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# Risk perception, changing social context, and norms prevent transition to regular injection among people who smoke heroin

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## **Abstract**

### **Background**

There is a dearth of research examining what prevents people who smoke heroin from transitioning to regular injection. This qualitative study aims to improve understanding of environmental influences preventing people who smoke heroin from transitioning to regular injection.

### **Methods**

In-depth, semi-structured interviews ( $n=15$ ) were conducted with people who currently smoked heroin but never injected ( $n=10$ ) and those who injected on a few occasions but did not transition to regular injection ( $n=5$ ) in Northern Ireland. Multiple recruitment strategies were utilized to generate a community-based sample. Interviews were thematically analysed.

### **Main findings**

Participants identified two main, interconnected influences preventing transition to injecting heroin. Firstly, resistance towards injecting was rooted in micro level perceptions of risks primarily arising from meso level social interactions with people who inject drugs and, to a lesser extent, harm reduction agencies. Secondly, participants identified meso and macro environments defined as changing social contexts and normative beliefs surrounding the acceptability of injecting within their drug-using social networks which was facilitated by expanding heroin markets, negative interactions with people who inject drugs and new groups of people choosing to smoke heroin due to perceptions of injection risks.

### **Conclusions**

Findings illuminate environmental influences surrounding and shaping drug consumption practices. Harm reduction strategies should develop and implement safer smoking rooms, community and peer interventions, and improve accessibility to opioid substitution therapy and low threshold outreach services to prevent transitioning to regular heroin injecting.

## **Key words**

People who smoke heroin; Injecting drug use; Route transition; Risk; Harm reduction

## **1 Introduction**

Smoking heroin carries less risk than injecting due to injection being associated with blood-borne viruses, mortality, fatal and non-fatal overdose and other avoidable risks (Darke et al., 2016; Lopez-Quintero et al., 2015; Martins et al., 2015; Rondinelli et al., 2009). Research examining transitions to and from injecting drug use discern that preferred routes of administration may be temporal or permanent and are dynamic and complex dependent on a range of individual, situational and contextual factors (Bluthenthal et al., 2017; Bridge, 2010; Griffiths et al., 1992, 1994; Mars et al., 2014; Sotheran et al., 1999; Strang et al., 1997; van Ameijden et al., 1994). Given the increased risks associated with a permanent transition to injecting heroin, it is important to understand what prevents people who smoke heroin (PWSH) from regular injection and so better inform effective public health responses (Werb et al., 2018).

Research examining transitions to regular injection discern various individual (e.g., curiosity, increasing tolerance, pleasure seeking), contextual (e.g., increased interaction/relationships with people who inject drugs (PWID)) and socio-structural reasons (e.g., heroin market constraints, social, economic and political environmental issues) (Bluthenthal et al., 2017; Guise et al., 2017; Harocopos et al., 2009; Mars et al., 2016, 2014; Mayock et al., 2015; Sherman et al., 2002; Small et al., 2009; Rhodes and Bivol, 2012; Werb et al., 2018). Mars and colleagues' (2016, 2014) ethnographic research examining transitions from opioid pills to injecting heroin in Philadelphia and San Francisco also draw attention to the importance of the source-type of heroin available within local heroin markets upon consumption practices. They found that wider availability of low purity grey/brown powder heroin (Columbian sourced powdered hydrochloride salt) promoted injecting initiation (Mars et al., 2014).

The few studies focusing on influences preventing transitions to injecting discern a fear of needles, early engagement with treatment, especially opioid substitution treatment (OST), social environment influences and the stigmatised identity of PWID (Best et al., 2007; Bravo et al., 2003; Griffiths et al., 1994; Kelley and Chitwood, 2004; Smith et al. 2009; Sotheran et al., 1999; Witteveen et al., 2006). Sotheran et al.'s (1999) life history research with people who sniffed heroin in Manhattan, New York City, also found that those who had never injected or experimented with injecting conceptualised non-injecting routes of administration as protecting them from perceived health and social risks of injecting drug use (e.g., controlling tolerance, avoiding overdose, dislike or fear of the distinct sensation and overwhelming 'rush' which can characterise injecting episodes and controlling exposure to stigma).

There has been less emphasis on how heroin consumption practices are relational to other socio-structural environmental factors, such as heroin market changes, social, policy and law enforcement contexts which may prevent transition to injecting (Andrade et al., 1999; de la Fuente et al., 1997; Grund and Blaken, 1993; Rhodes and Bivol, 2012; Smyth et al., 2000; van Ameijden and Coutinho, 2001). Research from Europe and the United States (US) highlights the importance of how different forms and purity levels of heroin can prevent transitioning to injection (de la Fuente et al., 1997; Ciccarone, 2009; Grund and Blaken, 1993; Mars et al., 2016, 2014). For example, Mars et al. (2014) found that 'black tar' heroin (Mexican sourced hydrochloride salt) acted as a protective factor against transitioning for some participants. Ciccarone (2019) maintains that heroin smoking is more common in Europe due to the Afghanistan sourced base heroin which is more amenable to smoking than the predominant heroin hydrochloride powder and less dominant heroin hydrochloride salt available within US heroin markets.

The Northern Ireland (NI) context was characterised by constrained heroin markets during the political conflict (1968-1998) due to high levels of police and military security and the strong anti-drug stance from influential paramilitary organisations (Higgins et al., 2004; Higgins and McElrath, 2000; McElrath, 2004; McElrath and Jordan, 2005). McElrath and Jordan's (2005) study found most who initiated heroin during this period and the early post-conflict period moved onto injecting within a six-month timeframe. Some participants connected injection transition directly to the limited availability and low purity of the brown heroin available within NI. Thus, while the Afghanistan sourced base heroin characterising European heroin markets is more suitable to being smoked, shortages in supply and low purity levels appear to have promoted injection transition within the jurisdiction (EMCDDA, 2019; Ciccarone, 2019; UNODC, 2019). NI drug policy was also slow to develop, and abstinence based until 2001 when harm reduction approaches, such as OST and pharmacy-based needle and syringe exchange programmes, were implemented (McElrath, 2004, 2003, 2001). However, little is known about people who use heroin and their drug consumption practices within the post-conflict era.

Rhodes' (2009, 2002; Rhodes et al., 2005) risk environment framework was applied in line with similar research on injecting drug use (e.g., Boyd et al., 2017; Harocopos et al., 2009; Mayock et al., 2015). The framework considers multiple and interacting ecological influences, including individual, social, and structural, on drug use practices. Environmental influences operate at the micro (e.g., individual), meso (e.g., social group and organisational), and macro (e.g., societal) levels. The aim of this paper is to understand the environmental influences preventing PWSH from transitioning to regular injection

## **2 Materials and methods**

The qualitative methods have been described elsewhere and are summarised here (Harris, 2017; McElrath and Harris, 2013; Harris and McElrath, 2012). Findings are based upon a

subset of PWSH ( $n=15$ ) who self-reported never injecting ( $n=10$ ) or injected on a few occasions but did not transition to injection ( $n=5$ ). Participants were drawn from a larger study ( $n=54$ ) in NI examining transitions to and from injecting drug use (Harris, 2017). The subset of participants all self-reported smoking heroin as their regular and preferred route of administration ( $n=15$ ), while others in the main study preferred frequent movement between smoking and injecting ( $n=13$ ) or solely injecting ( $n=26$ ). Inclusion criteria for the subsample included: (1) aged 18+ years; (2) injected heroin within 30 days prior to interview; and (3) smoked heroin within 30 days before interview. Ethical approval was granted from: (1) the School of Sociology, Social Policy and Social Work, Queen's University, Belfast (QUB); (2) Research Governance, QUB; (3) Belfast Health and Social Care Trust (08104JH-M); (4) the Office for Research Ethics for NI (08/NIR01/96).

## **2.1 Sampling and Recruitment**

The study was advertised through needle and syringe exchange services, personal contacts, hostels, a statutory outreach service, community and voluntary drug agencies (McElrath and Harris, 2013). Participants were given advertising cards to share within their social networks. For ethical reasons, participants attempting to stop or reduce drug use were not asked for referrals. Eligibility was checked during initial phone contact. To overcome selection bias, all referrals were monitored and no more than four referrals from a participant were followed up (Shaghghi et al., 2011). Targeted sampling was used when types of respondents were under-represented. Eligible participants booked an interview appointment, provided written consent and compensated £20 for their time/travel expenses.

## **2.2 Data collection and analysis**

Qualitative semi-structured, in-depth interviews were conducted between 2008-2010 in private locations. JH devised the guide which contained a short demographic questionnaire, drug use history, transitions in route of administering heroin, environmental influences upon

risk practices during initiation into injecting and heroin use, and subsequent patterns of drug use (schedule available by contacting the corresponding author). Interviews were digitally recorded, transcribed and anonymised by JH. Field-notes were recorded throughout data collection detailing post-interview reflections, follow-up meetings with participants and professional drug workers which produced more detailed exploration of emergent analytical themes.

Verbatim transcripts were entered into NVivo 10 and thematically analysed (Braun and Clarke, 2006). JH identified an initial coding scheme from the interview schedule, with sub-nodes developing throughout data collection and multiple transcript reads. Inductive coding was completed to identify themes and subthemes. KM used transcripts to check the reliability and validity of the coding framework. Final coding used the risk environment framework (Rhodes, 2009, 2002; Rhodes et al., 2005) to identify levels of environmental influence (micro, meso and macro) preventing transitioning to injecting among PWSH.

Member validation occurred throughout data collection and analysis with participants being invited to review their interview transcripts and analytical findings (Thomas, 2016). While most PWSH choose continuing participation, changing life circumstances resulted in three participating. No amendments were made to transcriptions by PWSH; however, follow-up conversations provided opportunities to develop and understand analytical themes.

Participants agreed with the final analysis, interpretation, and anonymisation of the data. This validation enhanced rapport and increased the reliability and credibility of the research as a relevant and acceptable interpretation of participants experiences (McElrath and Harris, 2013). Reporting follows the COREQ guidance (Tong et al., 2007; see Supplementary Material 1).



### **3 Findings**

The two main, interconnected themes participants identified as preventing transition to regular injecting are presented in alignment with levels of environmental influence in the risk environment framework (Rhodes, 2009, 2002; Rhodes et al., 2005). Firstly, perceptions of injecting risk constituted micro environments preventing transition. Secondly, macro and meso environments manifested as changing social context and norms which inhibited transitions to regular injection.

#### **3.1 Sample characteristics**

Data included five women (33%) and ten men (67%), aged between 18-52 years (mean=28.4; SD=8.26). Mean self-reported age of initiation into smoking heroin was 21 years (SD=3.69; range=16-29 years). Duration of heroin use career spanned from 1-22 years (mean=6.7; SD=5.92). Ten (67%) respondents had never injected heroin. Three men and two women (33%) injected heroin on a few occasions but had not transitioned to regular injection. Ten participants (67%) had never received OST treatment, one man (7%) had received OST outside of NI but was not in-treatment at the time of interview, while four men (27%) were becoming engaged with OST.

#### **3.2 Perceptions of risk**

Participants conceptualised individual perceptions of risks associated with injecting as an important micro environmental influence preventing initiation and transition to injecting. Two issues defined this theme: (1) health risks; and (2) social risks (Figure 1).

#### **Figure 1: Theme and subthemes explaining perceptions of risk among PWSH**

##### **3.2.1 Health risks**

All participants reported knowledge of health and social risks associated with injecting. Several participants reported a fear of needles which was physiologically defined in relation to “*air bubbles*” (male, 05, smoker, mid 20s), “*miss[ing] the vein*” (male 06, smoker, early

20s), “veins getting distorted [...] make your immune system really shit” (male 07, smoker, early 20s), “overdose” (female 08, smoker, mid 20s), “leaving yourself vulnerable to infection or any disease” (male 14, smoker, infrequent injector, early 30s) and specific bloodborne viruses:

*AIDS, hepatitis, all the scary ones like. A few of my mates have hep. And if I start injecting then I will probably end up having hep. I know another wee girl too and she has AIDS, know what I mean? People aren't immune to these things like. (Male 09, smoker, early 30s)*

Most participants (75%) who injected but did not transition emphasised dislike of the intense physiological effects of injecting heroin. These were described as “overwhelming” (male 02, smoker, infrequent injector, mid 20s), “losing control” (male 10, smoker, infrequent injector, early 20s) of the effects of the substance, and dislike of the agitation following the main effects. They preferred the gradual build-up sensation produced by smoking the substance:

*It's like [when you inject] you sit there and you'd sit there and your eyes and all would shut and you would like go into a wee daze and all for a while, then you keep on snapping out of it. Then you'd get up and you can't sleep or nothing. That's just the way it is. You can't sleep and you feel all agitated and stuff, I don't know, it's weird [...] With smoking it, it's just easier to get into it. It doesn't hit you as hard. That's why I stopped it. (Male 10, smoker, infrequent injector, early 20s)*

Another described experiencing extreme paranoia and social interaction problematic each time he injected which influenced his choice to avoid transitioning:

*Whenever I was digging [injecting heroin], it made me very fucking paranoid, very self-conscious. I found it hard to interact and all that, it was really starting to pull me*

*down and this was only the third time of having a dig like, this was already in my head, this was already my thinking. So, I went on the tablets [prescribed opioid analgesic] and thought, “Fuck it. I’ll have a wee smoke [of heroin] and I’ll be sound.” So that’s what I was doing, smoking and smoking. (Male 02, smoker, infrequent injector, mid 20s)*

Most participants had limited contact with OST and emphasized the primary role of meso level social interactions with PWID in relation to perceptions of injection risk. However, some attributed the growth of smoking heroin to macro level policy changes which increased interactions with harm reduction providers specifically services offering low threshold outreach:

*I just think that the message has gone out there about the dangers of injecting it like, you know? [Outreach service] definitely help with that, you know? (Male 07, smoker, early 20s)*

### **3.2.2 Social risks**

Two-thirds (67%) of participants reported physical dependency on heroin and were often exposed to social risks associated with injecting (e.g., lack of income, relationship breakdown and social isolation); moving on to injecting was perceived as escalating these risks:

*I just did not want to end up going down that road [injecting], there was no way. [...] No matter how sick I was I would never steal off my friend like, I just wouldn’t do it. Or I would never, there’s things that I just wouldn’t do, like prostitution I wouldn’t do, or people that I would know that you would never even dream of going into prostitution and that’s a world I just wouldn’t want to go into [...] But all gear heads to me talk about is crime and stealing, getting money or getting this or doing that do*

*you know what I mean? And I have nothing in common with that. (Female 12, smoker, infrequent injector, late 20s)*

Three participants (20%) were employed and emphasised injecting heroin would negatively affect performance of employment duties. One was a mother who injected on a few occasions but smoked heroin for 13 years. She stated injecting would inhibit her ability to parent:

*If I was injecting, I wouldn't have no power over that. I wouldn't be able to drive because I just can't see [...] But if I smoke it, I have control over what I'm taking and being a mother, it's the knowing what's going on. Where if I'm injecting, no, I don't have that, I can't guarantee that. (Female 13, smoker, infrequent injector, late 30s)*

All participants expressed concerns over increased exposure to social and internalised stigma due to injecting. Respondents emphasised feeling “guilt, just feeling so dirty” (male, 02, smoker, infrequent injector, mid 20s), “shame” (male, 15, smoker, early 30s), social isolation and discrimination due to their drug use with many concealing use from friends, family and community members outside of immediate drug-using networks. They believed regular injection would increase their own internalised feelings of stigma and potentially expose them to further social stigma:

*It's hard enough walking around and feeling guilty and hating yourself all the time for turning into a gear head never mind the stereotypical you know? It makes my skin crawl thinking of myself and you do seem mental and dirty and weird. (Female 12, smoker, infrequent injector, late 20s)*

*People just think that injecting's worse, know what I mean? If you did hear about someone and there's someone smoking it and someone injecting it, they would think that injecting's worse. (Female 03, smoker, late teens)*

Some participants continued to occasionally smoke heroin with PWID, the majority actively avoided social interaction with PWID to manage exposure to health and social risks. One woman who smoked heroin for 11 years and injected on a few occasions emphasised avoidance of PWID as an important risk reduction strategy:

*I deliberately want to keep it [injecting] at arm's length. I mean, I don't want to talk about crime. I'm a heroin snob, I'm the first to admit that [...] It's a grimy world anyway, so I just try to get my drugs, run home and do them on my own, it's quite a solitary thing. (Female 12, smoker, infrequent injector, late 20s)*

### **3.3 Changing social context and norms**

Participants suggested drug-using social networks had developed comprised of individuals who actively choose to disassociate from PWID and resist transitioning to injecting through a cost benefit analysis of health and social risks. These new and emerging social groups of PWSH suggested previous social norms governing the acceptability of injecting within certain social networks in NI were changing. Three main, interrelated macro and meso influences conceptualised this theme: (1) expanding heroin markets; (2) social interactions with PWID; and (3) new social groups of PWSH (Figure 2).

#### **Figure 2: Theme and subthemes of changing social context and norms upon transitioning to injecting among PWSH**

##### **3.3.1 Expanding heroin markets**

Changing social context and normative beliefs surrounding routes of administration were linked to the growth of local heroin markets (late 2003 onwards). Participants reported that

in the years following the Good Friday Agreement (1998), heroin became increasingly available and all participants reported improved accessibility facilitating more people using heroin. Participants and key drug workers connected structural changes within local drug markets to the changing attitude and role of organised crime and certain paramilitary groups within heroin markets. In this context, preferred routes of administration had diversified with certain people and social groups resisting the transition to injecting. Participants variously stated:

*A few years back it [heroin] was unheard of, it was absolutely unheard of, it just seemed to creep in but it's all very "Shusssssh", very cloak and dagger. Now you can get it as easy as you can get benzos, do you know what I mean? (Female 08, smoker, mid 20s)*

*The way it [heroin scene] is now, everyone seems to be into it and chasing that buzz. (Male, 05, smoker, mid 20s)*

### **3.3.2 Social interactions with PWID**

Indicative of changing social context and norms surrounding heroin injection was that participants emphasised that their primary source of risk perception knowledge was observations arising from meso level social interactions with other PWID, specifically acquaintances, friends, family members, and/or intimate partners. One woman who had smoked heroin for 13 years and never injected recounted:

*I just sat and watched my [ex-partner] doing it for years, killing himself. And then it got to the point where he was jaggging [injecting] in his groin and if there's anything that's ever going to put you off it, that's definitely going to be it. And walking into the house and you're seeing him lying blue on the kitchen floor. I mean, that is such a turn off to anything like that. It didn't matter how rough I was, there was nothing*

*beyond smoking, I'd rather sit there and rattle [withdraw]. (Female 01, smoker, early 30s)*

Past personal experiences of watching the physical and social deterioration of PWID was cited as a conscious reason to avoid transitioning to injection. Instead of normalizing injecting, this involved learning about health and social risks through observing others' which constructed ideas on managing their own drug use and risk behaviours preventing transitioning. Examples of how participants frequently described PWID include that they were on a "downward spiral" (male, 02, smoker, infrequent injector, mid 20s) and "downward turn" (female, 03, smoker, late 30s). An experienced man who had injected on a few occasions and smoked heroin for 22 years stated:

*When I first started using heroin, I had a couple of friends who were bad cases and they went down very quickly through injecting, where they were losing all their veins and stuff and I would see them 'cause they would be using my flat sometimes [...] It [injecting] just seemed like losing the last wee bit of yourself, respect or something. Like when you see someone digging and digging and trying to find a vein and there's like blood everywhere and blood-stained tissues lying around and they're crying, literally crying 'cause they can't find a vein. It's just all that. It's very degrading, I think. (Male 04, smoker, infrequent injector, early 50s).*

### **3.3.3 New social groups of PWSH**

Most participants (87%) commenced smoking heroin after the main political conflict (1998) when heroin markets were expanding. They reported increased availability of heroin combined with perceptions of injecting risks and close social bonds with other PWSH prevented transitioning. Participants resisted the continued social acceptance of injecting heroin within other social networks who injected. Several recounted seeking out and/or formulating new social groups comprised of individuals sharing their ideas regarding

acceptable ways of consuming heroin. Participants reported that initial social networks where they commenced smoking heroin often broke down when members began injecting:

*But me and him and a few others sorta took away from that crowd of it [PWID] and decided just to stay smoking it, whereas the rest of them started to inject it and all.*  
*(Male 06, smoker, mid 20s)*

Around a third (31%) of young men with strong connections to organised crime and paramilitary groups reported an increasing acceptance of smoking heroin within these networks. They resisted transitioning to injecting to retain existing relationships and avoid coercive paramilitary sanctions. One recounted:

*You see that's how [smoke and sniff] a lot of them [organised crime and paramilitary groups] take [heroin] socially, it's acceptable to them, that's why I only have a smoke and a sniff 'cause they can't object. So, in the criminal world, there's a lot of one's taking it now, that's their kinda way, "Oh we only smoke it, we don't inject it." So, if somebody knew I was injecting, maybe you could hide it, but if somebody found out, they could use that as a stick to beat you with, know what I mean? (Male 11, smoker, late 20s)*

#### **4 Discussion**

Participants identified two main, interrelated influences preventing transitioning from smoking to regular injection which intersected through levels of environmental influences within the risk environment framework (Rhodes, 2009, 2002; Rhodes et al., 2005). The first was micro level perceptions regarding the health and social risks of injecting primarily arising from observations and interactions with PWID. The second was meso and macro level environments facilitating changing social contexts and norms within specific drug-using social networks towards the acceptability of injecting heroin enabled by growing heroin



markets, negative social interactions with PWID and the formulation of new social groups of PWSH resisting injection. As rates of smoking heroin increase across Western European Countries (Barrio et al., 2013; EMCDDA, 2019), injecting rates are increasing in other jurisdictions (EMCDDA, 2019; UNODC, 2019), meaning that the insight is relevant to the development of harm reduction strategies promoting noninjecting routes over injection.

Regarding micro level protective influences, others' have found some PWSH conceptualised injecting as a "risk boundary" (Rhodes, 1997a: 220) and the "lowest form of drug use" within their social networks (Best et al., 2007). Similar to Sotheran et al.'s (1999) findings, participants reported specific health and social risks associated with injecting as a preventive influence. These risk perceptions were constructed through an individual level cost-benefit analysis and at a meso level due to negative social interactions with PWID (Rhodes, 1997b). Indeed, participants positioned PWID as the stigmatised 'other' to maintain their self-image as a 'responsible' consumer of drugs. This echoes neo-liberal conceptions of acceptable drug consumption practices suggesting the influence of other macro level forces (e.g., media and public health discourse) implicitly shaping perceptions (Bunton, 2001; Fraser, 2004).

Consistent with previous research (Best et al., 2007; Rhodes, 1997a; Sotheran et al., 1999), maximising social distance from PWID was projected as an important risk management strategy allowing more control over their drug use, decreased exposure to potential health and social risks, and a less stigmatised identity.

Despite macro level policy changes within Northern Ireland enabling the development of meso level harm reduction services during the fieldwork for the study, participants had limited contact with OST, and some contact with low threshold harm-reduction informed outreach services. Early engagement with harm-reduction based treatment and support programmes can have a positive impact on preventing regular injection (Bluthenal et al., 2017; Kelly and Chitwood, 2004). However, for these to be effective, PWSH need to access

these services. Harm reduction focussed primary care services may offer opportunities for intervention (Henihan et al., 2015); however, education and influence also come from more sources than OST, healthcare, or other treatment and support services.

At a meso and macro level, our findings highlighted how social norms governing the acceptability of injecting had changed within specific drug-using social networks, particularly among younger people with shorter heroin use careers, which was facilitated by individualised perceptions of risk, expanding heroin markets and the growth of new social groups of PWSH avoiding injection. The Afghanistan sourced base heroin characterising the NI heroin market also enables smoking heroin in comparison to other jurisdictions who have different chemical forms affecting drug consumption practices and choices (EMCDDA, 2019; Ciccarone, 2019; UNODC, 2019). Furthermore, even if there are strong anti-injecting sentiments, it is noted that heroin shortages, changes in the type of heroin and other social, political and economic factors can also influence consumption practices (Bridge, 2010; McElrath and Jordan, 2005; Rhodes and Bivol, 2012).

At the meso and macro level, some participants connected continued smoking of heroin to the approval from certain organised crime and paramilitary groups. This growing acceptance suggests a shift in their social norms regarding the acceptance of heroin use within certain locations and under certain conditions. Our findings contrast with others' documenting coercive control and intimidation of all who use heroin (Higgins and Kilpatrick, 2005). This attitudinal change is connected to the changing role and nature of specific paramilitary groups in the post-conflict era to increased involvement in the local drugs trade (Higgins et al. 2004; Hourigan et al., 2018). Decreased security surveillance during the post-conflict era facilitated a structural risk environment for heroin markets to expand (Higgins et al., 2004; Higgins and Kilpatrick, 2005). These meso and macro factors helped to facilitate new, larger and more

diverse social networks continuing to smoke heroin as opposed to moving onto injecting.

Future research may wish to explore the paramilitary influence in more detail.

#### **4.1 Limitations**

Socially desirable reporting is possible when people are asked to discuss drug use experiences (Latkin et al., 1993), this may have influenced our findings. However, rapport was facilitated through the lengthy duration of interviews, follow-up contact, and assurances of confidentiality to minimise this bias. During data collection, self-disclosure was used by JH on occasion to enhance trust and rapport with participants (Dickson-Swift et al., 2008; Liamputtong, 2007). JH's partial insider status with participants may have resulted in positive prejudice towards the population and/or certain behaviours or group norms overlooked as they were familiar. To combat potential bias, JH's own values, beliefs and attitudes were monitored and challenged through contextualising analytical findings within policy and practice documents, research literature, liaison with key informants, study participants and the research team. We also sought a range of experiences by monitoring the demographic spread of participants; however, we understand that some of the societal issues may limit the generalisability, and future exploration of particular social and environmental factors is welcomed.

#### **4.2 Conclusions**

Important micro, meso and macro environmental influences have been identified to understand what prevents transitioning to regular injecting among PWSH to compliment what is known about individual reasons. The socio-structural issues embedding drug consumption practices offer novel opportunities for harm reduction-based public health strategies. Developing safer environment interventions would provide PWSH safety from environments promoting injecting, manage exposure to social risks, and provide access to social and health resources to enable, promote, and facilitate safe consumption practices

(McNeil and Small, 2014). Safer smoking rooms could be implemented for PWSH separate from supervised injecting facilities to maintain a distance from repeated injecting exposure. Harm reduction agencies, particularly OST and low threshold outreach services, should engage with PWSH early in heroin use careers given the risk of transitioning to injection and to address behavioural and socio-structural factors which may influence injecting transitions. The role of community and peers provide another important opportunity to prevent transition. At a local level, NI should develop the provision and accessibility of harm reduction services, monitor drug consumption practices of PWID and PWSH and developments in local heroin markets within the post-conflict era to better understand implications for public health and preventive approaches. A global strategy to prevent injecting transitions needs to consider research from multiple sites given regional variations in the availability and type of heroin, policy, social, and economic environments (Werb et al., 2018). Finally, future public health approaches must also avoid the further stigmatisation of PWID by seeking to reduce this behaviour with a strong, non-judgemental, and informed harm reduction focus.

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