

**Citation for published version:**

Gillian M. Craig, and Alimuddin Zumla, 'The social context of tuberculosis treatment in urban risk groups in the United Kingdom: a qualitative interview study', *International Journal of Infectious Diseases*, Vol. 32: 105-110, March 2015.

**DOI:**

<https://doi.org/10.1016/j.ijid.2015.01.007>

**Document Version:**

This is the Published version.

**Copyright and Reuse:**

© 2015 The Authors. Published by Elsevier Ltd.

This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License CC BY NC-ND 4.0

( <http://creativecommons.org/licenses/by-nc-nd/4.0/> ), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way.

**Enquiries**

If you believe this document infringes copyright, please contact the Research & Scholarly Communications Team at [rsc@herts.ac.uk](mailto:rsc@herts.ac.uk)



Contents lists available at ScienceDirect

International Journal of Infectious Diseases

journal homepage: [www.elsevier.com/locate/ijid](http://www.elsevier.com/locate/ijid)

# The social context of tuberculosis treatment in urban risk groups in the United Kingdom: a qualitative interview study



Gillian M. Craig<sup>a,\*</sup>, Alimuddin Zumla<sup>b</sup>

<sup>a</sup> School of Health Sciences, City University London, Northampton Square, London, EC1 V 0HB, UK

<sup>b</sup> Department of Infection, Division of Infection and Immunity, Centre for Clinical Microbiology, University College London, and NIHR Biomedical Research Centre, University College London Hospitals, London, UK

## ARTICLE INFO

### Article history:

Received 15 November 2014

Received in revised form 6 January 2015

Accepted 7 January 2015

**Corresponding Editor:** Eskild Petersen, Aarhus, Denmark

### Keywords:

Tuberculosis  
Social determinants  
Adherence  
Homeless persons  
Drug users  
Stigma

## SUMMARY

**Objectives:** There is scant qualitative research into the experiences of tuberculosis (TB) treatment in urban risk groups with complex health and social needs in the UK. This study aimed to describe the social context of adherence to treatment in marginalized groups attending a major TB centre in London.

**Methods:** A qualitative cross-sectional study was performed using semi-structured interviews with patients receiving treatment for TB. Analytical frameworks aimed to reflect the role of broader social structures in shaping individual health actions.

**Results:** There were 17 participants; the majority were homeless and had complex medical and social needs, including drug and alcohol use or immigration problems affecting entitlement to social welfare. Participants rarely actively chose not to take their medication, but described a number of social and institutional barriers to adherence and their need for practical support. Many struggled with the physical aspects of taking medication and the side effects. Participants receiving directly observed therapy (DOT) reported both positive and negative experiences, reflecting the type of DOT provider and culture of the organization.

**Conclusions:** There is a need for integrated care across drug, alcohol, HIV, and homeless services in order to address the complex clinical co-morbidities and social needs that impact on the patient's ability to sustain a course of treatment.

© 2015 The Authors. Published by Elsevier Ltd on behalf of International Society for Infectious Diseases. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## 1. Introduction

A recent cross-sectional survey of tuberculosis (TB) notification rates across the European Union (EU) reported that 15 out of 54 cities had notification rates twice the national country rate, with some cities experiencing rates three to four times the national level.<sup>1</sup> These included Birmingham and London (UK), Brussels (Belgium), and Rotterdam (Netherlands). The authors attributed the high rates of TB in major conurbations, in countries otherwise classified as having a low incidence of disease, to the high concentration of urban risk groups. This raises particular challenges for a national TB control programme.

Cases of TB are over-represented in socially and economically marginalized groups in high-income countries. In 2013 in the UK, for example, 70% of the TB caseload came from the 40% most deprived areas, and 44% of TB cases did not have employment.<sup>2</sup> Groups that are affected by TB in the UK include migrants from high TB endemic countries, homeless populations, prisoners, people living with HIV/AIDS (PLWHA), and people who use drugs (PWUD) and alcohol. These groups are at greater risk of TB than the general population. They also comprise 38% of non-treatment adherent cases, 44% of cases lost to follow-up, and 30% of cases deemed highly infectious, and represent approximately 17% of the London TB caseload.<sup>3</sup> Approximately 10% of the national caseload is characterized by at least one social risk factor associated with non-adherence, including drug abuse, alcohol abuse, homelessness, and imprisonment (3.2%, 3.9%, 3.3%, and 2.9%, respectively).<sup>2</sup> Failure to adhere to a prescribed course of treatment can result in the development of drug-resistant disease (which is more difficult

\* Corresponding author. Tel.: +44(0)20 7040 5843.  
E-mail address: [Gill.Craig.1@city.ac.uk](mailto:Gill.Craig.1@city.ac.uk) (G.M. Craig).

and expensive to treat), serious morbidity and mortality, and an increased risk of transmission.<sup>4</sup>

The World Health Organization (WHO) has endorsed the use of supervised pill-taking (directly observed therapy, DOT) as the standard of care to promote adherence, although this has not been applied consistently in the UK context,<sup>3</sup> with fewer than half of eligible patients receiving DOT in 2013.<sup>2</sup> This can either be interpreted as a failure of services to upscale DOT, or that some patients are perceived to be able to manage a course of treatment without DOT.

Two reasons for non-adherence to medication have been theorized: unintentional non-adherence (people intend to take medication but fail to do so in the correct way), and intentional non-adherence (people choose not to take medication).<sup>5</sup> Criticism of the adherence literature has been the dominance of psychological approaches, which over-emphasize individual agency, particularly in marginalized populations where choice and control are most constrained.<sup>6,7</sup>

Gaining a better understanding of how wider contextual factors impact on adherence is crucial if we aim to develop responsive services that address both clinical and social needs. For example, the results of two systematic, qualitative reviews concluded that adherence to TB treatment was dependent on a range of complex and interrelated factors, including both personal and structural factors, the configuration of health services, and the social and economic context.<sup>8,9</sup> The WHO adherence framework additionally emphasizes therapy and condition-related factors (e.g., side effects and co-morbidities).<sup>10</sup>

In this study we aimed to contextualize the experiences of our participants within a 'social determinants of health' framework<sup>11,12</sup> in order to highlight how broader social structures shape individual health actions that give rise to intentional and unintentional non-adherence. We also aimed to identify examples of 'resilience strategies' that our participants adopted to manage their treatment.<sup>5</sup> The study formed part of a wider service development project conducted in London, UK, which aimed to develop a social outreach model of care for marginalized groups with TB and generate an evidence base for the need of a TB caseworker in supporting clients with complex needs; this project is reported elsewhere.<sup>13,14</sup>

## 2. Methods

### 2.1. Recruitment

Participants in this interview study were recruited from a major TB centre characterized by a culturally diverse catchment area including migrant and homeless populations, between 2003 and 2004. Interviewees were selected for inclusion based on a risk assessment<sup>14</sup> completed by nurses; this identified factors that could complicate adherence to treatment (e.g., drug use, homelessness, and missed appointments) and the need for referral to a caseworker for enhanced case management. Participants were referred to the researcher by nurses or a case worker at different stages of their treatment. Sampling was broadly purposive and reflected a range of 'critical case' experiences typical of those presenting with complex needs and the caseworker's caseload.<sup>15,16</sup> Participants were informed that the study was part of a new initiative developing a social outreach model of support.<sup>17</sup> Interviews lasted between 30 and 60 min and covered broad-based themes about experiences of treatment. The majority of interviews took place in the hospital outpatient clinic; three took place on a hospital ward, one took place in a homeless hostel, and one in a prison with the permission of managers. Clinic interpreters were used in two cases. Interviews generally coincided with patient appointments and they were offered a food voucher to the

value of £5. Due to the difficulty of researching this group within a clinical environment (e.g., lack of private spaces, frequent interruptions) and because some patients experienced different social risks impacting on adherence later in their treatment (e.g., people became homeless or their immigration status changed affecting entitlements), participants were interviewed on more than one occasion. All interviews were audio recorded and transcribed verbatim, except for the two interviews involving interpreters and one in the prison. Here notes were taken.

### 2.2. Analysis

The analysis was informed by a critical health psychology perspective that understands illness behaviour within social, political, and cultural contexts, which not only influence health and illness, but healthcare organization and delivery.<sup>18</sup> We adopted a theoretical thematic analysis<sup>19</sup> involving both deductive (top down) and inductive (bottom up) coding and linking codes, drawing on the WHO adherence framework (i.e., personal factors such as resilience, social and economic contexts, therapy- and condition-related factors, and healthcare systems). Segments of relevant text relating to adherence and contextual information were identified and compared across transcripts. Analytic memos were used to aid analysis. Data analysis was managed using a computer software programme designed specifically for the coding and retrieval of qualitative data (QSR NUDIST\*Vivo 10). Coding was compared and corroborated between researchers, one with a social science background and one with a background in nursing and homelessness.

### 2.3. Ethical considerations and consent

This research was carried out within the guidelines of the University College London Hospital Research Ethics Committee, which approved the study. Written or verbal consent was obtained (as agreed with the Ethics Committee). Participants were advised that the interview did not form part of their clinical care. If the participant became tired or agitated, the interview was terminated and rescheduled. Where a participant became distressed or disclosed distressing experiences, the researcher terminated the interview and offered a referral to the caseworker.

## 3. Results and discussion

### 3.1. Participant characteristics and the wider context of adherence

Seventeen participants were interviewed: 16 with a confirmed diagnosis of TB and one with suspected TB. The majority of interviewees were male (71%; 12/17). Just over half were born in the UK (59%; 9/17); six of these participants described their ethnicity as White British. The remainder were of Irish origin ( $n = 2$ ), Black British ( $n = 1$ ), or Black African ( $n = 2$ ); one woman described herself as Jewish. Of those born outside the UK, two were Ethiopian and three were Somali. The mean age of respondents was 44 years (range 18–67 years;  $n = 16$ ) at the start of their initial treatment. [Table 1](#) provides further details, including co-morbidities and drug resistance.

### 3.2. Income, housing, and employment

The majority of participants were homeless according to statutory legislation. Five participants had complex immigration cases affecting their entitlement to housing and welfare. Three became unemployed due to illness and were therefore left without an income. The remainder were in receipt of social welfare or a voucher scheme (used in exchange for food in designated shops).

**Table 1**  
Social characteristics of interviewees<sup>13</sup>

| Interviewee ID | Usual pattern of housing <sup>a</sup>                            | Place of birth | Criminal justice | Drug use | OST | Alcohol | HIV-positive | Other self-reported health conditions | Drug-resistant TB |
|----------------|--|----------------|------------------|----------|-----|---------|--------------|---------------------------------------|-------------------|
| ID01           | Hostel   | UK             | ✓                | PWID     | ✓   | ✓       |              | Epilepsy                              | INH               |
| ID02           | NFA  | UK             | ✓                |          |     | ✓       |              | Epilepsy                              |                   |
| ID03           | Shared house (temporary)   | Ethiopia       |                  |          |     |         |              |                                       |                   |
| ID04           | Bedsit; hostel   | Nigeria        | ✓                | PWUD     |     | ✓       |              | Diabetes                              | INH               |
| ID05           | NFA  | UK             |                  | PWID     | ✓   |         |              |                                       |                   |
| ID06           | NFA  | UK             | ✓                | PWID     | ✓   |         | ✓            |                                       |                   |
| ID07           | B&B; staying with relatives in their house                       | Somalia        |                  |          |     |         |              | Hypertension, diabetes, ulcer         |                   |
| ID08           | At risk as no recourse to public funds due to immigration status | Nigeria        |                  |          |     |         | ✓            | Drug-induced diabetes                 |                   |
| ID09           | NFA  | UK             | ✓                | PWID     | ✓   |         |              | Hepatitis C                           |                   |
| ID10           | NFA; hostel  | Ethiopia       |                  |          |     |         |              |                                       |                   |
| ID11           | NFA; sometimes stays at a friend's house                         | UK             |                  |          |     | ✓       |              | Stomach ulcers                        |                   |
| ID12           | B&B  | Somalia        |                  |          |     |         |              |                                       |                   |
| ID13           | NFA  | Ireland        |                  |          |     | ✓       |              | Arthritis                             |                   |
| ID14           | Hostel   | UK             | ✓                | PWID     | ✓   | ✓       | ✓            |                                       |                   |
| ID15           | Temporary bedsit   | UK             | ✓                | PWID     | ✓   |         | ✓            | Hepatitis                             |                   |
| ID16           | Hostel   | UK             |                  | PWID     | ✓   |         |              |                                       | INH               |
| ID17           | B&B  | Somalia        |                  |          |     |         |              |                                       | INH               |

OST, opioid substitution therapy (methadone); TB, tuberculosis; PWID, person who injects drugs; PWUD, person who uses drugs; INH, isoniazid; NFA, no fixed abode usually sleeping on streets; B&B, an individual room to sleep where breakfast is sometimes offered.

<sup>a</sup> Did not have one main place of residence but would alternate.

Participants described a range of measures to supplement their income, including sex work, begging, stealing to obtain food or drugs, reliance on food handouts, informal assistance from relatives, casual labour, and community support.

### 3.3. Drug and alcohol use

Nine (53%) participants reported drug use including polydrug use. Seven participants were receiving opioid substitution therapy (OST; methadone maintenance) at the time of interview. PWUD also reported consuming alcohol, but to different degrees. Three other participants reported problematic alcohol use. Everyday routines were dominated by drug and alcohol consumption, and for people who injected drugs (PWID), measures to finance their drug use and prevent drug withdrawal syndrome.

### 3.4. Experiences of violence and social exclusion

Many participants disclosed past experiences of violence, torture, and physical and sexual abuse. Others spoke of lives dominated by a cycle of crime, including youth offending, drug use, and imprisonment. Their experiences were firmly embedded within narratives of violence and exclusion,<sup>20</sup> and in some cases illustrated the cumulative effect of disadvantage impacting and constraining behavioural choices.<sup>10,11</sup>

### 3.5. Support

A lack of social support from friends and family was a significant issue for many participants due to their migrant/refugee status, or because they were estranged from their family. Few were able to identify people who offered support on a regular basis. Some family members were reported to provide financial support, but not emotional or practical aid. People who were homeless mostly had other homeless people in their social network, which limited the type of support available. One person reported increased support from his family following a noticeable improvement in his condition (ID12). Another received support from a close friend who would ring him to remind him to take his medication (ID03). In general, the participants were reliant on the TB clinic for support,

or hostel workers who would remind patients to take their medicines or accompany them to clinic appointments. However this was not always consistent, as funding sources and lack of training often precluded assistance with healthcare. One man reported that hostel staff would not come to his room if he was too ill to get up:

“They don’t [check on you]. No. Because they say they are, it is not a nursing home” (ID04).

When asked about the type of support needed, participants responded with reference to material or practical assistance, such as finding a job, housing, money to buy ‘good’ food, assistance with shopping, coming off drugs, and someone to talk to.

### 3.6. Disclosure and stigma

An older Somali refugee described how she hid her diagnosis and her TB medication from the relatives she lived with, administering them in secret. Her fear of disclosure related to the threat of eviction and rejection by the wider Somali community, resulting in a loss of material and social support:

“I keep medication in a secret place and take medication at a secret time. The other illness (diabetes) they (relatives) know about it and accept it. The first thing I will lose is my accommodation and the relationship. My situation could then be communicated to other Somalians” (ID07).

Scambler<sup>21</sup> suggests the fear of negative reactions (felt stigma) can be more detrimental psychologically than the actual experience of discrimination (enacted stigma) because of the effort people expend when trying to conceal their condition. According to this theory, people become so adept at concealment as a first choice strategy that examples of enacted stigma are rare. Moreover the adverse effects of stigma may have a greater impact on women because of their (gendered) social location.<sup>22</sup> Some participants reported that the disease was used as an excuse to shun or evict a person because of dislike (ID03) rather than stigma. Others noted social distancing (ID01), sympathy (ID05), indifference (ID02), and acceptance where family were able to witness the beneficial effects of treatment (ID12).

### 3.7. Healthcare systems

#### 3.7.1. Hospital practice on methadone maintenance, drugs, and alcohol consumption

Although there are guidelines on OST to stabilize PWID while in hospital,<sup>23</sup> there was a perception that, along with other drugs obtained illicitly (e.g., valium/diazepam), these were under-prescribed. The frequency of dosing, sometimes with long intervals due to delays in administering methadone, was such that some patients experienced withdrawal syndrome.<sup>24</sup> This was frightening where they felt they had little control, illustrating the psychosocial aspects of withdrawal. Physicians may fear the consequences of over-prescribing methadone and the conflicts experienced between meeting the needs of patients and adhering to prescribing protocols, with the potential for an impact on the therapeutic relationship having been documented.<sup>25</sup>

As some hospital wards operated a zero tolerance policy in relation to drug and alcohol use, participants reported leaving the hospital to obtain drugs to cope. Some reported that staff, adopting a lenient approach, turned a blind eye to alcohol use off premises provided patients returned to the ward; a 'compromise' to encourage adherence to treatment plans. Consultants sometimes refused to treat patients unless they agreed to modify their behaviour. In extreme cases, patients were coerced into complying with treatment in order to avoid compulsory detention.

#### 3.7.2. Hospitalization as a safety net or welcome break

In contrast to those who experienced drug withdrawal while in hospital, one homeless man was more able to tolerate the demands of hospitalization, which he viewed as a welcome break from the cold and months of homelessness living on the street: "it was like a bit of a holiday" (ID05). As a methadone user with occasional heroin use, his daily routines were less dominated by drug use and withdrawal.

In some cases, interviewees experienced lengthy periods of hospitalization for social reasons in addition to medical need. One young woman spent several months in hospital due to homelessness and a history of sexual exploitation (ID10). Despite having lived in the UK since a child, her immigration status precluded any recourse to public funds, rendering her destitute. The doctors decided to delay discharge from the hospital because she was very young and vulnerable. She remained an in-patient for several months until the Social Services accepted they had a duty of care and provided accommodation allowing a safe-discharge and stable environment for her to complete her treatment.

### 3.8. Directly observed therapy (DOT)

Those patients receiving medicines through DOT ( $n = 9$ ) spoke of the benefits in terms of contact with 'normal people' and 'female company' (for some homeless men), support from staff, and the structure the clinic visits afforded:

"...the day I'm not going to the clinic it's difficult to get up. It's my day out" (ID01).

For PWID, DOT was provided at a number of locations including the Drug Dependency Unit (DDU) or pharmacist in conjunction with methadone, the hostel via outreach workers, or the TB clinic. However DOT was not always successful even where the location or provider changed. PWID did not always attend the DDU, either because of the distance they had to travel, or because they had used or intended to obtain drugs. The monitoring of pill swallowing also varied across different healthcare locations; whereas some staff made distinct efforts to check that all pills had been swallowed,

particularly where methadone was dispensed, others supervised at arm's length "out of the corner of their eye". There was however evidence of resentment where DOT was administered in an authoritarian atmosphere:

"I hated it. Um, (pause) I felt that, I was threatened, you know, it's like, if you didn't take this, then you couldn't have that, I felt like I was at school. And, in the end I just wanted to say: \*\*\*\* the lot of you. Because I couldn't take the TB pills you know, my body did not want the pills any more, but, my body still needed the methadone" (ID15).

### 3.9. Personal factors – experience of medication and resilience strategies

For those participants not receiving DOT, a dominant theme was the way treatment regimens impacted on everyday routines, compounded by the number and size of tablets and frequency of dosing.<sup>26</sup> A healthcare worker taking medication for both HIV and TB spoke of the day dominated by pills and the difficulty of taking the prescribed regimen when trying to maintain daily routines such as shopping. She took nine pills in the morning, seven at lunch time, three in the afternoon, and seven at night. The only way to manage her regimen was to skip the afternoon dose:

"I've never missed my morning drugs and my night drugs. But my afternoon drugs: yes" (ID08).

This example illustrates the limitations of pill organizers when faced with the demands of the schedule of dosing. It was not her memory that failed her; rather, the lack of practical support with her daily activities. Others appeared more able to incorporate tablets into their daily routines where pill-taking already formed part of their everyday lives (e.g., pills for hypertension).

The difficulty of combining medication with an itinerant lifestyle and the storage of medicines was a major problem. One homeless man had his bag stolen (ID05) and others reported difficulties carrying medicines with them such that where they had stored their medication was not where they ended up sleeping. Participants reported running out of medicines. The requirement to take medicines on an empty stomach, 1 h before food, when some patients had little control over the availability of food in terms of supply or affordability, was also a factor, particularly where they depended on 'handouts' provided by charities. Here food was prioritized over pill-taking. Others radically changed their eating and sleeping patterns in order to take medication.<sup>27</sup> One participant ensured that she did not eat anything after 3 a.m. in order to take her morning medication on an empty stomach. Another reported that he missed his medicines if looking for money to buy drugs or if taking heroin instead of methadone.

Those with more routinized and stable lifestyles were able to manage their medicines and devised resilience strategies by creating reminders,<sup>5</sup> such as setting an alarm clock, or a memory aid in the form of a chart to record pill-taking. Others attempted to cut up or crush tablets (although not medically recommended) or consumed tablets with nutrient drinks to avoid feeling sick. Modifying regimens rather than take medicines as prescribed has been described as 'purposeful non-adherence'.<sup>27</sup>

The quality of reminder cues also varied and some were more vulnerable to failure, as in the example of the homeless man who struggled to take his medication due to a combination of poor memory, tiredness, problems swallowing, and alcohol use (ID02). He developed a routine that involved leaving his tablets in a place near to where he slept, only to awake to find someone had moved them.

### 3.10. Therapy-related factors and co-morbidities – adverse effects of medicines

Although much emphasis is placed on adherence to treatment, the adverse effects of therapy receive less attention.<sup>27</sup> Some reported feeling nausea or vomiting following taking their medicines (“Most day I vomit after taking my medication” (ID08)), which may be due to the number of tablets, particularly where administered through three-times weekly DOT (ID14). Numbness and dizziness (D08) has also been reported in patients taking antiretrovirals.<sup>27</sup> Others described what appeared to be adverse drug reactions that caused them to interrupt their treatment. The side effects of isoniazid also include nausea, vomiting, and numbness. Some PWUD found it difficult to distinguish between the symptoms of TB, other co-morbidities, and the adverse effects of medication:

“Feel better but can’t remember feeling bad because so wrapped up in drugs and alcohol. Walking from the hostel to get methadone, I was sweating like mad. Can’t remember if it was TB drugs, drink or combination” (ID01).

Conversely another patient was able to attribute the cause of his symptoms specifically to TB medication because of withdrawal syndrome, reflecting the way rifampicin reduces the effect of methadone.<sup>28</sup>

“The tablet’s, actually, [have] halved, the dosage of methadone. So instead of me being on a hundred and twenty five, I’m only getting sixty two and a half per cent in my body, because the pills are wiping out, the other sixty two and a half per cent” (ID14).

His methadone was later increased to compensate. Alcohol consumption resulting in vomiting, diarrhoea, or blackouts was also given as a reason for not taking medicines (ID16).

## 4. Conclusions

Research has theorized two reasons for non-adherence: intentional and non-intentional. The results of this study have highlighted the structural and institutional contexts impacting on adherence to treatment.<sup>29</sup> Drug and alcohol use was clearly a complicating factor, as was homelessness, but other factors included the culture of services (e.g., perceived to be authoritarian or punitive); institutional policies (e.g., methadone-prescribing practices and zero tolerance on drug and alcohol consumption resulting in withdrawal syndrome, patients leaving the hospital); lack of effective partnership working with homeless organizations or financial restrictions placed on those organizations by funders impacting on their ability to support patients; requirements to take medication in prescribed ways geared towards those with routinized lifestyles (e.g., in relation to mealtimes); and the adverse effects of therapy coupled with complex co-morbidities (resulting in nausea and vomiting). Those receiving DOT reported both positive and negative experiences relating to the type of DOT provider and culture of the organization.

Participants appeared more able to sustain a course of treatment where their environment was stable and where they received support through friends, family, community services, or a case worker, which played an important role. Practical support was valued and has been found to support adherence in other conditions.<sup>30</sup> Some participants showed evidence of quite sophisticated resilience strategies in managing their medication.

A Cochrane review of research to promote adherence more generally<sup>31</sup> identified 21 strategies that, with little exception (e.g., group meetings), focused on interventions at the individual patient level. In our study, however, people rarely actively ‘chose’ not to

take their medication. Rather adherence to treatment involved a complex interplay of factors involving their social location, co-morbidities, and service policy and delivery. Interventions that target individual coping skills are therefore unlikely to meet with success in marginalized populations, such as those described here, in the absence of measures to address the ‘risk environments’<sup>32</sup> (e.g., homelessness) that render people vulnerable to both TB disease and non-adherence to treatment.

Rather than view non-adherence as individual failure, a more productive approach would be for services to collectively share the responsibility for treatment adherence, and any associated risks, through the co-creation of localized, inter-sectoral, collaborative care pathways that integrate drug, alcohol, and homeless services and that are able to address both clinical and social risks.<sup>17,33</sup> This will require smarter approaches to commissioning joint health and social care services, with implications for resourcing and workforce development.

## Acknowledgements

We would like to thank the Alumni Fund at City University London for their donation in support of the analysis of the interview study and Louise Joly for assistance with coding and analysis. We would also like to thank the following funders for their support: the King’s Fund, the Henry Smith’s Charity, the Sir Halley Stewart Trust, the Kirby Laing Foundation, and the Adint Charitable Trust.

This research was carried out within the guidelines of the University College London Hospital Research Ethics Committee, which approved the study.

*Conflict of interest:* None declared

## References

- de Vries G, Aldridge RW, Caylà JA, Haas WH, Sandgren A, van Hest NA, et al. Tuberculosis in European Union Big Cities Working Group. Epidemiology of tuberculosis in big cities of the European Union and European Economic Area countries. *Euro Surveill* 2014;**19**. pii: 20726.
- Public Health England. Tuberculosis in the UK: 2014 report. London: HMS Government; 2014.
- Story A, Murad S, Roberts W, Verheyen M, Hayward AC, the London Tuberculosis Nurses Network. Tuberculosis in London: the importance of homelessness, problem drug use and prison. *Thorax* 2007;**62**:667–71.
- Dheda K, Shean K, Zumla A, Badri M, Streicher EM, Page-Shipp L, et al. Early treatment outcomes and HIV status of patients with extensively drug-resistant tuberculosis in South Africa: a retrospective cohort study. *Lancet* 2010;**375**: 1798–807.
- Furniss D, Barber N, Lyons I, Eliasson L, Blandford A. Unintentional non-adherence: can a spoon full of resilience help the medicine go down? *BMJ Qual Saf* 2014;**23**:95–8. <http://dx.doi.org/10.1136/bmjqs-2013-002276>.
- Farmer P. Social inequalities and emerging infectious diseases. *Emerg Infect Dis* 1996;**2**:259–69.
- Farmer P. Social scientists and the new tuberculosis. *Soc Sci Med* 1997;**44**: 347–58.
- Munro SA, Lewin SA, Smith HJ, Engel ME, Fretheim A, Volmink J. Patient adherence to tuberculosis treatment: a systematic review of qualitative research. *PLoS Med* 2007;**4**:e238.
- Noyes J, Popay J. Directly observed therapy and tuberculosis: how can a systematic review of qualitative research contribute to improving services? A qualitative meta-synthesis. *J Adv Nurs* 2007;**57**:227–43.
- Commission on Social Determinants of Health. Closing the gap in a generation: health equity through action on the social determinants of health: final report. Geneva, Switzerland: World Health Organization; 2008.
- Wilkinson R, Marmot M. The social determinants of health. The solid facts. Geneva, Switzerland: World Health Organization; 2004. Available at: [http://www.euro.who.int/\\_data/assets/pdf\\_file/0005/98438/e81384.pdf](http://www.euro.who.int/_data/assets/pdf_file/0005/98438/e81384.pdf) (accessed April 30, 2014).
- Berben L, Dobbels F, Engberg S, Hill MN, De Geest S. An ecological perspective on medication adherence. *West J Nurs Res* 2012;**34**:635–53.
- Craig GM, Joly L, Zumla A. ‘Complex’ but coping: experience of symptoms of tuberculosis and health care seeking behaviours—a qualitative interview study of urban risk groups, London, UK. *BMC Public Health* 2014;**14**:618. <http://dx.doi.org/10.1186/1471-2458-14-618>.
- Craig GM, Booth H, Story A, Hayward A, Hall J, Goodburn A, Zumla A. The impact of social factors on tuberculosis management. *J Adv Nurs* 2007;**58**:418–24.

15. Abrams LS. Sampling hard to reach populations in qualitative research: the case of incarcerated youth. *Qualitative Social Work* 2010;**9**:536–50.
16. Miles MB, Huberman AM. *Qualitative data analysis*. London: Sage; 1994.
17. Craig GM, Booth H, Hall J, Story A, Hayward A, Goodburn A, et al. Establishing a new service role in tuberculosis care: the tuberculosis link worker. *J Adv Nurs* 2008;**61**:413–24.
18. Hepworth J. The emergence of critical health psychology, can it contribute to promoting public health. *J Health Psychol* 2006;**11**:331. <http://dx.doi.org/10.1177/1359105306063298>.
19. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol* 2006;**3**:77–101.
20. Farmer P, Connors M, Simmons J. Women, poverty and AIDS: sex, drugs and structural violence. Series in Health and Social Justice. Common Courage Press; 1996.
21. Scambler G. Re-framing stigma: felt and enacted stigma and challenges to the sociology of chronic and disabling conditions. *Soc Theory Health* 2004;**2**:29–46.
22. Liamputtong P, Haritavorn N. To tell or not to tell: disclosure to children and family amongst Thai women living with HIV/AIDS. *Health Promot Int* 2014 Jul 17. pii: dau057 [Epub ahead of print].
23. National Institute for Health and Care Excellence. Community-based interventions to reduce substance misuse among vulnerable and disadvantaged children and young people. Public Health Intervention Guidance 4. London, UK: NICE; 2007.
24. Curtis R, Friedman SR, Neaigus A, Jose B, Goldstein M, Des Jarlais DC. Implications of directly observed therapy in tuberculosis control measures among IDUs. *Public Health Rep* 1994;**109**:319–27.
25. Van Hout MC, Bingham T. A qualitative study of prescribing doctor experiences of methadone maintenance treatment. *Int J Ment Health Addiction* 2014;**12**:227–42.
26. Chesney MA, Ickovics JR, Chambers DB, Gifford AL, Neidig J, Zwickl B, Wu AW. Self-reported adherence to antiretroviral medications among participants in HIV clinical trials: the AACTG adherence instruments. Patient Care Committee & Adherence Working Group of the Outcomes Committee of the Adult AIDS Clinical Trials Group (AACTG). *AIDS Care* 2000;**12**(3):255–66.
27. Pound P, Britten N, Morgan M, Yardley L, Pope C, Daker-White G, et al. Resisting medicines: a synthesis of qualitative studies of medicine taking. *Soc Sci Med* 2005;**61**:133–55.
28. Deiss RG, Rodwell TC, Garfein RS. Tuberculosis and illicit drug use: review and update. *Clin Infect Dis* 2009;**48**:72–82.
29. Sumartojo E. When tuberculosis treatment fails: a social behavioural account of patient adherence. *Am Rev Respir Dis* 1993;**147**:1311–20.
30. DiMatteo MR. Social support and patient adherence to medical treatment: a meta-analysis. *Health Psychol* 2004;**23**:207–18.
31. Haynes RB, Ackloo E, Sahota N, McDonald HP, Yao X. Interventions for enhancing medication adherence. *Cochrane Database Syst Rev* 2008;(2):CD000011. <http://dx.doi.org/10.1002/14651858.CD000011.pub3>.
32. Rhodes T. Transition and the HIV risk environment. *BMJ* 2005;**331**:220. <http://dx.doi.org/10.1136/bmj.331.7510.220>.
33. Grenfell P, Baptista Leite R, Garfein R, de Lussigny S, Platt L, Rhodes T. Tuberculosis, injecting drug use and integrated HIV–TB care: a review of the literature. *Drug Alcohol Depend* 2013;**129**:180–209. <http://dx.doi.org/10.1016/j.drugalcdep.2013.05.011>.