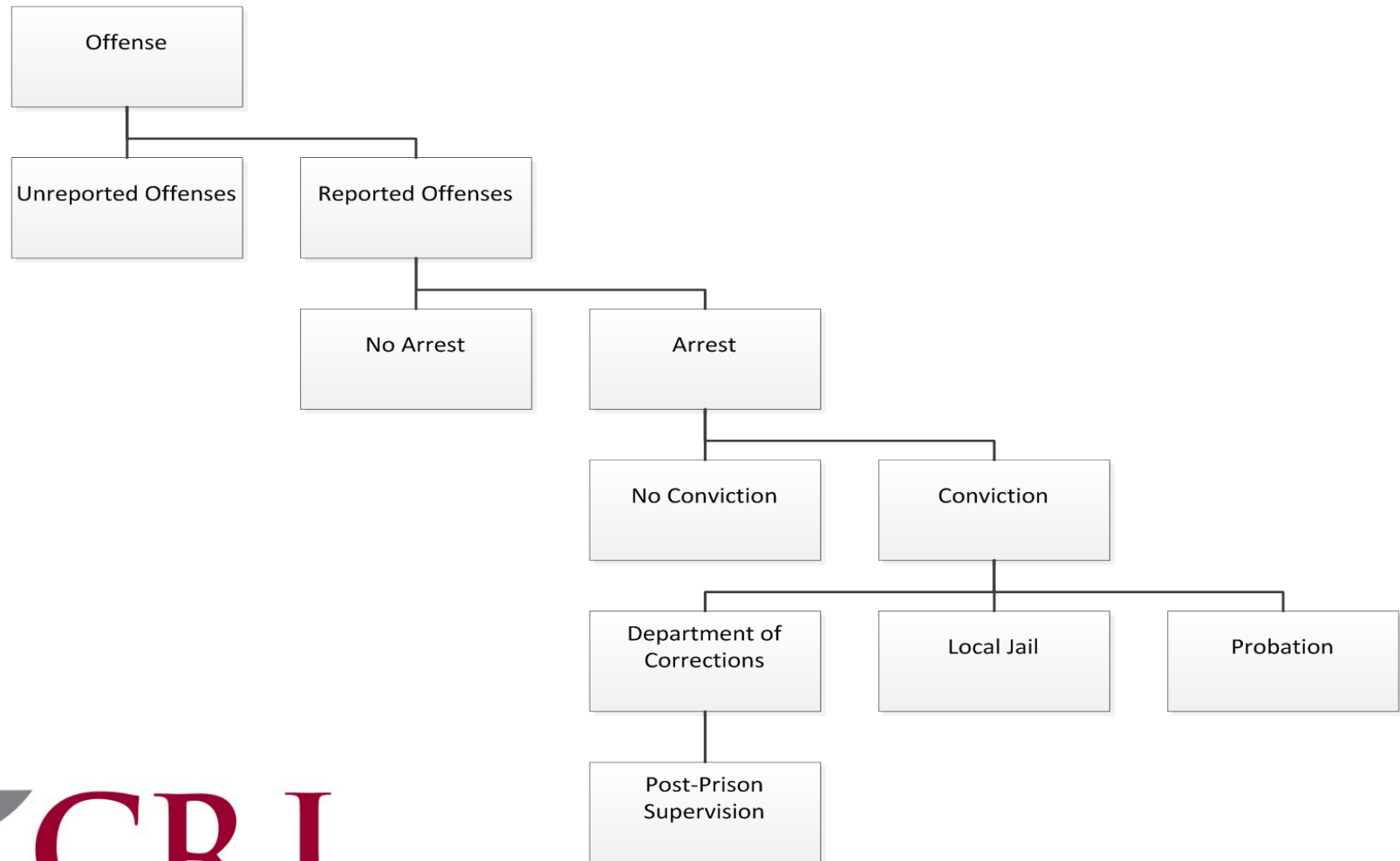


Table 2: Estimated Probability of Arrest and Conviction

Estimated Probability of Arrest and Conviction							
	2009 Adjusted Offenses	2009 Adjusted Arrests	% of Re- ported Crime	Estimated Crime	Prob of Arrest	Estimated Convictions	Prob of Conviction
Homicide	100	91	100%	100	91%	116	116%
Rape/Other Sex	2,690	607	31%	8,763	7%	1,565	18%
Robbery	2,513	1,169	66%	3,831	31%	782	20%
Aggravated Assault	5,790	3,225	57%	10,122	32%	2,279	23%
Property Total	50,247	8,774	62%	80,570	11%	6,241	8%
Burglary	19,726	2,658	50%	39,373	7%	1,305	n/a
Larceny	18,837	4,840	69%	27,499	18%	3,452	n/a
Auto Theft	11,684	1,276	85%	13,698	9%	n/a	n/a

Probability of an Offense Being Reported

- Source: National Victimization Survey (2007)
 - Person crimes: 46% reported
 - Property crimes: 37% reported

Probability of a Reported Offense Leading to an Arrest

- Source: Uniform Crime Reports
 - Offense and arrest data
 - Oregon Example: Arrest Rate

Crime Type	Number reported	Number of arrests	Arrest rate
Rape/Other Sex	2,690	607	23%
Assault	5,790	3,225	56%
Motor vehicle theft	11,684	1,276	11%

Probability of an Offense Leading to an Arrest

- Oregon Example

Crime Type	Number Reported	Number of arrests	National rate of report ¹	Number of actual offenses	Probability of arrest
Rape/Other Sex	2,690	607	31%	8,763	7%

Source: National Victimization Survey, 2007.

- For number of actual offenses, divide number reported by national rate of report.
- For probability of arrest, divide number of arrests by number of actual offenses.

Probability of an Arrest Leading to a Conviction

- How many arrests end in conviction
- Same calculation as above to estimate how likely it is that further criminal justice resources will be used

Costs of Crime: Sentencing Distributions



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Sentencing Distributions

- Need to know the sentencing distribution to calculate prison, jail and supervision costs
 - What percentage of convicted offenders get prison, probation and local jail?
 - What are the average lengths of stay for each?
 - What are the present value costs of incarceration and supervision?

Table 3: Sentencing Distribution

Felony Sentences 2008-2009										
Crime	Sentence Type			Prison			Local Control			Probation
	Prison	Local Control	Probation	Sentence Length (months)	Post-Pris. Supervision	Time Served Credit	Sentence Length (months)	Post-Pris. Supervision	Time Served Credit	Sentence Length (months)
Homicide	96%	0%	4%	356.4	11.2	8.2	0	24	0.0	36.0
Rape, Sex Offense	83%	4%	13%	88.0	87.5	3.4	3.58	24	0.6	61.6
Robbery	79%	2%	19%	60.8	29.5	2.5	3.26	24	0.0	35.1
Assault	65%	5%	30%	50.2	25.9	2.3	4.97	24	1.3	37.1
Property	66%	4%	30%	26.4	15.7	1.4	3.92	24	2.6	29.5
Other	25%	16%	59%	32.4	24.4	1.6	2.9	24	0.9	23.5

Questions?

To submit a question, please use the chat or Q&A function. Due to the size of the webinar, direct communication with the panelist is not available.



Example:

Calculating the Cost of An Offense



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Example 1

What is the estimated cost of an assault?

Victimization	\$ _____
Arrest	\$ _____
Conviction	\$ _____
Adult Corrections	\$ _____
Jail	\$ _____
Probation	\$ _____
Post-Prison Supervision	\$ _____

What is the estimated cost of an assault?

Victimization:

Out of Pocket Victim Costs	\$9,064	Table 1
Quality of Life Victim Costs	\$13,997	Table 1
Total Cost	\$23,061	

Add out of pocket costs and quality of life costs

What is the estimated cost of an assault?

Arrest:

Cost of Arrest	\$701	Table 1
Probability of Arrest	0.32	Table 2
Total Cost	\$224	

Multiply cost of an arrest by probability of arrest

What is the estimated cost of an assault?

Conviction:

Cost of Conviction	\$5,100	Table 1
Probability of Conviction	0.23	Table 2
Total Cost	\$1,173	

Multiply cost of a conviction by probability of conviction

What is the estimated cost of an assault?

Adult Corrections:

Number of convictions per offense	0.23	Table 2
Probability of adult corrections given conviction for assault	0.65	Table 3
Present value of prison costs		Must calculate
Total Cost		

Multiply number of convictions per offense by probability of adult corrections and present value of prison costs

What is the estimated cost of an assault?

Present value of adult corrections costs:

Unit of measurement	Measure	Source
Cost per year	\$14,235	Table 1
Average length of sentence	50.2 months (4 years)	Table 3
Discount Rate	3 percent	Common practice

What is the estimated cost of an assault?

Present value of adult corrections costs:

Cost of Year 1	$\$14,235/(1+0.03)$
Cost of Year 2	$\$14,235/(1+0.03)^2$
Cost of Year 3	$\$14,235/(1+0.03)^3$
Cost of Year 4	$\$14,235/(1+0.03)^4$
Total Present Value	\$53,000

Add cost per year of imprisonment and incorporate time value of money

What is the estimated cost of an assault?

Adult Corrections:

Number of convictions per offense	0.23	Table 2
Probability of adult corrections given conviction for assault	0.65	Table 3
Present value of prison costs	\$53,000	See previous slide
Total Cost	\$7,900	

Multiply number of convictions per offense by probability of adult corrections and present value of prison costs

What is the estimated cost of an assault?

- Use the same formula from prison costs to calculate the costs for jail, probation, and post-prison supervision
 - Number of Convictions
 - Probability of Resource Use
 - Present Value of Costs

Example

What is the estimated cost of an assault?

Victimization	\$23,061
Arrest	\$224
Conviction	\$1,173
Adult Corrections	\$7,900
Jail	\$525
Probation	\$530
Post-Prison Supervision	\$1,200
Total Cost	\$34,613

The cost of an assault and other types of crime

- The cost of one assault is \$34,613.
- It is possible to calculate the cost of multiple offenses.
- It is also possible to change the unit measured to calculate the cost of fewer arrests, convictions, inmates, parolees, or probationers.



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Applications of Cost Benefit: Three Examples



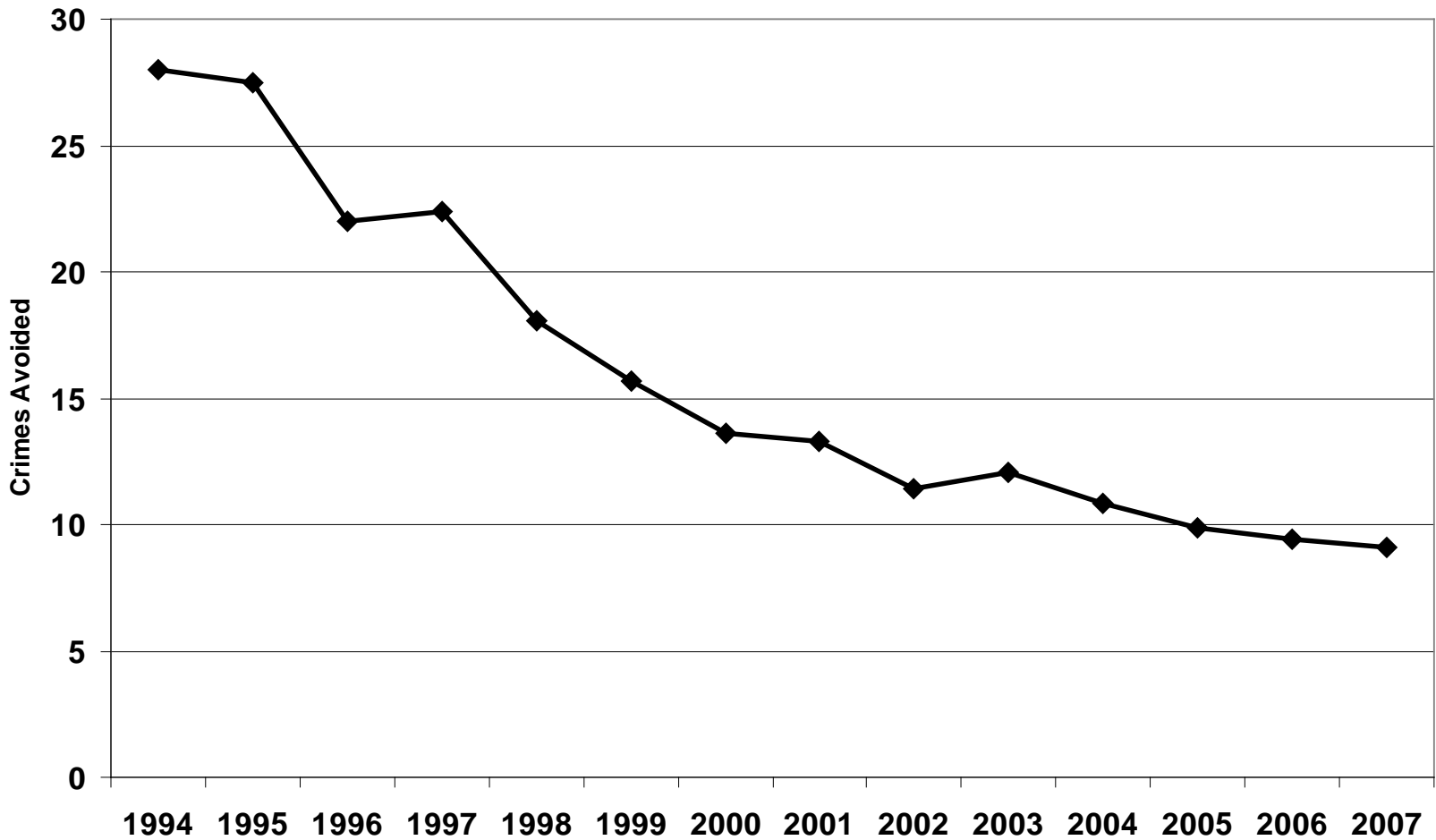
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Example 1: Prison Economics

- What is the impact of incarceration on crime?
 - The Oregon Criminal Justice Commission found that a 10% increase in the incarceration rate leads to a 2.6% reduction in crime.
 - Many others around the country have found similar results.
- How many crimes are avoided by incarceration?
- What is the cost-benefit ratio of incarceration?



Crimes Avoided by Incarcerating an Additional Offender



Source: Oregon Criminal Justice Commission

Cost-Benefit Analysis of Incarceration

Cost-Benefit Analysis of Incarceration				
	Oregon	Washington		
Year	All	Violent	Property	Drug
1994	\$2.78	\$9.57	\$2.36	\$0.37
1995	\$2.42	\$8.20	\$2.40	\$0.37
1996	\$1.98	\$7.06	\$2.23	\$0.34
1997	\$1.81	\$6.58	\$2.22	\$0.36
1998	\$1.60	\$5.85	\$1.94	\$0.36
1999	\$1.31	\$5.37	\$1.74	\$0.32
2000	\$1.10	\$5.24	\$1.61	\$0.31
2001	\$1.11	\$4.87	\$1.46	\$0.28
2002	\$0.95	\$4.46	\$1.20	\$0.26
2003	\$1.01	\$4.82	\$1.26	\$0.29
2004	\$1.01	\$4.33	\$1.18	\$0.32
2005	\$0.93	\$4.35	\$1.10	\$0.35
2006	\$0.96	N/A	N/A	N/A
2007	\$0.91	N/A	N/A	N/A

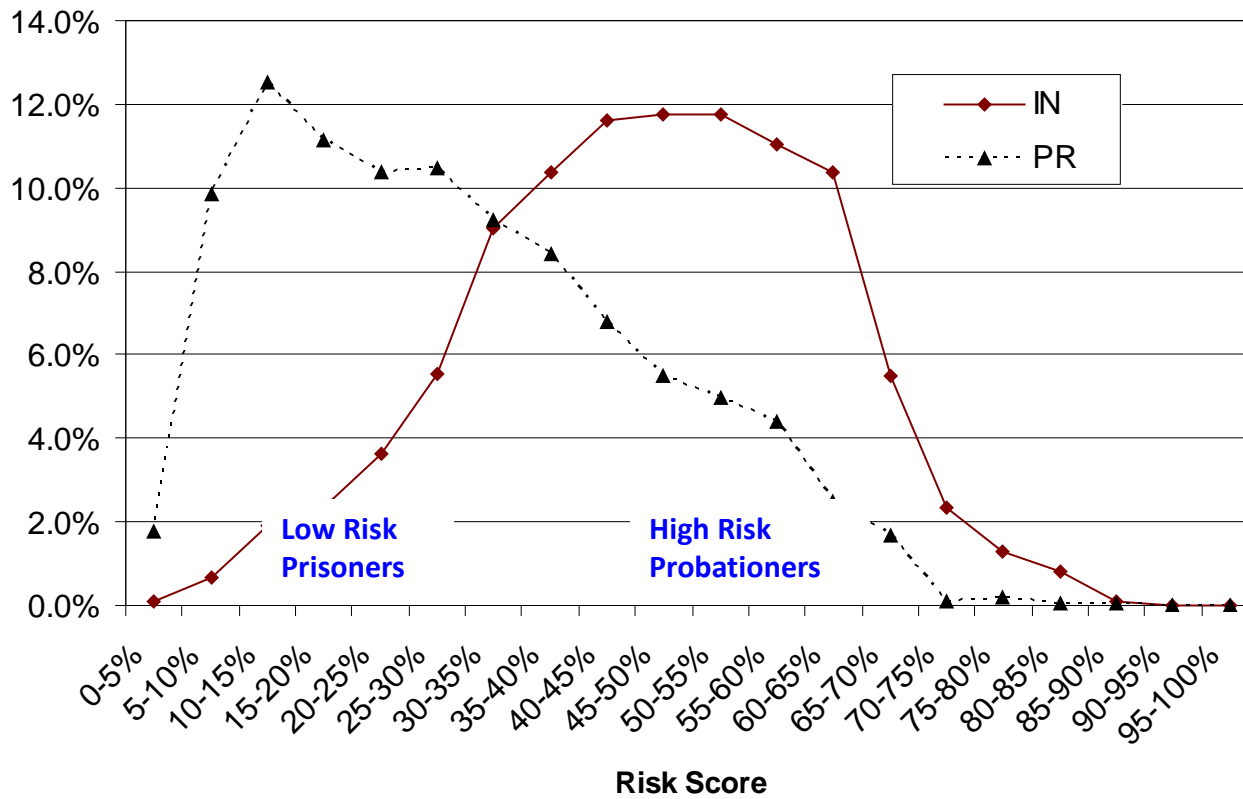
Source: Oregon Criminal Justice Commission and WSIPP

Example 2. Cost-Benefit and Risk Assessment

- Examine property offenders from 2005-2007
- Examined their risk of being reconvicted of a felony
- Overlap where some high risk property offenders were sentenced to prison and some low risk property offenders were sentenced to probation
- By using risk at sentencing it is possible to save prison beds while keeping crime constant or to reduce crime while keeping beds constant

Distribution of Risk Scores by Sentence Type for Property Offenders

Risk Scores by Sentence Type
Property Convictions 2005-2007



Swap high risk probationers with low risk prisoners

- Method 1 – Prison Bed Neutral
 - Move 650 high risk probationer to prison
 - Expect to avoid 350 felony arrests
 - Move 650 low risk prisoners to probation
 - Expect to have 240 felony arrests
 - Savings of 110 felony arrests
 - Using the cost-benefit model we avoid an estimated \$3.9 million in costs to tax payers and crime victims



Swap high risk probationers with low risk prisoners

- Method 2 – Crime Neutral
 - Move 780 low risk prisoners to probationer
 - Expect to have 900 felony arrests
 - Move 550 high risk probationers to prison
 - Expect to avoid 940 felony arrests
 - Savings of 230 prison beds and avoids 40 felony arrests
 - Using the cost-benefit model based on Oregon's cost of incarceration we save \$3.4 million to tax payers

Example 3: Cost-Benefit and Programs

- What is an effect size
 - Quantifies the effectiveness of a particular policy or program
 - Estimates how much a program reduces crime
 - Provides a foundation for cost-benefit analysis

Where do effect sizes come from?

- Evaluations of own-state programs
 - Are there estimates for a given program in your state?
- Meta-analysis
 - Meta-analysis summarizes research to estimate an effect size
- If no effect size available, you can calculate what effect size would be needed to pay for the program

Effect Sizes and Meta-Analysis

- The Washington State Institute of Public Policy (WSIPP) has read hundreds of studies of criminal justice programs
- Only include studies with the most rigorous research methodology
- Included all studies, including unpublished reports



WSIPP Meta-Analysis on Community Supervision

Supervision Strategy	Number of Studies	<u>Estimated Crime Reduction</u>
Supervision with Risk Responsivity Need Model	6	16%
Intensive Supervision Probation/Parole (with treatment)	17	10%
Intensive Supervision Probation/Parole (surveillance only)	14	0%

Source: *Return on investment: “What works” in community supervision: Interim report (Document No. 11-12-1201).* Olympia: Washington State Institute for Public Policy. E. K. Drake (2011).

Applying an Effect Size

- CBA monetizes effect sizes:
 - Program costs
 - Averted taxpayer costs (arrest, conviction, state and local adult costs)
 - Averted victim costs (out of pocket and emotional)
 - Offender, family, community benefits



Cost-Benefit and Programs

- Statewide Re-Entry Program
 - Reduces recidivism by 27%
 - For every 10 participants we estimated that more than three and half felony convictions will be avoided over a 10 year period
 - Costs of Oregon's Re-Entry program are \$3,400 per participant
 - Benefits are \$8,600 to taxpayers and \$14,000 in avoided victimizations
 - Benefit-cost ratio of \$6.73

Other Examples of Cost-Benefit Findings Using Meta-Analysis

Programs	Costs	<u>Net Total Benefits</u>	<u>Benefit to Cost Ratio</u>
Drug Treatment in the Community	\$2,102	\$13,317	\$7.35
Drug Court	\$4,099	\$7,651	\$2.87
Intensive Supervision: with Treatment	\$7,712	\$9,809	\$2.28
Intensive Supervision: Surveillance Only	\$4,050	-\$4,606	-\$0.14
CBT (in the Community)	\$217	\$7,522	\$35.13

Source: *Return on investment: Evidence-based options to improve statewide outcomes (Document No. 11-07-1201). Olympia: Washington State Institute for Public Policy.* Aos, S., Lee, S., Drake, E., Pennucci, A., Klima, T., Miller, M., Anderson, L., Mayfield, J., & Burley, M. (2011).

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Limitations of CBA in criminal justice

- Requires investment of dollars
- Requires time for benefit to accrue
- Requires data on costs and programs
- Risk adverse investors on 2 year cycle
- “Past performance does not guarantee future results”

Big picture take-aways

- Incarceration reduces crime but there are diminishing returns to incarceration.
- Research shows that many programs can reduce crime and victimizations while reducing future spending
- Using effect sizes, CBA can provide a framework to compare across policy choices and help inform how to best spend limited dollars

Thank you!

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