

The role of social capital in facilitating hepatitis C treatment scale-up within a treatment-as-prevention trial in the male prison setting

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ABSTRACT

Background and Aims Hepatitis C (HCV) is a global public health concern, particularly in the prison setting where prevalence is substantially higher than in the general population. Direct-acting antivirals have changed the treatment landscape, allowing for treatment scale-up efforts potentially sufficient to achieve prevention of onward transmission (treatment-as-prevention). The Surveillance and Treatment of Prisoners with hepatitis C (SToP-C) study was the first trial to examine the efficacy of HCV treatment-as-prevention in the prison setting. Social capital is a social resource which has been found to influence health outcomes. This qualitative study sought to understand the role of social capital within an HCV treatment-as-prevention trial in the prison setting. **Design** Semi-structured in-depth interviews were undertaken with participants recruited from the SToP-C study following HCV treatment completion (with cure). **Setting** Three male correctional centres in New South Wales, Australia (including two maximum-security and one minimum-security). **Participants** Twenty-three men in prison participated in semi-structured interviews. **Measurements** Thematic analysis of transcripts was completed using a social capital framework, which enabled exploration of the ways in which bonding, bridging and linking social capital promoted or inhibited HCV treatment uptake within a treatment-as-prevention trial. **Findings** Social capital fostered HCV treatment uptake within an HCV treatment-as-prevention trial in the prison setting. Bonding social capital encouraged treatment uptake and alleviated concerns of side effects, bridging social capital supported prison-wide treatment uptake, and linking social capital fostered trust in study personnel (including nurses and correctional officers), thereby enhancing treatment engagement. **Conclusions** Social capital, including bonding, bridging and linking, can play an important role in hepatitis C treatment-as-prevention efforts within the male prison setting.

Keywords Hepatitis C, hepatitis C treatment, people in prison, people who inject drugs, social capital, treatment-as-prevention.

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Submitted 9 February 2020; initial review completed 20 May 2020; final version accepted 27 September 2020

INTRODUCTION

Hepatitis C (HCV) is a blood-borne virus that is primarily transmitted through injecting drug use in high-income countries [1]. Due to the illegal nature of injecting drug use and subsequent high levels of incarceration of people who inject drugs, HCV is prevalent among the prisoner population [2]. Globally, 15% of those incarcerated are HCV antibody-positive [3]. HCV prevalence is significantly higher in correctional centres in New South Wales, Australia, where approximately 42% of the prisoner population are antibody-positive and 48% reported having used illicit drugs while in prison [4].

People who inject drugs in prison are at high risk of HCV transmission due to the limited prevention measures available within the prison setting [2]. Although frequency of injecting drug use decreases during incarceration, the per-episode risk of HCV transmission increases is estimated at one in 200 [5]. Injecting equipment is sparse within the prison setting, resulting in increased needle- and equipment-sharing among people who inject drugs while incarcerated [6]. Current prevention strategies in NSW prisons include general access to Fincol (a quaternary bleach alternative) [7] and opioid agonist therapy (although access is limited) [8,9].

Injecting drug use is often a social process, from initiation through to ongoing use [10]. This social organization also exists among injecting networks within the prison setting [11]. Social capital has been found to be a valuable social resource among people who inject drugs while incarcerated through shared connections of drug user identity [12].

Social capital is an accumulation of a person's social resources [13,14]. Putnam defines the social resource as: 'features of social organization such as networks, norms, and social trust that facilitate co-ordination and co-operation for mutual benefit' ([15], p. 67). Social capital relies upon the establishment of informal and formal networks [16–18]. Trust and reciprocity are integral to the development of social capital in which actors are able to give and receive with assurance that comparable contributions will be maintained [19]. There are three types of social capital: bonding, bridging and linking. Bonding social capital refers to connections between peers within homogeneous social groups or of similar preferences [20,21]. Bridging social capital refers to connections between social groups, creating a 'bridge' between social networks [22]. Linking social capital describes connections between individuals or groups and institutions [22].

Social capital can be a catalyst for health promotion [23] and has been found to influence health outcomes [24]. Social capital promotes health through the spread of healthy norms (such as peer influence: bonding) and facilitation of information dissemination (that is, from trusted health authorities: linking) [25]. Similarly, social capital can decrease mortality and increase self-rated health through support from close relations (bonding) during times of illness, with access to diverse networks (bridging) providing a protective effect against poor mental health and greater access to (and provision of) social resources, such as school and housing (linking) [18]. With regard to public health, social capital has been credited with both improving population health and reducing health inequities [26]. However, social capital can produce both positive and negative health consequences [23,27]. For example, social contagion occurs when 'network influences are agnostic' in whether the health behaviour is 'health promoting or health damaging', resulting in what is considered the 'dark side' of social capital ([27], p. 106). In this regard, increasing levels of social capital have been found to correlate with decreasing risks of needle-sharing (with those with higher social capital reporting greater resources to obtain new injecting equipment) among people who inject drugs in the community, thereby reducing risk of blood-borne virus exposure such as HCV [28]. Conversely, injecting drug use within prison, where equipment is routinely shared (and its acquisition may be reliant on social capital) [6,29], could be viewed as health damaging due to increased risk of exposure to

HCV. Some members of injecting networks within prison may assume other members to be HCV-negative [29]; accessing HCV care may 'out' a network member as having HCV, threaten their place within injecting networks and ultimately impact upon their access to bonding social capital via drug user connections [12]. Consequently, the potential risk of being 'outed' as a person who injects (or has injected) drugs can become a barrier to engaging with HCV care in prison [30,31].

A period of imprisonment is often viewed as an opportunity time to deliver public health interventions [32,33], with prisons seen as a priority setting for HCV elimination efforts [34]. Mathematical modelling has shown that HCV treatment scale-up may reduce HCV transmission through reduction in the viraemic pool in the population, therefore known as treatment-as-prevention (TasP) [35–37]. The Surveillance and Treatment of Prisoners with hepatitis C (SToP-C) was a global first clinical trial to explore the feasibility of TasP in a real-world setting. This paper explores the ways in which social capital influences health by facilitating or hindering enrolment and participation (i.e. treatment uptake and completion) in an HCV TasP clinical trial within the prison setting.

METHODS

The SToP-C study was carried out at four correctional centres (two maximum-security, one minimum-security and one minimum–medium-security women's prison) in New South Wales, Australia. An initial surveillance phase was undertaken to assess HCV prevalence and incidence, followed by a treatment scale-up phase in which all participants testing HCV RNA positive (i.e. had current infection) were provided with treatment. Surveillance remained ongoing to identify incidence of primary and re-infection following treatment scale-up and assess the efficacy of TasP. Eligibility criteria for this qualitative substudy required that all participants were enrolled and had completed HCV treatment through the SToP-C study.

Potential participants for the qualitative component were recruited through dedicated study research nurses at each of the four correctional centres. Nurses obtained preliminary verbal consent, passing on the participants' inmate identification numbers to the researcher. Participants were then invited to attend the prison health clinic where interviews were conducted. The interviewer reviewed the participant information consent form; signed consent was obtained before commencing interviews. At the two maximum-security facilities, participants had achieved sustained virological response 12 weeks post-treatment (SVR12) and had been advised of their SVR12 test results prior to participating in the interview. This criterion was revised to the end of treatment for the minimum-security

men's prison and the women's prison, as the sentence length in these centres was generally shorter.

Prisoner patients participated in semi-structured qualitative interviews with a social health researcher (a post-doctoral scientist with experience interviewing people in prison, including those with a history of injecting drug use). Participants were asked questions pertaining to their history of HCV diagnosis and treatment, knowledge of HCV transmission, risk and prevention within the prison setting, concerns of re-infection and demographics, including age when first injected and most recent injecting drug use. Interviews were confidential, conducted in closed rooms away from correctional or justice health staff. Participants were remunerated with AU\$10 into their prisoner account as compensation for their time.

A total of 24 prisoner patients were interviewed following HCV treatment completion (with cure) throughout the four prisons where SToP-C was being conducted. Of two possible participants at the women's correctional facility, only one agreed to participate in the qualitative substudy after treatment completion (the other person did not provide a reason for not wanting to participate). Consequently, her transcript was omitted to ensure confidentiality. Qualitative data collection was completed February–March 2018.

Interviews were audio-recorded and transcribed verbatim. Transcripts were proofed for accuracy and de-identified. The first-round coding framework, developed among the authors (L.L., J.R., C.T.) was revised from the pre-treatment coding framework and modified to reflect nuances within the post-treatment interview schedule. The first author completed a secondary round of coding using thematic analysis, exploring components of social capital with nodes for bonding, bridging and linking, to identify clinical imperatives of TasP through a social capital lens. Data coded under each form of social capital were extracted. Detailed summaries of the data were generated by close reading of these data using a modified iterative categorization approach [38] to map the ways in which each form of social capital was apparent in participants' experiences and associated with engagement in HCV care. This included looking for instances of both positive and negative social capital effects and dissenting cases. These data summaries provided an audit trail to the primary data and included extensive quotes which were viewed and discussed by authors to further refine interpretation and aid in the selection of quotes which illustrated the themes relevant to each form of social capital. Using Putnam's [20] definition of bonding social capital, which includes connections within homogeneous groups, we considered people undergoing hepatitis C treatment (within the same prison wing) as actors contributing to bonding social capital. For bridging social capital, which is reliant upon connections between groups [20], we have considered people who have

not engaged in HCV treatment (and are presumably not engaged in high-risk practices) as belonging to heterogeneous networks. Linking social capital has been defined by Szreter & Woolcock as 'norms of respect and networks of trusting relationships between people who are interacting across explicit, formal or institutionalized power or authority gradients in society' ([39], p. 655). Incarcerated people's liberties have been limited and are strictly governed by the correctional institution in which they are imprisoned. The inmate code is indicative of the contrasting institutionalized social systems of prisoners and correctional officers, whereby correctional officers and other personnel, including health-care workers, are in a position of representing institutionalized power over prison detainees [40].

There was some overlap of bonding and bridging, as well as bonding and linking, with a few sections of data being double-coded. The themes which emerged from this secondary round of coding included HCV testing and treatment initiation (uptake), treatment adherence, re-treatment for re-infection and trust in health-care delivery and engagement with study personnel (including nurses and correctional officers).

Four human research ethics committees provided ethical approval for this qualitative research: Corrective Service NSW (received on 5 April 2016); Justice Health and Forensic Mental Health Network (G621/13); Aboriginal Health and Medical Research Council of NSW (1253/17); and University of New South Wales Sydney (HC15645).

RESULTS

Among the 23 patients included in this analysis, 11 reported current injecting drug use. For the purposes of this analysis, injecting drug use was defined as current if injecting of illicit substance(s) occurred at least once since commencing HCV treatment, as this is a period in which patients may be at risk of re-infection through new exposure. One participant had contracted HCV again through injecting drug use since completing HCV treatment (and achieving SVR12).

Bonding and bridging social capital

Bonding social capital among cellmates, groups within prison yards and injecting networks influenced HCV treatment initiation, emotional support during treatment, reminders for daily pill-taking and, for a few who wanted to, a source of support to abstain from drug use during treatment (although this was not a requirement for HCV treatment within the study). Participants also described important elements of bridging social capital, in which there was perceived broad support for HCV treatment uptake and adherence among everyone within the prison

wing, not only those undergoing or having completed treatment.

Treatment uptake

For participants within the SToP-C study, social capital was a resource for encouragement to commence HCV treatment. Prior to the advent of direct-acting antivirals (DAAs), previous HCV therapies were lengthy (24–48 weeks) and included interferon—a drug that often induced challenging side effects [41]. Although DAAs are renowned for having minimal side effects and very high cure rates, the memory of previous therapies remains as a barrier to HCV DAA treatment uptake [42]. Within an HCV TasP trial using DAAs in the prison setting, people in custody were able to observe and talk with others completing HCV treatment and deduce that the new treatment regime was significantly more tolerable than previous therapies.

(Do you remember what you guys would talk about when you talked about (your treatment)?) Just saying that it's like one tablet a day for three months, instead of getting injections and yeah, no side effects (Theo, maximum-security).

(And then did you talk to anyone in here about doing the treatment like with any of the other guys?) Oh yeah, we speak about it, because there's a few doing it like in my yard. They went through it pretty unscathed you know (Xavier, maximum-security).

Timeliness of treatment within one's sentence was raised, with some participants highlighting concerns that treatment earlier in one's sentence (rather than close to release) had the unintended consequence of creating a risk factor for HCV re-infection. However, bonding social capital provided some buffering regarding these concerns. One participant clearly grasped the notion of HCV TasP, as he encouraged peers to commence treatment sooner rather than later as this aided the preventive effect of treatment that would reduce HCV future transmission in the prison setting.

Some blokes I know have said, 'well I won't do it until I'm nearly ready to get out' and stuff like that and then I've said, 'no you should do it now, because if something happens, you can do it again before you get out. You can continue in the community. The idea is to get rid of (your HCV) so that they don't catch it again'. Because when a friend of mine said that, I said 'No. Go now, go now. Think about it, you've got 12 or 13 years to go and you're going to wait until you've 12 months to go until you get tested, [...] you could cost the tax payers hundreds of thousands of dollars, because you don't

realize that it's you that is giving it to everyone again accidentally'. And he said, 'oh yeah I didn't realize it like that' (Rick, maximum-security).

A combination of bonding (within networks) and bridging (between networks) social capital served to foster a supportive environment of HCV treatment uptake during the trial. As Andre explains, this encouragement extended beyond those living with HCV (bonding), often with entire wings being supportive of treatment uptake (bridging), thus normalizing HCV testing and treatment within prison.

I know a couple of boys over in the wing who haven't got the hep C and they were wrapped when they heard everyone was getting treated. They sort of said, 'good on you, you are doing something' and they've known boys that have had hep C and said, 'look, this is a good thing for everyone'. They didn't really push them to the side because they had it, they didn't seclude them from any programs or anything, but it was just the fact that, 'you're doing the course, good on you'. *(So there's like prison-wide support for hep C treatment?)* Yeah, especially here actually. It's good in here actually. Everyone sort of pushes everyone to get tested. 'Go get tested, it's not going to hurt you' (Andre, maximum-security).

Like 80 percent of my yard has done (treatment). There's not much hep C in my yard. *(So it's kind of like a little bit of a buffer effect is happening then in your yard of going, of treatment-as-prevention ...)* [...] That's right, like I encourage people to do it (HCV treatment) as well like. If someone doesn't want to do it, I say, 'fucking do it mate, why wouldn't you?' (Joey, maximum-security).

Kieron (below) described a combination of bonding (within network) and linking (to the study nurse) social capital contributing to his friend's treatment uptake. He described his efforts to encourage his friend to get tested (bonding), but also wanting to instruct the nurse (linking) on how to collect blood (as a precursor to prescribing treatment) from his friend who has compromised veins from drug use.

So, my mate that I used to use with, I had to actually tell... what's her name, is it (SToP-C nurse)? [...] I had to give her an instructional thing one day when she was doing my blood test on how to get a needle into his vein and which vein to hit, because his veins are bloody horrible. [...] it took a long time for me to convince him to do the treatment too. [...] *(Why did you convince him?)* Because he's my mate (Kieron, maximum-security).

Treatment adherence

The DAAs (sofosbuvir–velpatasvir) prescribed within the SToP-C trial are one pill taken once daily for 12 weeks (for all strains of HCV). A majority of patients were provided with a 1-month supply of medication to keep in their cell (rather than daily supervised dispensing), and so were responsible for remembering to take their medication. Consequently, it was important for these individuals to develop and continue a routine of pill-taking. Some participants described reciprocal prompts with cellmates and others within their network to take their medication.

Sometimes I would say, ‘oh fuck’ when I’m having my morning coffee, I forget to have my tablet and think, ‘oh fuck, my tablets’ because my (cell mate) he was on it too. So, when he would take his, we would take ours together. He would say, ‘did you take your tablet?’ I said, ‘yeah, did you take yours?’ And sometimes, he would go ‘oh fuck, I forgot to take one’ and I’d be like, ‘Oh fuck, I need to take one too’ you know (Connor, maximum-security).

There was a few boys here that were forgetting. I would just have to remind them. I was that one, ‘you take your pill today?’ (Aiden, maximum-security).

For others, going through the treatment with peers allowed for ‘checking in’ and providing a supportive network during treatment.

(Do you talk to the other guys about the study?) Yeah, a couple of boys have done it too. We started around the same time and that as well and we just talked about any side effects or whatever. [...] We’ve all cleared it now. *(Fantastic.)* So we’re happy. It’s good (Aiden, maximum-security).

(Did you talk to other people in here about hep C treatment when you were on treatment?) Yeah. The wing I was in had a few boys on it at the time and I know a few other boys that had got hep C that I was trying to suggest we get in and they get the blood tests. So, yeah, we all talk to each other, see how we’re going on the treatment, you know (Dominic, minimum-security).

Bonding social capital can be conducive to positive outcomes, but can also be inhibiting due to the social constraints within peer networks [43]. Some participants did not disclose to others in their wing that they were completing HCV treatment. Wes described his impression of ongoing stigma associated with HCV within the prison setting, which could be an

inhibitor for HCV dialogue within his network. While Rory and Wes did not discuss their treatment experiences with others, both were able to successfully complete treatment within the trial and cure their HCV.

You don’t talk about treatments or anything like that. Normally... if you get seen coming out of the clinic, that’s your business, no one else’s. You come and get your pills in the morning, you don’t sit around and go, ‘oh what pills are you on?’ It doesn’t happen. So, no one talks about it (Rory, maximum-security).

(Did you tell anyone you got treated?) At first no, but after I had been, I told a few people yeah. *(So, you didn’t tell people while you were on treatment?)* No, a couple, but you know, I didn’t want to share it too much because everyone’s got their own opinion and they like to judge people, so I kept it quiet first. *(What do you mean by that, about the treatment or hep C?)* About having hep C. You know, there’s a bit of a stigma that goes along with it (Wes, maximum-security).

Linking social capital

People in prison adhere to the inmate code, whereby distrust of authority is often at the forefront of their interactions with correctional and other personnel [40]. However, previous research has shown that linking social capital is an important resource for HCV treatment uptake among those incarcerated, particularly an ability to trust health-care personnel within the prison setting [44]. Within this TasP trial, dedicated study nurses fostered opportunities to build trust with participants in a setting in which it can be challenging to build trust in authority. This had the effect of improving health-care engagement and confidence in delivery of care. Aiden described receiving reassurance from the nurses during what he felt was a somewhat concerning HCV diagnosis. This interaction is indicative of a participant’s confidence and trust in the provision of health care received during the trial, and his sense of ease in being reassured by the study nurse.

I freaked out when I found out that I had two different genotypes, like 1a and 3a and I never thought that could happen you know, so I was a bit worried, but the nurse reassured me and that (Aiden, maximum-security).

As Charlie explains, he was comfortable in being honest with the nurse about his ongoing drug use (and associated HCV risk practices) even though he was commencing a second course of treatment for HCV re-infection.

Yeah, well I went on (treatment) and they said that I'd cleared it and I was like 'cool' and I finished the course and about a week or two weeks later they said, 'you've been re-infected but with a different strain and you cleared the first one, but now you've got a different strain, so we're going to put you back on it again.' I said, 'alright, cool' but I said, 'I'm not going to stop shooting up' anyway so... (So, you felt like you could be honest with the nurse about that?) Yeah. (That's awesome, okay.) Got to keep it real (Charlie, maximum-security).

However, one participant was greatly discouraged that others continued to inject drugs while taking HCV treatment—this was due in part to his appreciation of the study nurse and his gratitude towards the study for providing HCV cure to people in prison. This is suggestive of a strong sense of pride in the study (and associated personnel) and the investment made in people in prison living with HCV to treat and cure the disease.

What annoys me is people that do it and they don't think about the effect on other people, especially people like (SToP-C nurse) here. You know, like I know she's started certain people here in the jail on the treatment and you know, they've just abused it basically. They don't give a screw about it and they're still using and carrying on like imbeciles would. Like if you're not going to be sincere about it, don't do it. You know what I mean, why waste the government's money, why waste you know (SToP-C nurse's) efforts to help you if you're not going to accept it and be gracious for it. You know, that's the way I look at it you know what I mean. At the end of the day, we don't come across nurses like (SToP-C nurse) very often in the system, okay [...] I just don't understand why people waste other people's time that are sincere in their job, like the (SToP-C nurse) is okay, she's very sincere and very passionate about her work, okay, and like, I can't admire that person enough you know for the strength that she puts into the job (James, maximum-security).

At the two maximum-security prisons, a dedicated officer was employed at each facility by the study to assist with participant recruitment and day-to-day activities associated with seeing patients (such as patient escort to the clinic). Both officers were recruited internally from their respective prisons. As described by Rick and Mark, these officers were able to overcome the usual distrust among prisoners in correctional personnel and provide a supportive and non-judgemental space for participants to engage in HCV care and to access treatment.

I've known (SToP-C officer) for a while too and she works with the nurses and she's always poking around and if she needs to say anything. [...] It's not like she stands at one end of the wing shouting out, you know, she'll come and say 'listen... it's all good'. I tell the nurse, 'thanks' because (SToP-C officer), she's really cool. They got the right officer for it. (What makes her good for it?) I don't know, she's just got a good nature, she has a care factor I suppose. Like I wouldn't mind if she was sitting there, I wouldn't mind her hearing anything (Rick, maximum-security).

(The SToP-C officer is) good actually. She is good. (What's good about her?) She doesn't judge, always has a smile on her face, she tries to help you. She's good, I like her (Mark, maximum-security).

One participant described distrust among his peer network in the efficacy and validity of the treatment offered and scepticism in post-treatment test results. This is probably an enactment of the inmate code; that is, distrust among people in prison towards those who govern them [40]. This participant was from a minimum-security prison in which there were multiple study nurses and no dedicated study officers (only rostered officers employed on an ad hoc basis to fulfil study needs).

(Do you ever talk to or did you ever talk to other guys in here about hep C treatment?) Yeah, I've told people about it, you know, I've told people it works, so I've had a few mates that have actually done the proper treatment and that, like a mate at work, you know what I mean. (In here?) Yeah. (Okay. Cool. What was their take on it? Were they okay to come up and get tested and get treated?) Yeah, they were alright. Some of them did, some of them didn't, like not many people believe in it. They think it's a load of crap, but I know it works. (What do you mean? Can you explain it?) I've told people, 'Hey, look, how's it going to work? What's the tablets going to do?' You know what I mean. I tell them, 'Look, I beat hep C', and they tell me, 'I think they're only just telling you that', like. I said, 'They can't. They're either going to tell me if I have it or not.' I can get tested again anyway, you know what I mean. They're not going to tell me that I haven't got it like if I have got it. Yeah, that's just some people, that's not everyone, just some people (Tony, minimum-security).

DISCUSSION

The findings in this qualitative substudy of SToP-C evidence the positive role of social capital for HCV treatment

scale-up in the prison setting. Social capital was observed as influencing treatment uptake and adherence through encouragement of peers to get tested and treated, as well as reminders to take medication daily. Furthermore, this research also highlights the valuable role of dedicated hepatitis nurses and officers in fostering trust among people in prison towards hepatitis C services and, in turn, enabling honest discussion about risk factors and reassurance regarding other HCV-related concerns.

Bonding social capital among those living with (or treated for) HCV was described as integral to the success of HCV treatment outcomes, primarily through the social supports of encouragement for treatment uptake, observation of others accessing treatment (and assessing experiences of side effects) and treatment adherence. These findings highlight the valuable opportunity for peer HCV education and care engagement programmes within the prison setting. It is likely that peer-led programmes enacted by people undergoing or having completed HCV treatment would foster trust in correctional health care, with peer educators able to 'vouch' for the trustworthiness of health professionals and increase linkages to care through prisoner-led health promotion initiatives. Peers would also be able to provide first-hand accounts of treatment experiences, alleviating concerns about treatment side effects [42]. Not all people in prison opted to participate in the SToP-C study; it is plausible that some people did not want to come forward for HCV screening due to concerns of risk of current/ongoing or re-infection following cure [45]. Peer educators could support people who inject drugs while incarcerated to overcome this barrier to HCV care engagement.

There were some instances of non-disclosure of HCV status and/or treatment by participants within their social groups. The setting in which social capital occurs can produce different resources which can influence the ways in which social capital impacts upon health [21]. Thus, within prison, the resources accumulated/acquired from social capital can be influenced by a variety of factors, such as HCV-related stigma within prison wings or, conversely, wing-wide support for HCV treatment (inclusive of support from those who have never had HCV) or possibly whether custodial officers support or undermine treatment of HCV infection among people in prison. Similarly, non-disclosure can have the effect of reduced supportive networks (i.e. lower bonding social capital), which could be the result of stigma or fear of breach of confidentiality [46]. These social and environmental influences can contribute to social capital's role in HCV-related health outcomes.

Trust in others has been shown to be an important element of social capital within studies of self-rated health [47,48] and community health [49], with low trust in the health-care system corresponding with low self-rated

health [50]. The findings presented here demonstrate the utility of trust among networks (bonding), as well as trust in health-care personnel and dedicated officers (linking) within an HCV TasP trial in the prison setting. Dedicated study officers were shown to foster linking social capital within TasP efforts, with an ability to engage prisoners for study enrolment, and escort and retrieval for ongoing health-care engagement (e.g. pathology, treatment initiation and end-of-treatment results). In two community-based studies, trusting relationships with health-care providers were found to influence HCV treatment uptake [51,52], while research undertaken in the prison setting has found prisoners' trust in health-care providers to be influential in HCV care engagement [46]. Our findings further highlight the importance for people within prison to have trusting relationships with both health-care and correctional personnel while engaging with HCV care.

Through policy or in the choices of prescribers, previous generation HCV therapies have been withheld from people who may continue to be at risk of future infection, such as those who continue to inject drugs [53]. In the context of HCV treatment in the prison setting, institutionally imposed restrictions to treatment access can create imbalances in status among the prisoner population, with those who are ineligible for curative therapies deemed less important than those who have been able to receive treatment. These ruptures of social cohesion are likely to inhibit the development of social capital among people in prison (bonding), as well as from prisoners towards institutional authorities, such as nurses and correctional officers (linking). Applied to our research, HCV TasP has disrupted previous notions of being 'worthy of treatment' ([54], p. 1023), as all people in prison who screened HCV RNA + were eligible for treatment irrespective of ongoing drug use. Treatment as prevention, by definition, enables treatment for all, dismissing notions of status imposed upon people living with HCV. Thus, it may be that social capital's role in HCV treatment uptake is more easily harnessed in prison settings in which all prisoners with HCV infection are eligible for treatment, rather than restricting treatment to a selected few.

This paper could be seen as one further example of the importance of social capital in promoting health. In the very specific setting of prison, where notions of authority and division are paramount, we cannot assume that all effects of social capital will be positive and useful for health promotion efforts. Our results indicate that institutionalized power and symbols of authority need to be very carefully scrutinized. It could have been hypothesized that health-care workers in prison could have been seen as an extension of correctional authorities rather than autonomous actors within the prison setting, and hence be of limited utility to efforts based on social capital to promote health. However, health-care workers were seen as

instrumental in HCV care engagement, with many participants describing nurses as trustworthy, concerned with prisoners' wellbeing and viewed as a separate entity from correctional personnel with whom participants felt they could be honest about their HCV risk behaviours without recourse.

Participants within this qualitative substudy were recruited from a larger clinical trial. All participants had recently been cured of their HCV (inclusive of the one person who was receiving treatment for re-infection). Consequently, there may have been response bias during the interviews [55], due to participants wanting to appear appreciative of their HCV cure to a study representative (the interviewer) or through enactment of the inmate code [40]. The interviewer is an experienced qualitative researcher within the prison setting and worked to address concerns relating to response bias; for example, by addressing participants' concerns of treatment eligibility following re-infection when discussing HCV risk behaviours post-treatment [56]. Results of this substudy may not be transferable to other prisons in which the prison culture is not conducive or amenable to HCV treatment (such as stigma of HCV treatment in prison [57]), or in which HCV treatment eligibility is restricted. Additionally, this substudy included only male participants. It is possible that the role of social capital in HCV linkage to care within the prison setting may be different for women, as gendered differences in access to and creation of social capital have been shown to influence self-rated health [58]. All participants had completed HCV treatment through enrolment in the larger clinical trial. Consequently, these findings may disproportionality represent social capital as a facilitator to HCV treatment uptake within scale-up efforts while overlooking the experiences of people not enrolled in SToP-C. However, our results draw attention to the facilitative role of social capital within HCV TasP efforts in the prison setting.

Bonding social capital is a necessary social resource in efforts to achieve HCV micro-elimination, particularly within the prison setting, where prevention and harm reduction strategies are minimal. Bonding and bridging social capital were both influential in treatment uptake, adherence, screening for re-infection and re-treatment. Dedicated TasP nurses and officers are able to build trust and rapport with prisoners, thereby enhancing linking social capital within a setting known for low levels of trust in authority. These findings suggest that peer support roles, such as HCV champions within prison wings, could be valuable for HCV treatment scale-up efforts, and that trusted health and correctional personnel are integral to HCV TasP efforts. Collectively, these findings provide numerous strategies for the ways in which social capital can be harnessed within correctional institutions to support HCV care engagement.

Declaration of interests

L.L. and J.R. have no conflicts of interest to report. G.J.D. is an advisory board member and receives honorarium from Gilead, Merck and Abbvie, and has received research grant funding from Gilead, Merck and Abbvie, and travel sponsorship from Gilead, Merck and Abbvie. A.R.L. has received investigator-initiated research support from Gilead and Abbvie. C.T. has received speaker fees from AbbVie and Gilead Sciences and has received research grant funding from Merck.

Acknowledgements

This research was supported in part by Gilead Sciences, Inc. The opinions expressed in this paper are those of the authors and do not necessarily represent those of Gilead Sciences, Inc. The research was also supported by the Australian Government Department of Health and Ageing through a National Health and Medical Research Council (NHMRC) Partnership Project Grant (APP1092547). A. R.L. and G.J.D. are both supported by NHMRC Practitioner Fellowships (APP1137587 and APP1118864). The contents of the published material are solely the responsibility of the individual authors and do not reflect the views of NHMRC. The Kirby Institute and the Centre for Social Research in Health are funded by the Commonwealth Department of Health and Ageing. The views expressed in this publication do not necessarily represent the position of the Australian Government. The SToP-C Protocol Steering Committee members include: Stuart Loveday (Chair, Hepatitis NSW), Gregory Dore (UNSW Sydney), Andrew Lloyd (UNSW Sydney), Jason Grebely (UNSW Sydney), Tony Butler (UNSW Sydney), Natasha Martin (University of California San Diego), Georgina Chambers (UNSW Sydney), Carla Treloar (UNSW Sydney), Marianne Byrne (UNSW Sydney), Colette McGrath (Justice Health and Forensic Mental Health Network), Julia Bowman (Justice Health and Forensic Mental Health Network), Luke Grant (Corrective Services NSW), Terry Murrell (Corrective Services NSW), Annabelle Stevens (NSW Health), Mary Harrod (NSW Users and AIDS Association), Alison Churchill (Community Restorative Centre), Kate Pinnock (Community Restorative Centre) and Sallie Cairnduff (Aboriginal Health and Medical Research Council). The authors gratefully acknowledge the pivotal role played by the following partner organizations and key stakeholders in study planning and implementation: Justice Health and Forensic Mental Network; Corrective Services NSW; NSW Health; Hepatitis NSW; NSW Users and AIDS Association; the Community Restorative Centre; and the Aboriginal Health and Medical Research Council. We would like to recognize the contribution of current and past researchers and staff involved in the study at the participating correctional centres. Finally,

the authors would like to thank the study participants for their generous contribution to the research.

Author contributions

Lise Lafferty: Conceptualization; data curation; formal analysis; investigation; methodology. **Jake Rance:** Conceptualization. **Gregory J. Dore:** Funding acquisition. **Andrew R. Lloyd:** Funding acquisition. **Carla Treloar:** Conceptualization; funding acquisition; methodology.

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