

All cause and cause specific mortality among individuals imprisoned for Driving Under the Influence of alcohol and drugs in Norway (2000-2016)

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Overview

- Background and aims
- Material and methods
- Results
- Conclusion

Conflicts of interest: none



Background

In 2019, 21% of all prison sentences in Norway included at least one offence of driving under the influence (DUI) of alcohol and/or drugs

The DUI- offender (some characteristic)[1,2]:

- frequent psychoactive substance use and dependence
- major depressive- and anxiety disorders
- hyperactivity disorders
- risk-taking dispositions
- lower levels of education
- higher rates of unemployment, disability pensions and divorce compared to the general population

DUI-recidivism is common

Background

- Prison population: greater risk of premature death [3]
- Particularly high among individuals arrested for alcohol and drug related crimes [4]
- DUI is included in the category of alcohol and drug related crimes [5]

- Most dominant causes of death among DUI-offenders [5,6]:
 - alcohol and drug poisoning/overdose
 - accidents and suicide
 - diseases of the circulatory system

DUI-offenders is large and heterogeneous and therefore more specific knowledge on the risk factors and mortality has been warranted for this group [5]

3. Binswanger. I.A.. et al.. *Release from prison--a high risk of death for former inmates*. N Engl J Med. 2007. **356**(2): p. 157-65.
4. Skardhamar. T. and V. Skirbekk. *Relative Mortality among Criminals in Norway and the Relation to Drug and Alcohol Related Offenses*. PLOS ONE. 2013. **8**(11): p. e78893.
5. Impinen. A.. et al.. *High mortality among people suspected of drunk-driving. An 18-year register-based follow-up*. Drug Alcohol Depend. 2010. **110**(1-2): p. 80-4.
6. Karjalainen. K.. et al.. *Mortality and causes of death among drugged drivers*. Journal of Epidemiology and Community Health. 2010. **64**(6): p. 506-512.



Aims

Using data from The Norwegian Prison Release Study (nPRIS) we aim to;

1. describe three different groups of DUI-imprisoned individuals in the Norwegian prison population between 2000-2016
2. describe all-cause and cause specific mortality in the DUI-groups compared with mortality among those imprisoned for other crimes than DUI, and
3. to investigate factors associated with internal and external mortality in the prison population



Material and methods

Design and study population:

- retrospective cohort study
- all persons imprisoned in Norway over a 17-year period (January 1st. 2000 until December 31st. 2016) collected from the Norwegian Prison Registry (nPRIS cohort) (n= 114 745)



Material and methods

Setting:

Blood alcohol concentration (BAC)	Sanctions
Legal limit: 0.2 g/kg	
≤ 0.5 g/kg	Fine
$> 0.5 - \leq 1.2$ g/kg	Fine + conditional/unconditional prison
> 1.2 g/kg	Fine + unconditional prison



Material and methods

Setting cont.:

Per se limits for 28 psychoactive drugs corresponding to BAC of 0.2 g/kg, graded sanction corresponding to BACs of 0.5 and 1.2 g/kg for 24 of these drugs

Data sources:

- The Norwegian Prison Registry: age, sex, convictions, sentences, date of admission and date of release
- The Norwegian Cause of Death Registry (NDR): time of death, underlying cause of death, immediate causes of death. ICD-10 codes



Material and methods

Measures:

All causes of death categorized as either internal or external

Internal: ICD-10 chapters A – Q

External: ICD-10 chapters V – Y

Drug- and alcohol-related causes (F10-F19) were defined as external causes of death

Groups of DUI

“DUI only” = those having no other convictions but DUIs

“DUI drug” = those having both DUI and drug-related convictions

“DUI other” = those having DUI and other not-drug-related convictions



Results

	Total (n=96856)	No DUI (n=68463)	DUI total (n=28393, %=29.3)		
			DUI only	DUI drug	DUI other
			%	%	n
Total	100	70.7	9.2	16.7	3.4
Sex					
<i>Men</i>	89.7	89.3	86.3	92.0	94.6
<i>Women</i>	10.3	10.6	13.7	8.0	5.4
DUI convictions ≥ 2	13.9	-	2.7	21.1	9.1
Deceased	8.3	7.4	9.3	11.3	10.2
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Number of incarcerations	1.7 (1.6)	1.6 (1.4)	1.1 (0.3)	2.7 (2.6)	1.6 (0.9)
Age at last incarceration	35.3 (12.1)	34.6 (11.8)	38.4 (14.1)	36.2 (11.4)	36.6 (13.4)
Age at death, all cause	48.0 (14.9)	46.4 (14.9)	56.4 (13.0)	47.6 (14.6)	52.8 (14.1)
<i>Internal</i>	57.5 (12.0)	56.6 (12.2)	61.1 (10.2)	57.0 (12.1)	59.6 (10.9)
<i>External</i>	39.9 (12.4)	38.7 (11.9)	47.8 (13.3)	40.4 (12.2)	45.1 (13.9)



Results

Cause of death	Total (n=8053)	No DUI (n=5064)	DUI (n=2989)		
			DUI only (n=825)	DUI drug (n=1825)	DUI other (n=339)
	%	%	%	%	%
Internal					
Cancer	13.0	12.6	17.5	11.7	13.6
Circulatory	13.3	12.2	19.1	12.8	18.3
Alcoholic liver disease	2.7	2.1	5.2	3.1	4.7
Total, n= 3379	42.0	39.6	58.9	39.8	48.1
External					
Transport-related	4.3	4.4	1.6	4.9	5.0
Intoxication ¹	30.3	31.8	19.9	32.9	20.6
• <i>Alcohol</i>	4.6	3.4	9.1	5.3	9.1
• <i>Drug-induced</i>	25.7	28.4	10.8	27.4	11.5
Suicide	10.0	11.2	6.5	8.8	8.3
Total, n= 4139	51.4	53.9	33.0	54.1	44.0
Unknown	6.7	6.6	8.1	6.0	7.9
Total deceased	100	100	100	100	100



Results

Adjusted OR for internal cause and external cause of death

Cause of death	Internal cause n=3379		External cause n=4139	
	OR (95% CI)	<i>p</i>	OR (95% CI)	<i>p</i>
Sex (female ref.)	1.136 (1.002-1.288)	0.05	1.134 (1.018-1.264)	0.02
Age at last incarceration	1.106 (1.103-1.110)	<.001	1.013 (1.010-1.015)	<.001
Convictions:				
No DUI (ref.)	1		1	
DUI only	1.171 (1.049-1.307)	0.005	0.751 (0.661-0.853)	<.001
DUI drug	1.540 (1.406-1.688)	<.001	1.573 (1.459-1.695)	<.001
DUI other	1.302 (1.093-1.552)	0.003	1.124 (0.949-1.331)	n.s.



Conclusions

- The overall risk of premature death was significantly elevated for those who had a history of DUI-imprisonment combined with a history of imprisonments due to any other type of crime compared to those who had been imprisoned but with no history of DUI



Conclusions

Distinct DUI-groups:

- The “DUI only”-group: generally older at death, had the largest proportion of women. Higher risk of death from internal causes, possibly related to a high alcohol consumption. Lower risk of death due to external causes, might be related to less risk-taking behavior
- The “DUI drug”-group: largest DUI-group, generally died at young age. Had several incarcerations and high degree of DUI-recidivism. Higher risk of death both from internal and external causes. External causes of death were over-represented, mainly due to intoxications



Collaborators



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Thank you for the attention!

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