

Easy to Use Cost-Outcome Analysis Data for 160 Different Injury Interventions Webinar

Tuesday October 5th 2010 from 1:00 to 2:30pm EST

Featured Speakers: Ted Miller, Ph.D.

Moderator: Monique Sheppard, Ph.D.

On your telephone please dial: 1-866-835-7973 The webcast will begin shortly. Dollars & Sense of Preventing Injury, Violence and Substance Abuse

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Age-Adjusted Injury Death Rates



Source: Lois Fingerhut, NCHS, based on 2000-2004 data

10 Leading Causes of Death by Age Group, United States – 2006

	Age Groups										
Rank	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	Total
1	Congenital Anomalies 5,819	Unintentional Injury 1,610	Unintentional Injury 1,044	Unintentional Injury 1,214	Unintentional Injury 16,229	Unintentional Injury 14,954	Unintentional Injury 17,534	Malignant Neoplasms 50,334	Malignant Neoplasms 101,454	Heart Disease 510,542	Heart Disease 631,636
2	Short Gestation 4,841	Congenital Anomalies 515	Malignant Neoplasms 459	Malignant Neoplasms 448	Homicide 5,717	Suicide 4,985	Malignant Neoplasms 13,917	Heart Disease 38,095	Heart Disease 65,477	Malignant Neoplasms 387,515	Malignant Neoplasms 559,888
3	SIDS 2,323	Malignant Neoplasms 377	Congenital Anomalies 182	Homicide 241	Suicide 4,189	Homicide 4,725	Heart Disease 12,339	Unintentional Injury 19,675	Chronic Low. Respiratory Disease 12,375	Cerebro- vascular 117,010	Cerebro- vascular 137,119
4	Matemal Pregnancy Comp. 1,683	Homicide 366	Homicide 149	Suicide 216	Malignant Neoplasms 1,664	Malignant Neoplasms 3,656	Suicide 6,591	Liver Disease 7,712	Unintentional Injury 11,446	Chronic Low. Respiratory Disease 106,845	Chronic Low. Respiratory Disease 124,583
5	Unintentional Injury 1,147	Heart Disease 161	Heart Disease 90	Heart Disease 163	Heart Disease 1,076	Heart Disease 3,307	HIV 4,010	Suicide 7,426	Diabetes Mellitus 11,432	Alzheimer's Disease 71,660	Unintentional Injury 121,599
6	Placenta Cord Membranes 1,140	Influenza & Pneumonia 125	Chronic Low. Respiratory Disease 52	Congenital Anomalies 162	Congenital Anomalies 460	HIV 1,182	Homicide 3,020	Cerebro- vascular 6,341	Cerebro- vascular 10,518	Diabetes Mellitus 52,351	Diabetes Mellitus 72,449
7	Respiratory Distress 825	Septicemia 88	Cerebro- vascular 45	Chronic Low. Respiratory Disease 63	Cerebro- vascular 210	Diabetes Mellitus 673	Liver Disease 2,551	Diabetes Mellitus 5,692	Liver Disease 7,217	Influenza & Pneumonia 49,346	Alzheimer's Disease 72,432
8	Bacterial Sepsis 807	Perinatal Period 65	Influenza & Pneumonia 40	Cerebro- vascular 50	HIV 206	Cerebro- vascular 527	Cerebro- vascular 2,221	HIV 4,377	Suicide 4,583	Nephritis 37,377	Influenza & Pneumonia 56,326
9	Neonatal Hemorrhage 618	Benign Neoplasms 60	Septicemia 40	Septicemia 44	Influenza & Pneumonia 184	Congenital Anomalies 437	Diabetes Mellitus 2,094	Chronic Low. Respiratory Disease 3,924	Nephritis 4,368	Unintentional Injury 36,689	Nephritis 45,344
10	Circulatory System Disease 543	Cerebro- vascular 54	Benign Neoplasms 38	Benign Neoplasms 38	Complicated Pregnancy 179	Influenza & Pneumonia 335	Septicemia 870	Viral Hepatitis 2,911	Septicemia 4,032	Septicemia 26,201	Septicemia 34,234

Source: National Vital Statistics System, National Center for Health Statistics, CDC.

Produced by: Office of Statistics and Programming, National Center for Injury Prevention and Control, CDC.

Injury Death Rate by Age Group



- Costs of injury & substance abuse
- Savings from prevention

Why Cost Social Problems? Single Compact Metric

- Communication
- Problem size & risk assessment
- Advocacy
- Performance comparison
- Priority setting & resource allocation
- Program evaluation

You are the Governor of OH

- 11.4 M residents in OH
- 110K deaths/year

 Can I convince you to continue my \$2M childhood injury prevention program? • We did a thorough evaluation. The results are highly significant statistically. Our program reduced deaths and hospital admissions due to injury by



 Our program prevented 76 child deaths and 1820 hospital admissions last year. • Our \$2 M program saved OH taxpayers \$106 M in medical payments and work losses last year. That's \$8.50 per OH resident.

PROBLEM SIZE Annual Spending per U.S. Child, 0-19



RISK ASSESSMENT: Unintentional Injury Cost \$134 B in 2000, Ages 0-14



Vehicular Injury Costs/1000 Kids by Age





Annual Poisoning Costs/Child



Cost of Injuries, Ages 0-4 \$51 B, 2000



Cost of Injuries, Ages 5-9 \$52 B, 2000



Cost of Injuries, Ages 10-14 \$79 B, 2000



Cost of Injuries, Ages 15-19 \$121 B, 2000





How can we make \$65 B comprehensible?



Use A Yardstick



Underage drinking US Depts Justice & Education

Divide by a Sensible Exposure Measure

\$5100 Per Underage Drinker
\$2280 Per Youth Ages 14-20
\$3.30 Per Illegal Drink

Per Illegal Underage Drink



Tangigle A DrinkProfitTaxesCost

Performance Comparison: \$/Youth



Costs of Underage Drinking per Youth Ages 14-20



Gunshot Cost Per Resident







Gunshot Costs Per Gun







BROAD PRIORITY SETTING Medical Spending, Ages 0-19, 2000



Resource Allocation Leading Consumer products by % of nonfatal injury cost, US, 1995-1996

Rank	Age < 1	%	Age 1 - 4	%
1	Stairs or steps	15	Stairs or steps	8
2	Beds (not cribs)	11	Beds	7
3	Floors	9	Floors	7
4	Baby walkers	6	Tables	6
5	Tables	5	Doors	5
6	Baby strollers	4	High chairs & chairs	4
7	Sofas	4	Poisoning	3
8	Car seats	3	Bicycles	3

Leading Consumer Products by % of Nonfatal Injury Cost, US, 1995-1996

Rank	Ages 5 - 9	%
1	Bicycles	14
2	Monkey bars	6
3	Swings	4
4	Beds	4
5	Doors	4
6	Stairs or steps	4
7	In-line/rollerskating	4
8	Floors	4

Leading Consumer Products by % of Nonfatal Injury Cost, US, 1995-1996

Rank	Age 10 – 14	%	Age 15 - 19	%
1	Bicycles	13	Basketball	15
2	Basketball	11	Football	11
3	Football	9	Bicycles (incl. mountain)	6
4	Baseball & softball	6	Baseball & softball	5
5	In-line/ rollerskating	5	Stairs or steps	4
6	Soccer	3	Soccer	4
7	Stairs or steps	3	Floors	2
8	Trampolines	2	In-line/ rollerskating	2

Program Evaluation A Poison Control Center Call



Costs

Medical Care Avoided

Regional Trauma Care Raises Initial Care Costs by \$1,850/Admission, Saving \$5,100




 Costs are estimated from a perspective Society • Government Insurers Employers



Incidence-based costs

- Lifetime consequences of injuries in one year
- Measure savings from prevention
- Must be discounted to present value

• Discount Rate

\$1 million in 20 years 2.5% \$625,000 7% \$275,000

Burden Categories

• ECONOMIC COSTS

- Medical & mental health
- Other resources/ Tangible
 - Emergency services
 - Victim services
 - Legal/court/jail
 - Insur Admin

Property damage

- Work loss (productivity)
 - Wage work
 - Household work

• QUALITY OF LIFE



COST EFFECTIVENESS





160 Interventions

	Youth	Adult	Youth & Adult	Total
Motor Vehicle	10	0	28	38
Impaired Driver	1	10	0	11
Open Flame/Burn	1	0	8	9
Violence	15	17	2	34
Other Injury	6	2	3	11
Substance Abuse	22	4	10	36
Tobacco	4	17	0	21
Total	59	50	51	160

Data Sources

- US & some international published and unpublished studies from 1987-2010
 - Medline & Internet search
 - Bibliographic review
 - Contact with Federal agencies
- Excluded analyses of occupational, air, rail, & water transport safety programs

Methods

- Costs take society's viewpoint (everyone's costs count)
- Costs given in 2009 dollars
- Savings from demonstration programs reduced by 25% when scaled up

Methods

- Serious study flaws were corrected when possible
- Studies were subjectively graded based on the rigor of program cost and effectiveness estimates
- Studies which showed reductions in fatalities, but ignored nonfatal injuries were excluded

Definitions: Costs and Savings

- *Cost per Unit:* cost of the intervention for a single individual
- *Total Benefits per Unit:* the amount the intervention saved by preventing injuries & other problems
- Aggregate Benefit/Unit = Total Benefits Cost
- *Benefit Cost Ratio (BCR):* savings from preventing injuries divided by cost of the intervention
- Cost-effective: the BCR > 1.0 Return on investment in the intervention exceeds amount invested

Definitions: Costs and Savings

- Cost per Quality Adjusted Life Year (Cost of intervention medical & other resource savings)/ QALY: A QALY is a health outcome measure that assigns a value of 1 to a year of perfect health & 0 to death. The QALY measure captures the work loss & quality of life savings
- *Cost-saving:* cost/QALY < 0 which means that the cost of the intervention is less than the savings generated in medical and other resource costs

Choosing Interventions

- We recommend interventions with a BCR <2 or cost/QALY > \$100,000 should rarely be implemented
- Some interventions with low BCRs may address unique component of injury problem
- Laws generally would have lower costs & higher BCRs from a government perspective

Notable Newly Added Interventions

	BCR
20-Bed Domestic Violence Shelter	11
Speed Camera	19
Red Light Camera	4
Sprinklers in New Ranch House	6
Sprinklers in New Colonial or Town House	3
Mattress Flammability Standard	3
Baby Walker Redesign - Less Falls Down Stairs	46
Impact-Absorbing Playground Surfacing	2



NON-OFFENDER VIOLENCE PREVENTION	Cost/ child	BCR
Nurse-family partnership home visitation to 1 st born	\$10,700	4.8
Parent-teacher training	\$4,600	3.9
Big brothers-big sisters mentoring	\$4,800	1.8
Head start + 12 home visits	\$20,000	4.9

Violence often is part of a problem complex Cost of Violence



ETOH Only 28%

None 53%

Cost of Youth Crime



JUVENILE VIOLENCE	Other	BCR
MEASURES	Impact	
Treatment foster care	Y	65
Multisystemic therapy	Y	39
Functional family therapy	Y	32
Aggression replacement training	Ν	90
Adolescent diversion	Ν	39
Intensive probation supervision	N	4.4
Boot Camp	Ν	0.1
Scared Straight	Ν	0

ADULT VIOLENCE	Other	BCR
MEASURES	Impact	
Moral reconation therapy	Y	31
Job @ release	Ν	11
Drug Court	Y	4
In-prison SA treatment	Y	3
Optimized sentencing	Ν	2
In-prison voc educ	?	9
Money aid at release	Ν	3
Nonincarc intensive supervision	Ν	1.4
Community SA treatment	N	0



A \$12 Bike Helmet for Kids 3-14 Saves Insurers \$41





Misuse Reduction Saves \$569/seat & Costs \$7 (BCR 81)



A booster seat with back costs \$35 and saves \$2,474 (BCR = 71)



Equipping A Home with Smoke Alarms + Maintenance Costs \$44 & Saves \$770 (BCR 18)

\$656



American Academy of Pediatrics TIPP Sheet Counseling for Ages 0-4 Costs \$11/Visit & Saves \$97/Visit (BCR 9)



DONT'T DRINK AND DRIVE

and the second second

Program Selection

- No one intervention will reduce most problems more than 10%-15%
- Need a package of complementary interventions

DWI Deaths



	% Redux	BCR
ALL DRIVERS	DWI Deaths	
Enforce SIP Laws	11%	71
Admin License Revoc	6.5%	17
.08 Max Driver BAC	7%	14
Intensive Breath Tests	15%	7
Server Training	17%	3.4
YOUTH		
0-Tolerance LT 21	4% (20%)	25
Grad License/Curfew	2% (5%)	8
21 MLDA	4% (19%)	3.6



	% Redux	BCR/
RECIDIVISTS	DWI Deaths	ROI
Ignition Interlock	7%	7
Impoundment	4%	5
Intensively Supervised Treatment	4%	4
House Arrest	3%	3
BROADER IMPACT		
Child Seat Law	LT 1%	38
M/C Helmet Law	2.5%	3
Primary Belt Law	10%	18

BROADER MEASURES	% Redux	BCR/
	DWI	ROI
	Deaths	
Regional Trauma System	14%	2.7
Brief ETOH Intervention	6%	31
20% Tax on ETOH	4%	9
30% Tax on ETOH	6%	6


SA Prevention Typology

Universal/ Environmental

Selective/ Educational

Indicated/ Behavioral

BCRs for School-Based Programs (T=tobacco, V=Violence)

PROGRAM	Cost/ Kid	MJ redux	Alc redux	BCR
All Stars T	\$170	6%	7%	36
Keepin' It Real T	\$160	5%	11%	28
Life Skills Training T	\$270	3%	1%	22
Project Northland T	\$490	7%	7%	19
Project Star Midwest	\$490	7%	3%	11
Prev Pgm T				
Project Alert	\$140	4%	0%	4

BCRs for Youth Development Programs

PROGRAM	Cost/ Kid	MJ redux	Alc redux	BCR
Family Matters T	\$190	?	7%	32
FamilyStrengtheningT	\$1100	15%	18%	11
AdolescntTransitionsT	\$1500	?	14%	8
SocialCompetncPromo	\$430	?	11%	6
SOAR V Dropout	\$3700	2%		6
Child Development Pjt	\$280	4%	4.5%	5
Guiding Good Choices	\$870	9%	8%	3
(Prep f/Drug-FreeYrs) V				

Lower Return on Investment

- Project TND (Toward No Drugs) 0%, D
- STARS for families 8% binge

- CASAstart costs more than it saves
- Across Ages razor-thin savings

Environmental Prevention





BCRs for Environmental Interventions (costs & benefits computed comparably)

	BCR
20% Alcohol Tax	9
30% Alcohol Tax	6
Reduce Outlet Density by 10%	9
Restrict Alcohol Sales Hours/Days	9
TV Alcohol Advertising Ban	9
21-Minimum Drinking Age	4
Enforce Serving Intoxicated Patrons Law	71
Mandatory Server Training	3

BCRs for Workplace Programs, Often Oriented to Young Workers

Prime Life	22
Team Resilience, Restaurant Sector	15
Team Awareness, Retail Sector	8
Workplace Peer Support & AOD Testing	24

 Evaluations often do not assess some impacts, notably for midnight driving curfew, 0tolerance, .08, family programs

Program Selection Criteria

- Return on investment
- Aggregate benefits
- Affordability
- Local priorities & problems
- Appropriateness for the target population
- Political feasibility
- Government savings
- Immediacy of the impacts (weeks versus years)
- Intervention overlap
- Unevaluated spillover effects

21 Minimum Drinking Age



21 Minimum Drinking Age

- Reduces % of youth who drink & binge
- Raises age of initiation which lowers the risk of alcoholism in adulthood
- Reduces youth DWI deaths by 19%
- Reduces alcohol-involved youth suicides by 27%

• Confuses college presidents

Retail Alcohol Monopolies (State Stores) Reduce Underage Drinking





Wine & Spirits

Spirits Only

If Sell Off Retail Spirits Monopolies in VA or WA

- Spirits consumption rises 21%
- Total consumption rises 6-7%
- State loses \$200-300M/year in revenue net of taxes on added sales
- The real price is a crime wave
- State pays \$50 million/year for added harm; 225 residents die/year
- Industry's slides are bogus; label 6 states w/o retail monopolies as control states

43 human exposure calls from rural areas prevent one hospital admission (Medical ROI 5.9)



BCR for State to break even on its investment



• Laws that interfere with personal freedom would have much higher BCRs if looked at governmental perspective only

- The job of the State is to protect and enhance the welfare of its citizens
- Like medical care, preventive health & safety efforts are designed to save lives & increase quality of life
- The savings to citizens & employers count

Costs to Government

- Medicaid, CHIP, Medicare, etc. 6% state
- Income taxes perhaps 4% of wages
- Welfare; lost sales taxes
- Victim assistance
- Police, fire, EMS, road cleanup & repair
- Adjudication & sanctioning; CPS
- Education system (special ed, truancy)

If target intervention to Medicaid recipients

• 25%-50% of medical care savings go to the state

Who pays the annual \$500B crash bill?

Employers 11%

Government 6%

Families 83%

Costs to Government as Employer

- Workers' Comp, health insurance, sick leave
- Disability & life insurance
- Liability if an on-the-job employee harms others
- Investigation of on-the-job incidents
- Distraction
- Work disruption, juggling schedules, hiring
- Employees who abuse drugs & alcohol are less productive

Crashes Cost Employers \$62 Billion/Year



Fringe Benefit Payments

MV at Work 18%



Crash Injuries/1000 Working Adults/Year (Including Dependents)

Main Reason = Exposure: Most Miles Are Driven Outside Work





3



Where does that \$62 billion come from?

Profits Price Increases

Online Resources

- ROI fact sheets, costs of child abuse & neglect by state at http://www.childrenssafetynetwork.org/publications_resources/ showPubByTopic.asp?pkTopicID=10
- Underage drinking by State (+DC, PR) www.udetc.org/factsheets
- Hospitalized injury by cause & age group in 38 states; impaired driving in 50 + DC – www.hsc.wvu.edu/icrc/AHRQFORM.asp
- Report on SA prevention ROI -- Google NCADI dollars cents or download.ncadi.samhsa.gov/prevline/pdfs/SMA07-4298.pdf
- Crime costs by state, total or alcohol & drug involved : e-mail taylor@pire.org (also use that address for problems or free technical assistance. Dexter Taylor, PhD, 301-755-2796)

References: Injury Costs & Prevention Savings

- The Cost of Child and Adolescent Injuries and The Savings from Prevention, T Miller, E Finkelstein, E Zaloshnja, D Hendrie. In K Liller (ed.), *Injury Prevention for Children and Adolescents: Research, Practice, and Advocacy*, Washington DC: American Public Health Association, 15-64, 2005.
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SUMMARY

- Injury is the leading child health risk
- Prevention yields large savings for taxpayers
- Unrealistic to expect State gov't savings
- Targeting to Medicaid population can help
- Laws & enforcement often save the State \$
- People do not understand big numbers
- Select costs to suit the audience
- You cannot spend some savings
- Put a face with the \$