

How can health services effectively meet the health needs of homeless people?

Nat MJ Wright and Charlotte NE Tompkins

ABSTRACT

Background

Homelessness affects many people in contemporary society with consequences for individuals and the wider community. Homeless people experience poorer levels of general physical and mental health than the general population and there is a substantial international evidence base which documents multiple morbidity. Despite this, they often have problems in obtaining suitable health care.

Aim

To critically examine the international literature pertaining to the health care of homeless people and discuss the effectiveness of treatment interventions.

Design of study

Review and synthesis of current evidence.

Method

Medline (1966–2003), EMBASE (1980–2003), PsycINFO (1985–2003), CINAHL (1982–2003), Web of Science (1981–2003) and the Cochrane Library (Evidence Based Health) databases were reviewed using key terms relating to homelessness, intervention studies, drug misuse, alcohol misuse and mental health. The review was not limited to publications in English. It included searching the internet using key terms, and grey literature was also accessed through discussion with experts.

Results

Internationally, there are differing models and services aimed at providing health care for homeless people. Effective interventions for drug dependence include adequate oral opiate maintenance therapy, hepatitis A, B and tetanus immunisation, safer injecting advice and access to needle exchange programmes. There is emerging evidence for the effectiveness of supervised injecting rooms for homeless injecting drug users and for the peer distribution of take home naloxone in reducing drug-related deaths. There is some evidence that assertive outreach programmes for those with mental ill health, supportive programmes to aid those with motivation to address alcohol dependence and informal programmes to promote sexual health can lead to lasting health gain.

Conclusions

As multiple morbidity is common among homeless people, accessible and available primary health care is a pre-requisite for effective health interventions. This requires addressing barriers to provision and multi-agency working so that homeless people can access the full range of health and social care services. There are examples of best practice in the treatment and retention of homeless people in health and social care and such models can inform future provision.

Keywords

alcoholism; health care delivery; homeless persons; mental health; primary care; substance related disorders.

INTRODUCTION

Homelessness is a complex concept, embracing many types of insecure housing status.¹ 'Rooflessness' is one form of homelessness, covering rough sleepers, newly arrived immigrants and victims of fire, floods or violence. Homelessness also refers to 'houseless,' people such as those living in emergency and temporary accommodation including hostels and those released from psychiatric hospitals, custodial establishments or foster homes with nowhere to go. People living in insecure or inadequate and overcrowded or substandard accommodation such as those staying with friends or relatives on a temporary basis, tenants under notice to quit, those whose security is threatened by violence and squatters are also homeless. However, such households are often 'concealed,' as people may involuntarily share accommodation if they cannot secure or afford separate housing.²⁻⁵

While some experience homelessness once, more commonly people experience repeat (or periodic) homelessness.⁶⁻⁸ Relationship breakdown, physical or sexual abuse, lack of qualifications, unemployment, alcohol or drug misuse, mental health problems, contact with the criminal justice system, debt, lack of a social support network,⁹ institutionalisation as children, or death of a parent during childhood¹⁰ are all risk

NMJ Wright, DRCOG, FRCGP, clinical director, Leeds Community Drug Treatment Services. CNE Tompkins, BA(Hons), MSc, research assistant, North East Leeds Primary Care Trust.

Address for correspondence

Dr Nat Wright, Centre for Research in Primary Care, 71–75 Clarendon Road, Leeds, LS2 9PL.
E-mail: n.wright@leeds.ac.uk

Submitted: 24 May 2005; **Editor's response:** 23 August 2005; **final acceptance:** 20 December 2005.

This article is an edited version of the World Health Organisation Health Evidence Network synthesis of the evidence basis pertaining to health care for homeless populations.

©British Journal of General Practice 2006; 56: 286–293.

factors for homelessness. Institutional factors for homelessness include fragmentation of services and lack of community programmes for difficult-to-serve people.¹¹ The number of households accepted by councils in England as unintentionally homeless and in priority need in the quarter ending September 2004 was 32 220.¹² The lack of national level data in many European countries, together with differences in definition and approach to data collection and measurement, makes it impossible to arrive at a single statistic for homelessness in Europe.¹³

This review synthesises the effectiveness of health interventions targeting homeless people in the developed world, focusing on homeless populations in high income countries. Reviewing health interventions among homeless populations living in extreme poverty in low income countries is beyond the scope of this synthesis.

METHOD

This paper reviews the current evidence base relating to the health care of homeless populations. The search strategy has been described elsewhere.¹⁴ Briefly, Medline (1966–2003), EMBASE (1980–2003), PsycINFO (1985–2003), CINAHL (1982–2003), Web of Science (1981–2003) and the Cochrane Library (Evidence Based Health) databases were reviewed using key terms relating to homelessness, ‘and’ intervention studies, ‘and’ [drug misuse ‘or’ alcohol misuse ‘or’ mental health]. The review was not limited to publications in English. It included searching the internet using key terms, and grey literature was also accessed through discussion with experts.

Reviewing such a topic was a significant challenge as homelessness is a broad subject area. Additionally there is an acknowledged paucity of trials evaluating the effectiveness of health interventions for homeless people.³ Therefore it was not possible to undertake a meta-analysis of the data. Rather, we synthesised qualitatively consistently recurring themes with greater weight attached to findings from primary research of higher quality. Space constraints precluded the inclusion of asylum seekers, although they often access health services for homeless people¹⁵ and discussions pertaining to provision of social or housing services.

RESULTS

Morbidity

Homeless people, particularly rough sleepers, have a higher rate of serious morbidity compared to the general population.¹⁶ Many homeless people present to health services with multiple morbidity due to exposure to risk factors, complications of illicit drug or alcohol overuse, or from delay in presentation to services.¹⁷ Additionally homeless people, especially men, have

How this fits in

Homelessness is associated with ill health, commonly mental ill health drug dependence syndrome or alcohol dependence syndrome. Opiate maintenance therapy can improve health of homeless drug users and assertive outreach programmes can help those with mental ill health. Supportive behavioural programmes aid recovery in homeless people with alcohol dependence syndrome. Informal interactive interventions can successfully promote sexual health.

high rates of imprisonment¹⁸ and offending.^{10,19} The most common health needs of homeless people relate to drug dependence, alcohol dependence or mental ill-health, and dual diagnosis is frequent.^{20–22} Polydrug use is common, especially heroin and cocaine.^{23,24} A recent cross-sectional survey of 389 homeless people in London showed that 372 had used an illicit substance within the last month. The two most popular illicit drugs used were heroin and crack cocaine. Four out of five responders reported starting taking at least one new drug since becoming homeless. Thirty-nine per cent of those who had been homeless for 2 years or less had used heroin in the last month, whereas 49% who had been homeless for 10 years or more had used heroin in the last month.²³ Pathological gambling is more common among substance abusing homeless people than the general population, but comparable to the prevalence rate among drug-dependent populations.²⁵ Physical ill-health is also more common in homeless people. The range of health problems experienced by homeless populations is described in Box 1.

Smoking is more common among homeless populations^{26,27} and prevalence may be as high as 80%.²⁸ Smoking, overcrowding, poor nutritional status or HIV infection predispose homeless people to respiratory disease (Box 1).²⁹ The prevalence of latent tuberculosis (TB) has been reported to be between 9–79% with the prevalence of active TB to be between 1.6–6.8%.²⁹ Treatment of TB entails tuberculin test screening as chest x-ray and sputum testing is not necessarily feasible. When a diagnosis is made contact tracing should take place and this is more effective through homeless shelters rather than using named person contacts.³⁰ Treatment has higher completion rates if directly observed through housing programmes rather than in acute hospital settings.²⁹

Mortality

Premature mortality is higher among homeless populations. A 10-year follow up of a homeless cohort in Denmark described age and sex standardised mortality ratios of 2.8 for men; 5.6 for women; 6.0 for cause of death as suicide; 2.6 for death from natural causes; 14.6 for death from unintentional injuries; and 62.9 for unknown cause of death. Risk factors for premature death were death of the father and misuse

Box 1. Diseases found among homeless people.

- ▶ Drug dependence syndrome — most commonly heroin or cocaine
- ▶ Alcohol dependence syndrome²¹
- ▶ Mental ill-health: schizophrenia, depression and other affective disorders, psychosis, anxiety states, personality disorder, earlier onset of drug misuse and severity of alcohol use
- ▶ Physical trauma
 - Injury
 - Foot trauma — due to walking for long times in inappropriate shoes, standing or sitting for long periods leading to venous stasis, oedema and infection, frost bite, skin anaesthesia due to alcoholic peripheral neuropathy, lack of hygiene due to over wearing of unwashed clothing, or overgrown toe nails
 - Dental caries due to self neglect
- ▶ Adverse effects of illicit drugs
 - Heroin-related death secondary to respiratory coma^{92,93} Cocaine — case reports of toxic inhalation leading to pulmonary inflammation and oedema ('crack lung')^{94,95} agitation and paranoia due to acute toxicity and thromboembolic events.^{96,97} Adverse effects of alcohol overuse⁹¹
 - Cardiological — cardiomyopathy
 - Neurological — peripheral neuropathy, erectile dysfunction, Wernicke's encephalopathy, Korsakoff's psychosis, amnesic syndrome, cerebellar degeneration, alcohol withdrawal seizures
 - Gastrointestinal and hepatobiliary — hepatitis, liver cirrhosis, pancreatitis, gastritis, peptic ulceration, oesophageal varices, carcinoma of the oesophagus and oropharynx, cardiomyopathy
 - Metabolic — vitamin deficiency (particularly thiamine), obesity
 - Psychosocial ill-health — including depression and suicide, sexual dysfunction, alcoholic hallucinosis, marital, family or employment breakdown
- ▶ Complications of injecting illicit drugs
 - Blood-borne virus infections (see below)
 - Skin commensals or pathogens causing septicaemia, encephalitis, endocarditis, cellulitis and abscesses or deep vein thrombosis (a combination of poor hygiene and repeated skin puncture)
 - Tetanus — possibly secondary to injecting contaminated drugs⁹⁸⁻¹⁰⁰
- ▶ Infections
 - Blood-borne virus — hepatitis B,C or HIV
 - Hepatitis A^{101,102}
 - Skin infections — cutaneous diphtheria¹⁰³ impetigo, viral warts
 - Secondary to louse infestations — typhus (caused by *Rickettsia prowazekii*), trench fever (caused by *Bartonella Quintana*) or relapsing fever (caused by *Borrelia recurrentis*)^{29,104,105}
 - Fungal — most commonly tinea
- ▶ Inflammatory skin conditions
 - Erythromelalgia
 - Pediculosis
 - Seborrhoeic dermatitis
 - Acne rosacea
 - Eczematoid eruptions
 - Xerosis
 - Pruritus
- ▶ Skin infestations
 - Body louse
 - Scabies
- ▶ Respiratory illness
 - Pneumonia — common pathogens *Streptococcus pneumoniae*, *Haemophilus influenzae* b, aspiration of anaerobes or *Pneumocystis carinii* (the latter occurring almost exclusively in immunocompromised patients).
 - Influenza
 - Minor upper respiratory infections
 - Tuberculosis (often latent)

of alcohol and sedatives.¹⁰ Premature mortality is confirmed by German research, which considered postmortem and autopsy findings of 388 homeless people. The average age of death was 44.5 years with unnatural causes accounting for a high percentage (62.6% deaths due to intoxications). Infection was the most common natural cause of death.³¹

Primary care provision

As indicated above, homeless people face a risk of marginalisation due to their age, sex, ethnic background or sexual orientation.^{21,32-35} To address these barriers, differing frameworks for providing health care to homeless populations have been described.³⁶⁻³⁹ The first is the mainstream general practice that takes on an extended role (also known as 'general practice with a special interest') in primary care provision for homeless people. The second is that of the 'specialised' general practice that registers only homeless people.²¹ It is uncertain as to how many homeless people obtain care in each type of practice setting and this could be a topic for future research. Specialised general practices are usually only found in large cities and are therefore not a viable option to the problems of rural homelessness. In the UK, they have become more common, with legislation permitting trusts to employ GPs through salaried options to provide primary care in a multidisciplinary team environment.²¹ Arguably the merits of this model are that it integrates care of the homeless into mainstream general practice.³⁹ Specialised general practice, however, can arguably provide more intensive and focused care for more complex cases where integration into mainstream primary care could be problematic. Therefore it is an effective setting for providing initial treatment and early rehabilitation.²¹ There is face validity to a pathway whereby once their acute condition has stabilised and they are familiar with the primary care setting, such patients can be encouraged to register with mainstream primary care.²¹ However, such a pathway has yet to be formally evaluated. Mainstream primary care is also the only viable option to meet the primary healthcare needs of the rural homeless. Other models seek to provide primary health care to homeless populations in secondary care hospitals.¹⁵ Models vary from a single centralised unit to all hospital departments offering care. Social worker support appears to be a crucial factor in the success of such programmes.¹⁵ However, one study of 36 people in Germany showed that primary care programmes for homeless people led to a reduction in hospital admissions.³⁸

Primary prevention interventions

The current literature is heavily weighted towards preventing infectious diseases in injecting drug user

Box 2. Primary prevention interventions to reduce infectious disease prevalence.

- ▶ Vaccination schedules — against tetanus, influenza, pneumococcus, diphtheria, hepatitis A and B. An accelerated hepatitis B immunisation schedule (0, 7, 21 days), with a booster at 12 months, results in superior completion rates compared to traditional schedules with similar seroconversion rates.⁴⁰
- ▶ Needle exchange programmes (including provision of needles, syringes, water, spoons/cookers and filters)
- ▶ Medically supervised injecting centres for drug users
- ▶ Washing and laundry facilities
- ▶ Podiatry interventions to provide adapted shoes or cut toe nails
- ▶ Insecticide application to bedding in shelters

homeless sub-populations. Primary prevention interventions to reduce the prevalence of infectious disease are shown in Box 2. An accelerated hepatitis B immunisation schedule (0, 7, 21 days), with a booster at 12 months, results in superior completion rates compared to traditional schedules with similar seroconversion rates.⁴⁰ Homeless people should also be offered both hepatitis A, tetanus, influenza, pneumococcus and diphtheria vaccination. Homeless drug users should be encouraged to use needle exchange schemes to reduce the prevalence of blood-borne viruses.^{41,42} Quantifying the precise size of the effect of needle exchange programmes is difficult as the intervention is often delivered alongside others such as counselling and testing, outreach, bleach distribution and education.⁴³ However, schemes limiting exchange to one clean needle for every one returned are associated with higher rates of HIV than those with no limitation.⁴⁴ A major reason for the sustained high prevalence of hepatitis C in injectors is the sharing of injecting equipment such as spoons and filters.⁴⁵ Health promotion should therefore encourage users to not share any injecting equipment. In the UK and other European countries this has been facilitated by providing a legal framework for distributing sterile injecting paraphernalia (alongside needle and syringe distribution) to drug users to minimise health risks, however in some countries (notably US) this contravenes federal legislation.⁴⁶ French research demonstrated that having both needle vending machines and needle exchange programmes results in wider coverage to drug users.⁴⁷ Reducing injecting-related risk behaviour is a health promotion priority among the homeless.⁴⁸ This makes users aware of the risk factors for fatal heroin-related death, namely injecting alone, polydrug use, particularly the use of benzodiazepines or alcohol with heroin,⁴⁹ and loss of tolerance after abstinence.⁵⁰ Future programmes for peer administration of naloxone may be introduced as early evidence shows this is effective in reducing mortality from heroin-related death.⁵¹

Management of drug dependence

There appears to be limited UK-based research evaluating the impact of behavioural and empowerment health promotion approaches to drug users. From the US literature common findings are assertive community treatments retain users in services but do not yield high abstinence rates,⁵² and therapeutic communities for those with dual diagnoses result in greater drug use reductions than community interventions (although both modalities reduce drug use).⁵³⁻⁵⁵ A US conducted randomised controlled trial found that compared to 'usual care', homeless crack cocaine abusers participating in an enhanced day treatment programme plus abstinence contingent work therapy and housing had statistically significant fewer positive cocaine toxicologies at 2 and 6 months, fewer days homeless in the past 2 months and more days employed in the past 30 days from baseline to 12 months. The authors summarised that homeless cocaine users can be retained and treated effectively.⁵⁶

Safe opiate medication substitute prescribing is now a cornerstone of the management of heroin dependence and the UK has best practice guidelines for professionals working with drug users, which are applicable to homeless drug users.⁵⁷ This includes doctors only prescribing with the support of a drugs worker who will offer an assessment and devise a treatment plan⁵⁸ prior to substitute opioid medication is started. There is only an established evidence base for either buprenorphine or methadone maintenance medication, which has demonstrated reduced crime and reduced drug use.^{59,60} Some homeless drug users present to primary care having recently moved to the area and request immediate continuation of their prescription prior to assessment. Prescriptions should only be issued on confirmation with the previous prescriber to minimise the risk of duplicate prescribing.²¹

Prescribing injectable heroin is receiving renewed attention, for example in Switzerland where it is available to homeless people through prescribing among prison populations. However in the UK, it is recommended for drug users who have failed oral methadone treatment.⁶¹ This policy position is supported by the results of a recent Cochrane review which concluded that due to the non-comparability of the experimental studies included in the review there was insufficient evidence to recommend heroin prescription as a first line treatment.⁶²

Medically supervised injecting centres

International research has demonstrated that medically supervised injecting centres reduce the incidence of drug-related death; halt the increase in reported hepatitis B or C infections; reduce injecting related-risk behaviour; increase the likelihood of starting treatment

for drug dependence; reduce the prevalence of discarded syringes in public places; do not increase the number of theft and robbery incidents in the area; and increase acceptance of the centres by both businesses and residents.⁶³⁻⁶⁵ Research from Frankfurt showed that a drug user who overdoses on the street is 10 times more likely to stay in hospital for 1 night compared to a drug user who overdoses in a safer injecting centre.⁶⁶ This confirms the economic evaluation of deaths averted by this being comparable to other widely accepted public health measures. The benefit to homeless drug users is clear from the Sydney evaluation, in which the most common reason drug users gave for not using the centre was that they injected in their own home. Some therefore contend that homeless drug users are a priority group for medically supervised injecting centres.^{67,68}

Sexual health promotion

A narrative review of the literature pertaining to sexually transmitted diseases among drug users and street youth concluded that such populations were sexually active with a high rate of partner turnover, and frequently exchanged sex for money or drugs.^{69,70} There is a high prevalence of sexually transmitted diseases (STDs) (including HIV) among such populations. The review called for targeted special outreach STD control programmes for these populations as homeless drug users generally do not access mainstream control programmes.^{69,70}

There is limited evidence to inform best practice for targeted sexual health promotion interventions among homeless people. Common findings are that interventions which seek to effect attitudinal and behavioural change through interactive methods such as role-play, video games and group work lead to a lasting reduction in both risk from drugs and sexual activity.⁷¹⁻⁷⁴ One randomised clinical trial study while evaluating the impact of a sexual health promotion intervention at reducing sexual health risk also sought to evaluate the possibility of the intervention itself initiating risky sexual activity in previously sexually inactive homeless people. It demonstrated that the intervention did not lead to an initiation of risk-taking behaviour.⁷⁵ Further research is required to evaluate interventions targeting differing sub-populations of homeless people. Little research has been undertaken into homeless women's perception and use of contraception. One US study demonstrated side effects, fear of potential health risks, partner's dislike of contraception and cost as deterrents.⁷⁶

Management of alcohol dependence

Observational research shows homeless alcohol-dependent people to more likely have had an alcoholic parent, had more children and a lower level of

education and job qualification than housed alcohol-dependent people.⁷⁷ Observational research highlighted high use of general medical or social care services by homeless alcoholics, but poor use of specific alcohol dependence services.^{78,79} Research among homeless women described more addiction symptoms, fewer positive effects from using alcohol, and not having an alcohol-using partner as being associated with a positive attitude to stopping alcohol. In terms of drug use, a positive attitude about stopping drugs was predicted by more drug problems, greater drug use in past 6 months, more active coping, more education, less emotional distress, not having a drug-using partner and fewer addiction symptoms.⁸⁰

Observational research among homeless alcohol-dependent recovering mothers in the US identified that completion of aftercare programmes was predicted by length of residential drug treatment, length of sobriety, strong support networks and concerns about housing and parenting. Emotional instability and the severity of problems correlated with participation in the peer support group.⁸¹ Randomised controlled trial research evaluating supportive intervention programmes showed within group improvements in employment and housing stability, and decline in drinking in those followed up for up to 1 year. Recovery from alcohol dependence appears to be strongly associated with personal motivation and a supportive intervention programme. Personal motivation for recovery, rather than programme related factors, were most influential in determining outcomes.⁸²

Such findings are similar for those service delivery intervention models for homeless codependent (alcohol and/or illicit substances). All improved significantly over time in terms of reduced alcohol and cocaine use, increased employment, and increased stable housing. Successful outcomes were predicted by personal lifestyle factors which included lower recent and lifetime substance use, fewer prior treatment episodes, more stable housing at baseline, fewer incarcerations, and less social isolation.⁸³

Management of mental ill-health

Chronicity of homelessness is associated with the causes of mental ill-health described in Box 1.^{22,33,84} Homelessness and mental ill-health is more commonly associated with men, aged 20–59 years, being unmarried separated or divorced, and unemployment.⁸⁵ ‘Dual diagnosis’ of mental ill-health and substance dependence occurs in approximately 20% of homeless people with mental ill-health.^{84,86} For some elderly homeless people, mental illness was the entry into homelessness.³³ Less than one-third of homeless people with mental illness actually receive treatment.¹⁶

Assertive community treatment programmes with active case management to integrate social services

with psychiatric care can shift the locus of care from crisis-oriented services.⁸⁷ Compared to generic mental health community services they result in fewer psychiatric inpatient days, fewer emergency department visits, more days in community housing, more outpatient visits and significantly greater improvements in symptoms, life satisfaction and perceived health status.^{88–90} Given that death from overdose is common among homeless people, caution and safe prescribing should be exercised in prescribing antidepressants that are cardio or respiratory toxic.

DISCUSSION

In conclusion, multiple morbidity and premature mortality are more common among homeless populations. Drug dependence, alcohol dependence and mental ill health are the most frequently expressed health needs of homeless people. Internationally, there are differing models and services aimed at providing health care for homeless people. Effective interventions for drug dependence include adequate oral opiate maintenance therapy, hepatitis A, B and tetanus immunisation, safer injecting advice and access to needle exchange programmes. There is emerging evidence for the effectiveness of supervised injecting rooms for homeless injecting drug users and for the peer distribution of take home naloxone in reducing drug-related deaths. There is some evidence that assertive outreach programmes for those with mental ill health, supportive programmes to aid those with the motivation to address alcohol dependence, and informal interactive programmes to promote sexual health can lead to lasting health gain. One core theme appeared to be that the type of community intervention is less important than the fact that an intervention is offered. Residential interventions however, appear to lead to greater reductions in drug use than community interventions.

The strength of this synthesis is that it has synthesised the international evidence base pertaining to health interventions for homeless populations residing in developed countries. We have summarised the recurring themes. Our synthesis has several limitations. As homelessness is such a broad topic area it was necessary to focus the review. This precluded consideration of asylum seeking and refugee populations and those residing in extreme poverty in the developing world.

Our synthesis has several implications for future research activity. While there is some face validity to agreed good practice models of primary care provision to meet the health needs of homeless people, this area merits further formal evaluation. Also a future clinical and research challenge for health promotion activity is how to practically involve homeless people as peer trainers and mentors. Previous research has argued

that peer involvement of homeless people in health promotion activities will maximise the success of the intervention, yet such practice is not widespread.⁴⁸ With respect to UK homeless populations, there is still a paucity of evaluation of health interventions that are UK based. Much of the current research has been conducted in the US. While there are clear themes that are transferable to the UK setting from some of this research, there is a pressing need for further research that takes account of homelessness in the UK context.

Funding

Not applicable

Ethics committee

Not applicable

Competing interests

The authors have stated that there are none

Acknowledgements

We would like to thank the World Health Organisation, Health Evidence Network for allowing the original synthesis to be edited.

REFERENCES

1. Edgar B, Doherty J, Meert H. *Access to housing: homelessness and vulnerability in Europe*. Bristol: Policy Press, 2002.
2. Bramley G, Doogan K, Leather P, et al (eds). *Homelessness and the London housing market*. Bristol: School for Advanced Urban Studies, 1988.
3. Connelly J, Crown J. *Homelessness and ill health. Report of a Working party of the Royal College of Physicians*. London: Royal College of Physicians, 1994.
4. Fitzpatrick S, Kemp P, Klinker S. *Single homelessness: an overview of research in Britain*. Bristol: Policy Press, 2000.
5. Wessel T, Porksen N, Zechert C. Homeless patients in the psychiatric clinic. Results of a 12-month study of the living conditions of psychiatric patients in an urban public health clinic. *Psychiatr Prax* 1997; **24**(4): 167–171.
6. Fitzpatrick S. *Pathways to independence: the experience of young homeless people*. Edinburgh: Scottish Homes, 1999.
7. Jones G. *Young People in and out of the housing market: research project*. University of Edinburgh: Centre for Educational Sociology, 1999.
8. Reid P, Klee H. Young homeless people and service provision. *Health Soc Care Community* 1999; **7**(1): 17–24.
9. Randall G, Brown S. *Prevention is better than cure: new solutions to street homelessness from Crisis*. London: Crisis, 1999
10. Nordentoft M, Wandall-Holm N. 10 year follow up study of mortality among users of hostels for homeless people in Copenhagen. *BMJ* 2003; **327**(7406): 81.
11. Slegers J. Similarities and differences in homelessness in Amsterdam and New York City. *Psychiatr Serv* 2000; **51**(1): 100–104.
12. Office of the Deputy Prime Minister. *Homelessness statistics September 2004 and delivering on the positive outcomes. Policy Briefing Number 10*. http://www.odpm.gov.uk/pub/759/0HomelessnessStatisticsSeptember2004andDeliveringonthePositiveOutcomesPDF270Kb_id1149759.pdf (accessed 3 Mar 2006).
13. Edgar B, Doherty J, Meert H. *Review of statistics on homelessness 2003*. <http://www.homelesspages.org.uk/prods/products.asp?prid=2032> (accessed 3 Mar 2006).
14. Wright NMJ, Tompkins CNE. *How can health care system effectively deal with the major health needs of homeless people?* http://www.euro.who.int/eprise/main/WHO/Progs/HEN/Syntheses/homeless/20050124_12?language= (accessed 3 Mar 2006).
15. Brucker G, Nguyen DT, Lebas J. Access to health care for destitute persons at Public Assistance Hospitals in Paris. *Bull Acad Natl Med* 1997; **181**(8): 1681–1697.
16. Bines W. *The health of single homeless people*. York: Centre for Housing Policy, University of York, 1994.
17. Wright N, Smeeth L, Heath I. Moving beyond single and dual diagnosis in general practice: many patients have multiple morbidities, and their needs have to be addressed. *BMJ* 2003; **326**(7388): 512–514.
18. Newton JR, Geddes JR, Bailey S, et al. Mental health problems of the Edinburgh 'roofless'. *Br J Psychiatry* 1994; **165**(4): 537–540.
19. North CS, Smith EM. A comparison of homeless men and women: different populations, different needs. *Community Ment Health J* 1993; **29**(5): 423–431.

20. Griffiths S. *Addressing the health needs of rough sleepers: a paper to the Homelessness Directorate*. London: Stationery Office, 2002.
21. Wright N. *Homelessness: a primary care response*. London: Royal College of General Practitioners, 2002.
22. Reinking DP, Wolf JR, Kroon H. High prevalence of mental disorders and addiction problems among the homeless in Utrecht. *Ned Tijdschr Geneesk* 2001; **145**(24): 1161–1166.
23. Fountain J, Howes S. *National Addiction Centre. Home and dry? Homelessness and substance use*. London: Crisis, 2002.
24. Lempens A, van de MD, Barendregt C. Homeless drug users in Rotterdam, the Netherlands: profile, way of life, and the need for assistance. *Subst Use Misuse* 2003; **38**(3–6): 339–375.
25. Shaffer HJ, Freed CR, Healea D. Gambling disorders among homeless persons with substance use disorders seeking treatment at a community center. *Psychiatr Serv* 2002; **53**(9): 1112–1117.
26. Heffron WA, Skipper BJ, Lambert L. Health and lifestyle issues as risk factors for homelessness. *J Am Board Fam Pract* 1997; **10**(1): 6–12.
27. Segal SP, Gomory T, Silverman CJ. Health status of homeless and marginally housed users of mental health self-help agencies. *Health Soc Work* 1998; **23**(1): 45–52.
28. Holohan TW. Health and homelessness in Dublin. *Ir Med J* 2000; **93**(2): 41–43.
29. Raoult D, Foucault C, Brouqui P. Infections in the homeless. *Lancet Infect Dis* 2001; **1**(2): 77–84.
30. Barnes PF, Yang Z, Preston-Martin S, et al. Patterns of tuberculosis transmission in Central Los Angeles. *JAMA* 1997; **278**(14): 1159–1163.
31. Ishorst-Witte F, Heinemann A, Puschel K. Morbidity and cause of death in homeless persons. *Archiv Kriminol* 2001; **208**(5–6): 129–138.
32. Edgar B, Doherty J, Mina-Coull A. *Women and homelessness in Europe*. Bristol: Policy Press, 2001.
33. Crane M. The associations between mental illness and homelessness among older people: an exploratory study. *Ageing Ment Health* 1998; **2**(3): 171–180.
34. Kruks G. Gay and lesbian homeless/street youth: special issues and concerns. *J Adolesc Health* 1991; **12**(7): 515–518.
35. O'Connor W, Molloy D. *'Hidden in plain sight': homelessness amongst lesbian and gay youth*. London: National Centre for Social Research, 2001.
36. Trabert G. Health status and medical care accessibility of single, homeless persons. *Gesundheitswesen* 1997; **59**(6): 378–386.
37. Crane M, Warnes AM. Primary health care services for single homeless people: defects and opportunities. *Fam Pract* 2001; **18**(3): 272–276.
38. Doering TJ, Hermes E, Konitzer M, et al. Health situation of homeless in a health care home in Hannover. *Gesundheitswesen* 2002; **64**(6): 375–382.
39. Lester H, Wright N, Heath I, RGCP Health Inequalities Standing Group. Developments in the provision of primary health care for homeless people. *Br J Gen Pract* 2002; **52**(475): 91–92.
40. Wright NM, Campbell TL, Tompkins CN. Comparison of conventional and accelerated hepatitis B immunisation schedules for homeless drug users. *Comm Disease Public Health* 2002; **5**(4): 324–326.
41. Goldberg D, Cameron S, McMenamin J. Hepatitis C virus antibody prevalence among injecting drug users in Glasgow has fallen but remains high. *Comm Disease Public Health* 1998; **1**(2): 95–97.
42. Heimer R, Kaplan EH, Khoshnood K, et al. Needle exchange decreases the prevalence of HIV-1 proviral DNA in returned syringes in New Haven, Connecticut. *Am J Med* 1993; **95**(2): 214–220.
43. Moss AR, Hahn JA. Syringe exchange and risk of infection with hepatitis B and C viruses: invited commentary: needle exchange-no help for hepatitis? *Am J Epidemiology* 1999; **149**(3): 214–216.
44. Broadhead RS, Kerr TH, Grund JPC, Altice FL. Safer injection facilities in North America: their place in public policy and health initiatives. *J Drug Issues* 2002; **32**(1): 329–355.
45. Hagan H, Thiede H, Weiss NS, et al. Sharing of drug preparation equipment as a risk factor for hepatitis C. *Am J Public Health* 2001; **91**(1): 42–46.
46. Drug Policy Alliance. Syringe availability: part 1. <http://www.drugpolicy.org/library/research/syringe.cfm> (accessed 3 Mar 2006).
47. Moatti JP, Vlahov D, Feroni I, et al. Multiple access to sterile syringes for injection drug users: vending machines, needle exchange programs and legal pharmacy sales in Marseille, France. *Eur Addict Res* 2001; **7**(1): 40–45.
48. Power R, Hunter G. Developing a strategy for community-based health promotion targeting homeless populations. *Health Educ Res* 2001; **16**(5): 593–602.
49. Advisory Council on the Misuse of Drugs. *Reducing drug related deaths: a report by The Advisory Council on the Misuse of Drugs*. London: The Stationery Office, 2000.
50. Strang J, McCambridge J, Best D, et al. Loss of tolerance and overdose mortality after inpatient opiate detoxification: follow up study. *BMJ* 2003;

- 326(7396): 959–960.
51. Oldham NS, Wright N. A UK policy on 'take home naloxone' for opiate users — strategy or stalemate? *Drugs: Education Prevention & Policy* 2003; **10(2)**: 105–119.
 52. Meisler N, Blankertz L, Santos AB, McKay C. Impact of assertive community treatment on homeless persons with co-occurring severe psychiatric and substance use disorders. *Community Ment Health J* 1997; **33(2)**: 113–122.
 53. Conrad KJ, Hultman CI, Pope AR, et al. Case managed residential care for homeless addicted veterans. Results of a true experiment. *Med Care* 1998; **36(1)**: 40–53.
 54. De Leon G, Sacks S, Staines G, McKendrick K. Modified therapeutic community for homeless mentally ill chemical abusers: treatment outcomes. *Am J Drug Alcohol Abuse* 2000; **26(3)**: 461–480.
 55. Nuttbrock LA, Rahav M, Rivera JJ, et al. Outcomes of homeless mentally ill chemical abusers in community residences and a therapeutic community. *Psychiatr Serv* 1998; **49(1)**: 68–76.
 56. Milby JB, Schumacher JE, Raczynski JM, et al. Sufficient conditions for effective treatment of substance abusing homeless persons. *Drug Alcohol Depend* 1996; **43(1–2)**: 39–47.
 57. Department of Health, The Scottish Office Department of Health, Welsh Office, Department of Health and Social Services NI. *Drug misuse and dependence—guidelines on clinical management*. London: The Stationery Office, 1999.
 58. The National Treatment Agency for Substance Misuse. *Models of care for treatment of adult drug misusers*. London: The National Treatment Agency for Substance Misuse, 2002.
 59. Mattick RP, Kimber J, Breen C, Davoli M. Buprenorphine maintenance versus placebo or methadone maintenance for opioid dependence. *Cochrane Database Syst Rev* 2003; (2): CD002207
 60. Ward J, Mattick R, Hall W. *Methadone maintenance treatment and other opioid replacement therapies*. Amsterdam: Harwood Academic Press, 1997.
 61. The National Treatment Agency for Substance Misuse. *Injectable heroin (and injectable methadone) potential roles in drug treatment. Full Guidance Report*. London: The National Treatment Agency for Substance Misuse, 2003.
 62. Ferri M, Davoli M, Perucci CA. Heroin maintenance for chronic heroin dependents. *The Cochrane Library* 2006. <http://www.mrw.interscience.wiley.com/cochrane/cdsysrev/articles/CD003410/frame.html> (accessed 3 Mar 2006).
 63. Jacob J, Rottman J, Stoeber H. *Entstehung und Praxis eines Gesundheitsraumangebotes für Drogenkonsumentende. Abschlussbericht der einjährigen Evaluation des 'drop-in Fixpunkt', Hannover*. Oldenburg: Bibliotheks und Informationssystem der Universität Oldenburg, 1999.
 64. Medically Supervised Injecting Centre Evaluation Committee. *Final report on the evaluation report of the Sydney medically supervised injecting centre*. Sydney: MSIC Evaluation Committee, 2003.
 65. Robinson BB, Bockting WO, Rosser BR, et al. The sexual health model: application of a sexological approach to HIV prevention. *Health Education Research* 2002; **17(1)**: 43–57.
 66. Integrative Drogenhilfe. *Jahresbericht 1996 (Annual Report 1996)*. Frankfurt: Integrative Drogenhilfe, 1997.
 67. Hunt N. *Safer injecting rooms: an overview of the evidence with consideration of some implementation issues for the UK*. York: Joseph Rowntree Foundation, 2003.
 68. Wright NMJ, Tompkins CNE. Supervised injecting centres. *BMJ* 2004; **328**: 100–102.
 69. Kral AH, Lorrwick J, Edin BR. Sex and drug related risk among populations of younger and older injecting drug users in adjacent neighbourhoods in San Francisco. *Journal of Acquired Immune Deficiency Syndrome* 2000; **24(2)**: 162–167.
 70. Van Den Hoek A. STD control in drug users and street youth. *Genitourin Med* 1997; **73(4)**: 240–244.
 71. Nyamathi A, Flaskerud J, Keenan C, Leake B. Effectiveness of a specialized vs. traditional AIDS education program attended by homeless and drug-addicted women alone or with supportive persons. *AIDS Educ Prev* 1998; **10(5)**: 433–446.
 72. Nyamathi AM, Leake B, Flaskerud J, et al. Outcomes of specialized and traditional AIDS counseling programs for impoverished women of color. *Res Nurs Health* 1993; **16(1)**: 11–21.
 73. Nyamathi AM, Stein JA. Assessing the impact of HIV risk reduction counseling in impoverished African American women: a structural equations approach. *AIDS Educ Prev* 1997; **9(3)**: 253–273.
 74. Stein JA, Nyamathi A, Kington R. Change in AIDS risk behaviors among impoverished minority women after a community-based cognitive-behavioral outreach program. *Am J Comm Psychol* 1997; **25(6)**: 519–533.
 75. Susser E, Valencia E, Berkman A, et al. Human immunodeficiency virus sexual risk reduction in homeless men with mental illness. *Arch Gen Psychiatry* 1998; **55(3)**: 266–272.
 76. Gelberg L, Leake B, Lu MC, et al. Chronically homeless women's perceived deterrents to contraception. *Perspect Sex Reprod Health* 2002; **34(6)**: 278–285.
 77. Dufeu P, Podschus J, Schmidt LG. Alcohol dependence in homeless men. Incidence, development and determinants. *Nervenarzt* 1996; **67(11)**: 930–934.
 78. Fichter MM, Quadflieg N. Alcoholism in homeless men in the mid-nineties: results from the Bavarian public health study on homelessness. *Eur Arch Psychiatry Clin Neurosci* 1999; **249(1)**: 34–44.
 79. Fichter MM, Quadflieg N. Course of alcoholism in homeless men in Munich, Germany: results from a prospective longitudinal study based on a representative sample. *Subst Use Misuse* 2003; **38(3–6)**: 395–427.
 80. Nyamathi AM, Stein JA, Dixon E, Longshore D, Galaif E. Predicting positive attitudes about quitting drug and alcohol use among homeless women. *Psychol Addict Behav* 2003; **17(1)**: 32–41.
 81. Coughney K, Feighan K, Cheney R, Klein G. Retention in an aftercare program for recovering women. *Subst Use Misuse* 1998; **33(4)**: 917–933.
 82. Lapham SC, Hall M, Skipper BJ. Homelessness and substance use among alcohol abusers following participation in project H&ART. *J Addict Dis* 1995; **14(4)**: 41–55.
 83. Stahler GJ, Shipley TF Jr, Bartelt D, et al. Evaluating alternative treatments for homeless substance-abusing men: outcomes and predictors of success. *J Addict Dis* 1995; **14(4)**: 151–167.
 84. North CS, Pollio DE, Smith EM, Spitznagel EL. Correlates of early onset and chronicity of homelessness in a large urban homeless population. *J Nerv Ment Dis* 1998; **186(7)**: 393–400.
 85. Thomsen RL, Balslov KD, Benjaminsen SE, Petersen P. [Homeless persons residing in shelters in the county of Funen I. Psychosocial characteristics and need of treatment. *Ugeskr Laeger* 2000; **162(9)**: 1205–1210.
 86. Scott J. Homelessness and mental illness. *Br J Psychiatry* 1993; **162**: 314–324.
 87. Palmstierna T, Gadd K, Norman C, Svensson J. Drug addicts with severe mental disorders can be helped by programs using moderate means. Good results when psychiatric, social and drug abuse services cooperate. *Lakartidningen* 2000; **97(18)**: 2205–2206.
 88. Lehman AF, Dixon LB, Kernan E, et al. A randomized trial of assertive community treatment for homeless persons with severe mental illness. *Arch Gen Psychiatry* 1997; **54(11)**: 1038–1043.
 89. Lam JA, Rosenheck R. Street outreach for homeless persons with serious mental illness: is it effective? *Med Care* 1999; **37(9)**: 894–907.
 90. Buhrich N, Teesson M. Impact of a psychiatric outreach service for homeless persons with schizophrenia. *Psychiatr Serv* 1996; **47(6)**: 644–646.
 91. Salize HJ, Dillmann-Lange C, Stern G, et al. Alcoholism and somatic comorbidity among homeless people in Mannheim, Germany. *Addiction* 2002; **97(12)**: 1593–1600.
 92. Darke S, Ross J, Zador D, Sunjic S. Heroin-related deaths in New South Wales, Australia, 1992–1996. *Drug Alcohol Depend* 2000; **60(2)**: 141–150.
 93. O'Driscoll PT, McGough J, Hagan H, et al. Predictors of accidental fatal drug overdose among a cohort of injection drug users. *Am J Pub Health* 2001; **91(6)**: 984–987.
 94. Meisels IS, Loke J. The pulmonary effects of free-base cocaine: a review. *Cleve Clin J Med* 1993; **60(4)**: 325–329.
 95. Tashkin DP. Airway effects of marijuana, cocaine, and other inhaled illicit agents. *Curr Opin Pulm Med* 2001; **7(2)**: 43–61.
 96. Mirzayan R, Hanks SE, Weaver FA. Cocaine-induced thrombosis of common iliac and popliteal arteries. *Ann Vasc Surg* 1998; **12(5)**: 476–481.
 97. Webber J, Kline RA, Lucas CE. Aortic thrombosis associated with cocaine use: report of two cases. *Annals Vasc Surg* 1999; **13(3)**: 302–304.
 98. CDC. Tetanus surveillance — United States, 1998–2000. *Morbidity Mortal Wkly Rep MMWR* 2003; **52(Suppl 3)**: 1–12.
 99. Chin J, Archer MS. *Control of communicable diseases manual: an official report of the American Public Health Association*. 17th edn. Washington: American Public Health Association, 2000.
 100. Rushdy AA, White JM, Ramsay ME, Crowcroft NS. Tetanus in England and Wales, 1984–2000. *Epidemiol Infect* 2003; **130(1)**: 71–77.
 101. Kern G, Frisch-Niggemeyer W, Wewalka G, Bruns C. Hepatitis A outbreak in a shelter for the homeless in Vienna. *Wien Klin Wochenschr* 1986; **98(14)**: 457–461.
 102. Queiroz DA, Cardoso DD, Martelli CM, et al. Seroepidemiology of hepatitis A virus infection in street children of Goiania-Goias. *Rev Soc Bras Med Trop* 1995; **28(3)**: 199–203.
 103. Monsuez JJ, Mathieu D, Arnoult F, Passeron J. Cutaneous diphtheria in a homeless man. *Lancet* 1995; **346(8975)**: 649–650.
 104. Arfi C, Dehen L, Benassaia E, et al. Dermatologic consultation in a precarious situation: a prospective medical and social study at the Hôpital Saint-Louis in Paris. *Ann Dermatol Venerol* 1999; **126(10)**: 682–686.
 105. Moy JA, Sanchez MR. The cutaneous manifestations of violence and poverty. *Arch Dermatol* 1992; **128(6)**: 829–839.