

Release from Prison: Mortality Rates, Risk Factors, and Strategies to Reduce the Risk

Ingrid Binswanger, MD, MPH

University of Colorado at Denver and Health Sciences Center

Marc F. Stern, MD, MPH

Washington State Department of Corrections

Objectives

- 1) Understand the health risks to former prisoners after their release
- 2) Be familiar with risk factors for death after release from prison
- 3) Consider and verbalize potential strategies to reduce the risk of death after release from prison

Outline

1. Mortality after release

- a) Rates - International and US data from prior studies
- b) Risk factors – Preliminary data
- c) Next steps in risk factor analysis

2. Interventions to reduce the risk

- a) Existing programs
- b) Future programs

Selected International Studies of Death after Release

Author	Location	Population	RR/SMR*
Bird SM, 2003	Scotland	Male 15-24 y/o released after 14 d incarceration	Drug-related deaths in first 2 weeks compared to other 2 week periods: RR 7.4
Hobbs M, 2006	Western Australia	Former prisoners compared with general population	SMR 1.5-4.6
Pritchard C, 1997	UK	Male probationers compared with general population	SMR 2
Verger P, 2003	France	Male former prisoners <55 y/o compared with general population	SMR 3.5-10.6

*RR=Relative Risk SMR=Standardized mortality ratio

What were the death rates after release from prison?

- Retrospective cohort study
- 38,809 releases from WA DOC, July 1999-Dec 2003 (N=30,257)
- Data from WA DOC linked to National Death Index
- Data for comparison population of WA residents from CDC Wonder
- Data censored at:
 - Date of death, or
 - Dec. 31, 2003 (end of study), or
 - Date of re-incarceration if not released again
- If re-incarcerated, time back in prison did not count towards person-time at risk

Binswanger IA, Stern MF, Deyo RA, Heagerty PJ, Cheadle JG, Elmore JG, Koepsell. Release from prison--a high risk of death for former inmates. *NEJM*, 2: 157-65; 2007.

Demographic characteristics

N=30,257

Male	87%
Age, mean years	33
Race/ethnicity	
White, non-Hispanic	62%
African American, non-Hispanic	20%
Latino/Hispanic	13%
American Indian/Alaska Native	3%
Asian/Pacific Islander	2%

Deaths after release

N=30,257

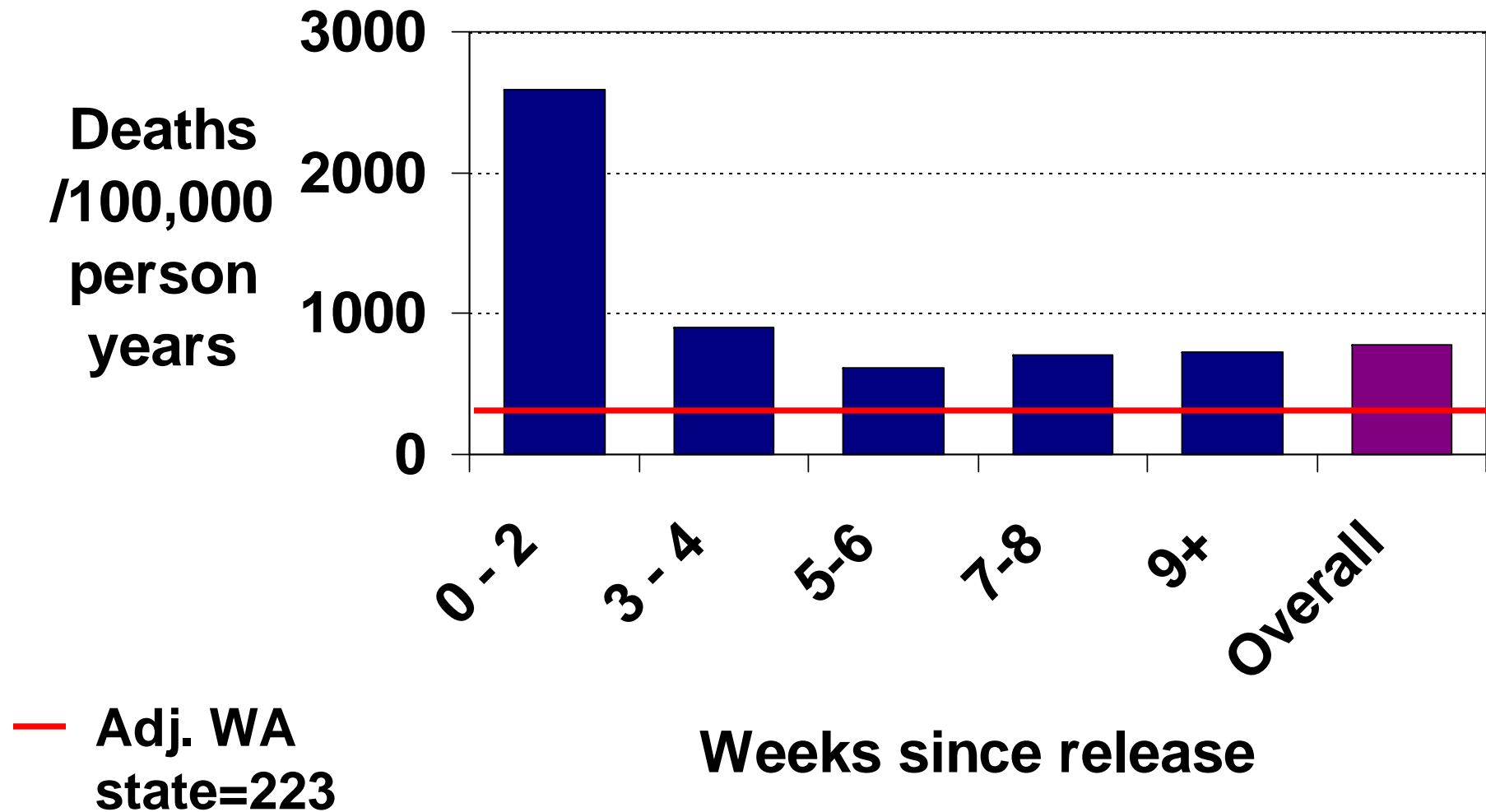
- 57,049 person-years of follow-up
- 443 deaths
- Mean time at risk, out of prison: 1.9 years
- Mean age at death: 42

Mortality rates

	Deaths/100,000 person-years
Released inmates	777
In WA prison	201
Other Washington residents*	223

*Adjusted for age, gender and race

Elevated mortality rates in first 2 weeks after release



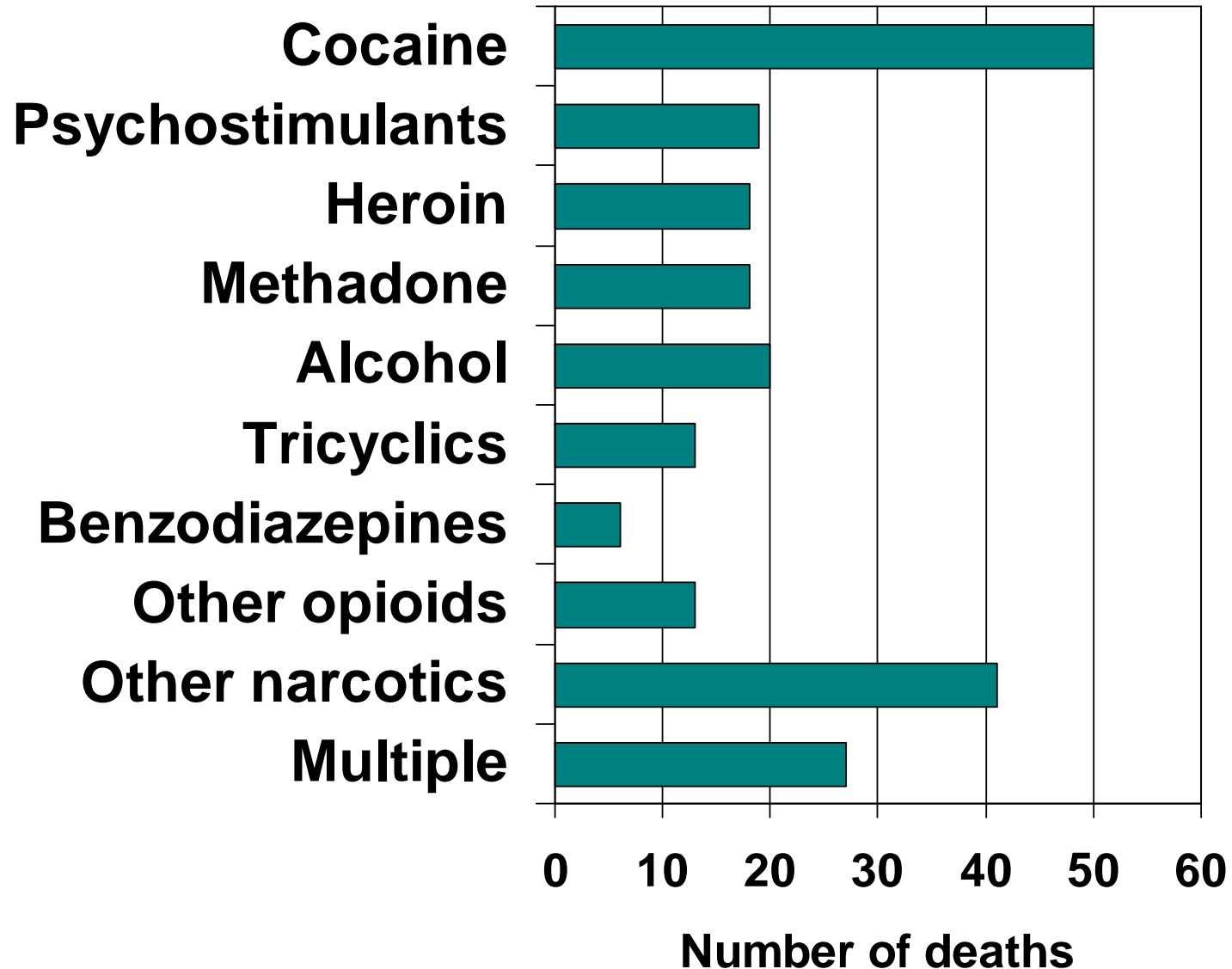
Leading causes of death

n=443

	No.	Relative Risk*
Drug overdose	103	12.2
CV disease	57	2.1
Homicide	55	10.4
Suicide	41	3.4

*Compared to other Washington State residents,
adjusted for age, gender and race

Drug overdose deaths (n=103)



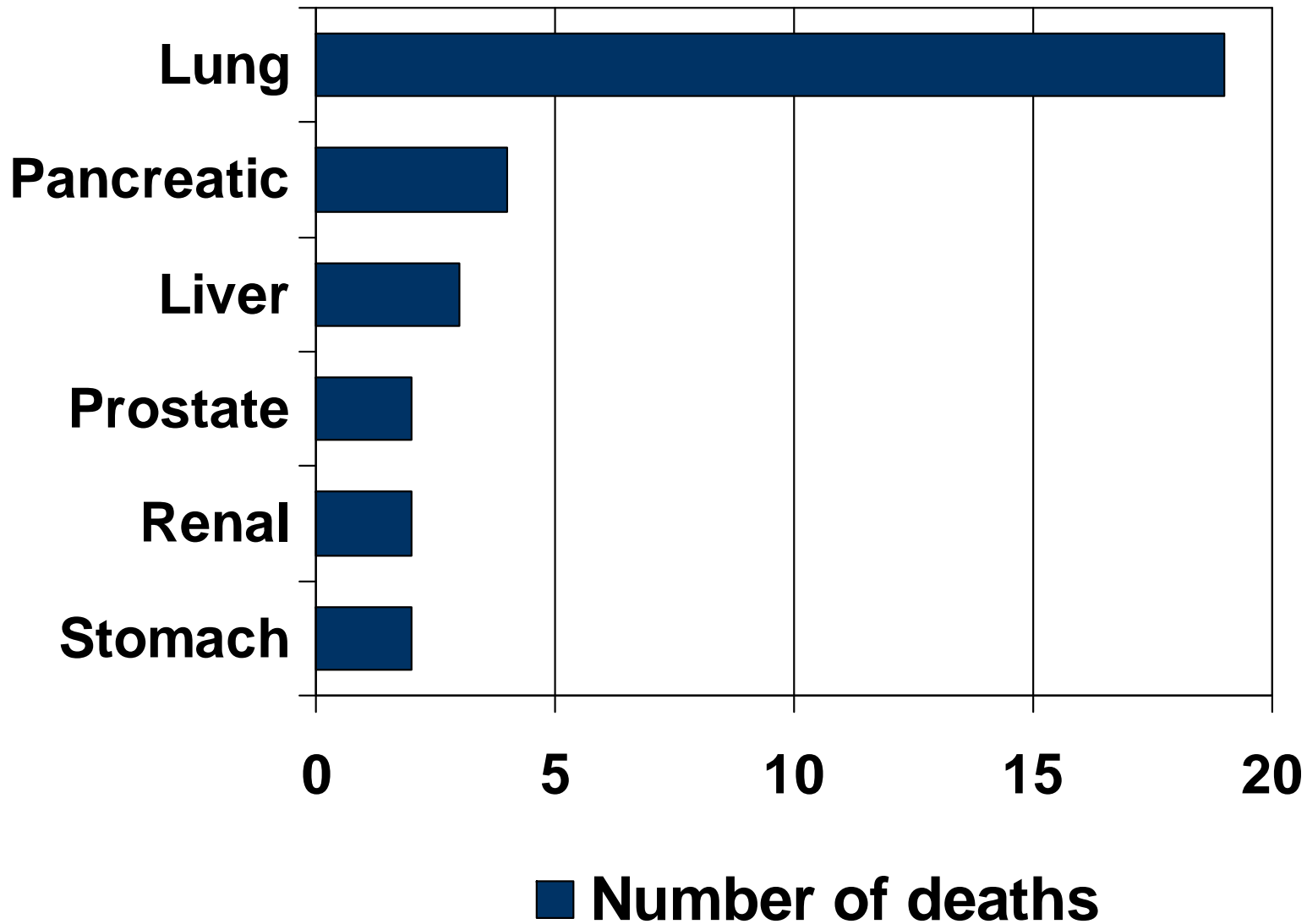
Other causes of death

n=443

	No.	Relative risk
Cancer	39	1.7
Motor vehicle accident	35	3.4
Liver disease	23	4.7

*Compared to other WA residents, adjusted for age, gender and race

Cancer deaths after release (n=39)



Rates of Death: Conclusions

- Former inmates at high risk for death after release
- Risk greatest in first 2 weeks after release
- Released inmates were at highest risk from overdose, cardiovascular disease, homicide and suicide

For more details go to: <http://content.nejm.org/> for reference or contact ingrid.binswanger@uchsc.edu for reprint: Binswanger IA, Stern MF, Deyo RA, Heagerty PJ, Cheadle JG, Elmore JG, Koepsell. Release from prison--a high risk of death for former inmates. NEJM, 2: 157-65; 2007.

Deaths among Parolees versus Prisoners, 1996

State	Prisoner deaths per 100,000	Parolee deaths per 100,000	Risk ratio of parole to prison death
California	172	760	4.4
Colorado	177	729	4.1
Idaho	78	5230	67.1
Indiana	224	631	2.8
Massachusetts	251	397	1.6
New Mexico	85	1908	22.4
Texas	283	759	2.7
TOTAL*	254	822	3.2

* Voluntary reporting of deaths and population from 22 state parole departments, May JP & Hegewald A, personal communication, 2007

Rhode Island combined jail and prison system

- 273 inmates admitted to correctional system in 1992
- Deaths determined through 1998
- Many likely died after release
- 27 (10%) died
- Leading causes of death: Overdose, HIV/AIDS and hepatitis 1,598 deaths/100,000 person-years
 - Contrast to 777/100,000 in our study

Allen S, Stone A, Spaulding, A, NCCHC abstract, 2002

Critical Questions for the Field

1. Why are the death rates among released inmates so high?
2. Can we predict who is at greatest risk for death well enough to target prevention efforts?
3. What can be done to prevent excess mortality?

Outline

1. Mortality after release

- a) Rates - International and US data
- b) Risk factors – Preliminary data
- c) Next steps in risk factor analysis

2. Interventions to reduce the risk

- a) Existing programs
- b) Future programs

What are the risk factors for all-cause mortality among released inmates?

- Highest risk? Hypotheses:
 - Women
 - African American
 - Older age
 - Substance dependent
 - Mentally ill
 - Multiple incarcerations (& releases)
 - Longer time in prison
- Goal: Who should we target for intervention?

Risk Factors: Methods

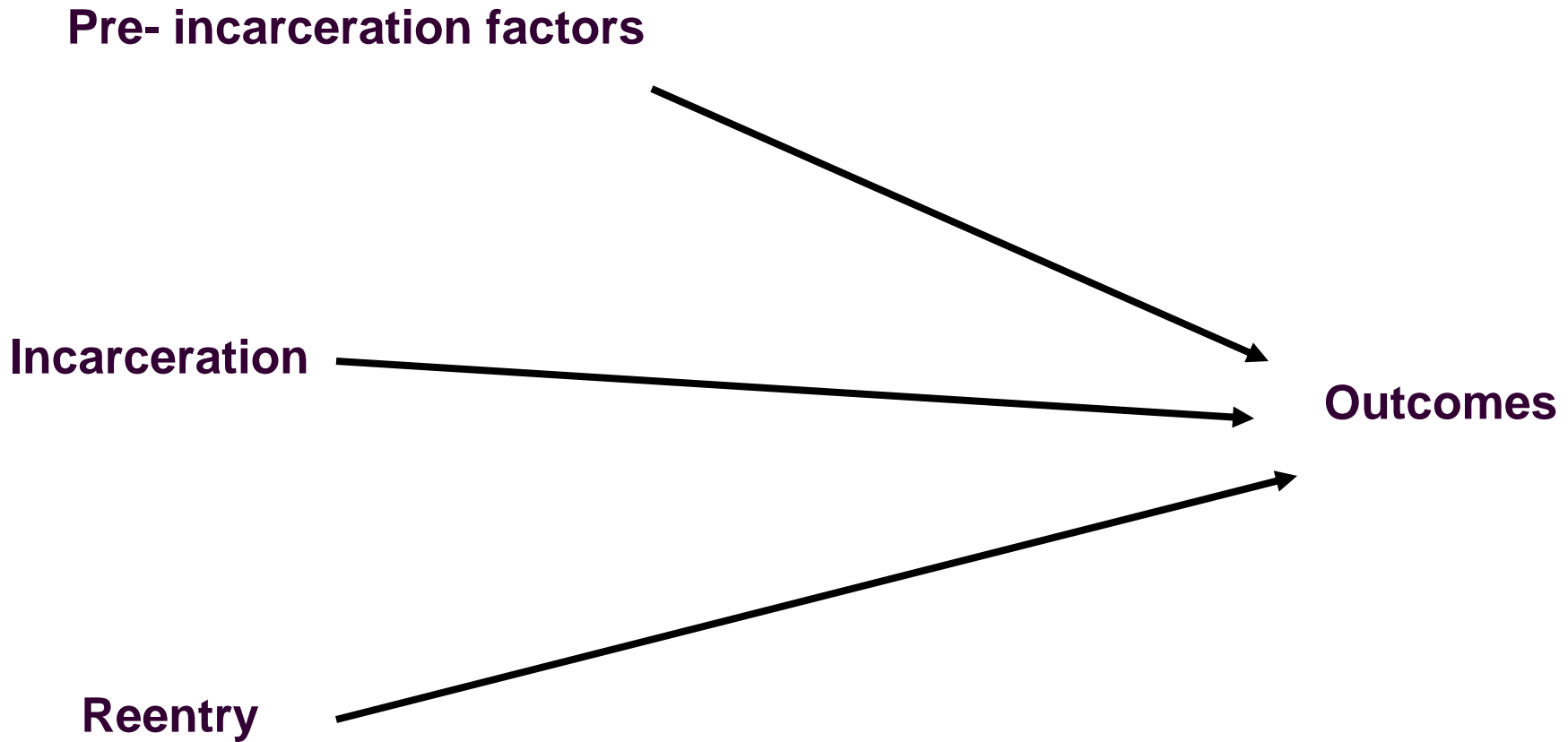
- Analysis of existing cohort data
- Data on demographic factors identified from administrative data of DOC
- Data on chemical dependency and mental health characteristics identified from medical records database
- Deaths identified in National Death Index

Collaborators: Patrick Heagerty, Allen Cheadle, Thomas Koepsell, John Steiner

Risk Factors: Analysis

- Account for same individuals in multiple releases (“id” variable)
- Cox proportional hazards regression
- Assess proportional hazards

Prisoner re-entry and health



Modified from Gelberg L, 2000

Prisoner re-entry and health: Non-modifiable Factors

Pre- incarceration factors

Race, age, gender, education, neighborhood, drug and alcohol dependence, mental health disorders, risk behavior, exposure to violence, access to health care, history of incarceration

Incarceration

Length of incarceration, quality of care, preventive services, chemical dependency treatment, psychiatric treatment

Reentry

Transitional challenges, type of release, re-entry policies, physiologic changes, access to health care, prescriptions, drug treatment

Outcomes
Mortality
Health
Disability
Risk behavior



Modified from Gelberg L, 2000

Prisoner re-entry and health: Potentially Modifiable Factors

Pre- incarceration factors

Race, age, gender, education, neighborhood, **drug and alcohol dependence, mental health disorders**, risk behavior, exposure to violence, access to health care, **history of incarceration**

Incarceration

Length of incarceration, quality of care, preventive services, chemical dependency treatment, psychiatric treatment

Reentry

Transitional challenges, **type of release**, re-entry policies, physiologic changes, access to health care, prescriptions, drug treatment

Outcomes
Mortality
Health
Disability
Risk behavior

Modified from Gelberg L, 2000

Risk Factors for Death after Release

- Preliminary results were presented
- Final analyses are pending

Risk Factors: Next steps

Age, gender, race, chemical dependency, serious mental health disorder, length of incarceration, release type, number incarcerations

What other risk factors should be examined after release?

Outline

1. Mortality after release

- a) Rates - International and US data
- b) Risk factors – Preliminary data
- c) Next steps in risk factor analysis

2. Interventions to reduce the risk

- a) Existing programs
- b) Future programs

Existing Programs to Improve Transitions

Program	Location
Primary care provision in jail & community by same providers	Hampden County, MA
Referral to early entry into methadone after release	Rhode Island
Provision of 30 days of medications	Washington DOC
Drug Treatment Halfway Houses	Colorado DOC & ARTS
Others?	

Potential Interventions to Improve Health Outcomes after Release

- Patient education
 - Individual
 - Group
 - Media
- Case management
- Patient navigation
- Integrated information technology systems
- Others?

Intervention and models listed by audience members during discussion

- Housing
- Transitional Linkage to community – Connecticut for HIV+ released inmates
 - Case managers – in and out
 - Links to ID nurses
 - Referral to Medical care
 - Transportation
 - Medical records
 - Entitlements
- North Carolina
 - Aftercare
 - Treatment intensified prior to release
 - Bio-psychosocial
- Project Bridge
 - Case management

Intervention and models listed by audience members during discussion

- NY Discharge planning
- Pre-entry facility – Oregon
 - 6 months
 - Curriculum
 - Own personal plan
- Drug treatment closer to release
- “Therapeutic” prison
 - For people with personality disorders
 - United Kingdom
- In-reach worker
- Family programs
- Discharge screening
- Needs assessment
- Number of visits → in custody records; if number of visits an independent protective risk factor against mortality, use it to justify ↑ (an increased) number of visitations, reducing barriers, video visiting if inmates removed from urban areas.

Funding

- Robert Wood Johnson Clinical Scholars Program
- Department of Veteran's Affairs
- University of Colorado and Health Sciences Center Division of General Internal Medicine