Exploring Associations Between Perceived HCV Status and Injecting Risk Behaviors Among Recent Initiates to Injecting Drug Use in Glasgow

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The aim of this study was to explore the influence of testing for hepatitis C virus (HCV) and perceived HCV status on injecting risk behavior. A cross-sectional, community-wide survey was undertaken at multiple sites throughout Greater Glasgow during 2001–2002. Four hundred ninety-seven injecting drug users (IDUs) consented to participate and were interviewed using a structured questionnaire to ascertain HCV test history and injecting risk behavior. The average age of participants was 27 years and the majority of the sample were male (70.4%). Participants had been injecting for an average duration of 2.5 years. Logistic regression analysis revealed no significant associations between having been tested and injecting risk behavior. After adjustment for potential confounding variables, HCV-negatives were significantly less likely to borrow needles/syringes and spoons or filters as compared with unawares and were significantly less likely to borrow spoons or filters as compared with HCV-positives. Due to the cross-sectional design of the study, it is uncertain whether this reduction in risk behavior could be attributed to perception of HCV status. Further research is recommended to consolidate the evidence for this relationship.

Keywords hepatitis C; injecting drug use; test; risk behavior; status perception

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Introduction

Worldwide, it is estimated that around 170 million persons have been infected with the hepatitis C virus (HCV; World Health Organization [WHO], 1999). In resource-rich countries such as the UK and the United States, in which an estimated 250,000 and 4 million persons, respectively, have been infected (Alter et al., 1999; Department of Health, 2004), the majority of infections have been acquired by injecting drug users (IDUs). Blood tests to detect past and current infection with HCV became available in the early 1990s and since then numerous guidelines have recommended that current IDUs should be offered HCV testing (Scottish Needs Assessment Programme, 2000).

It is recognized that, potentially, there are three benefits of testing: (a) to identify persons who might be eligible for antiviral therapy, (b) to reduce the risk and rate of disease progression among those infected by vaccinating them against hepatitis A/B and advising them against excessive alcohol consumption, and (c) to advise those both with and without infection against engaging in practices, particularly those relating to injecting drug use, that would result in them transmitting or acquiring infection, respectively (Goldberg and Anderson, 2004). Apropos current IDUs, reason (a) is usually not relevant as current injecting is generally a contraindication to therapy (National Institute for Clinical Excellence, 2003) and reason (b) could be achieved without testing for HCV. Reason (c) is often cited by healthcare professionals as the principal one for HCV testing current IDUs (Scottish Needs Assessment Programme, 2000). Few evaluations of the impact of HCV testing in this respect, however, have been undertaken (Aitken, Kerger, and Crofts, 2002; Cook, McVeigh, Syed, Mutton, and Bellis, 2001; Kwiatkowski, Fortuin Corsi, and Booth, 2002; Malliori et al., 1998; Ompad, Fuller, Vlahov, Thomas, and Strathdee, 2002; Vidal-Trécan, Coste, Varescon-Pousson, Christoforov, and Boissonnas, 2000) and those performed were seriously hampered by methodological limitations. Accordingly, the authors investigated the possibility of associations between self-reported HCV test/perceived result status and injecting risk behavior among a sample of recent initiates to injecting drug use in Glasgow.

Methods

Design/Sample

We analyzed data generated through a cross-sectional behavioral survey of IDUs interviewed in Glasgow during 2001 and 2002. Using a community-wide, multiple-site sampling strategy—regarded as the optimal approach for this population group and used previously on seven occasions in Glasgow since 1990 (Taylor et al., 2000)—497 IDUs were recruited from needle exchanges (141, 28%), drug treatment agencies (108, 22%), and street sites (248, 50%) throughout the Greater Glasgow Health Board area. Interviewers recruited participants between May 2001 and July 2002 and rotated days of the week and times of the day at which they visited the sites to capture as representative a sample as possible.

To be eligible for the study, participants were required to have injected drugs on at least one occasion and to have commenced injecting drugs since January 1, 1997. This date was chosen because Glasgow has had a well-established network of harm reduction services (needle exchanges and treatment agencies) since 1996 (Gruer, Cameron, and Elliott, 1993; Taylor et al., 2000), and one of the main objectives of the survey was to investigate injecting risk behavior in IDUs since the establishment of these services.

Data Collection

A questionnaire was administered by trained interviewers, after obtaining informed consent from the participant. Potential participants were approached, showed an identification card of the interviewer, and given a brief description of the study. If the individual met the eligibility criteria, he or she was given an information sheet describing the aims of the study and the rights of participants. Seven hundred sixty-seven individuals who were approached to participate were either not eligible or refused. Interviews at street sites were conducted in a mobile camper van, located in areas of high deprivation and IDU prevalence; those at drug user treatment agencies and needle exchanges were undertaken in a private room. Following the interview, participants were given information on obtaining HCV testing and counseling and drug treatment. Ethical approval for the study was granted from the North Glasgow LREC Executive Committee.

The questionnaire contained questions about socio-demographic characteristics, injection history, drug use practices, prison history, attendance at needle exchanges, knowledge and perceptions of HCV transmission and infection, and testing history for HCV. The questions relating to injecting risk behavior were derived from a validated questionnaire, the IRQ (Injecting-Risk Questionnaire), which contains empirically based questions designed to measure the sharing of injecting equipment. It has previously been assessed with respect to reliability and validity and found to be highly acceptable for use in a variety of settings (Stimson, Jones, Chalmers, and Sullivan, 1998). Initials and date of birth were the only identifiers collected from respondents and, to ensure that no respondent was included more than once, any apparent duplicates were removed.

Measures

Outcomes. Respondents were asked whether they had engaged in the following risk behaviors in the 6 preceding months: (a) injecting with a n/s (needle/syringe) that had previously been used by someone else ("borrowing n/s"), (b) using spoons or filters into which someone else had put a used n/s ("borrowing spoon/filter"), (c) backloading or frontloading (the process by which drug solute is injected from one n/s into the back or front of another), and (d) giving, lending, renting, or selling a n/s that had been previously used by the respondent to others ("lending n/s"). Non-responders were excluded from the analysis.

Exposures. Two exposure variables were considered: having received an HCV test and the respondent's perception of his or her HCV status. The latter variable grouped respondents into three categories—HCV-positives, HCV-negatives, and "HCV-unawares"—based on their self-reported status. HCV-unawares included those who did not have a test or were not able to cite their status (either because they could not recall or had not returned to receive the test result).

Confounding Variables. Variables known or suspected to be associated with injecting risk behavior or HCV testing were considered as potential confounders in the analyses. These variables were age, sex, length of injecting career in years, frequency of injection (a proxy for drug dependence), interviewees' perception of the prevalence of HCV in Glasgow IDUs (a proxy for knowledge/perception of the risk of transmission), time taken to get to a needle exchange (a proxy for access to resources), homelessness, imprisonment, and treatment for drug use.

Analysis

Binary logistic regression was used to determine the association between the exposure and outcome variables. Univariate analyses were conducted by regressing each of the exposure variables onto each of the outcomes in turn. Multifactorial models were then created by the addition of the confounding variables to each model. In these analyses, respondents who had a test within the 6 months prior to the interview were excluded in order to ensure that the test occurred prior to the injecting risk behavior; this reduced the sample size by 56 individuals (11.7% of the total sample).

Results

The characteristics, injecting risk behaviors, and perceived HCV status of the study participants are summarized in Table 1. The average age of participants was 27 years and the mean length of injecting career was 2.5 years. The majority of the sample were male (70.4%) and had ever been in treatment for drug use (84%), and more than half the sample was currently receiving treatment. Most respondents reported having injected heroin in the 6 months prior to interview (442, 89%), followed by cocaine (168, 34%) and temazepam (95, 19%). Over 50% reported having been imprisoned since commencing injecting drug use. The primary place of residence in the past 6 months varied, with the largest percentage of respondents reporting living in their own home, followed by someone else's home, and a hostel for the homeless. Sixty-two percent of respondents reported injecting at least twice a day. The majority (80.5%) of respondents reported less than 30 minutes travel time to the nearest needle exchange. When asked to estimate the number of HCV-infected Glasgow IDUs out of 100, 60% of respondents estimated the prevalence to be 75% or greater.

In terms of HCV test uptake, nearly half (48.8%) of respondents reported having ever received a test. Thirteen percent of all respondents cited a positive test result, 25.8% cited a negative result, and the remaining respondents could not cite their status. Injecting risk behaviors were markedly prevalent in the sample: the proportions of those having lent or borrowed injecting equipment ever and in the last 6 months ranged from 54 to 78% and 40 to 60% respectively. Backloading/frontloading was not as common, with 36.3% of respondents reporting having ever engaged in this behavior. Fewer respondents reported engaging in these injecting risk behaviors in the 6 months prior to the interview, yet the behaviors were nevertheless quite common, with 43.9% of respondents reporting having shared n/s, 60.2% having shared spoons or filters, 24.1% having backloaded/frontloaded, and 39.6% having passed on n/s.

The results of the unadjusted and adjusted analyses of the association between having received an HCV test and injecting risk behavior are presented in Table 2. Those who had previously been tested for HCV had lower odds of engaging in all types of injecting risk behavior relative to those who had never been tested, although none of the associations reached statistical significance, even after adjustment for confounding variables.

The results of the unadjusted and adjusted analyses of the association between perceived HCV status and injecting risk behavior are presented in Table 3. Relative to unawares, HCV-negatives were significantly less likely to have borrowed n/s (adjusted OR = 0.52, p = 0.027) and spoons or filters (adjusted OR = 0.46, p = 0.008). Relative to HCV-negatives, HCV-positives were significantly more likely to have borrowed spoons or filters (adjusted OR = 4.81, p = 0.004) but not n/s (OR = 1.57, p = 0.355). No significant associations were observed for backloading or frontloading. Relative to unawares, HCV-positives were less

Table 1

Characteristics, injecting risk behaviors, and perceived HCV status among 497 IDUs, who had commenced injecting since January 1, 1997, surveyed in Glasgow, 2001–2002

Characteristic	Mean (SD)
Age at recruitment into study (years)	27.1 (5.4)
Length of injecting career (years)	2.5 (1.6)
Characteristic	**N (%)**
Male sex	349 (70.4%) (non-responses = 1)
Ever been in treatment for drug use	409 (84.0%) (non-responses = 10)
Currently in treatment for drug use	270 (55.3%) (non-responses = 9)
Imprisoned since commenced injecting	264 (53.7%) (non-responses = 5)
Primary place of residence in past 6 months	
Own home	162 (32.6%)
Someone else's home	126 (25.4%)
Homeless hostel	114 (22.9%)
No fixed abode	39 (7.8%)
Prison	34 (6.8%)
Other	22 (4.4%)
Frequency of injection	
Once per day	176 (38.3%)
2–3 Times per day	175 (38.1%)
>3 Times per day	108 (23.5%)
	(non-responses = 38)
Time taken to get to needle exchange	
0–14 Minutes	203 (50.1%)
15–29 Minutes	123 (30.4%)
30–44 Minutes	66 (16.3%)
45+ Minutes	13 (3.2%)
	(non-responses = 92)
Interviewee's estimated prevalence of HCV in Glasgow IDUs	
<50% Prevalence	46 (10.3%)
50–75% Prevalence	132 (29.7%)
75%+ Prevalence	267 (60.0%)
	(non-responses = 52)
Perceived HCV status	**N (%)**
Previous HCV test	233 (48.8%)
	(non-responses = 20)
Perceived HCV status	
Positive	64 (12.9%)
Negative	128 (25.8%)
Unaware**	305 (61.4%)

Risk behavior	Ever (N, %)	Last 6 months (N, %)
Borrowed used n/s	324 (65.9%) (non-responses = 5)	217 (43.9%) (non-responses = 3)
Borrowed used spoon/filter	390 (78.5%) (non-responses = 0)	299 (60.2%) (non-responses = 0)
Backloaded/frontloaded	178 (36.3%) (non-responses = 6)	119 (24.1%) (non-responses = 4)
Lent n/s*	264 (53.8%) (non-responses = 6)	194 (39.6%) (non-responses = 7)

*Given/lent/rented/sold a n/s previously used by the respondent to another user.

**Includes non-responders, those who did not have a test, those who did not receive test result, and those who could not recall test result.

Table 2

Logistic regression analyses: Associations between various risk behaviors and having received an HCV test (presented with 95% confidence intervals and p-values)

	Borrowing n/s		Borrowing spoon/filter		Backloading/ frontloading		Lending n/s	
	Unadjusted OR	Adjusted[a] OR	Unadjusted OR	Adjusted[a] OR	Unadjusted OR	Adjusted[a] OR	Unadjusted OR	Adjusted[a] OR
Tested relative to untested	0.85 [0.58, 1.26] p = 0.428	0.66 [0.40, 1.08] p = 0.100	0.75 [0.50, 1.12] p = 0.163	0.69 [0.41, 1.17] p = 0.171	0.94 [0.60, 1.48] p = 0.785	0.86 [0.51, 1.46] p = 0.576	0.82 [0.55, 1.23] p = 0.339	0.76 [0.46, 1.26] p = 0.289

[a] Adjusted for: age, sex, length of injecting career, frequency of injection, homelessness, imprisonment, estimated prevalence of HCV, current drug treatment, and length of time taken to get to needle exchange.

Table 3

Logistic regression analyses: Associations between various risk behaviours and perceived HCV status (presented with 95% confidence intervals and p-values)

	Borrowing n/s		Borrowing spoon/filter		Backloading/frontloading		Lending n/s	
	Unadjusted OR	Adjusted[a] OR	Unadjusted OR	Adjusted[a] OR	Unadjusted OR	Adjusted[a] OR	Unadjusted OR	Adjusted[a] OR
HCV-positive relative to unawares[b]	0.94 [0.51, 1.73] p = 0.843	0.82 [0.38, 1.81] p = 0.630	1.43 [0.72, 2.84] p = 0.304	2.19 [0.81, 5.92] p = 0.122	1.19 [0.61, 2.35] p = 0.609	1.12 [0.49, 2.56] p = 0.786	0.52 [0.26, 1.03] p = 0.059	0.45 [0.19, 1.03] p = 0.058
HCV-negative relative to unawares[b]	0.71 [0.44, 1.15] p = 0.163	0.52 [0.30, 0.93] p = 0.027	0.56 [0.35, 0.90] p = 0.017	0.46 [0.26, 0.81] p = 0.008	0.85 [0.49, 1.48] p = 0.570	0.87 [0.48, 1.60] p = 0.661	1.08 [0.68, 1.73] p = 0.747	0.99 [0.56, 1.74] p = 0.964
HCV-positive relative to HCV-negative	1.32 [0.66, 2.63] p = 0.435	1.57 [0.66, 3.74] p = 0.355	2.53 [1.20, 5.36] p = 0.015	4.81 [1.67, 13.87] p = 0.004	1.40 [0.64, 3.05] p = 0.398	1.28 [0.52, 3.20] p = 0.591	0.48 [0.23, 1.02] p = 0.056	0.45 [0.18, 1.12] p = 0.087

[a] Adjusted for age, sex, length of injecting career, frequency of injection, homelessness, imprisonment, estimated prevalence of HCV, current drug treatment, and length of time taken to get to needle exchange.

[b] Unawares include those who could not recall test result, did not return to receive test result, or never received a test.

likely to have lent n/s, an association which almost reached significance (adjusted OR = 0.45, p = 0.058).

Discussion

This analysis did not reveal any statistically significant differences in injecting risk behavior between those who reported having previously received a test for HCV compared with those who had not. This observation was in contrast to previous findings (Aitken et al., 2002; Cook et al., 2001), which described a benefit of testing in terms of reducing subsequent injecting risk behavior. A possible reason for the lack of observed differences in the current analysis is that the classification of individuals as either tested or untested might have concealed those differences, since individuals who were tested but did not receive the result would have been assigned to the tested category. It has been suggested that it is the outcome of the test that has implications for risk behavior (Weinstein, Rothman, and Nicolich, 1998); accordingly, when risk behavior was examined in relation to perceived HCV status in the current analysis, some significant associations were found. After adjustment for confounding variables, HCV-negatives were approximately half as likely to borrow n/s or spoons/filters relative to those who were unaware of their status. It could be hypothesized that HCV-negatives were motivated to reduce their borrowing of injecting equipment in order to preserve their negative status. This association was not observed for the lending of n/s, which is consistent with the hypothesis, since the individual would not be incurring or conveying any risk of infection by lending a n/s to another user. The results do not lend support to the supposition advanced by previous authors that, after being notified of an HCV-negative result, the individual might feel that he/she is somehow resilient to infection and continue to engage in the same high-risk drug injecting practices as before testing (Brogly, Bruneau, Lamothe, Vincelette, and Franco, 2002).

No significant associations were found in the comparison of HCV-positives relative to unawares, although the observation that HCV-positives were less likely to lend n/s was very nearly significant. Since a reduction in lending would confer no benefit to the individual, it suggests that perceived positive status might inspire altruistic behaviour and is consistent with the finding of Kwiatkowski et al. (2002) that a lower proportion of IDUs who were aware of their positive status had lent n/s within the month prior to interview compared to IDUs who were unaware of their positive status.

In the comparison of HCV-positives and -negatives, we found that HCV-positives were significantly more likely to borrow spoons or filters than HCV-negatives. Again, these behaviors put the individual who is accepting the drug equipment at risk of infection and is consistent with the previous argument that HCV-negatives would be less likely to engage in these behaviors in order to preserve their negative status.

With respect to backloading/frontloading, no significant associations were observed for any of the comparisons. The absence of any observed associations may be due to a lack of statistical power, since backloading/frontloading was only reported by a small percentage of respondents.

It should be emphasized that the HCV-negative or HCV-positive result used in this analysis was the status reported by the respondent. Self-reported status may not have reflected true status (Cook et al., 2001; Stein, Maksad, and Clarke, 2001), either because the individual incorrectly understood the results of a test or became infected after receiving a negative test result. Such discrepancies would not have compromised the analysis since it was the participant's perception of his HCV result status, rather than his true status, that mattered, apropos associations with injecting risk behavior.

The validity and reliability of retrospective self-report data obtained from injecting drug users may be questionable due to recall and/or social desirability biases. However, numerous studies support the use of this method in terms of both reliability (Brown, Kranzler, and Del Boca, 1992; Goldstein et al., 1995; McElrath, Chitwood, Griffin, and Cornerford, 1994) and validity (Brown et al., 1992). In addition, the current research took all reasonable measures to reduce socially desirable responses by collecting only initials and date of birth as personal identifiers, assuring participants of anonymity, and conducting interviews in private settings.

The analysis excluded respondents who received a test within the 6 months prior to the interview in an attempt to ensure that the test occurred prior to the risk behavior. It should nevertheless be recognized that an observational study design allows associations but not conclusions regarding any cause and effect to be determined. It is quite possible, for example, that injectors perceiving themselves to be HCV-negative were more likely to subsequently engage in less risky behavior than those unaware of their HCV status because of factors unrelated to HCV testing, such as HIV testing, or some other health care intervention. As those who have been tested for HCV are also more likely to have had an HIV test, we cannot exclude the possibility that changes in risk behavior might have been motivated by perceptions or fear of HIV infection. Other study limitations included lack of information about the knowledge, if any, imparted by the health care professionals who were directly involved with the participant in the HCV testing process. If participants were tested but not informed of the risks or consequences of HCV infection, then knowing one's status would not necessarily translate into behavioral changes.

Due to the cross-sectional nature of the survey, the possibility that the associations observed operate in the opposite direction, i.e., that perceived HCV-negative individuals are indeed negative as a result of having engaged in less risk behavior in the past, cannot be excluded. A longitudinal study design is preferable to determine the direction of associations and has previously been carried out in this context (Aitken et al., 2002; Ompad et al., 2002); however, issues with respect to this type of design include the substantial difficulties associated with follow-up in the IDU population.

Despite the aforementioned limitations, the current analysis has several strengths. The sample size was similar to, or larger than, all of those generated in the context of previous studies of HCV test result status and behaviour among injecting drug users (Aitken et al., 2002; Cook et al., 2001; Kwiatkowski et al., 2002; Malliori et al., 1998; Ompad et al., 2002; Vidal-Trécan et al., 2000). This analysis distinguished between borrowing vs. lending behaviors and borrowing n/s vs. borrowing injecting equipment, activities that have previously been combined in some studies. After Vidal-Trécan et al. (2000), this analysis is only the second of the aforementioned studies to have considered the role of potential confounding variables. The study also employed a comprehensive sampling strategy, similar to that undertaken by Cook et al. (2001). As such, the sample was more likely than those from most previous studies to be representative of the IDU population. However, since the study's inclusion criteria limited the sample to recent initiates, the extrapolation of the results of this analysis to other IDU populations should be undertaken with caution.

This analysis has contributed to the small body of evidence on the relationship between HCV test/result status and injecting risk behavior. The findings of the current analysis did not provide evidence of a benefit of testing per se but did lend some support to the theory that HCV status perception affects injecting risk behavior. In spite of this, the results are still largely inconclusive and further research is required to evaluate properly the impact of HCV testing on injecting risk behavior. Future studies should be longitudinal in design and involve larger samples to increase precision.

In the meantime, however, what should our policy be, regarding HCV testing of IDUs? The results of the current analysis as well as previous research indicate that knowledge of one's HCV status in this population is indeed very limited. While the evidence of any major benefit to current IDUs of HCV testing is currently lacking, there is none to suggest that testing promotes risky injecting behaviour. Accordingly, it would be reasonable to advocate (a) the offer, without strong recommendation, of an HCV test to all current injectors; and (b) the offer, with strong recommendation, of a test to former injectors. The subtle difference reflects the importance of identifying individuals likely to (a) be infected with HCV, (b) have moderate or severe hepatitis and, (c) have no contraindications, such as chaotic current injecting, to receiving antiviral therapy.

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RÉSUMÉ

Exploration des associations entre le statut perçu d'infection avec l'hépatite C et les comportements à risque dans un échantillon d'utilisateurs de drogues injectables à Glasgow

Cette étude a pour objectif d'examiner l'influence du testage pour l'hépatite C et de la perception de statut sur le comportement à risque. Nous avons entrepris un sondage communautaire d'utilisateurs de drogues injectables (UDI); 497 UDI recrutés dans divers lieux à Glasgow pendant 2001–2002 ont donné leur accord et participé aux entretiens. L'age moyen des participants était de 27 ans et la plus grande partie était des hommes (70.4%). En moyenne, les participants avaient utilisé des drogues pour une durée de 2.5 ans. Les analyses de régression logistique n'ont pas démontré d'associations entre le testage pour l'hépatite C et le comportement à risque. Après avoir ajusté notre analyse pour les variables confondantes, les participants qui se percevaient négatifs pour l'hépatite C étaient significativement moins à risque d'avoir emprunté des seringues et des cuillères/filtres que ceux qui étaient méconnaissants, et significativement moins à risque d'avoir emprunté des cuillères/filtres que ceux qui se croyaient positifs. Puisqu'il s'agit ici d'un échantillon, on ne peut pas conclure avec certitude que la réduction du comportement à risque peut être attribuée à la perception de statut de l'hépatite C et des recherches supplémentaires sont recommandées afin de consolider nos connaissances actuelles.

RESUMEN

Asociaciones que exploran entre el estado de HCV y los comportamientos percibidos del Inyectar-Riesgo entre iniciados recientes al uso de la droga que inyecta en Glasgow

La puntería de este estudio era explorar la influencia de la prueba para el virus de la hepatitis C (HCV) y del estado percibido de HCV en comportamiento del inyectar-riesgo. Un examen seccionado transversalmente, a nivel comunitario fue emprendido en

los sitios múltiples a través de mayor Glasgow durante 2001–2002. Cuatro cientos y ninety-seven inyectando a usuarios de droga (IDUs) consintieron participar y fueron entrevistados con usando un cuestionario estructurado para comprobar historia de la prueba de HCV y comportamiento del inyectar-riesgo. La edad media de participantes era 27 años y la mayoría de la muestra era masculina (70.4%). Los participantes habían estado inyectando para una duración media de 2.5 años. El análisis logístico de la regresión no reveló ninguna asociación significativa entre la prueba y el comportamiento del inyectar-riesgo. Después del ajuste para las variables de la confusión del potencial, HCV-negatives eran perceptiblemente menos probables pedir prestado needles/syringes y las cucharas o los filtros con respecto a unawares, y eran perceptiblemente menos probables pedir prestados las cucharas o los filtros con respecto a HCV-positives. debido al diseño seccionado transversalmente del estudio, es incierto si esta reducción en comportamiento del riesgo se podría atribuir a la opinión del estado de HCV. La investigación adicional se recomienda para consolidar la evidencia para esta relación.

THE AUTHORS

Norah Palmateer received an M.Sc. in epidemiology from the University of Edinburgh in 2004. She has since worked as an analyst for a cancer registry and is currently employed as an epidemiologist with Health Protection Scotland (formerly the Scottish Centre for Infection and Environmental Health). Her current work primarily concerns the epidemiology of hepatitis C, including the prevalence and incidence of, and behaviors associated with, HCV infection among current injecting drug users.

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Glossary

Backloading/Frontloading: the process by which drug solute is injected from one n/s into the back or front of another.
HCV: hepatitis C virus.
IDU: injecting drug user.
Injecting-Risk Behavior: sharing needles/syringes or other injecting equipment, or backloading or frontloading.
n/s: needles/syringes.

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