Viral Hepatitis Prevention Board

Highlight underserved for screening, prevention and treatment of viral hepatitis B and C in Europe

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HCV seropositivity in inmates and in the general population: an averaging approach to establish priority prevention interventions

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Inserm

SESSTIM

Background (1/2)

- General French population: HCV prévalence: 0.84% du VHC (Ac anti-VHC positif) (BEH, 2009)

- Populations at risk :

  - People who use drugs: 44% -56% (Marseille) in 2011 (BEH, 2013)

  - Prison population: 4.8% in Prevacar study 2010 (BEH 2013)

Background (2/2)

Risk factors of HCV transmission are well known in the general population

To what extent the prison environment modifies the strength of the association between known risk factors and HCV seropositivity?

=> Better prioritize intervention in prison setting.

Design

- Surveillance system on HCV testing and counseling between 2004 and 2010 in PACA region.

- 26 centers for HIV/HCV testing in southeastern France (23 in the general population and 3 in prison).

- HCV testing systematically proposed to individuals referred presenting at least one risk factor for HCV

- 2 groups: Inmates vs " General population"=individuals referred for at least one risk factor.

Data collection and statistical methods

- HCV seropositivity measured with ELISA test
- A self administered questionnaire to collect socio-demographic data and risk factors
- Medical questionnaire filled in by the physician including the result of HCV testing and possible co-infections with HIV or HBV.
- A propensity score method to ensure that the general and inmate populations could be compared
- A multimodel averaging to estimate the degree (strong,weak, none) of the association of a number of specific factors with HCV seropositivity in each group.

Statistical methods: Multimodel averaging

- It enables the ranking of explanatory variables according to their relative importance using Akaike weights.

- Several model specifications are first estimated (there are as many models as possible combinations between the explanatory variables).

=> A final model computed by using the average-weighted parameters and SEs obtained from the different model specifications.

- 19 HCV risk factors are ranked according to their relative importance weights (values between 0 (no evidence) and 1 (strong evidence

Results

Prevalence of HCV :

1.5% in the general population (N=46125)

5.2% in inmates (N=5957)

Prevalence by calendar year

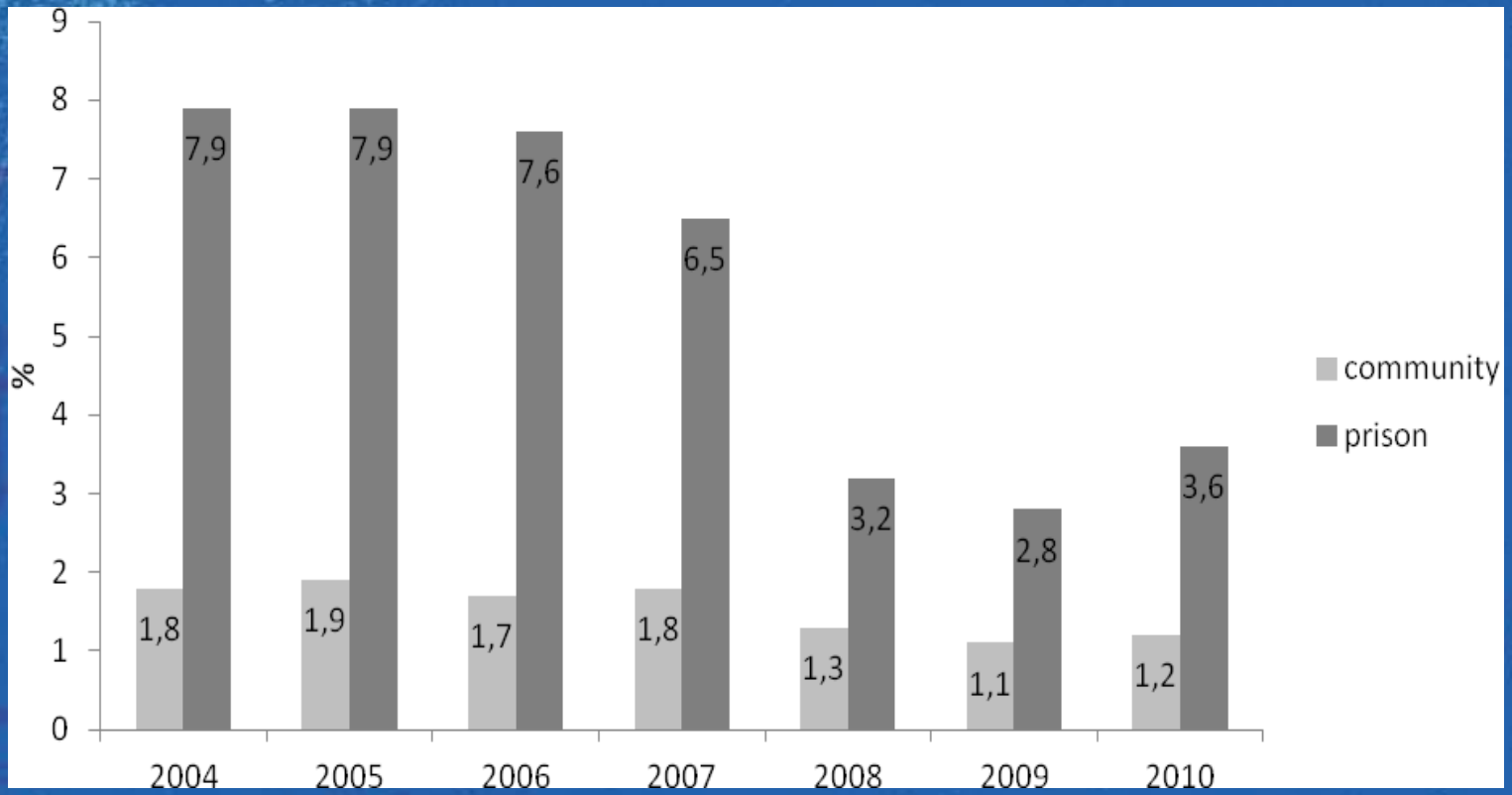

Table 2 Sociodemographic and behavioural characteristics of participants tested for HCV infection in the prison population and in the general population after matching the data (n=9954)

	Prison screening centre (n=4977)	General population screening centre (n=4977)	p Value*	Total (%)
Positive HCV test, n (%)	255 (5)	106 (2)	$<10^{-3}$	361 (4)
Mean, age median (IQR)	28 (23–37)	28 (23–37)	0.72	28 (23-37)
Sex, n (%)				
Men	4640 (93)	4636 (93)	0.87	9276 (93)
Women	337 (7)	341 (7)		678 (7)
Employment, n (%)				
Worker or retired	2174 (44)	2647 (54)	$<10^{-3}$	4821 (49)
Unemployed or student	2759 (56)	2267 (46)		5056 (51)
Secondary school certificate, n (%)				
No	4761 (96)	4767 (96)	0.77	9528 (96)
Yes	216 (4)	210 (4)		426 (4)
Endemic HCV level in native country, n (%)				
Low†	4159 (84)	4161 (84)	0.96	8320 (84)
Medium or high‡	818 (16)	816 (16)		1634 (16)
History of drug use, (%)				
Yes	1931 (39)	1903 (38)	0.56	3834 (39)
No	3046 (61)	3074 (62)		6120 (62)
Drug injection without snorting, n (%)				
Yes	59 (1)	54 (1)	0.66	113 (1)
No	4915 (99)	4885 (99)		9800 (99)
Drug snorting without drug injection, n (%)				
Yes	1484 (30)	1292 (26)	$<10^{-3}$	2776 (28)
No	3490 (70)	3647 (74)		7137 (72)
Drug snorting with drug injection, n (%)				
Yes	270 (5)	160 (3)	$<10^{-3}$	430 (4)
No	4704 (95)	4779 (97)		9483 (96)
Haemodialysis, n (%)				
Yes	74 (2)	33 (1)	$<10^{-3}$	107 (1)
No	4882 (98)	4714 (99)		9596 (99)
Tattoo/piercing, n (%)				
Yes	2152 (43)	2130 (43)	0.98	4282 (43)
No	2816 (57)	2790 (57)		5606 (57)
Sexual intercourse with an HCV+person, n (%)				
Yes	71 (2)	136 (3)		207 (2)
No	3865 (80)	3126 (64)	$<10^{-3}$	6991 (72)
Did not know	898 (18)	1636 (33)		2534 (26)
Sharing toiletry items, n (%)				
Yes	89 (2)	224 (5)	$<10^{-3}$	313 (3)
No	4201 (86)	3379 (69)		7580 (77)
NSP	620 (12)	1309 (27)		1929 (20)

Résultats (3)

Table 3 Factors associated with an HCV positive test in participants tested in the prison population and in the general population, 2004–2010 (n= 4977) using an averaging approach

	Prison screening centre		General population screening centre	
Explanatory variables	IRR (95% CI)	Akaike weights (level of evidence)	IRR (95% CI)	Akaike weights (level of evidence)
Drug snorting without injection				
No	1		1	
Yes	2.21 (1.39 to 3.52)	0.99 (strong)	2.12 (1.05 to 4.29)	0.75 (weak)
Drug injection without snorting				
No	1		1	
Yes	32.25 (20.07 to 51.84)	1 (very strong)	47.07 (24.24 to 91.4)	1 (very strong)
Drug injection with snorting				
No	1		1	
Yes	30.91 (21.25 to 44.95)	1 (very strong)	30.31 (17.24 to 53.32)	1 (very strong)
Tattoo/piercing				
No	1		1	
Yes	1.22 (0.92 to 1.61)		1.13 (0.74 to 1.72)	
Sexual intercourse with an HCV+ person				
No	1		1	
Yes	1.21 (0.66 to 2.2)	0.50 (weak)	1.9 (0.86 to 4.2)	0.30 (no)
Do not know	0.9 (0.62 to 1.31)	0.18 (no)	1.27 (0.75 to 2.14)	0.35 (no)
Sharing toiletry items				
No	1		1	
Yes	1.44 (0.84 to 2.47)		1.38 (0.69 to 2.75)	
Do not know	0.7 (0.47 to 1.06)	0.65 (weak)	0.72 (0.41 to 1.26)	0.40 (no)

Limits and strengths

- Risk factors based on self-report, social desirability bias and underreporting

- External validity => southeastern France

- Statistical power which made possible comparisons between general population and inmates using propensity scores

- Novelty of the approach, ranking the importance of risk factors in different environments

=> Impact on future guidelines for HCV prevention in prison setting

Discussion

- HCV prevalence in prison is 3 times higher than that found in the general population with at least one HCV risk factor.

- Main risk factor in both populations is drug injection

- Drug snorting is an under-evaluated risk factor in prison setting as well as sexual encounters and sharing toiletry

⇒To be taken into account in future guidelines for HCV prevention in prison

Icrease access to new HCV prevention tools in prison setting and reduce harms from the under-estimated risk factors

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