

## A systematic review of the effectiveness and cost-effectiveness of peer-based interventions to maintain and improve offender health in prison settings

*Jane South, Anne-Marie Bagnall, Claire Hulme, James Woodall, Roberta Longo, Rachael Dixey, Karina Kinsella, Gary Raine, Karen Vinall-Collier and Judy Wright*



**National Institute for  
Health Research**



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# Abstract

## A systematic review of the effectiveness and cost-effectiveness of peer-based interventions to maintain and improve offender health in prison settings

Jane South,<sup>1\*</sup> Anne-Marie Bagnall,<sup>1</sup> Claire Hulme,<sup>2</sup> James Woodall,<sup>1</sup> Roberta Longo,<sup>2</sup> Rachael Dixey,<sup>1</sup> Karina Kinsella,<sup>1</sup> Gary Raine,<sup>1</sup> Karen Vinall-Collier<sup>2</sup> and Judy Wright<sup>2</sup>

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**Background:** Offender health is deemed a priority issue by the Department of Health. Peer support is an established feature of prison life in England and Wales; however, more needs to be known about the effectiveness of peer-based interventions to maintain and improve health in prison settings.

**Objectives:** The study aimed to synthesise the evidence on peer-based interventions in prison settings by carrying out a systematic review and holding an expert symposium. Review questions were (1) what are the effects of peer-based interventions on prisoner health and the determinants of prisoner health?, (2) what are the positive and negative impacts on health services within prison settings of delivering peer-based interventions?, (3) how do the effects of peer-based approaches compare with those of professionally led approaches? and (4) what are the costs and cost-effectiveness of peer-based interventions in prison settings?

**Data sources:** For the systematic review, 20 electronic databases including MEDLINE, PsycINFO, the Cumulative Index to Nursing and Allied Health Literature and EMBASE were searched from 1985. Grey literature and relevant websites were also searched. To supplement the review findings 58 delegates, representing a variety of organisations, attended an expert symposium, which provided contextual information.

**Review methods:** Two reviewers independently selected studies using the following inclusion criteria: population – prisoners resident in prisons and young offender institutions; intervention – peer-based interventions; comparators: review questions 3 and 4 compared peer-led and professionally led approaches; outcomes – prisoner health or determinants of health, organisational/process outcomes or views of prison populations; study design: quantitative, qualitative and mixed-methods evaluations. Two reviewers extracted data and assessed validity using piloted electronic forms and validity assessment criteria based on published checklists. Results from quantitative studies were combined using narrative summary and meta-analysis when appropriate; results from qualitative studies were combined using thematic synthesis.

**Results:** A total of 15,320 potentially relevant papers were identified of which 57 studies were included in the effectiveness review and one study was included in the cost-effectiveness review; most were of poor methodological quality. A typology of peer-based interventions was developed. Evidence suggested that peer education interventions are effective at reducing risky behaviours and that peer support services provide an acceptable source of help within the prison environment and have a positive effect on recipients; the strongest evidence came from the Listener scheme. Consistent evidence from many predominantly qualitative studies suggested that being a peer deliverer was associated with positive effects across all intervention types. There was limited evidence about recruitment of peer deliverers. Recurring themes were the importance of prison managerial and staff support for schemes to operate successfully, and risk management. There was little evidence on the cost-effectiveness of peer-based interventions. An economic model, developed from the results of the effectiveness review, although based on data of variable quality and a number of assumptions, showed the cost-effectiveness of peer-led over professionally led education in prison for the prevention of human immunodeficiency virus (HIV) infection.

**Limitations:** The 58 included studies were, on the whole, of poor methodological quality.

**Conclusions:** There is consistent evidence from a large number of studies that being a peer worker is associated with positive health. Peer support services can also provide an acceptable source of help within the prison environment and can have a positive effect on recipients. This was confirmed by expert evidence. Research into cost-effectiveness is sparse but a limited HIV-specific economic model, although based on a number of assumptions and evidence of variable quality, showed that peer interventions were cost-effective compared with professionally led interventions. Well-designed intervention studies are needed to provide robust evidence including assessing outcomes for the target population, economic analysis of cost-effectiveness and impacts on prison health services. More research is needed to examine issues of reach, utilisation and acceptability from the perspective of recipients and those who choose not to receive peer support.

**Study registration:** This study was registered as PROSPERO CRD42012002349.

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## List of abbreviations

ACE	AIDS, Counselling and Education	ISPOR	International Society for Pharmacoeconomics and Outcomes Research
AIDS	acquired immunodeficiency syndrome		
ASSIA	Applied Social Sciences Index and Abstracts	MD	mean difference
AVP	Alternatives to Violence Project	MeSH	medical subject heading
CARATS	Counselling, Assessment, Referral, Advice and Throughcare Services	NHS EED	NHS Economic Evaluation Database
CI	confidence interval	NOMS	National Offender Management Service
CINAHL	Cumulative Index to Nursing and Allied Health Literature	OR	odds ratio
DATCAP	Drug Abuse Treatment Cost Analysis Program	POA	Prison Officers' Association
DoPHER	Database of Promoting Health Effectiveness Reviews	PSA	probabilistic sensitivity analysis
EPPI-Centre	Evidence for Policy and Practice Information and Co-ordinating Centre	PST	Peer Support Team
HIV	human immunodeficiency virus	QALY	quality-adjusted life-year
HMP	Her Majesty's Prison	RCT	randomised controlled trial
IBSS	International Bibliography of the Social Sciences	RePEc	Research Papers in Economics
		RR	risk ratio
		SD	standard deviation
		STI	sexually transmitted infection
		TC	therapeutic community
		YOI	Young Offender Institution



## Plain English summary

Offenders have higher levels of ill health than the general population and are more likely to engage in risky health behaviours. One of the ways of improving health in prisons is through peer-based interventions, in which prisoners provide education, support or advice to their fellow prisoners. This study aimed to review previous research to find out whether or not peer interventions work to improve and maintain health in prisons and young offender institutions. We also wanted to find out what types of intervention exist, how they work in a prison setting and what the balance is between costs and benefits.

The findings have come from a systematic review in which we gathered the results of studies across the world to provide a comprehensive and unbiased summary of whether or not peer interventions work in prison and whether or not they are cost-effective. We also held a mini-conference at which we invited experts in this area to share their opinions of how these approaches work in prisons, and held some listening exercises at which we consulted about the study with serving prisoners.

The study conclusions were that there is good evidence that becoming a peer helper is linked to feeling more confident and having better health. Peer helpers can offer a valuable source of support within prisons, particularly for prisoners with mental health needs. Overall, there is not much research on costs but our analysis showed that involving prisoners in education about HIV infection may be more cost-effective than education by staff. The study has highlighted the importance of peer helpers working within the prison environment and has identified areas for future research.





# Scientific summary

## Background

Offender health concerns health and social care for adults and children in contact with the criminal justice system. This population experiences significant health inequalities associated with multifaceted social problems.

Research shows that ill health is more prevalent in the prison population than in the general population. Prison itself can produce adverse health impacts, particularly with regard to mental health. Prisoners are more likely to engage in risky health behaviours, such as drug and alcohol misuse, and there are inequalities in long-term conditions.

The prison setting offers opportunities for improving the physical and mental health of this socially excluded population. Peer-based interventions, in which prisoners provide education, support or advice to other prisoners, are an established feature of prison life in England and Wales. A 2002 survey estimated that 7% of prisoners were involved in peer support roles encompassing substance misuse, violence reduction, translation services, housing and employment advice and mentoring schemes. More recently, health trainers have emerged as a feature of prison health services.

Given the place of peer schemes in current practice, it is important to develop a robust evidence base to inform service commissioning and delivery options.

## Objectives

The study aimed to synthesise the evidence on peer-based interventions in prison settings by carrying out a systematic review and holding an expert symposium. The main research question was, 'What are the effectiveness and cost-effectiveness of peer-based interventions to maintain and improve health in prisons and Young Offender Institutions (YOIs)?'. Review questions were: (1) What are the effects of peer-based interventions on prisoner health and the determinants of prisoner health? (2) What are the positive and negative impacts on health services within prison settings of delivering peer-based interventions? (3) How do the effects of peer-based approaches compare with those of professionally led approaches? (4) What are the costs and cost-effectiveness of peer-based interventions in prison settings?

A full study protocol was developed and peer reviewed by the study steering and advisory groups prior to publication in the PROSPERO database (reference no. CRD42012002349).

## Methods

### *Systematic review of effectiveness*

#### Data sources

Twenty electronic databases including MEDLINE, PsycINFO, the Cumulative Index to Nursing and Allied Health Literature and EMBASE were searched for papers published since 1985, with no language restrictions.

Unpublished (grey) literature was identified from contacts with experts, conference and dissertation abstracts, reference lists of key papers, hand searches of relevant book chapters and searches of relevant websites.

### Study selection

Two reviewers independently selected studies, according to the following inclusion criteria:

- *Population*: Prisoners resident in prisons and YOIs in any country, all ages, male and female.
- *Intervention*: Any peer-based intervention operating within prisons and YOIs in any country. 'Peer' includes prisoners and ex-prisoners delivering interventions to prisoners.
- *Comparators*: For review question 3, studies comparing peer-led and professionally led approaches to the same health or social problem. For all other questions, studies with any or no comparator (or usual care).
- *Outcomes*: For review question 1, studies reporting any effects of peer-based interventions on prisoner health or determinants of health within the prison setting. For the other review questions, studies reporting organisational/process outcomes and views of prison populations.
- *Study designs*: Quantitative, qualitative and mixed-methods evaluations.

### Data extraction and assessment of validity

Data were extracted onto piloted electronic forms by one reviewer and checked by a second. Data extraction fields included bibliographic detail, population details, setting/institution details, intervention details, health or social issue, method of delivery and outcomes.

Two reviewers assessed each study for validity using published checklists. Disagreements were resolved by consensus.

### Data synthesis

Quantitative data were combined in a narrative synthesis, grouped by review question and then by intervention mode. When data were suitable for statistical meta-analysis, studies were combined using a fixed-effect model to give relative risks with 95% confidence intervals (CIs) for binary outcomes and weighted or standardised mean differences with 95% CIs for continuous outcomes. Statistical heterogeneity was examined using the  $I^2$  statistic with an  $I^2$  value of  $> 50\%$  indicating statistical heterogeneity.

A thematic synthesis of qualitative studies was undertaken using an inductive approach. Two reviewers worked independently to undertake free coding of all of the texts reporting qualitative findings. To develop analytical themes, the complete set of descriptive codes ( $n = 99$ ) was organised into themes and then grouped into thematic categories using an iterative process to obtain the best fit to explain the data. Themes were then mapped back to the review questions.

For review questions 1 and 3, qualitative themes on outcomes were mapped to quantitative results grouped by intervention mode and then type of outcome. For review question 2, a thematic synthesis combined results across heterogeneous studies. The narrative account of the qualitative results was pooled with quantitative results using the themes generated inductively by qualitative analysis as a framework for reporting.

### Systematic review of cost-effectiveness

#### Data sources

In addition to the databases searched for the effectiveness review, systematic searching took place of the economic databases NHS Economic Evaluation Database and Research Papers in Economics (IDEAS) using

an adaptation of the economics search filters developed by the NHS Centre for Reviews and Dissemination combined with the search terms used in the effectiveness literature search strategy.

### Study selection

The cost-effectiveness review inclusion and exclusion criteria were in line with those of the effectiveness review. Additionally, the criteria included papers reporting resource use/cost and/or outcome comparisons between peer-based interventions and standard care.

### Data extraction and assessment of validity

The included studies were summarised and critically appraised by two reviewers. The quality of each paper was assessed using good practice guidance on economic evaluations.

### Data synthesis

The results of the effectiveness review were used to develop an economic model to establish the cost-effectiveness of a peer-led educational intervention and a professionally led educational intervention compared with a 'do nothing' scenario to prevent future human immunodeficiency virus (HIV) infections among offenders in prison settings and their partners when they are released from prison.

### Expert symposium

Fifty-eight delegates attended the expert symposium. Invited experts represented organisations including the prison service, the NHS, charities and academic institutions. Some ex-prisoners from organisations representing service users participated as lay experts. Experts discussed two key questions in discussion groups:

1. What factors affect whether and how well peer-based interventions work in prison?
2. What are the positive and negative impacts of peer-based interventions?

The discussion groups were audio-recorded with the permission of delegates. The verbatim transcripts and accompanying notes were analysed using framework analysis.

## Results

The literature search identified 15,320 potentially relevant papers. In total, 57 studies were included in the review of effectiveness and one study was included in the review of cost-effectiveness. A substantial proportion of the studies were carried out in the UK. A typology of interventions was developed with working definitions for the major intervention modes: peer education, peer support, the Listener scheme, the Insider scheme, the Peer Support Team programme, prison hospice volunteers, peer mentoring, health trainers, peer advisors and other intervention modes. Peer education was the most studied intervention mode followed by peer support.

The majority of included studies were of poor methodological quality, with only five judged to have good internal validity.

### **Review question 1: what are the effects of peer-based interventions on prisoner health?**

There is moderate evidence from quantitative studies that peer education interventions are effective at reducing risky behaviours; however, peer education is not prominent in current practice in English and Welsh prisons.

There is moderate evidence from qualitative and quantitative studies that peer support is an acceptable source of help within the prison environment and has a positive effect on recipients and peer deliverers.

There is consistent evidence from three qualitative studies and one quantitative study that the Listener scheme is effective in providing targeted emotional support for prisoners who identify need. There is weak evidence on the impact on suicide and self-harm. Positive effects on listeners' mental health and well-being are consistently reported in six qualitative studies, although there can be an associated emotional burden. Listener schemes operate across most prisons in England and Wales.

Two interventions, health trainers and peer mentors, focused on changing behaviours. There is weak evidence from one study that mentoring results in positive effects on health behaviours, treatment adherence, abstinence from drug taking and propensity to reoffend. There was moderate evidence from two studies that becoming a health trainer had positive effects on knowledge, attitudinal and behaviour change, self-esteem and development of transferable skills. There was little evidence of effects on health trainer clients; however, limited evidence showed that health trainers discussed a range of lifestyle issues with clients and referred them to other services.

There is consistent evidence from a large number of predominantly qualitative studies that being a peer worker is associated with positive effects on mental health and its determinants. These findings were consistent across a number of different models including peer education, peer support, the Listener scheme, prison hospice volunteers, health trainers and peer advisers (housing). Skills development, including having transferable employment skills, was also identified in relation to peer advisors and health trainers. There were some negative effects in relation to experiencing a burden of care, particularly in roles involving emotional support. Much of the evidence comes from interventions that feature across prisons in England and Wales; therefore, the results have high relevance for health services.

### ***Review question 2: what are the positive and negative impacts on health services in prison settings of delivering peer-based interventions?***

Factors relating to security and risk management often featured in selection criteria for peer positions, along with interpersonal skills, knowledge and likely length of stay. There is very little evidence on selection procedures, except for the Listener scheme.

Training processes varied in terms of content, duration and intensity. There is weak evidence suggesting that mental health topics should be covered in training and that training should be flexible. A link between participation in training and individual benefits such as the development of skills and confidence is suggested, although it is difficult to separate training from other aspects of the peer experience. The added value of gaining accreditation was identified, also a theme in the expert symposium.

There is strong evidence from qualitative studies that retention of peer deliverers, and attrition because of prisoner movement between prisons, was an important process issue. This finding was reflected in the expert symposium.

The importance of role boundaries and confidentiality were recurring themes. Moderate evidence suggests that peer deliverers can recognise role boundaries and when to refer to staff or other professionals, but problems such as dependency may arise. Ongoing supervision of peer deliverers was found to be helpful.

Factors that influence prisoners' choices not to use peer-based interventions were lack of awareness, personal need, concerns about confidentiality and breaches of trust, preferences for support from other sources, language barriers and fear of demonstrating weakness.

There is strong and consistent evidence from qualitative studies of the importance of organisational support within the prison. Resistance from staff was identified as a negative factor inhibiting implementation of peer-based interventions.

There is equivocal evidence of the impact of peer-based interventions on prison culture and ethos; the most positive effects were reported in relation to peer support, prison hospice volunteers and the

Listener scheme. Some studies reported that having a cadre of peer workers can increase service capacity, but there was limited evidence on the impact on the prison workforce or health services. The review identified that peer interventions may increase security risks as peers often have enhanced freedoms. The expert symposium also highlighted that security concerns and risks require active management.

Overall, the review findings indicate that peer interventions cannot be considered 'stand-alone' interventions that are independent of the organisation of the prison. Instead, there are multiple interactions between the intervention and different levels of the prison system, in line with understandings of complex interventions.

### ***Review question 3: what is the effectiveness of peer delivery compared with the effectiveness of professional delivery?***

There is consistent evidence from 10 qualitative studies that peer delivery was preferred to professional delivery, with cross-cutting themes including peer deliverers demonstrating empathy because of lived experiences, being non-judgemental, being trusted by prisoners and being able to offer more time than staff. Accessibility was also a theme, with prisoners feeling more at ease talking to peer deliverers.

There is consistent evidence from four quantitative studies that peer educators are as effective as professional educators in the prevention of HIV infection.

### ***Review question 4: what is the cost-effectiveness of peer-based interventions in prisons?***

Only one study was identified that assessed the cost or cost-effectiveness of peer-based interventions to improve and maintain health in prisons and YOIs. The focus of this study was costs rather than health outcomes and the programme aim was poorly described. Evidence from the study shows savings in management costs in prisons through the use of a therapeutic community (TC) programme in the short term, albeit these were relatively small compared with the overall costs. The findings suggest that TC activities or the existence of the TC environment may help to reduce or control prison management costs.

The economic model, although based on data of variable quality and a number of assumptions, suggested that both peer-led and professionally led educational interventions to prevent future HIV infections among offenders in prison settings were cost-effective compared with a 'do nothing' alternative. In addition, the peer-led intervention was dominant when compared with the professionally led intervention (more effective and less costly). Although the model is surrounded by considerable uncertainty, the dominance scenario was confirmed in all of the one-way sensitivity analyses conducted and in the probabilistic sensitivity analysis.

## **Limitations**

Thirty-seven included studies were conducted outside the UK and therefore some caution is needed when considering the application of some findings to English and Welsh prisons. Studies published before 1985 or which reported only non-health outcomes were not included in the review. Studies of prison health and of interventions delivered by non-professionals are not well indexed in electronic databases and therefore some relevant studies may have been missed. Clinical heterogeneity in outcomes and interventions between the included studies precluded meta-analysis for most outcomes.

## **Conclusions**

This study adds to existing knowledge about the effects of peer-based interventions and the way that these interact with the prison environment. A typology of peer-based interventions was developed. The findings confirm that there is considerable heterogeneity in the range of peer interventions.

The 58 included studies, which represent the best available evidence, were on the whole of poor methodological quality.

Overall, current evidence is strongest in terms of evaluating effects on peer deliverers, with some evidence on impact on prison services. There is less evidence on outcomes for recipients of peer interventions and more generally on the prison population. There is strong and consistent evidence from a large number of qualitative studies that being a peer worker is associated with positive effects on mental health and its determinants, and these were consistent across a number of models.

There is consistent quantitative evidence that peer educators are as effective as professional educators in HIV prevention outcomes, and stronger qualitative evidence that peer delivery was preferred to professional delivery. Research into cost-effectiveness is sparse, with little economic evaluation even of schemes with evidence of effectiveness. A limited economic model, although based on data of variable quality and a number of assumptions, suggested that both peer-led and professionally led educational interventions are cost-effective compared with a 'do nothing' alternative, with the peer-led intervention being dominant.

More research is needed to assess the effectiveness and cost-effectiveness of peer support/mentoring interventions delivered in prison settings in England and Wales. The current evidence base is dominated by qualitative research, much of which looks only at the effects on the peer workers. There is much less evidence on outcomes for recipients of peer interventions and more generally on the prison population. Well-designed intervention studies are needed to provide robust evidence including assessment of outcomes for the target population, economic analysis of cost-effectiveness and impacts on prison health services. More research is needed to examine issues of reach, utilisation and acceptability from the perspective of recipients and the perspective of those who choose not to receive peer support. There is scope for more interventions designed to improve or maintain physical or mental health, manage long-term conditions or reduce health risks associated with prison.

In conclusion, peer-based interventions can be considered a valuable mechanism to maintain or improve health and well-being in the prison setting; however, the current evidence base needs strengthening. The study has identified a number of implications for the management and implementation of peer schemes.

## Study registration

This study was registered as PROSPERO CRD42012002349.

## Funding

The National Institute for Health Research Health Services and Delivery Research programme.

# Chapter 1 Introduction

## Offender health and inequalities in health

Offender health concerns health and social care for adults and children in contact with the criminal justice system. Offender health is deemed a priority of the Department of Health<sup>1</sup> because this population experiences significant health inequalities associated with multifaceted social problems.<sup>2,3</sup> The focus of this study is specifically on the health of those residing in prisons and Young Offender Institutions (YOIs). In March 2013, the prison population of England and Wales was 87,645,<sup>4</sup> one of the highest imprisonment rates in Europe.<sup>5</sup> Within England and Wales there are 130 prison establishments (including YOIs and juvenile and foreign national prisons), which are functionally as well as geographically diverse. Of the 130 establishments, eight are deemed 'high-security' male prisons, 11 are female establishments and 20 are YOIs (18–21 years) or juvenile institutions (15–18 years).<sup>6</sup> Children placed in custody may also be located in secure children's homes, designed for boys and girls aged 10–17 years, or secure training centres (holding boys and girls aged 12–17 years).

Prisons are broadly categorised as being open or closed institutions. Open prisons (referred to as category D prisons) are characterised by low levels of security and allow opportunities for offenders to conduct work outside of the prison. Most prisons, however, are closed establishments and security driven and do not allow such levels of freedom. Closed institutions are further classified as local prisons, category B and category C training prisons and high-security institutions.<sup>7</sup> The majority of prisons are funded and managed by Her Majesty's Prison Service, but 13 are contractually run by private companies.<sup>6,7</sup>

Research evidence has consistently demonstrated that the prevalence of ill health in the prison population is higher than that in the general population.<sup>8</sup> Prison itself can produce adverse health impacts for those admitted into custody, and in this regard the mental health of the prison population is of particular concern.<sup>9,10</sup> In the 12 months ending June 2012, for example, there were a total of 23,435 incidents of self-harm in prisons. The incidence of suicide in prison per year (2005) has been reported to be 102.6 per 100,000 prisoners, and this contrasts with the 10–12 per 100,000 population estimated in the general population.<sup>11</sup> There is evidence that prisoners are more likely to engage in risky health behaviours such as drug and alcohol misuse<sup>3</sup> and smoking,<sup>12</sup> and this has been found to be more prevalent in women than men.<sup>13</sup> There is also evidence of inequalities in relation to long-term conditions; one study reported that over one-quarter of newly sentenced prisoners reported a long-standing physical disorder or disability,<sup>14</sup> with evidence suggesting that women prisoners have greater physical health needs than men.<sup>13,14</sup>

Since 2006 the responsibility for health care in prison establishments in England and Wales has rested with the NHS, which has a duty to ensure that services provided are equivalent to those in the community. Although many offenders experience barriers to accessing health services outside of prison,<sup>15</sup> the prison setting can offer opportunities for improving the physical and mental health of a socially excluded population. In 2002 the Department of Health published *Health Promoting Prisons: A Shared Approach*,<sup>16</sup> which was described by some commentators as championing a health promotion focus in prison health care, advocating the prevention of deterioration in health and encouraging prisoners to adopt healthy behaviours.<sup>17</sup> Subsequent policy to *Health Promoting Prisons: A Shared Approach* has continued to emphasise the importance of improving the health of the prison population<sup>2,18,19</sup> and the contribution of health interventions to desistance and prisoner rehabilitation.<sup>20,21</sup>

## Involving prisoners

Peer-based interventions, in which prisoners provide education, support or advice to other prisoners, can contribute to achieving health and social goals within the prison environment and beyond. Various justifications have been advanced including the ability of peers to connect with other prisoners<sup>22</sup> and to have social influence with vulnerable populations resistant to professional advice;<sup>23,24</sup> the direct benefits for the peer deliverers themselves;<sup>22,25</sup> and the wider benefits for the prison system including effective use of resources.<sup>26,27</sup> Peer delivery expands the range of health services on offer in the criminal justice system.<sup>28</sup> Lord Patel's report<sup>29</sup> on prison drug treatment and Lord Bradley's review<sup>30</sup> of people with mental health needs and learning disabilities in the criminal justice system both highlight the potential value of peer-based approaches. More recently, a report by the Prison Reform Trust<sup>25</sup> advocates increased opportunities for prisoners to make a positive contribution whilst residing in prison.

Peer support is an established feature of prison life in England and Wales. The first Listener scheme was launched in 1991 at Her Majesty's Prison (HMP) Swansea<sup>31</sup> as a part of a suicide prevention strategy and now Listener schemes operate across almost all prisons in England and Wales. A survey reported in 2002 estimated that 7% of prisoners were involved in peer support roles.<sup>32</sup> Currently, peer-based interventions in prisons in England and Wales encompass substance misuse, violence reduction, support for new prisoners, translation services, housing and employment advice and mentoring schemes.<sup>25</sup> More recently, health trainer schemes have emerged as a feature of prison health services.<sup>28</sup>

## Study rationale

There is an extensive evidence base on lay and peer roles as a means of widening access to health-care services and removing barriers to health in the general population;<sup>33,34</sup> however, more needs to be known about the effectiveness of peer-based interventions in prison settings. Given the place of peer schemes in current practice,<sup>25,32</sup> it is important to develop a robust evidence base to inform service commissioning and delivery options.<sup>21</sup> There is an international literature on prison-based peer education and peer support, particularly in the area of the prevention of human immunodeficiency virus (HIV) transmission,<sup>24</sup> but to date there has been no systematic review examining the effectiveness of different types of peer interventions, including those models seen in UK practice. A literature review by Devilly and colleagues<sup>24</sup> on prison-based peer education schemes noted the dearth of evidence demonstrating effectiveness but also the positive impacts reported by some studies. A recent systematic review of peer health promotion<sup>35</sup> concluded that peer education could have a positive impact on attitudes, knowledge and behaviours around sexual health and the prevention of HIV transmission but that there was a lack of research around other health issues. There is literature on peer support in relation to suicide prevention and self-harm,<sup>22,26</sup> which points to the benefits of offering emotional support through peers, including reported decreases in the prevalence of prison suicide.<sup>36,37</sup> To date, research on peer support, which is the primary approach in UK prisons,<sup>25,32</sup> has not been the subject of a review.

Any assessment of effectiveness needs to account for evidence which suggests that participation can result in psychosocial benefits for prison peer deliverers, for example an increased sense of worth<sup>38</sup> or successful reintegration into the community.<sup>39</sup> Some research indicates that peer-based interventions result in a healthier and more supportive prison environment,<sup>22</sup> but negative as well as positive organisational impacts have been reported.<sup>36,40</sup>

Devilly and colleagues<sup>24</sup> suggest that peer-based interventions might be more cost-effective than professionally delivered ones. The cost-effectiveness of peer interventions promoting behavioural change has been assessed in a variety of settings and populations using a range of economic methods, with mixed results,<sup>41-43</sup> but to date there has been no review of the cost-effectiveness of peer interventions in prison settings. There is some evidence of the cost-effectiveness of peer interventions in the criminal justice



system from an American study<sup>44</sup> that evaluated the benefits of a hospital-based peer intervention programme for violently injured youths.

In summary, this study addresses a knowledge gap in synthesising evidence on a range of peer-based interventions in prison settings and their impacts at individual and organisational levels. The results will contribute to the development of an evidence base to support the application of service user involvement in prison health services.<sup>35</sup>

## Study aims and review questions

The aims of the study were to conduct an evidence synthesis on peer-based interventions in prison settings, including YOIs, and to provide research-based information on types of intervention, outcomes, costs and benefits to aid decision-making within the prison health service. The study sought to examine the outcomes for both the target population (recipients) and the individuals who deliver the intervention (peer deliverers). The main research question was 'What is the effectiveness and cost-effectiveness of peer-based interventions to maintain and improve health in prisons and YOIs?'

Specific questions framing the review were as follows:

- *Review question 1* – what are the effects of peer-based interventions on prisoner health and the determinants of prisoner health?
- *Review question 2* – what are the positive and negative impacts on health services within prison settings of delivering peer-based interventions?
- *Review question 3* – how do the effects of peer-based approaches compare with those of professionally led approaches?
- *Review question 4* – what are the costs and cost-effectiveness of peer-based interventions in prison settings?

The scope of the study was defined using the PICOS (population, intervention, comparator, outcomes, study design) framework (see *Chapter 3* for further details of inclusion and exclusion criteria):

- *Population* – prisoners resident in prisons and YOIs in any country, all ages (although in the UK only those aged  $\geq 15$  years would be in a YOI, younger age limits may apply to equivalent institutions in other countries and therefore we did not specify age as an inclusion criteria), male and female. For review question 1, the population was limited to those taking part in peer-based interventions, whether peer deliverers or programme recipients. For other questions, studies involving the whole prison population, including staff, were eligible for inclusion.
- *Intervention* – any peer-based intervention, including peer education, peer support, peer mentoring, befriending, peer counselling and self-help groups, operating within prisons and YOIs in any country. 'Peer' includes prisoners and ex-prisoners delivering interventions to prisoners.
- *Comparator* – for review question 3, studies comparing peer-led and professionally led approaches to the same health or social problem. For all other questions, studies with any or no comparator (or usual care).
- *Outcomes* – for review question 1, studies reporting any effects of peer-based interventions on prisoner health or determinants of health within the prison setting, for example social support. For the other review questions, studies reporting organisational/process outcomes and views of prison populations were also eligible.
- *Study design* – quantitative, qualitative and mixed-methods evaluations, with and without comparator groups.

There were two elements to the review (see *Chapter 3* for details of the review methods): (1) a systematic review of the effectiveness of peer-based interventions, reported in *Chapters 4–7* and (2) a systematic review of the cost-effectiveness of peer-based interventions, reported in *Chapter 8*. The economic analysis also included the development of an economic model, which is reported in *Chapter 9*. Additional elements in the study design were an expert symposium to gather expert opinion on peer approaches within the prison system in England and Wales and listening exercises with serving prisoners as part of patient and public involvement. The symposium was designed to supplement the systematic reviews, including identifying additional grey literature, and to provide contextual information on the application of peer-based approaches within prison environments. Details of the symposium methods and findings can be found in *Chapter 10*. The overall study design is represented in a flow chart that can be found in *Appendix 1*.

## Public involvement and governance

A multidisciplinary research partnership, with strong links to prison establishments and prison health services, has overseen the design and implementation of the study (see [www.leedsmet.ac.uk/pips](http://www.leedsmet.ac.uk/pips)). Patient and public involvement has been an integral part of the study. The expert symposium provided an opportunity for dialogue with those with first-hand experience of peer-based interventions. Ex-offenders and representatives from third-sector organisations working with offenders participated in the expert symposium as lay experts; however, it was not possible to invite prisoners because of the challenges of managing the process at a public meeting.

A series of listening exercises were later undertaken with serving prisoners and also ex-prisoners working as volunteers as part of patient and public involvement in the study. The purpose of the listening exercises was to discuss the practical application of the results of the review with those with experience of working as peer support workers or prisoner representatives. Further details of the approach and key issues raised can be found in *Chapter 11*.

The study received approval from the National Offender Management Service (NOMS) National Research Committee (ref.: 165–11) and the research team agreed to conduct the study, including listening exercises, in compliance with the terms and conditions set out by the National Research Committee. The study did not require ethical approval through the National Research Ethics Service. Study documentation, including the conduct of the listening exercises with prisoners, was reviewed through the Faculty of Health and Social Sciences Research Ethics Committee, Leeds Metropolitan University.

## Chapter 2 Conceptual framework

The conceptual framework for the study built on understandings of the determinants of offender health and the nature of peer interventions as mechanisms for change. Peer interventions, like many public health interventions, can be described as complex interventions in which there are inter-related components and multiple factors are likely to have an influence.<sup>45,46</sup> This chapter briefly outlines the conceptual framework and the components of the preliminary logic model that was developed to illustrate the associations between peer methods and potential health outcomes for individuals and health services.

### Determinants of offender health

The concept of 'prison health' has traditionally been aligned to a biomedical perspective,<sup>47,48</sup> in which health is viewed in terms of pathology, disease, diagnosis and treatment.<sup>49</sup> This perspective has been critiqued as failing to exploit public health opportunities.<sup>50</sup> Recently, a social model of offender health has emerged, in which ill health and health inequalities in the prisoner population are seen as largely explained by social conditions, both within the prison environment and more critically across a life course. De Viggiani<sup>51</sup> has argued that both deprivation and importation factors are significant health determinants within prisons, with deprivation describing factors caused by imprisonment that contribute to ill health and importation describing those factors which are a result of circumstances that predate a custodial sentence. Additionally, the social model of health encompasses lay perspectives about health, taking into account subjective experience and understandings.<sup>52</sup> For example, factors such as social relationships have been found to be intimately intertwined with prisoners' ideas around being healthy.<sup>53</sup>

Determinants of offender health can be considered in relation to the main health issues:

- *Mental health, suicide and self-harm* – Mental health problems among the prison population are more prevalent than mental health problems among the general population.<sup>9,10</sup> The World Health Organization's Trenčín statement on prisons and mental health<sup>54</sup> suggests that there are a number of factors at work, including prisoners presenting with mental health issues before entering prison; prison environments being detrimental to mental health; and prisons too often becoming the place to hold individuals who have a wide range of mental and emotional disorders. The experience of incarceration, particularly in the early days, and stressors within the prison environment can impact on prisoners with or without underlying mental health problems, leading to a high incidence of suicide and self-harm.<sup>26,55</sup>
- *Physical health* – In terms of importation, a significant proportion of sentenced and newly sentenced male prisoners enter prison with long-standing physical disorders or disabilities.<sup>14,56,57</sup> Plugge and colleagues,<sup>58</sup> in their study conducted in two female remand prisons, also found poor levels of physical functioning and demonstrated that the physical health status of the women was significantly worse than that of women in the lowest social class in the wider community. On entering prison, over half of the sample were either overweight or obese or underweight.<sup>59</sup>
- *Substance misuse* – The majority of those entering prison have a background of drug and alcohol misuse.<sup>3</sup> For example, in some inner-city local prisons, it has been suggested that 80% of men have a class A drug in their system on reception.<sup>60</sup> Those addicted to opiates and those who inject drugs are over-represented in the prison population<sup>61,62</sup> and research indicates that a high proportion of prisoners are dependent on tobacco and alcohol.<sup>12,57,63,64</sup>

In addition to individual health behaviours, multifaceted social issues face the prison population, which in turn impact on health.<sup>14,65</sup> Many of those entering the criminal justice system have experienced a lifetime of social exclusion, including a poor educational background, low income, meagre employment opportunities, lack of engagement with normal societal structures, low self-esteem and impermanence in terms of accommodation (including bouts of homelessness) and relationships with family members.<sup>3,8,18,60,66</sup> The impact of imprisonment can exacerbate social problems; it is reported that one-third of prisoners lose

their home whilst in prison, over one-fifth face financial problems and over two-fifths lose contact with their family.<sup>3,67</sup> There are factors affecting functional health literacy,<sup>7</sup> for example research conducted at HMP Cardiff reported that 54% of male prisoners had left school before they were aged 16 years and 38% had no recognised qualifications.<sup>57</sup> In summary, multiple factors negatively affect prison health across the life course and, although physical access to health care may be improved in prison, there remain psychosocial and environmental factors that may prevent prisoners from achieving good health.

## The prison as a setting for health

The core business of prisons is not health improvement, but increasingly it is recognised that the prison setting represents an opportunity to address the health of some of the most socially excluded groups. For example, for many prisoners a period of imprisonment is often the first time that they consider their health needs or contemplate accessing support.<sup>68</sup> During imprisonment prisoners are heavy consumers of health-care services, despite being a group who typically makes very little use of equivalent provision in the general community.<sup>17</sup> A plethora of interventions to enable individuals in prison to take control over their health whilst serving their sentence and to encourage safer post-release behaviours has been deployed globally. These interventions range from screening services<sup>69</sup> and health promotion or 'wellness' programmes<sup>70,71</sup> to health education interventions<sup>72</sup> and changes to policy and environmental conditions within the prison that enable healthy choices to be made.<sup>73</sup> Notwithstanding these efforts there have been challenges in assessing the effectiveness of health interventions in the prison context, with many programmes failing to present convincing data on actual improvements in the health status of prisoners.<sup>73</sup> The effects of longer-term changes in the health behaviour of prisoners therefore remain unclear and further research is required to establish whether or not these changes are sustainable and durable during post-release periods.

The importance of the prison as a setting for health promotion (for both prisoners and staff) has been reflected in UK government policy over the past decade<sup>2,16,18,19</sup> and is recognised in international statements from the World Health Organization.<sup>62,74-76</sup> Prisoners are a mobile population, with the majority of prisoners serving short-term sentences, so there are opportunities for health effects to go beyond the prison<sup>16,19</sup> and to have positive impacts on the health of family members.<sup>77-80</sup> Indeed, research does show that prison can act as a 'stabilising and restorative force' (p. 388)<sup>81</sup> for certain individuals. Prison can allow prisoners to reclaim control over their health and life circumstances<sup>68</sup> and moreover evidence suggests that improvements can be seen in prisoners' mental well-being during a period of imprisonment (albeit remaining higher than in comparable groups in the general population).<sup>82</sup>

Conversely, the experience of incarceration is harmful to health and deprivations can collectively threaten a prisoner's personality and sense of personal worth.<sup>83</sup> Research shows how cell confinement has a deleterious effect on health, particularly for those with pre-existing mental health issues.<sup>84</sup> Prison overcrowding has implications for the transmission of communicable diseases and may potentially limit prisoners' access to services and support because of low staff-prisoner ratios. Evidence suggests that bullying,<sup>85,86</sup> violence,<sup>87,88</sup> homophobia<sup>89,90</sup> and racism<sup>91-93</sup> still occur in modern prison systems.

## Peer-based interventions

Peer-based interventions involve the provision of education, support or counselling between individuals who are of equal social status or who share similar characteristics or who have common experiences.<sup>94,95</sup> Peer interventions are considered to work on the principle of homophily, which suggests that contacts will be more frequent,<sup>96</sup> communication will be of better quality<sup>95</sup> and relationships will have more meaning<sup>97</sup> between people who share attributes or specific experiences. Lay or peer educators typically bring culturally specific knowledge and access to social networks and this can help with reaching marginalised groups<sup>98</sup> and heightening social influence.<sup>99</sup> These justifications are applicable in prisons where, despite

good functional access to health care, health and social inequalities persist<sup>27,100</sup> and resistance to professional support may be present.<sup>101</sup>

Peer-based interventions can be considered complex interventions as there are typically a number of inter-related components both in relation to the preparation, training and supervision of peer workers and in relation to their subsequent role and interactions with the target population. This study used an initial categorisation based on the results of a systematic scoping review on lay public health roles, conducted by South and colleagues:<sup>97</sup> peer education, peer support, popular opinion leaders and bridging models. It should be noted that some interventions involve peer workers delivering additional formal educational or behaviour change components; others are based on the peer role as the intervention, for example the direct peer support involved in befriending, or being a role model. Dennis's<sup>94</sup> concept analysis of peer support in health-care contexts maps the different facets of peer support, which all involve emotional, informational and appraisal support. Dennis argues that the effects of peer support can occur at different levels:

- direct effects – such as enhancing social relationships, facilitating access to health resources and reducing isolation
- buffering effects – protecting individuals from stressful events or promoting coping skills
- mediating effect – modifying self-efficacy through positive encouragement and providing role models.

## Initial study logic model and outcomes framework

Given the diversity of health issues in the prison setting and the variation in peer interventions, the review has needed to capture the range of potential outcomes and, when possible, the links between changes in personal, social and environmental factors, intermediate health outcomes, such as health behaviours, and longer-term health and social outcomes.<sup>102</sup> As well as interventions aiming for health behaviour change, those promoting mental well-being and resilience may consider a broad range of mental health outcomes.<sup>103</sup> Harm reduction approaches focus on preventing or reducing negative effects of individual behaviours and/or the experience of imprisonment.<sup>104,105</sup> Interventions that have adopted a harm-reduction philosophy use a range of health outcome measures including changes in attitudes and beliefs, behavioural intentions, greater uptake of screening services and reductions in risk behaviour.<sup>104–106</sup>

A preliminary logic model (*Figure 1*) was developed to make explicit the links between determinants of prison health, the focus on the prison as a setting for health, the types of peer models and the potential range of outcomes for individuals and for health services.<sup>45</sup> This study then examined whether or not different types of peer interventions, through the mechanisms of therapeutic alliances and modifying barriers to health care, resulted in positive health outcomes and what the wider impacts were in the prison system.

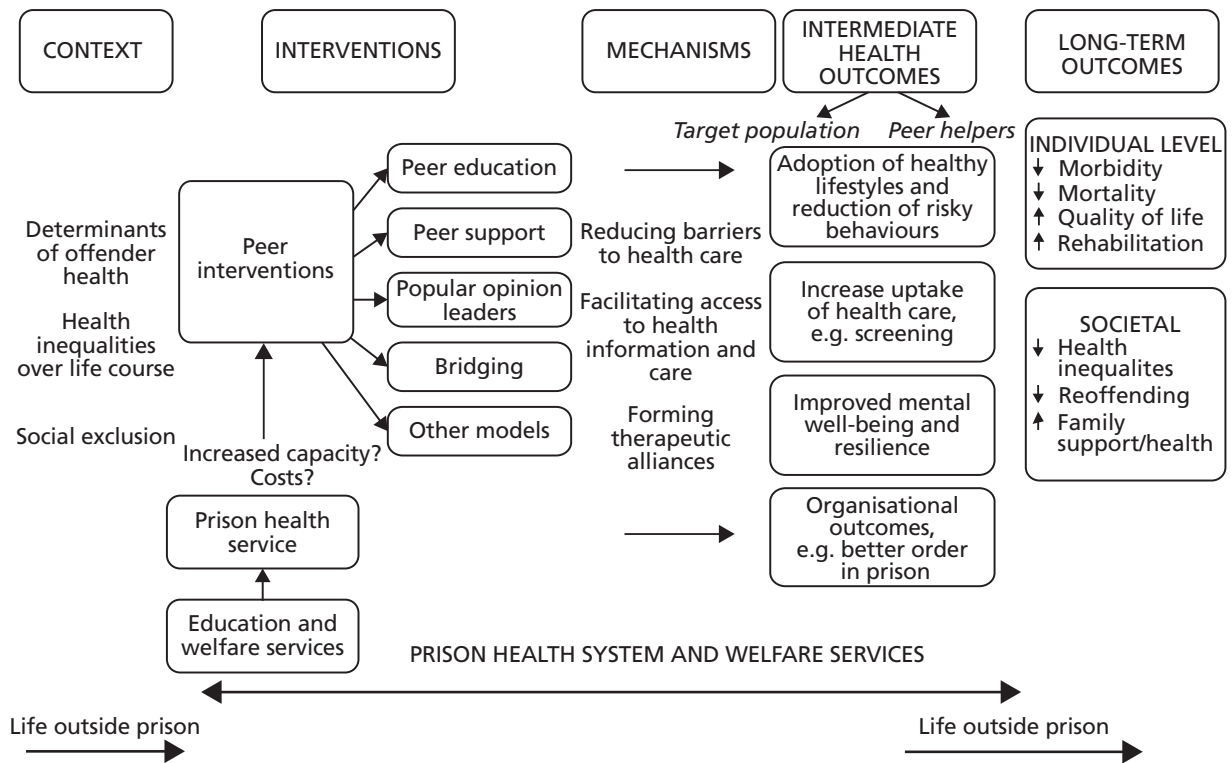


FIGURE 1 Preliminary logic model for the peers in prison settings study.

## Chapter 3 Review methods

### Study design: overview

The systematic review included quantitative, qualitative, cost-effectiveness and mixed-methods studies. The design uses standard systematic review methodology to appraise evidence on effectiveness and cost-effectiveness<sup>107–109</sup> with input from experts in the field in the form of steering and advisory groups and an expert symposium (see *Chapter 10*). There are two elements to the review:

- a systematic review of the effectiveness of peer-based interventions – findings reported in *Chapters 5–7*
- a systematic review of the cost-effectiveness of peer-based interventions – findings reported in *Chapter 8*.

A full study protocol was developed and peer-reviewed by the study steering and advisory groups prior to publication in the PROSPERO database (reference no. CRD42012002349).

### Review questions

1. What are the effects of peer-based interventions on prisoner health and the determinants of prisoner health?
2. What are the positive and negative impacts on health services within prison settings of delivering peer-based interventions?
3. How do the effects of peer-based approaches compare with those of professionally led approaches?
4. What are the costs and cost effectiveness of peer-based interventions in prison settings?

For question 1 we anticipated using mainly quantitative evidence of effects but if there was also qualitative evidence of effects (e.g. interviews with prisoners about knowledge, attitudes and behaviour) available this has also been included. Qualitative evidence on effect modifiers (e.g. appropriateness, acceptability, access) has been included for question 1 and question 3 as appropriate.

For question 2 we anticipated using mainly qualitative evidence, such as interviews with prison staff about organisational issues and with others about recruitment or training and barriers and facilitating factors, as well as process evaluations and any quantitative evidence that reports outcomes for health services (rather than for prisoners).

For question 3 we anticipated using mainly quantitative comparative evaluations of peer compared with professional approaches, but also included qualitative evidence of effects on, for example, knowledge, attitudes and behaviours and on effect modifiers (e.g. appropriateness, acceptability, access) if appropriate.

The methods used for the systematic review of effectiveness (review questions 1, 2 and 3) are described in the following section. The methods used for the cost-effectiveness review are described in *Cost-effectiveness review methods*.

## Systematic review of effectiveness methods

### Search strategy and information sources

For the systematic review of effectiveness the following databases were searched: MEDLINE, PsycINFO, Cumulative Index to Nursing and Allied Health Literature (CINAHL), EMBASE, International Bibliography of the Social Sciences (IBSS), Applied Social Sciences Index and Abstracts (ASSIA), Web of Science, Social Sciences Citation Index, National Criminal Justice Reference Service Abstracts, Social Services Abstracts, Sociological Abstracts, Database of Abstracts of Reviews of Effects, Trials Register of Promoting Health Interventions (TRoPHI), Database of Promoting Health Effectiveness Reviews (DoPHER), Social Care Online, Academic Search Complete and The Cochrane and Campbell Collaboration databases.

Search terms drew on the results of an earlier systematic scoping review<sup>97</sup> with further search terms identified in consultation with the project steering group. *Appendix 2* provides the search strategies and results.

The search was limited to papers published since 1985 and was not restricted to English-language papers. Listener schemes were implemented in the early 1990s and so a cut-off date of 1985 was chosen to capture any preliminary studies, for example pilot schemes. Electronic contents lists of key journals (*Journal of Correctional Health Care, Health Education & Behavior, Criminal Justice and Behavior*) were searched.<sup>110</sup>

Unpublished (grey) literature was identified from contacts with experts, including at the expert symposium, conference and dissertation abstracts, reference lists of identified and key papers, hand searches of relevant book chapters and searches of websites such as Google Scholar and Google and websites of relevant organisations (e.g. the Home Office). Contact was made with national and international experts including Offender Health Research Networks, Prison and Offender Research in Social Care and Health, the Samaritans (Listener scheme), Volunteering England, NOMS, primary care trusts (health trainers), the Ministry of Justice, the Prison Officers' Association (POA), Action for Prisoners' Families, CLINKS, the Prison Governors Association, the Shannon Trust, HM Inspectorate of Prisons, the Prisons and Probation Ombudsman, the National Network of Forensic Nurses and private sector prison organisations, for example Serco, Kalyx, the Prison Reform Trust and the Howard League for Penal Reform.

Practitioners and academics with expertise were contacted through appropriate academic and practice mailing lists (public-health@jiscmail, health-services-research@jiscmail, health-promotion-academics@jiscmail and health-equity-network@jiscmail).

A hand search of the reference lists of included papers was performed.

To keep to the project time plan, there was a cut-off date for submission of the end of August 2012, after which any research arriving was not included in the review. If necessary, study authors were contacted for additional or missing information.

### Study selection

#### Inclusion/exclusion criteria

- *Population* – Studies of prisoners resident in prisons and YOIs in any country, all ages, male and female, were eligible for inclusion in the review. For review question 1, participants were limited to those taking part in peer-based interventions, whether peer helpers or programme recipients. For other objectives studies involving the whole prison population, including staff, were eligible for inclusion.
- *Intervention* – Studies of peer-based interventions, including peer education, peer support, peer mentoring, popular opinion leaders, befriending, peer counselling and self-help groups, operating within prisons and YOIs in any country were eligible for inclusion in the review. Interventions were aimed at improving or maintaining prisoner physical or mental health and well-being either directly



(e.g. HIV awareness, Listener schemes) or indirectly by addressing determinants of health within prison settings (e.g. basic literacy and life skills). Multicomponent interventions that include a peer-to-peer element were included, although post hoc decisions were made to exclude studies of group therapies and therapeutic communities (TCs) unless a peer-to-peer intervention was mentioned in the abstract. 'Peer' includes prisoners and ex-prisoners delivering interventions to prisoners.

- *Comparators* – For review question 3, studies that compared peer-led and professionally led approaches to the same health or social problem were eligible for inclusion. For all other objectives, studies with any or no comparator interventions (or usual care) were eligible for inclusion.
- *Outcomes* – For review question 1, studies reporting any effects of peer-based interventions on prisoner health or determinants of health were eligible for inclusion, for example changes in physical or mental health or health behaviours, or determinants of health within the prison setting, such as social support, (literacy) skills, education or service delivery. Qualitative studies that reported organisational outcomes or views or perceptions of peer interventions, and process evaluations that reported on the implementation of peer evaluations were also eligible for inclusion for review questions 2, 3 and 4. Studies that reported only reoffending or other non-health outcomes were not included.
- *Study design* – Quantitative, qualitative and mixed-methods evaluations, with and without comparator groups, were eligible for inclusion in the review. For review question 3, a comparator group design was required. Included literature was limited to reports of evaluations; opinion pieces or raw data were excluded. Cross-sectional surveys were excluded unless there was no other evidence to answer a review question. Published and unpublished reports were eligible for inclusion.

### Study selection process

Titles and abstracts from the literature search were transferred to reference management software [EndNote X4 (Thomson Reuters, CA, USA)] and deduplicated. Two reviewers screened each title and abstract and selected studies that potentially met the eligibility criteria. These papers were obtained in full and two reviewers screened the full papers for inclusion, with any disagreements resolved by consensus with reference to the full papers and a third reviewer if necessary.

### Data extraction

Data were extracted onto a piloted electronic form (see *Appendix 3*). The data extraction form was piloted by four reviewers (AMB, JW, GR, KK) who independently extracted data from the same two studies (one qualitative and one quantitative) and met to compare results, which led to some changes in the form to ensure consistency. All studies were categorised according to the type(s) of data they contained and which review question(s) they addressed. Data extraction fields included:

- bibliographic details
- population details, for example age, sex, length of sentence/length of stay, stage (e.g. just arrived/about to leave), existing health problems (whether reported for peer helpers, programme recipients or both), whether on remand or sentenced, other details such as sex offenders or taking drugs
- setting/institution details, for example high-security/open prison, YOI, country
- intervention details, for example health or social issue, method of delivery, intervention components, theoretical model if given, number/length of contacts, definition of peer if given, definition of programme recipient if given, details of training and provider of training (e.g. NHS, the Samaritans), recruitment (methods and criteria), support given and level of supervision (and who supports/supervises), rewards
- outcomes – all reported health-related outcomes, including negative outcomes, experienced by peer deliverers, programme recipients and prison staff.

Detailed extraction of qualitative data took place in NVivo 9 software (QSR International, Southport, UK), using text conversion of PDF files to import the whole paper. Coding was then applied to methodological and other potential sources of variation (such as population, intervention and settings), as well as results, to allow data to be assembled in the most appropriate way. Data were extracted by one reviewer and checked by a second reviewer, with disagreements resolved by consensus, with reference to the original

papers and to a third reviewer and/or other experts as required. The data extraction tables were used to create evidence tables for each included study (see *Appendix 4*).

### **Validity assessment/risk of bias**

Appropriate validity assessment criteria were developed for each included study design. Checklists were updated based on National Institute for Health and Care Excellence (NICE) public health methods guidance for quantitative studies<sup>109</sup> and Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) expertise for qualitative reviews<sup>111</sup> (see *Appendix 5*). Unpublished data from grey literature were assessed using the same criteria as for published data.

Two reviewers assessed each study for validity on piloted forms using pre-agreed criteria. Validity assessment forms were piloted in the same way as the data extraction forms. Disagreements were resolved by consensus with reference to the original papers and a third reviewer if necessary. The decision-making process was recorded in a Microsoft Excel spreadsheet (version 14; Microsoft Corporation, Redmond, WA, USA), which was updated by all reviewers throughout the review process.

Each validity assessment form required the reviewer to make an overall assessment of internal validity and relevance, based on answers to the questions on the form. These were translated into a numerical score of 1–3 for internal validity (where 1 = good internal validity/low risk of bias, 2 = moderate internal validity/moderate risk of bias and 3 = poor internal validity/high risk of bias) combined with an alphabetical score of a–c for relevance (where a = highly relevant, b = of some relevance and c = not very relevant).

### **Quantitative analysis and synthesis**

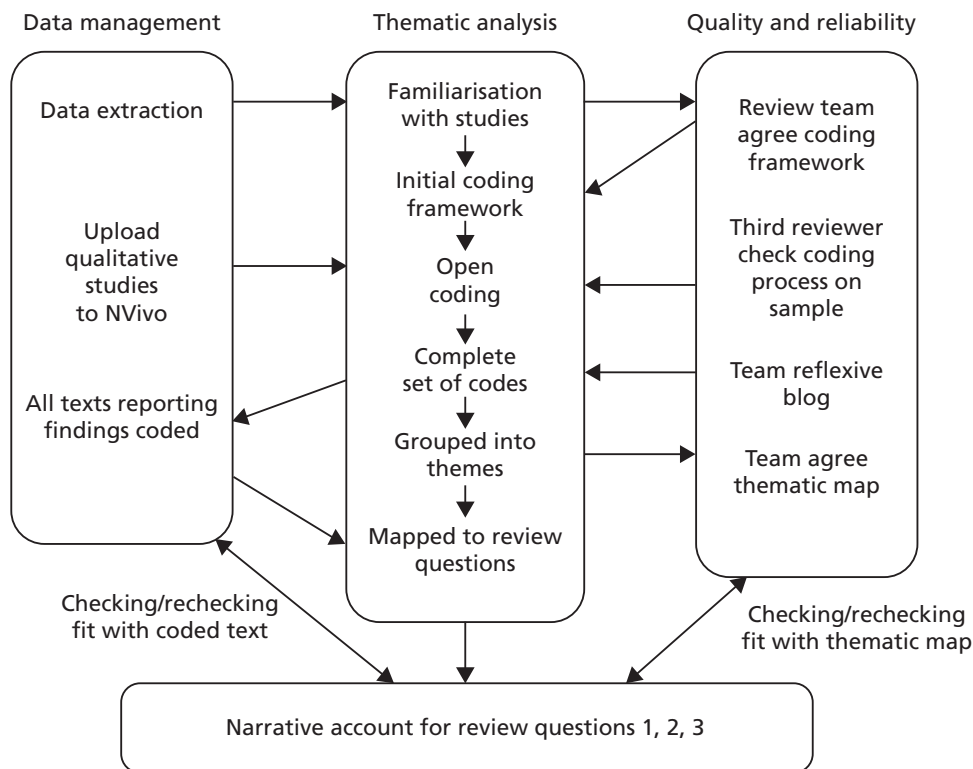
Detailed extraction of quantitative data took place into Microsoft Word tables and meta-analysis software (RevMan 5.0, The Cochrane Collaboration, The Nordic Cochrane Centre, Copenhagen, Denmark).

Synthesis of quantitative data was carried out by two reviewers (AMB and GR) and, after discussion with the advisory and steering groups, findings were presented combined in a narrative synthesis, grouped by review question and then by intervention mode. When data were suitable for statistical meta-analysis, studies were combined using a fixed-effect model to give relative risks with 95% confidence intervals (CIs) for binary outcomes and weighted or standardised mean differences (MDs) with 95% CIs for continuous outcomes. Statistical heterogeneity was examined using the chi-squared and  $I^2$  statistics, with a chi-squared  $p$ -value of  $> 0.1$  and a  $I^2$  value of  $> 50\%$  indicating statistical heterogeneity, in which case reasons for the heterogeneity would be investigated and a random-effects model would be used to determine whether or not the findings were robust to the choice of model.

When pooling was not appropriate because of clinical heterogeneity, it was still possible to display some quantitative results in forest plots to illustrate the spread of data.

### **Qualitative analysis and synthesis**

A thematic synthesis of qualitative studies was undertaken to combine the evidence, based on the methods described by Thomas and Harden<sup>112</sup> and using NVivo software to manage the data and ensure a transparent process. *Figure 2* provides an overview of the data management, analysis and quality processes. All studies reporting qualitative data were first uploaded into NVivo as PDF files. An inductive approach was used to produce a complete set of descriptive codes (managed as NVivo nodes) that summarised the themes in the data. The initial coding framework was developed from a process of familiarisation with the studies and piloting of qualitative data analysis methods with a sample of papers, each reviewed by four members of the review team (JW, KK, AMB, JS). Two reviewers (JW, KK) then worked independently to undertake free coding of all of the text reporting qualitative findings, labelling the text with single or multiple nodes for sentences and paragraphs respectively (including verbatim quotations from respondents presented in the studies).<sup>112</sup> The coding framework was expanded as open coding of the text allowed new codes to be added until a complete set of descriptive codes was generated that covered all of the textual data.



**FIGURE 2** Process of qualitative analysis and synthesis.

To ensure consistency of interpretation, the two reviewers (JW, KK) met to review codes on a number of occasions and to check coded text in a sample of papers as the coding framework was built. A third reviewer (JS) checked the inter-rater reliability of the coding process and the development of the final set of codes. This checking process involved first reading the full papers/reports of a sample of qualitative studies and making notes of themes. The sample, representing at least 25% of the qualitative studies ( $n = 10$  studies/11 papers), was selected to reflect variation in terms of type of publication, methods, intervention type and primary reviewer. The reviewer then checked codes as displayed on NVivo for a sample of studies to ensure consistency both of the coding process between reviewers and of interpretations between studies. During this stage a reflexive team e-mail journal was used and frequent meetings of the review team were held to agree the application of codes.

To develop analytical themes,<sup>112</sup> the complete set of descriptive codes ( $n = 99$ ) was organised into a set of themes and then grouped into thematic categories using an iterative process to obtain the best fit to explain the data. Themes were then mapped back to the review questions<sup>113</sup> (see *Appendix 6*). For review question 1 on effectiveness, themes on outcomes were further split into subcategories according to intervention mode and a narrative synthesis produced. For review questions 2 and 3, a thematic narrative synthesis was written by one reviewer (JW), checking back to the coded text to avoid decontextualising the data. The authenticity of the final account was agreed by the other two reviewers (KK, JS).<sup>114</sup>

### **Evidence synthesis of the results**

A mixed-methods systematic review design similar to that used by the EPPI-Centre<sup>112</sup> was used to combine data from different study designs. Evidence was initially synthesised by study type into two streams: quantitative and qualitative (for studies that use mixed methods, qualitative and quantitative data were extracted and treated separately in the relevant streams).

For review question 1, studies were grouped according to intervention mode to produce evidence statements summarising the effectiveness of interventions. Intervention modes were derived by checking the information recorded on data extraction sheets, which gave an initial categorisation of the intervention

and any theoretical models as reported by the study. An intervention typology, developed as part of the review process (see following section), was then applied to categorise all of the included studies until a best fit with the reported intervention mode was achieved.

For review questions 1 and 3, qualitative themes on outcomes for peer deliverers and recipients were mapped to quantitative results grouped by intervention mode and then type of outcome.<sup>115</sup>

For review question 2, a thematic synthesis was produced that combined results across heterogeneous studies.<sup>116</sup> The narrative account of the qualitative results was pooled with quantitative results using the themes generated inductively by qualitative analysis as a framework for reporting.

Because of the lack of detail provided in the included studies, it was not possible to look at the modifying effects of type of institution, prisoner pathway or gender.

### ***Development of a typology of peer-based interventions***

The typology of peer-based interventions, which was used to group interventions for the evidence synthesis, was developed as a heuristic tool because there was no existing categorisation that could be used to group very heterogeneous studies. Preliminary definitions of the types of intervention mode (e.g. peer education, health trainers) were developed by one reviewer (JS) using key background papers and theoretical literature matched to any definitions and ‘thick description’ of interventions when these were available in the included studies (as indicated from data extraction sheets). The final typology was derived by an iterative process of comparing definitions with reported intervention modes in the included studies until the best fit was obtained. Both the final typology and the categorisation of included studies was agreed by all members of the review team (see *Chapter 4*). The full definitions of interventions used for the evidence synthesis, with sources referenced, can be found in *Appendix 7*.

## **Cost-effectiveness review methods**

The aim of this part of the study was to review the evidence on cost and cost-effectiveness of peer-based interventions to improve and maintain health in prisons and YOIs. There were two components to the economic analysis, namely the systematic review of economic evaluations of peer-based interventions in prison settings and the development of an economic model, which was to be based on findings from the effectiveness and cost-effectiveness reviews. The systematic review to identify and assess the evidence on cost and cost-effectiveness is reported in *Chapter 8*. A further review is undertaken in *Chapter 9* to identify and assess any existing model structures to inform the development of an economic model of a peer-based intervention in prison and to potentially provide parameter estimates for that model (see *Chapter 9* for a description of the methods and findings).

### ***Search strategy***

All databases were searched using an adaptation of the economics search filters developed by the NHS Centre for Reviews and Dissemination combined with the search terms used in the effectiveness literature search strategy. The overall search strategy drew on work on retrieving cost information previously conducted at the NHS Centre for Reviews and Dissemination<sup>107</sup> and used the terms ‘cost benefit’, ‘cost effectiveness’, ‘cost utility’, ‘cost consequences’, ‘cost minimisation’, ‘economic evaluation’, ‘quality of life’, ‘utility’, ‘incremental cost effectiveness analysis’, ‘incremental cost effectiveness ratio’, ‘net present value’ and ‘incremental net benefit’ combined with the search terms used in the clinical literature search strategy. Sensitive searching [e.g. economics (ec) as a floating subheading] was used. Mirroring the effectiveness review, terms were developed with input from experts in the field.

In April and May 2012 a search was conducted in the following databases for studies of peer interventions in prisons that included economic evaluations, health utilities or other cost information: ASSIA, The Campbell Collaboration Library, Cost-effectiveness Analysis Registry, CINAHL, Conference Papers

Index, Dissertations & Theses, EMBASE Classic, EMBASE, Research Papers in Economics (RePEc) (IDEAS), IBSS, MEDLINE, MEDLINE In-Process & Other Non-Indexed Citations, National Criminal Justice Reference Service Abstracts, NHS Economic Evaluation Database (NHS EED), PsycINFO, Social Services Abstracts, Sociological Abstracts, Science Citation Index Expanded, Social Sciences Citation Index Expanded, Conference Proceedings Citation Index– Science, Conference Proceedings Citation Index – Social Science & Humanities. Full details of database hosts and database search dates are available in *Appendix 8*. The searches identified 1347 references, which were reduced to 1157 following deduplication.

Databases were selected that were likely to contain economic evaluations and cost and health utility studies, along with a range of health and social databases that include prison- and young offender-based studies. Grey (unpublished) literature was sought from conference, dissertation and working paper databases. The selection of databases was consistent with and complementary to those used for the effectiveness review searches. The search strategies were devised in collaboration with the effectiveness review information specialist. The searches were constructed around three concepts: prisoners, peer interventions and cost/health utility studies. The effectiveness review project team supplied potential search terms for 'peer interventions for prisoners'. A draft MEDLINE search strategy for the effectiveness review was checked by project team members and the search modified accordingly. The strategies comprised both text word searches and subject heading searches. For pragmatic reasons proximity operators (adjacency) were used between prison and peer intervention text word searches to improve the search precision. Some databases had the subject heading 'peer intervention' but it was discovered that this did not appear in some known relevant references. Therefore, a number of subject headings (e.g. 'focus groups', 'social support') were included in our search to retrieve references with relevant peer intervention content but without the 'peer intervention' subject heading. Searches were not limited by language or publication date.

The final MEDLINE 'peer interventions for prisoners' search was translated as closely as possible to all other databases. The cost search for most databases consisted of the 'peer interventions for prisoners' search plus a search for cost or health utility studies. We used previously designed searches to identify cost and health utility studies, which were adaptations of the NHS EED search strategies [see <https://sites.google.com/a/york.ac.uk/issg-search-filters-resource/filters-to-find-i> (accessed June 2014)]. Searches of economic databases were developed separately from but consistently with the effectiveness review searches. Full details of all search strategies are provided in *Appendix 8*.

Bibliographies of articles selected for inclusion were hand searched for relevant studies, and the wider research group was also contacted for advice, for peer review and to identify additional published and unpublished references. Any additional papers were subjected to the abstract review process before inclusion in or exclusion from the quality assessment process.

### **Study selection**

The cost-effectiveness review inclusion and exclusion criteria were developed in line with those of the effectiveness review. Additionally, the inclusion criteria included papers reporting resource use/cost and/or outcome comparisons between peer-based interventions and standard care. Economic evaluations were therefore considered for inclusion if they reported resource use/cost and/or outcome comparisons or presented a systematic review of either.

Titles and abstracts identified by the search strategy were assessed for possible eligibility by two reviewers independently. The full texts of relevant papers were then obtained and inclusion criteria were again applied by two reviewers independently. Any disagreements over eligibility were resolved by consensus or through consultation with a third reviewer. Data were extracted by both reviewers independently using a data extraction form, which was checked by the third reviewer.

The following data were extracted from the included studies:

- study characteristics – type of economic evaluation, aims and objectives, intervention, comparison, setting, country and/or currency, basis of costing, source of cost data, cost year and discounting
- characteristics of the study population – adult or youth and male or female inmates
- duration of follow-up
- results – summary of effectiveness and costs and cost-effectiveness/utility, sensitivity analysis
- conclusions as reported by the authors.

### **Inclusion criteria**

- *Population*: studies of prisoners resident in prisons and YOIs in any country, all ages, male and female were eligible for inclusion in the review. Studies involving the whole prison population, including staff, were eligible for inclusion.
- *Intervention*: studies of peer-based interventions including peer education, peer support, peer mentoring, popular opinion leaders, befriending, peer counselling and self-help groups, operating within prisons and YOIs in any country, were eligible for inclusion in the review. Interventions aimed at improving or maintaining prisoner physical or mental health and well-being either directly (e.g. HIV awareness, Listener schemes) or indirectly by addressing determinants of health within prison settings (e.g. basic literacy and life skills) were included. Multicomponent interventions that include a peer-to-peer element were included. 'Peer' includes prisoners and ex-prisoners delivering interventions to prisoners.
- *Comparators*: studies with any comparator intervention were eligible for inclusion.
- *Outcomes*: studies reporting any effects of peer-based interventions on prisoner health or determinants were eligible for inclusion, for example changes in physical or mental health or health behaviours or in determinants of health within the prison setting, such as social support, (literacy) skills, education or service delivery. Studies that report only reoffending or other non-health outcomes were not included.
- *Types of studies*: cost-effectiveness analyses, cost–utility analyses, cost–benefit analyses, cost–consequence analyses and cost analysis.
- *Data synthesis*: data were synthesised through a narrative review with tabulation of results of all included studies. Full data extraction forms are presented in *Appendix 9*.

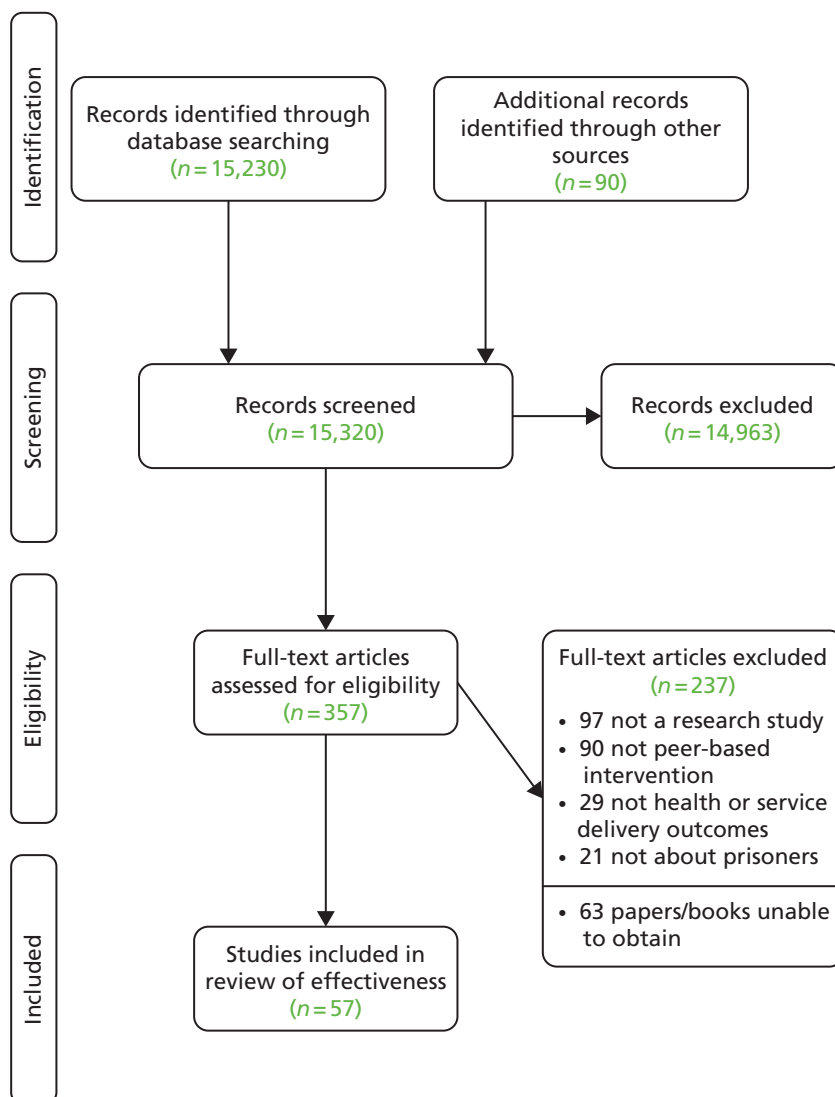
### **Validity assessment**

The included studies were summarised and critically appraised by two reviewers. The quality of each paper was assessed using a modified version of the checklist of Drummond and colleagues.<sup>117</sup> For papers reporting economic evaluations alongside clinical trials, this was supplemented with reference to the good practice guidance produced by the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) Task Force on economic evaluations alongside clinical trials.<sup>118</sup> For papers reporting cost-effectiveness models, the checklist was supplemented with reference to the checklist proposed by Drummond and colleagues<sup>117</sup> and the good practice guidance.<sup>118</sup> The results of the cost-effectiveness review together with the results of the effectiveness review were used to inform the economic model.

## Chapter 4 Findings of the review of effectiveness: overview of studies

### Search results

The literature search identified 15,230 potentially relevant titles and abstracts of which 14,963 were excluded at the first stage of screening, leaving 267 papers that were retrieved for second stage screening. A further 90 papers were identified from other sources, the majority ( $n = 60$ ) being from experts who attended or were invited to attend the expert symposium. In total, 237 papers were subsequently excluded: 97 were not research studies, 90 were not about peer-based interventions, 29 did not include health or service delivery outcomes and 21 were not about prisoners. In addition, we were unable to obtain the reports of 63 studies (Figure 3). For a list of excluded studies see Appendix 10.



**FIGURE 3** Process of study selection for the review of effectiveness.

In total, therefore, 57 studies<sup>23,25-27,31,32,36-38,101,106,119-164</sup> were included in the review of effectiveness (see *Table 4* and *Appendix 11*).

### Description of included studies

Of the 57 included studies, 20 were from the USA<sup>23,27,101,106,119-134</sup> and 20 were from the UK.<sup>25,31,32,37,38,135-149</sup> Other countries represented were Canada,<sup>26,36,150-156</sup> Australia,<sup>157,158</sup> Ireland,<sup>159</sup> the Russian Federation,<sup>160</sup> Israel,<sup>161</sup> South Africa,<sup>162</sup> the Republic of Moldova,<sup>163</sup> and Mozambique<sup>164</sup> (*Table 1*).

Health topics addressed by the included studies are detailed in *Table 2*. Twenty studies looked at the prevention of HIV/acquired immunodeficiency syndrome (AIDS)/hepatitis C or other blood-borne viral infections or sexually transmitted infections (STIs) (these were mostly peer education studies).<sup>23,27,101,106,120,121,123,125,126,128,130,131,134,144,150,158,160,162-164</sup> Twelve studies looked at general health and/or hygiene,<sup>25,32,38,40,119,127,133,136,140,148,149,157,159</sup> eight were about general emotional support,<sup>146,151-156,161</sup> seven looked at the prevention of suicide or self-harm,<sup>22,26,31,36,124,137,138</sup> four looked at issues affecting prisoners on release such as employment or housing,<sup>135,139,141,147</sup> two were about mental health or substance abuse,<sup>122,145</sup> two were about improving educational skills,<sup>142,143</sup> one was about parenting<sup>129</sup> and one was about violence reduction.<sup>132</sup>

In total, 51 studies contained information relevant to review question 1,<sup>23,27,31,32,36,38,101,106,119,121-127,129-162,164</sup> 32 contained information relevant to review question 2<sup>25,26,31,36,38,40,121,127,128,131,133,135-140,143,145-149,151,153-159,163</sup> and 14 contained information relevant to review question 3.<sup>23,25,123,124,126,135,136,138,139,147,151,153,155,156</sup>

Peer education was the most studied intervention mode (21 studies).<sup>23,27,101,106,120,121,123,125,126,128-131,134,143,144,158-160,162,164</sup> Of the other studies 14 were on peer support,<sup>25,26,32,38,140,149-157</sup> two were on peer advisors,<sup>135,139</sup> two were on health trainers,<sup>136,148</sup> two were on peer counselling,<sup>145,161</sup> three studies (four papers) were on prison hospice volunteers,<sup>40,119,127,133</sup> six were on Listener schemes,<sup>31,36,37,137,138,146</sup> four were on peer mentoring,<sup>122,141,142,147</sup> one was on peer outreach,<sup>163</sup> one was on peer observers<sup>124</sup> and one was on peer training<sup>132</sup> (*Table 3*).

A total of 16 studies gave details of the underpinning theoretical model for the intervention<sup>38,101,106,126,130,131,134,150,151,153-156,161-163</sup> but only two defined what was meant by 'peer'.<sup>146,157</sup>

**TABLE 1** Numbers of included studies by country

Country	No. of studies
USA	20
UK	20
Canada	9
Australia	2
Ireland	1
Israel	1
The Republic of Moldova	1
The Russian Federation	1
Mozambique	1
South Africa	1



**TABLE 2** Numbers of included studies by health topic

Health topic	No. of studies
HIV/AIDS/HCV/BBV prevention	20
General health, hygiene	12
Emotional support	8
Suicide/self-harm prevention	7
Employment/housing post release	4
Mental health/substance abuse	2
Improving educational skills	2
Parenting	1
Violence reduction	1

BBV, blood-borne virus; HCV, hepatitis C virus.

**TABLE 3** Numbers of included studies by intervention mode

Intervention mode	No. of studies
Peer education	21
Peer support	14
Listener schemes	6
Peer mentoring	4
Prison hospice volunteers	3
Peer advisors	2
Health trainers	2
Peer counselling	2
Peer outreach	1
Peer observers	1
Peer training	1

In total, 19 studies had a quantitative design,<sup>23,27,101,106,122–124,126,130,132,134,143,144,146,154,160–162,164</sup> 16 had a qualitative design<sup>31,38,119,121,125,128,137–140,142,147,148,150,159,163</sup> and 17 used mixed methods.<sup>25,32,36,120,129,131,133,135,136,149,151–156,158</sup> Three were randomised controlled trials (RCTs).<sup>27,123,126</sup> In five studies the study design was unclear.<sup>26,127,141,145,157</sup>

## Validity of the included studies

Overall, the internal validity of the included studies was quite poor, with only five studies judged to be of good quality.<sup>38,121,136,138,139</sup> Nineteen were of moderate quality<sup>25,31,37,101,106,126–128,131–133,135,137,140,147,148,151,161,162</sup> and 32 were of poor quality.<sup>23,27,32,36,119,120,122–125,129,130,134,141–146,149,150,152–160,163,164</sup> One study gave insufficient details for validity to be assessed.<sup>26</sup> In terms of relevance to the review context, five were judged to be highly relevant,<sup>38,135,136,138,139</sup> with 27 being of some relevance<sup>23,25,31,32,101,106,121,123,124,126–128,131,132,137,146–148,150–152,154–156,158,161,164</sup> and 22 being not very relevant.<sup>27,36,119,120,122,125,129,130,133,134,140–145,153,157,159,160,162,163</sup>

The main issues affecting internal validity were small sample size, lack of comparators and/or lack of adjustment for potential confounding factors, poor reporting of study methodology and poor reporting of

results, which precluded meta-analysis of quantitative studies or meta-ethnography of qualitative studies. This could be due in part to space restrictions in journal articles, as full reports tended to score more highly in validity assessment, but the small number of RCTs or ethnographically rich/thick qualitative studies suggests that there is much room for improvement in the quality of research in this area (see *Appendix 12*).

A summary of the characteristics of the included studies is provided in *Table 4*.

TABLE 4 Description of included studies

Study	Country	Study design	Health topics	Nature of intervention/scheme	Population/setting	Individual outcomes	Service, delivery or organisation outcomes	Validity score <sup>a</sup>
Ashton 2010 <sup>150</sup>	Canada	Qualitative	HIV/AIDS and HCV (and other infectious diseases)	Peer support	Healing Lodge – a small (28-bed) minimum/medium security prison for Aboriginal women, incorporating Aboriginal healing practices, meaningfulness and cultural connection. Most women are serving sentences of ≤ 3 years	Strengths of programme listed; staff perceptions	Not reported	3b
Betts-Symonds 2011 <sup>159</sup>	Ireland	Qualitative	Health, hygiene and cleanliness	Peer education	700 prisoners in Wheatfield Prison, Dublin, Ireland (medium to high security male prison) and their immediate family members	Personal development and changed outlook of the volunteers; results presented under six themes: environment, behaviours, capabilities, beliefs and values, identity and goals	Relationship between operational health services and inmate IRC volunteers	3c
Blanchette 1998 <sup>151</sup>	Canada	Mixed qualitative and quantitative	General emotional/mental health, psychological support and counselling	Peer support	Women resident in one of four small prisons in Canada: Nova Institution, Etablissement Joliette, Grand Valley Institution and Edmonton Institution	Self-esteem; sociometric tests for understanding personal and group dynamics; perceptions of the prison environment (Correctional Environment Status Inventory); staff and prisoners' views, feelings and ideas about the PST (interviews)	Staff and prisoners' awareness and perceptions of the role and functioning of the PST (surveys)	2b
Boothby 2011 <sup>38</sup>	UK	Qualitative	General health/support	Peer support	Male prison in the UK. The scheme supports prisoners who are new to the prison system	Insiders' perceptions of their role and themselves; prisoners' mood; suicide rates	Numbers of prison staff	1a

continued

TABLE 4 Description of included studies (continued)

Study	Country	Study design	Health topics	Nature of intervention/scheme	Population/setting	Individual outcomes	Service, delivery or organisation outcomes	Validity score <sup>a</sup>
Boyce 2009 <sup>35</sup>	UK	Mixed	Housing/resettlement	Peer advisors	Serving prisoners in three category B prisons (male) and one YOI (male)	Skills and self-confidence; work ethic; sense of control over their lives; work experience and qualifications	Effects on 'professional' time; staff concerns – potential for bullying or intimidation and breaches of confidentiality	2a
Brooker 2007 <sup>136</sup>	UK	Mixed qualitative and quantitative	Multiple health issues	Health trainers	Serving prisoners in four adult prisons, one YOI and one probation setting	Perceptions of tutors of the health trainers re. confidence, knowledge of services, communication skills, ability to assess someone's readiness to change, self-esteem and self-worth; perceptions of health trainers re. knowledge of health issues and attitude, confidence in signposting individuals to services and changing own behaviour; perceptions of health trainer clients, issues discussed and services referred on to	Perceptions of prison-based trainees re. their role; perceptions of stakeholders re. workload for prison physical education departments, training sessions, raising risk issues, engagement with health services, change of focus for the gym, highlighting a lack of health services in some areas, raising staff awareness of health issues and/or services available	1a
Bryan 2006 <sup>106</sup>	USA	Quantitative pretest post-test design (one group only)	Prevention of HIV infection	Peer education	196 serving prisoners in maximum and minimum security prisons; 90% male; mean age 30.4 years	Knowledge; perceived risk; condom attitudes; condom norms; condom self-efficacy; condom intentions; attitudes to not sharing needles; not sharing needles norms; not sharing needles self-efficacy; intentions to not share needles; peer education attitudes; peer education norms; peer education self-efficacy; peer education intentions; peer education behaviour	Not reported	2b

Study	Country	Study design	Health topics	Nature of intervention/scheme	Population/setting	Individual outcomes	Service, delivery or organisation outcomes	Validity score <sup>a</sup>
Chen 2006 <sup>61</sup>	Israel	Quantitative pre and post	General emotional/ mental health, psychological support and counselling	Peer counselling	93 male repeat offenders in three prisons in Israel (two maximum security and one minimum security); mean age 36 years (SD 6.35 years)	Sense of coherence; meaning in life; anxiety; depression; hostility	Not reported	2b
Cichowlas 2010 <sup>19</sup>	USA	Qualitative	General health/support	Prison hospice volunteers	Ill/dying prisoners at Dixon Hospice in Illinois	Perceptions of peer deliverers	Not reported	3c
Collica 2007 <sup>20</sup>	USA	Mixed quantitative and qualitative	HIV/AIDS and HCV (and other infectious diseases)	Peer education	All prisoners in USA were covered by the survey	Facilities were asked to report on (1) the number of HIV-positive inmates in their custody, (2) whether or not they mandated HIV testing and (3) whether or not they provided prison-based peer programming on HIV. If the answer to Q3 was yes, facilities were asked the extent of the HIV peer education, and other services. If the answer to Q3 was no, facilities were asked how HIV education was provided and why inmate peers were not used	Not reported	3c
Collica 2010 <sup>121</sup>	USA	Qualitative	HIV/AIDS and HCV (and other infectious diseases)	Peer education	Aimed at women in prison with HIV/AIDS. One maximum and one medium security prison for women	Role of peers	Not reported	1b

continued

TABLE 4 Description of included studies (continued)

Study	Country	Study design	Health topics	Nature of intervention/ scheme	Population/setting	Individual outcomes	Service, delivery or organisation outcomes	Validity score <sup>a</sup>
Correctional Service of Canada 2009 <sup>152</sup>	Canada	Mixed quantitative and qualitative	General emotional/ mental health, psychological support and counselling	Peer support	Women prisoners 'in distress'	From interviews: predominant mental health issues of women prisoners, how these are addressed in training sessions, benefits to trained peer counsellors. From survey: whether or not prisoners value the PST, reasons for asking to see a peer counsellor, benefits to service recipients, helpfulness of peer counsellors, recommendations for improvements	Trust between staff and prisoners; staff becoming part of the Peer Support Team; recommendations for improvements	3c quantitative/ 3b qualitative
Daigle 2007 <sup>26</sup>	Canada	Not applicable	Suicide/self-harm	Peer support	Canadian prisons (no further details reported)	Not reported	Concerns about recruitment, security and responsibility	NA
Davies 1994 <sup>31</sup>	UK	Qualitative	Suicide/self-harm	Listener scheme	HMP Swansea (adult prison)	Attempted suicide rate; use of the strip cell or care room; listeners' perceptions (benefits to listeners)	Staff time, prison atmosphere	2b
Delveaux 2000 <sup>153</sup>	Canada	Mixed quantitative and qualitative	General emotional/ mental health, psychological support and counselling	Peer support	Small women's prison, women prisoners all serving sentences of ≥ 2 years and classified as minimum or medium security risk	Self-esteem; sociometric tests for understanding personal and group dynamics; perceptions of the prison environment (Correctional Environment Status Inventory); staff and prisoners' views, feelings and ideas about the PST (interviews)	Staff and prisoners' awareness and perceptions of the role and functioning of the PST (surveys)	3c

Study	Country	Study design	Health topics	Nature of intervention/scheme	Population/setting	Individual outcomes	Service, delivery or organisation outcomes	Validity score <sup>a</sup>
Dhaliwal 2009 <sup>137</sup>	UK	Qualitative	Suicide/self-harm	Listener scheme	Vulnerable or distressed prisoners or those at risk of suicide	Listeners' own experiences; the impact on them as individuals; skills and/or benefits acquired	Presents findings in relation to what the prison service can do to support the scheme	2b
Dolan 2004 <sup>160</sup>	The Russian Federation	Quantitative pre and post	HIV/AIDS and HCV (and other infectious diseases)	Peer education	Male colony for drug-dependent prisoners in Siberia; mean age 24 years (range 18–30 years), 63% first time in prison, mean years served 1.2 (SD 0.7 years), 66% imprisoned for a drug-related offence	Whether or not seen the programme booklet; whether or not participated in peer training education; demographic characteristics; knowledge of HIV transmission; STI and BBVI status; drug use; sexual activity; tattooing; access to bleach and condoms	Access to bleach and condoms	3c
Eamon 2012 <sup>154</sup>	Canada	Mixed quantitative and qualitative	General emotional/mental health, psychological support and counselling	Peer support	Edmonton Institution for Women, population 65	Satisfaction with/ performance of the PST; hours per week of support provided by PST members; time to respond to inmate calls for peer response; level of trust in PST members; suggestions for improvement; improving relationships	Suggestions for improvement to number of sessions	3b
Edgar 2011 <sup>25</sup>	UK	Mixed quantitative and qualitative	Multiple health issues	Peer support/ listeners	Not stated	Various including listener and other peer roles	Diverting workload away from staff	2b
Farrin n.d. (PowerPoint presentation) <sup>157</sup>	Australia	Review	Multiple health issues	Peer support	At-risk prisoners in eight state prisons	Changes in responsibility, accountability and self-esteem (Syed and Blanchette <sup>155</sup> )	Reports the results from Devilly <i>et al.</i> <sup>24</sup> on changing attitudes and behaviours and offender preferences	3c

continued

TABLE 4 Description of included studies (continued)

Study	Country	Study design	Health topics	Nature of intervention/scheme	Population/setting	Individual outcomes	Service, delivery or organisation outcomes	Validity score <sup>a</sup>
Foster 2011 <sup>138</sup>	UK	Qualitative	Suicide/self-harm	Listeners	Adult category B local male prison; operational capacity 1103	Effect on listeners' personal development, self-esteem, well-being and relationships; numbers of potential suicides and incidents of self harm	Prison environment, burden on prison staff and health-care professionals	1a
Goldstein 2009 <sup>122</sup>	USA	Quantitative	Mental health/substance abuse	Peer mentoring	Two correctional facilities; incarcerated women with current or history of behavioural issues and/or substance abuse. Age range 19–59 years (mean 35 years); 15 out of the 32 participants had five or more previous incarcerations	Adherence to outpatient psychiatric treatment including medication management; medication compliance; sobriety and symptom reduction; reoffending; abstinence in the use of alcohol or illegal drugs or misuse of prescription drugs; employment or enrolment in an educational programme or completion of the application process for disability benefits; secure treatment; transitional housing or a permanent place to live	Not reported	3c
Grinstead 1997 <sup>123</sup>	USA	Quantitative, RCT	Prevention of HIV transmission	Peer education	Male inmates at a large (n = approx. 5600) medium-security state prison; 45% had a history of injection drug use and > 75% of these reported having shared equipment	HIV knowledge; preference for teacher; condom use intention; bleach use intention; HIV antibody use intention; interested in taking test now	Not reported	3b
Grinstead 1999 <sup>27</sup>	USA	Quantitative, RCT	Prevention of HIV transmission	Peer education	Large state prison for men. Mean age 35 years; 90% had just completed a sentence of < 5 years and < 10% were imprisoned for the first time	Risky behaviour at follow-up: used a condom the first time they had sex since release, used drugs since release, injected drugs since release, shared needles	Not reported	3c



Study	Country	Study design	Health topics	Nature of intervention/scheme	Population/setting	Individual outcomes	Service, delivery or organisation outcomes	Validity score <sup>a</sup>
Hall 2004 <sup>36</sup>	Canada	Mixed quantitative and qualitative	Suicide prevention	Listeners	Medium security prison with capacity of 585. Inmates have committed serious crimes. Modal age category 18–29 years, followed by 30–39 years. Length of sentence ranged from 2 years to life	Personal growth; knowledge of suicide; self-esteem; communication skills and sense of purpose; support; general programme operation; impact of training; personal development	Findings are reported related to programme implementation	3c
Hoover 2009 <sup>63</sup>	The Republic of Moldova	Qualitative	HIV/AIDS and HCV (and other infectious diseases)	Peer outreach	Seven prisons (six male and one female)	Not reported	Decline in HIV cases	3c
Hunter 2009 <sup>139</sup>	UK	Qualitative	Housing/resettlement	Peer advisors	Prisoners requiring housing advice in five prisons in south-east England [three category B prisons (male), one YOI (male) and one female open prison]	Social interaction with others; experience and qualifications to assist post release; self-confidence	Views of prisoners and staff re. staff workload and prisoners' use of their time in prison	1a
Jacobson 2008 <sup>140</sup>	UK	Qualitative	General health/support	Peer support	New arrivals at HMP Edinburgh	Effects on prisoners	Use of staff time	2c
Junker 2005 <sup>124</sup>	USA	Quantitative	Suicide/self-harm	Peer observers	Those prisoners judged to be suicidal	Not reported	Number of hours individuals spent on suicide watch post IOP compared with pre IOP (i.e. using staff for observations)	3b
Levenson 2002 <sup>32</sup>	UK	Mixed quantitative and qualitative	Multiple health issues	Peer support/listeners	Not stated	Perceptions of role (peer supporters); self-esteem; finding accommodation and small amounts of money after release	Not reported	3b quantitative/ 2b qualitative

continued

TABLE 4 Description of included studies (continued)

Study	Country	Study design	Health topics	Nature of intervention/scheme	Population/setting	Individual outcomes	Service, delivery or organisation outcomes	Validity score <sup>a</sup>
MacGowan 2006 <sup>125</sup>	USA	Qualitative	HIV counselling	Peer education	Male prisoners in state prisons in California, Mississippi, Rhode Island and Wisconsin, aged between 18 and 29 years, incarcerated for at least 90 days, classified as minimum or medium security level, scheduled for release within 14–60 days	Effects on HIV testing: mandatory testing at intake, voluntary testing at medical intake and voluntary testing during a peer health orientation class	Not reported	3c
Martin 2008 <sup>126</sup>	USA	Quantitative, RCT	HIV/HCV prevention	Peer education	Three sites: Delaware, Kentucky and Virginia (n = 343). Mean age 34 years; 86% male	The only outcome reported is condom use during sex	Not reported	2b
Maull 1991 <sup>127</sup>	USA	Study design unclear	General health/support	Prison hospice volunteers	Ill prisoners at US Medical Centre for Federal Prisoners in Springfield, MI	Effects on volunteers; effects on prisoners	Retention/attrition of volunteers	2b
Mentor2work 2005 <sup>141</sup>	UK	Study design unclear	Unclear	Peer mentoring	Prisoners with mental health problems at HMP Liverpool	Self-esteem, confidence and motivation; self-worth; communication skills, reasoning and reflection skills; mental health and treatment	Numbers of volunteers and prisoners being mentored; effects after release	3c
Munoz-Plaza 2005 <sup>128</sup>	USA	Qualitative	HIV/AIDS and HCV (and other infectious diseases)	Peer education	A state correctional facility in California. Drug treatment programme is located on a medium-security prison yard that houses male inmates, age range 20–50 years	Not reported	Not reported	2b
O'Hagan 2011 <sup>143</sup>	UK	Quantitative	Literacy	Peer education	Serving young offenders at five YOIs	Literacy: impact on learners; impact on mentors	Not reported	3c

Study	Country	Study design	Health topics	Nature of intervention/scheme	Population/setting	Individual outcomes	Service, delivery or organisation outcomes	Validity score <sup>a</sup>
Peek 2011 <sup>144</sup>	UK	Quantitative	Infectious disease prevention: screening and vaccination	Peer education	Male prisoners at HMP High Down category B local prison	Hepatitis B and hepatitis C awareness and vaccination uptake; chlamydia awareness and screening	Signposting to health care; nurses using their time in prison more effectively; effects on barriers between nursing staff and prisoners; prison atmosphere; changing role/perception of prisoners	3c
Penn State Erie 2001 <sup>129</sup>	USA	Mixed methods	Parenting	Peer education	Fathers in prison; state correctional institute at Albion (SCI Albion) in Erie county, PA; a medium-security institution for men	Contact with children per month/year; anger and frustration; knowledge about their child/children; parental locus of control; ICAN fathering profile; total parenting score; father's questionnaire: knowledge, attitudes, skills and behaviours	Staff awareness and perceptions of programme	3c
Player 1996 <sup>145</sup>	UK	Study design unclear	Addictions/substance abuse	Peer counselling	Prisoners with addictions at HMP Downview	Drug use; prisoner behaviour	Not reported	3c
Richman 2004 <sup>146</sup>	UK	Quantitative	General emotional/mental health, psychological support and counselling	Listeners	HMP Manchester	Change in demeanour; expected effects on release from prison (on listeners)	Effects on staff-peer worker relationship	3b
Ross 2006 <sup>101</sup>	USA	Quantitative pre and post	HIV/AIDS and HCV (and other infectious diseases)	Peer education	36 Texas state prison units. Peer educators and students were predominantly male, aged 34–43 years	HIV-related knowledge; self-assessed educator skills among peer educators; diffusion of HIV-related knowledge; HIV testing behaviour and intentions	Impact of the peer education programme on HIV testing at participating units	2b

continued

TABLE 4 Description of included studies (continued)

Study	Country	Study design	Health topics	Nature of intervention/scheme	Population/setting	Individual outcomes	Service, delivery or organisation outcomes	Validity score <sup>a</sup>
Schinkel 2012 <sup>147</sup>	UK	Qualitative	Housing/resettlement	Peer mentoring	Based in Glasgow – prisons not stated. Prisoners serving sentences of between 3 months and 4 years. Service offered to eligible prisoners who are returning to Glasgow, Renfrewshire and North Lanarkshire	Effects on prisoners	Staff perceptions of life coaches' need for support	2b
Schlapman 2000 <sup>150</sup>	USA	Quantitative pre and post	Prevention of HIV transmission	Peer education	Incarcerated adolescents in North Central Indiana Juvenile Facility	AIDS knowledge and self-reported sexual behaviours	Not reported	3c
Scott 2004 <sup>131</sup>	USA	Mixed quantitative (pre and post) and qualitative	HIV prevention	Peer education	Prisoners at five Texas prison facilities. A diversity of facilities was selected (small and large, short and long term, male and female prisoners)	HIV-related knowledge, attitudes and beliefs among peer educators and students	Factors affecting implementation, maintenance and overall impact of the programme from the perspective of programme co-ordinators, wardens and peer educators	2b quantitative/ 2c qualitative
Sifunda 2008 <sup>79,162</sup>	South Africa	Quantitative pre and post	HIV/AIDS and HCV (and other infectious diseases)	Peer education	Four medium-sized correctional facilities (male) in South Africa. Number housed comparable to that in UK prisons ( <i>n</i> = 263). Mean age 27 years (range 17–55 years); mean period of incarceration 2 years (range 6 months to 17 years); 65% were first-time offenders	Knowledge and beliefs; attitudes; sexual communication, social norms about gender relations and sexual violence; self-efficacy; intentions	Not reported	2c
Sirdifide 2006 <sup>148</sup>	UK	Qualitative	General health/support	Health trainer	All prisoners	Changes in health trainers' attitudes and health behaviour; recognising stress in other prisoners	Demands placed on prison staff and health services as a result of the intervention	2b

Study	Country	Study design	Health topics	Nature of intervention/scheme	Population/setting	Individual outcomes	Service, delivery or organisation outcomes	Validity score <sup>a</sup>
Snow 2002 <sup>37</sup>	UK	Quantitative	Suicide/self-harm	Listeners	Five prisons having a Samaritan-supported Listener scheme. All prisons were local-type establishments and were chosen because of the comparatively high rate of suicide	Perceived benefit from using the scheme; approachability of listeners; use of Listener scheme in the future; reasons for not using the scheme; ways to improve the scheme	Not reported	2b
Stewart 2011 <sup>149</sup>	UK	Quantitative and qualitative	General health/support	Peer support	Three UK prisons. Originally for older prisoners but including those with learning disabilities, mental health problems and physical and sensory disabilities	Effects on prisoner-carers	Communication between staff and prisoners; training and supervision issues; contribution to the health and social care services within the prison	3c
Syed 2000 <sup>155</sup>	Canada	Quantitative and qualitative	General emotional/mental health, psychological support and counselling	Peer support	Grand Valley Institution for Women, a small women's prison, <i>n</i> = 78 at time of study. All were serving sentences of a minimum of 2 years and were rated at minimum or medium security levels. Survey respondents, average age 34.5 years (SD 9.07 years, range 21–58 years); average sentence length 4.39 years (range 2–15 years); average time spent at Grand Valley 9 months (SD 0.62 months, range 2 weeks to 2 years)	Self esteem; sociometric tests for understanding personal and group dynamics; perceptions of the prison environment (Correctional Environment Status Inventory); staff and prisoners' views, feelings and ideas about PST (interviews)	Staff and prisoners' awareness and perceptions of the role and functioning of the PST (surveys)	3b quantitative/ 1c qualitative

continued

TABLE 4 Description of included studies (continued)

Study	Country	Study design	Health topics	Nature of intervention/scheme	Population/setting	Individual outcomes	Service, delivery or organisation outcomes	Validity score <sup>a</sup>
Joliette Syed 2000 <sup>156</sup>	Canada	Quantitative and qualitative	General emotional/ mental health, psychological support and counselling	Peer support	Joliette Institution, a women's prison in Canada, n = 56 at time of study. All were serving sentences of a minimum of 2 years and were rated at minimum or medium security levels. All women, average age 35.1 years (SD 11.3 years, range 21–62 years); average sentence length 4.7 years (range 2 years to life); mean time served at Joliette 13.3 months (range 2 months to 2.5 years)	Self esteem; sociometric tests for understanding personal and group dynamics; perceptions of the prison environment (Correctional Environment Status Inventory); staff and prisoners' views, feelings and ideas about PST (interviews)	Staff and prisoners' awareness and perceptions of the role and functioning of the PST (surveys)	3b quantitative/ 2b qualitative
Taylor 1994 <sup>158</sup>	Australia	Quantitative and qualitative, pre and post	HIV prevention	Peer education	New South Wales Correctional Centres; 90% of inmates had been in other correctional centres	Knowledge, attitudes	Awareness of the peer education scheme	3b
The Learning Ladder Ltd 2010 <sup>142</sup>	UK	Qualitative	Mentoring for education/to improve qualifications	Peer mentoring	HM Young Offender' Institution Reading, a small prison holding prisoners between the ages of 18 and 21 years	Self-esteem; confidence; attitude to offending behaviour	Success of the scheme	3c
Vaz 1996 <sup>64</sup>	Mozambique	Quantitative pre and post	HIV/STD prevention	Peer education	Largest prison in Mozambique (1900 prisoners incarcerated at time of study); 300 inmates sentenced to ≥ 1 year; mean age 26 years	Knowledge around HIV/AIDS; relationship between knowledge of HIV/AIDS and educational attainment of participants	Not reported	3b

Study	Country	Study design	Health topics	Nature of intervention/scheme	Population/setting	Individual outcomes	Service, delivery or organisation outcomes	Validity score <sup>a</sup>
Wallrath 2001 <sup>132</sup>	USA	Quantitative pre and post	Violence	Peer training	All-male medium-security correctional facility in Maryland housing inmates serving sentences of $\geq 3$ months. Age range 18–51 years (mean 30 years); average sentence 20 years, ranging from < 1 year to life	Anger; self-esteem; optimism; locus of control; behaviour	Not reported	2b
Wright 2007 <sup>40,133</sup>	USA	Mixed qualitative and quantitative	General health/support	Prison hospice volunteers	Dying prisoners in 14 prison hospices in the USA	Not reported	Impact of having a hospice (and, implicitly, using prisoner volunteers) on prison environment and climate	2c
Zack 2004 <sup>23</sup>	USA	Quantitative, RCT	HIV/AIDS and HCV (and other infectious diseases)	Peer education	Medium-security prison housing approximately 6000 men who stay at the prison for an average of < 2 years. Male prisoners arriving at and leaving the prison, and female visitors	Intention to use condoms and be tested for HIV; knowledge; HIV/AIDS testing; behaviour	Resistance from staff; institutional lockdowns	3b
Zucker 2009 <sup>134</sup>	USA	Quantitative, one-group pre and post	HCV prevention	Peer education	Massachusetts county jail, 25 men who spoke and wrote in English	Changes in self-reported behaviour, knowledge and relationship with teacher	Not reported	3c

BBV1, blood-borne viral infection; HCV, hepatitis C virus; ICAN, Involvement, Consistency, Awareness, Nurturance; IOP, Inmate Observer Programme; NA, not applicable; PST, Peer Support Team; SD, standard deviation; STD, sexually transmitted disease.

a Validity score: 1 = good internal validity, 2 = moderate internal validity and 3 = poor internal validity; a = highly relevant, b = of some relevance and c = not very relevant.





# Chapter 5 Findings of the review of effectiveness: what are the effects of peer-based interventions on prisoner health? (Review question 1)

## Introduction

In total, 51 studies contained information relevant to review question 1,<sup>23,27,31,32,36,38,101,106,119,121–127,129–162,164</sup> 18 of which had a quantitative design,<sup>23,27,101,106,122–124,126,130,132,134,143,144,146,160–162,164</sup> with three of these being RCTs.<sup>27,123,126</sup> Another 14 studies had a qualitative design,<sup>31,38,119,121,125,137–140,142,147,148,150,159</sup> 15 used mixed methods<sup>32,36,129,131,133,135,136,149,151–156,158</sup> and in four the design was unclear.<sup>127,141,145,157</sup> In total, 17 studies were from the UK<sup>31,32,38,135,137–147,149</sup> and 17 were from the USA.<sup>23,27,101,106,119,121–127,129–132,134</sup> The predominant intervention type that has been evaluated is peer education (21 studies<sup>23,27,101,106,120,121,123,125,126,129–131,134,143,144,158–162,164</sup>).

## Peer education

Peer education involves the teaching and communication of health information, values and behaviours to and between individuals who are of equal social status or who share similar characteristics or who have common experiences.<sup>94,95</sup> There are various rationales advanced for peer education, including accessing 'hard-to-reach' or socially excluded populations,<sup>165</sup> the influence of social networks and opportunities for positive social modelling and reinforcement of social norms<sup>95</sup> and personal development and empowerment of peer educators.<sup>166</sup> Peer education has been widely applied in the prison setting, particularly in relation to the prevention of HIV infection and risk reduction. Peer educators typically undertake formal training to equip them with the knowledge and skills to undertake the role. They then deliver (1) formal educational/behaviour change interventions, for example risk reduction planning,<sup>27</sup> and/or (2) engage in informal education and awareness raising through social interactions with fellow prisoners within the prison.<sup>106</sup>

Eighteen studies<sup>23,27,101,106,123,126,129–131,134,143,144,158–162,164</sup> contained quantitative findings about the effects of peer education on prisoner health. Of these, 12<sup>23,27,101,106,123,126,130,131,158,160,162,164</sup> were on HIV/AIDS prevention, one<sup>134</sup> was on hepatitis C prevention, one<sup>144</sup> was on the prevention of infectious diseases in general, one<sup>159</sup> was on health and hygiene, one<sup>161</sup> was on general and mental health, one<sup>129</sup> was on parenting and one<sup>143</sup> was on literacy.

Three studies<sup>27,123,126</sup> in this category were RCTs and one<sup>23</sup> reported the findings of a RCT among other study designs. Most studies in this category used a one-group design with outcomes being measured before and after (or pre and post) the intervention being delivered.<sup>23,101,106,130,131,134,143,158,160–162,164</sup> One study<sup>129</sup> seemed to use a two-group design for some aspects but mainly presented before and after data from one group and one study<sup>144</sup> did not present a clear study design.

## Knowledge

In total, 10 studies<sup>101,123,129–131,134,143,158,162,164</sup> contained quantitative findings about the effects of peer education on prisoner knowledge; seven<sup>101,123,130,131,158,162,164</sup> of these were aimed at the prevention of HIV infection, one<sup>134</sup> was aimed at the prevention of hepatitis C virus infection, one<sup>129</sup> was aimed at parenting and one was aimed at literacy.<sup>143</sup> There was no standard outcome measure used, even within the HIV studies. Four studies<sup>131,134,158,164</sup> recorded the number or percentage of correct answers to a set of questions; however, different questions were asked in each study, giving a total of 43 questions, only

three of which were asked by more than one of the four studies. Four studies<sup>101,123,158,162</sup> presented knowledge scores, although not all gave enough information for meta-analysis; however, standard deviations (SDs)<sup>123</sup> and numbers in group<sup>162</sup> were estimated when necessary.<sup>108</sup> Other studies presented the percentages agreeing with statements on literacy and other skills<sup>143</sup> and the results of statistical analysis.<sup>130</sup> A study on parenting skills<sup>129</sup> presented information from questionnaires about fathers' knowledge of their children. It was therefore not possible to pool the findings of the studies in this category, although effect measures [risk ratios (RRs) and MDs] with 95% CIs were calculated for studies when possible and displayed in forest plots.

Statistically significant improvements favouring peer education were seen in the number of correct answers to 22 of the 43 questions asked (*Table 5*), with negative effects of peer education seen in the answers to one of the 43 questions. For the remaining 20 questions there was no evidence of an effect of the intervention. RRs ranged from 0.43 (95% CI 0.33 to 0.56; one study,  $n = 949$ ), in favour of peer education, for the question 'HIV can be transmitted by bloody fights' to 3.06 (95% CI 1.91 to 4.91; one study,  $n = 200$ ), against peer education, for the question 'All forms of hepatitis can be transmitted by sex'.

Continuous data on knowledge scores that were suitable for meta-analysis came from four studies<sup>101,123,158,162</sup> and positive results were seen in all four studies; however, it should be noted that some data were imputed for two<sup>123,162</sup> of these studies so the results should be treated with caution. When results from two studies<sup>101,123</sup> were combined, the pooled MD was 0.46 (95% CI 0.36 to 0.56; two studies,  $n = 2494$ ); however, there was substantial statistical heterogeneity in this result ( $I^2 = 94\%$ ) (*Figure 4*).

There was also qualitative evidence to suggest that peer educators improved their own knowledge of health issues as a result of the training that they received.<sup>121,131,159</sup> In the study by Scott and colleagues,<sup>131</sup> HIV-related knowledge gained as a result of training increased individuals' knowledge and there was also evidence that this information was diffused to those outside the prison, such as family members and children.

In one study,<sup>130</sup> after the intervention detainees were significantly more knowledgeable about the danger of blood transfusions ( $p = 0.01$ ). On assessment after the intervention, the detainees were significantly less afraid of daily activities such as sharing a spoon or fork with another person ( $p = 0.03$ ). Detainees more often identified friends as a major source of knowledge and information about HIV/AIDS [ $\chi^2 (1, n = 69) = 4.73, p = 0.029$ ]. Finally, detainees became much more aware that if they did not use a condom during sexual intercourse their chances of getting HIV/AIDS were greatly increased [ $\chi^2 (1, n = 69) = 4.996, p = 0.025$ ].

In the study on parenting skills<sup>129</sup> there was no statistically significant effect of the intervention on fathers' knowledge of their children (MD  $-0.80$ , 95% CI  $-1.61$  to  $0.01$ ).

In the study on literacy,<sup>143</sup> questionnaire responses showed that > 90% of the programme recipients (learners) agreed that their reading and communication skills had improved, 92% agreed that they would go on to do more learning and 99% would recommend the programme to others. Sixteen learners who returned questionnaires had gained a total of 30 qualifications. All of the mentors who took part agreed that the programme had given them new skills, improved their communication skills, allowed them to understand others better, been a good use of their time in prison and helped them feel more positive about their future. In total, 98% agreed that they would go on to do more learning and 100% would recommend mentoring in the programme to others.

One study<sup>164</sup> reported that prisoners with less than full primary school education were significantly less likely than those with more schooling to respond correctly to all questions both before (43% vs. 69%,  $p < 0.00001$ ) and after (84% vs. 94%,  $p < 0.00001$ ) the peer education intervention. However, the less

TABLE 5 Knowledge: numbers of correct answers to 'yes/no' questions

Question	No. of studies	No. of participants	RR (Mantel–Haenszel, fixed, 95% CI)
Once it enters the body HIV virus spreads all by itself <sup>131</sup>	1	484	0.93 (0.87 to 1.00)
There is a vaccine for HIV <sup>131</sup>	1	484	0.97 (0.88 to 1.06)
HIV can cause some types of cancers <sup>131</sup>	1	484	0.73 (0.64 to 0.85)
A person can be infected with HIV without having AIDS <sup>131</sup>	1	484	0.96 (0.90 to 1.01)
A person can have HIV and have no signs or symptoms of the disease <sup>131</sup>	1	484	0.95 (0.91 to 1.00)
A person infected with HIV is not contagious and cannot spread the disease unless there are signs and symptoms <sup>131,164</sup>	2	1084	0.86 (0.81 to 0.91)
Only male homosexuals get HIV/AIDS <sup>131</sup>	1	484	0.99 (0.96 to 1.01)
Women don't need to worry about getting HIV/AIDS <sup>131</sup>	1	484	0.97 (0.94 to 1.00)
If you are poor you are at greater risk for getting HIV/AIDS <sup>131</sup>	1	484	0.77 (0.65 to 0.92)
The primary way HIV spreads from person to person is through saliva, sweat and urine <sup>131</sup>	1	484	1.00 (0.95 to 1.06)
HIV can be killed with bleach <sup>131</sup>	1	484	0.56 (0.48 to 0.66)
The more people you have sex with, the greater your risk of getting HIV <sup>131,164</sup>	2	1084	0.91 (0.88 to 0.94)
HIV-infected blood trapped inside an airtight syringe will remain infectious <sup>131</sup>	1	484	0.89 (0.83 to 0.97)
ELISA is the name of the woman who developed the HIV lab test <sup>131</sup>	1	484	0.70 (0.59 to 0.82)
Persons who have a sexually transmitted disease are at a higher risk for HIV <sup>131</sup>	1	484	0.89 (0.84 to 0.95)
People taking medicine for HIV/AIDS can take up to 30 pills a day <sup>131</sup>	1	484	0.83 (0.77 to 0.90)
The T cell count tells a doctor when to start a person on medicine <sup>131</sup>	1	484	0.90 (0.83 to 0.98)
It is sometimes OK to take a break from HIV medication <sup>131</sup>	1	484	1.01 (0.96 to 1.06)
An effective way to prevent HIV infection and other sexually transmitted diseases is abstinence <sup>131</sup>	1	484	0.93 (0.87 to 0.99)
Risk reduction means limiting or changing behaviours that transmit HIV <sup>131</sup>	1	484	0.95 (0.90 to 1.00)
AIDS exists in prisons <sup>164</sup>	1	600	0.41 (0.35 to 0.50)
You can get AIDS from using the same latrine or toilet <sup>158,164</sup>	2	1549	0.72 (0.68 to 0.75)
You can get AIDS from being in the same cell as a HIV-infected inmate <sup>164</sup>	1	600	0.31 (0.25 to 0.37)
Using condoms protects against AIDS <sup>164</sup>	1	600	0.70 (0.64 to 0.77)
Using tattoo bladders can transmit AIDS <sup>164</sup>	1	600	0.61 (0.55 to 0.68)
Oral sex among men can transmit AIDS <sup>164</sup>	1	600	0.43 (0.37 to 0.50)
Hepatitis C is caused by a virus <sup>134</sup>	1	200	0.96 (0.92 to 1.00)
A vaccination is available for hepatitis C <sup>134</sup>	1	200	0.85 (0.76 to 0.95)
All forms of hepatitis can be transmitted by sex <sup>134</sup>	1	200	3.06 (1.91 to 4.91)
The easiest way to get or give hepatitis C is through sharing bloody needles, syringes and deep cuts <sup>134</sup>	1	200	1.00 (0.98 to 1.02)

continued

**TABLE 5** Knowledge: numbers of correct answers to 'yes/no' questions (*continued*)

Question	No. of studies	No. of participants	RR (Mantel–Haenszel, fixed, 95% CI)
Once you are infected it is possible for you to be a chronic carrier of the virus <sup>134</sup>	1	200	0.88 (0.82 to 0.95)
A pregnant woman who is infected with hepatitis B or C can transmit the disease to her unborn child <sup>134</sup>	1	200	0.89 (0.81 to 0.99)
HIV can be transmitted by sharing an apple <sup>158</sup>	1	949	0.91 (0.89 to 0.94)
HIV can be transmitted by touching dry blood <sup>158</sup>	1	949	0.94 (0.88 to 0.99)
HIV can be transmitted by sharing needles <sup>158</sup>	1	949	0.99 (0.98 to 1.00)
HIV can be transmitted by sex <i>with</i> condoms <sup>158</sup>	1	949	0.93 (0.89 to 0.98)
HIV can be transmitted by sharing cigarettes <sup>158</sup>	1	949	0.96 (0.94 to 0.98)
HIV can be transmitted by blood splash on skin <sup>158</sup>	1	949	0.69 (0.61 to 0.78)
HIV can be transmitted by kissing <sup>158</sup>	1	949	0.87 (0.84 to 0.90)
HIV can be transmitted by touching <sup>158</sup>	1	949	0.97 (0.96 to 0.99)
HIV can be transmitted by sex <i>without</i> condoms <sup>158</sup>	1	949	0.99 (0.98 to 1.01)
HIV can be transmitted by bloody fights <sup>158</sup>	1	949	0.43 (0.33 to 0.56)

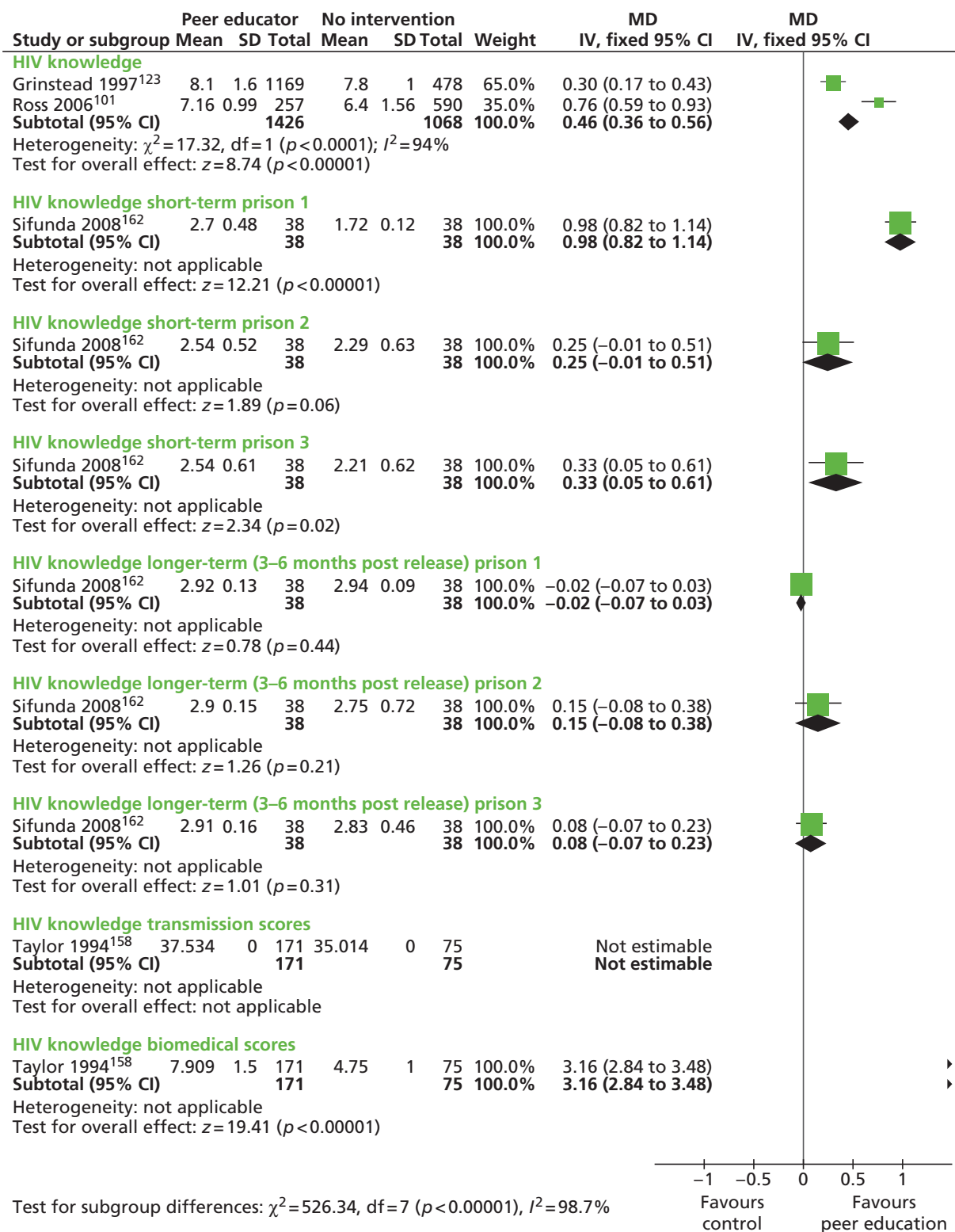


FIGURE 4 Knowledge scores.

educated group showed a greater improvement in the proportion of correct answers for all questions (41% vs. 24%,  $p < 0.00001$ ).

### Intentions

Four studies<sup>101,123,130,162</sup> contained quantitative data on intentions. One RCT<sup>123</sup> reported improvements in four out of five outcomes measured: interest in taking a HIV test for the first time (RR 1.49, 95% CI 1.12 to 1.97), interest in taking a HIV test now (RR 1.82, 95% CI 1.33 to 2.49), intention to use condoms (RR 1.15, 95% CI 1.08 to 1.22) and intention never to use condoms (RR 0.59, 95% CI 0.48 to 0.72). The fifth outcome, intention of injecting drug users to use bleach, showed no improvement after the intervention (RR 1.06, 95% CI 0.97 to 1.16). Another study<sup>101</sup> found no improvement in the number of students intending to take a HIV test (RR 1.24, 95% CI 0.75 to 2.05) and a negative effect on the number of peer educators intending to take a HIV test (RR 0.62, 95% CI 0.41 to 0.95). A study in South Africa<sup>162</sup> found positive effects of the peer education programme on intentions in two of the three included prisons, both in the short term and 3–6 months after release (Figure 5).

In a chi-squared comparison of pre-project and post-project assessments,<sup>130</sup> responses to two items on the AIDS Risk Reduction Model questionnaire approached significance with regard to an increase in knowledge of their participation in high-risk behaviours [ $\chi^2 (10, N = 69) = 16.533, p = 0.08$ ], but did not show any evidence of a commitment to change their behaviours [ $\chi^2 (10, N = 69) = 10.934, p = 0.36$ ].

Analysis of intentions by ethnicity in one RCT<sup>123</sup> appears to show that peer education has the most effect on white prisoners (Figures 6 and 7).

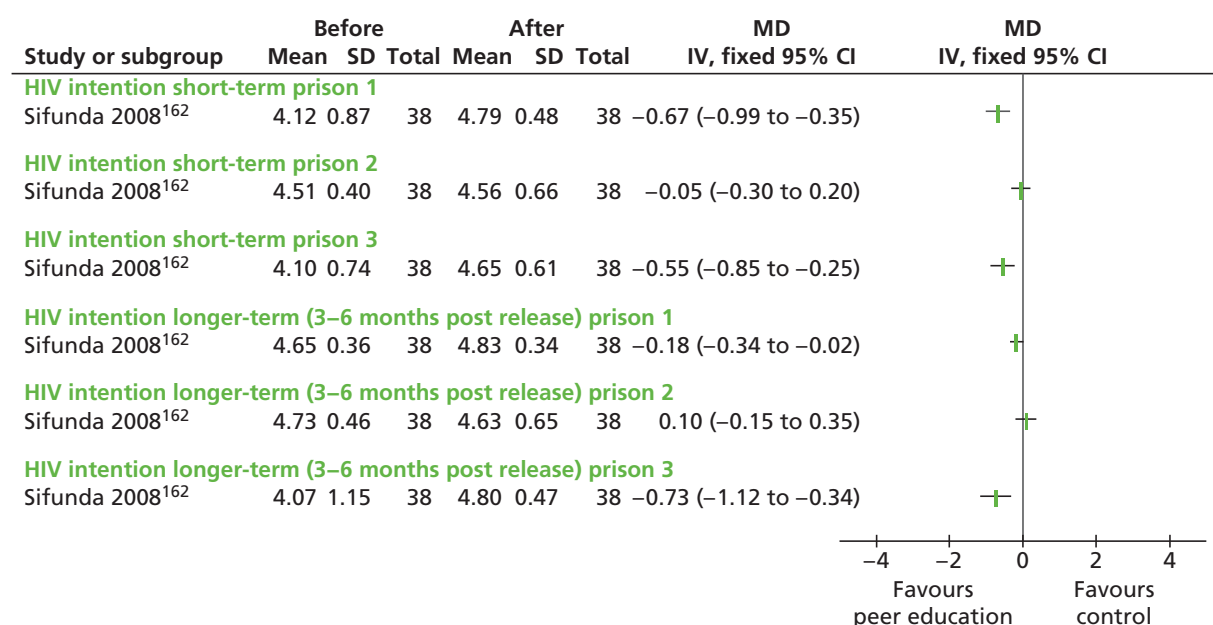


FIGURE 5 Effect of peer education on intentions in three South African prisons.

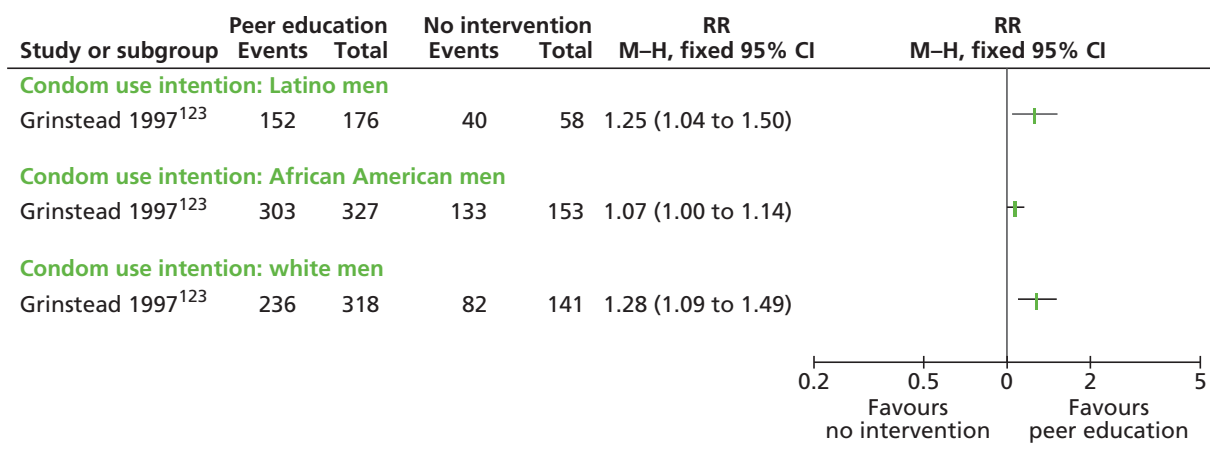


FIGURE 6 Intention to ever use condoms (by ethnicity).

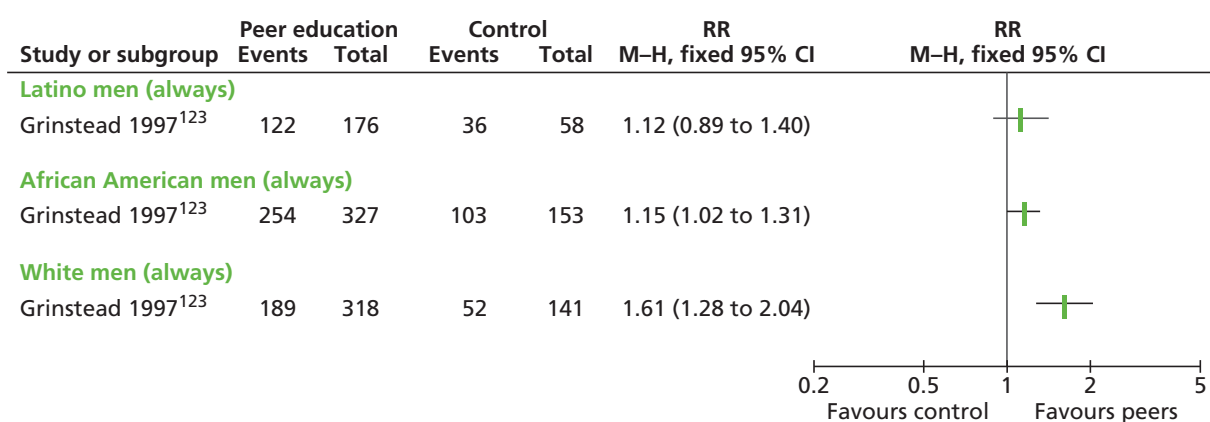


FIGURE 7 Intention to always use condoms (by ethnicity).

### Attitudes/beliefs

Four studies<sup>131,134,158,162</sup> contained quantitative data on the effects of peer education on prisoner attitudes. No changes were seen in prisoner attitudes after peer education in one study<sup>131</sup> whereas in another study<sup>158</sup> improvements were seen in the number of prisoners agreeing to all three of the following statements: 'HIV-positive inmates should be separated' (RR 2.55, 95% CI 1.94 to 3.33), 'I feel safe in the same wing as an inmate who is HIV positive' (RR 0.74, 95% CI 0.68 to 0.84) and 'I know enough to protect myself from catching HIV/AIDS' (RR 0.54, 95% CI 0.50 to 0.59). The South African study<sup>162</sup> showed no changes in attitude after peer education.

### Behaviour

In total, 11 studies<sup>23,27,101,106,125,126,129,134,144,160,162</sup> contained quantitative data on the effects of peer education on behaviour.

Figure 8 shows positive effects on/reductions in the following behaviours after peer education: not using a condom at first intercourse after release from prison (RR 0.73, 95% CI 0.61 to 0.88; two studies,  $n = 400$ ), injecting drugs after release from prison (RR 0.66, 95% CI 0.53 to 0.82; two studies,  $n = 400$ ), injected drugs in the past 4 weeks (RR 0.11, 95% CI 0.01 to 0.85; one study,  $n = 241$ ), sharing injection equipment after release from prison (RR 0.33, 95% CI 0.20 to 0.54; two studies,  $n = 400$ ) and peer educators never having had an HIV test (RR 0.31, 95% CI 0.12 to 0.78; one study,  $n = 847$ ).

One study<sup>160</sup> also reported that the prevalence of tattooing in a prison in the Russian Federation significantly decreased over the study period (42% vs. 19%,  $p = 0.03$ ) and of those who were tattooed the proportion using a new needle increased from 23% to 50%.

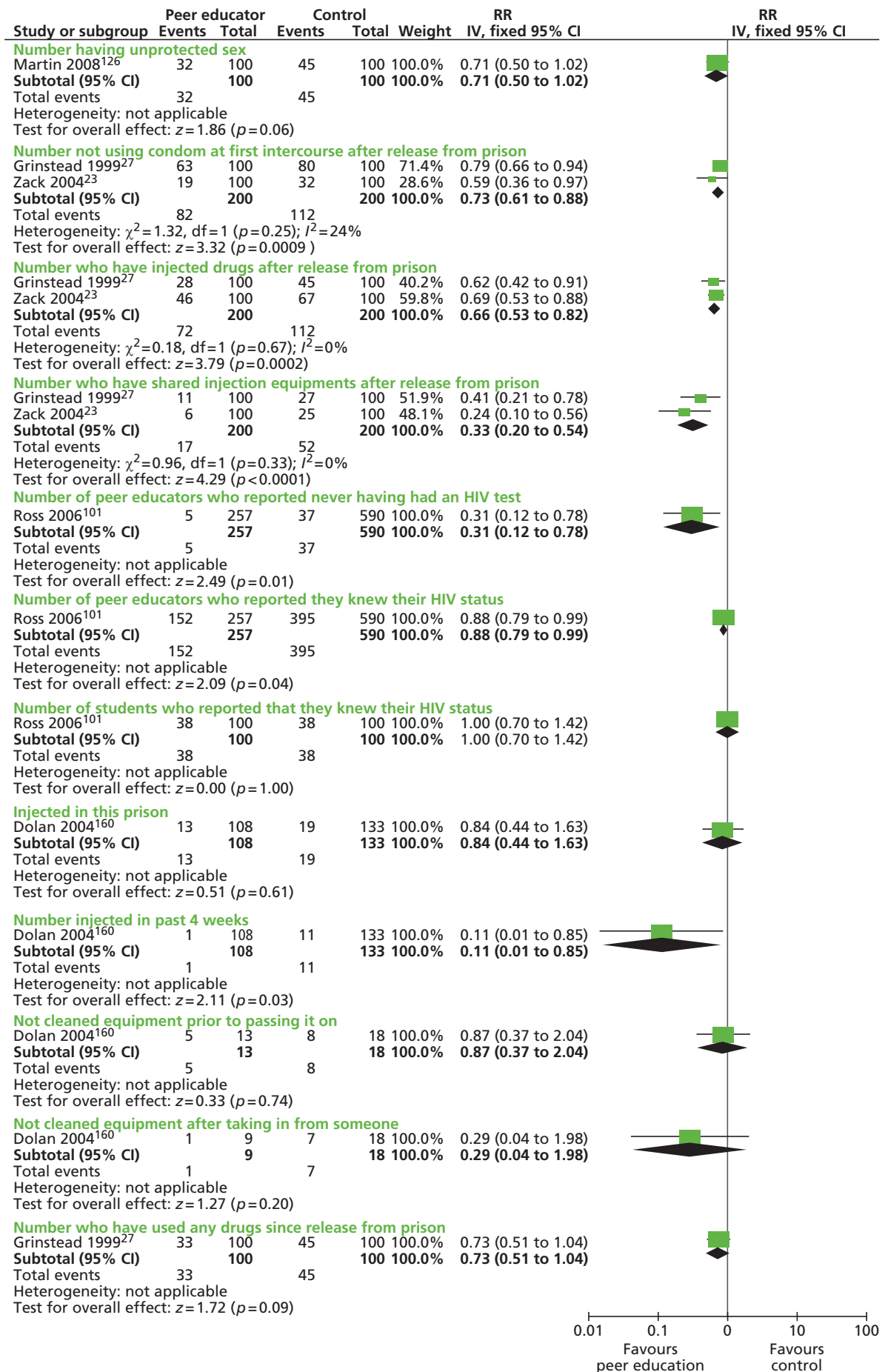


FIGURE 8 Effects of peer education on behaviour: binary outcome.



Positive effects on behaviour were seen in all three studies in which behaviour was measured on a scale,<sup>106,134,162</sup> although in the South African study<sup>162</sup> positive effects were seen only in the longer term and only in prisoners from two of the three prisons that received the intervention (Figure 9).

One study<sup>106</sup> reported that older prisoners were more likely than younger prisoners to engage in peer education behaviour ( $p < 0.05$ ).

One study<sup>125</sup> presented adjusted odds ratios (ORs) for voluntary peer-led policy. Having HIV tests in prison was associated with having attended a HIV prevention programme while in the study prison (OR = 2.81, 95% CI 1.09 to 7.24). The rate of HIV testing was significantly lower in the prison in which HIV testing was offered after a peer-led health education programme at intake (peer led, voluntary 46%, medical, voluntary 86%, mandatory 78%,  $p = 0.05$ ).

One study<sup>144</sup> found that the number of under-25s being screened for chlamydia rose from 13 to 83 in the 6-month period after beginning a peer education intervention. Similarly, the number being screened for hepatitis C increased from 9 to 46 and it was also stated that more participants were screened for HIV and underwent hepatitis B vaccination, although these numbers were not reported. Conversely, the number declining hepatitis C screening rose from 13 to 115.

The study on parenting skills<sup>129</sup> found statistically significant improvements in father/child contact (Figure 10), particularly in terms of the total contact with children per year (MD 41.3, 95% CI 6.47 to 76.13), although this was not supported by data from caregivers (Figure 11).

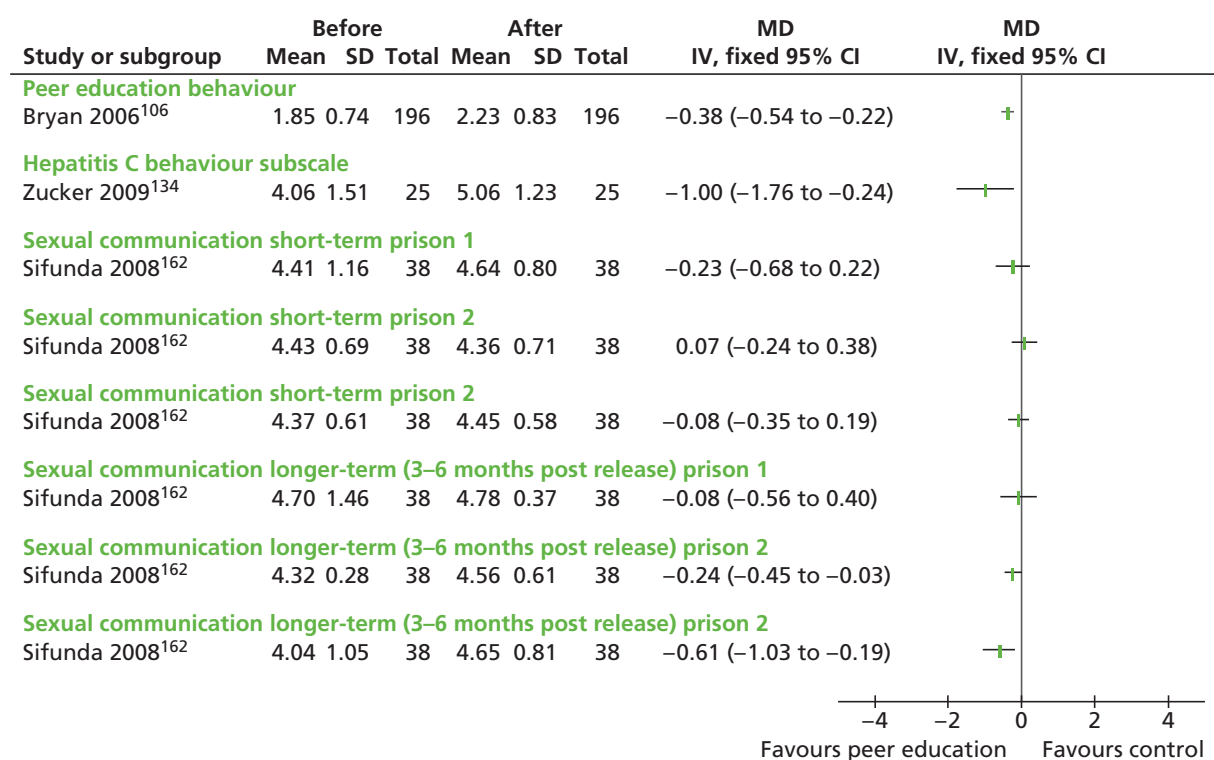


FIGURE 9 Effects of peer education on behaviour: scale outcomes.

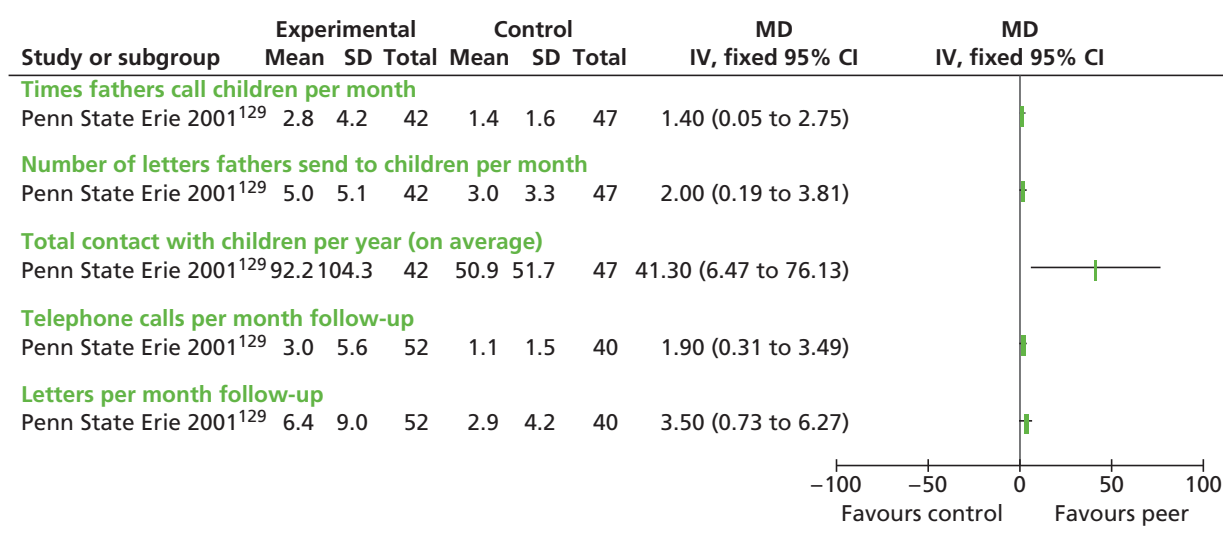


FIGURE 10 Effects of peer education on father/child contact.

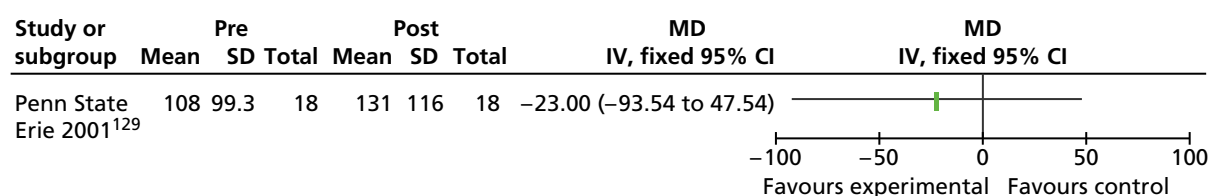


FIGURE 11 Effects of peer education on father/child contact: data from caregivers.

### Self-efficacy/locus of control

One study<sup>162</sup> reported quantitative data on the effects of peer education on self-efficacy. No significant differences were seen in the short or longer term in any of the three prisons involved.

### Mental health

The study of parenting skills also measured anger and frustration and found no effect of the intervention on these outcomes, either immediately post intervention (MD 0.20, 95% CI -1.42 to 1.82) or at longer follow-up (MD 1.40, 95% CI -0.03 to 2.83).

### Teacher preference

In the South African study<sup>162</sup> both HIV-negative and HIV-positive peer educators were used. In the short term no statistically significant differences were found between the group taught by HIV-negative educators and the group taught by HIV-positive educators except for the knowledge variable in one prison ( $p < 0.01$ ). In the longer term the group with the HIV-negative peer educators had higher average scores than both the HIV-positive peer educator group and the control group for both attitudes towards condom use and sexual communication.

In an American RCT<sup>123</sup> there was a strong preference among inmates for being taught by a HIV-positive inmate rather than by an HIV/AIDS (professional) educator. This was most marked in the group who had received education from a peer (68% preferred to be taught by an inmate with HIV and 11% preferred to be taught by a HIV/AIDS educator).

### Additional themes from qualitative evidence

Qualitative evidence suggested that prisoners involved in delivering peer education programmes had gained from the experience of being a peer deliverer and found the experience personally rewarding, giving their time in prison meaning and purpose.<sup>121,131</sup> In one study<sup>129</sup> this included improved listening and communication skills as a result of their participation. Collica's<sup>121</sup> research suggested that being a peer

educator also enabled the difficulties of prison life to be offset through the supportive network of other trained peer educators. There were indications that prisoners involved in the AIDS, Counselling & Education (ACE) programme saw other trained prisoners in the programme as a pseudo-family who could be utilised in time of crises:

*We were very close, tight knit. I looked upon many of them as an extended family. Early on, most of us were long termers and we were at the beginning of our sentences. ACE was a safe place to go to share our struggles together.*

p. 328<sup>121</sup>

## Peer support

Peer support is the support provided and received by those who share similar attributes or types of experience. Peer support can be an informal process between individuals and/or can be provided through formalised interventions in which peer supporters seek to promote health and/or build people's resilience to different stressors.<sup>94</sup> There is a range of different peer support interventions reported in the prison literature. As an overview, peer support in a prison setting involves peer support workers providing practical help and/or social support to other prisoners in a paid or voluntary capacity.<sup>25</sup> Peer support roles can include befriending, carrying out domestic duties for other prisoners (e.g. fetching meals), liaison with prison staff, translation, providing basic information and signposting to other services.<sup>25,149</sup> Some peer support interventions, such as the Peer Support Team (PST) programme in Canada, involve peers providing emotional support to alleviate stress.<sup>153</sup> In the UK, the Listener scheme is a specific peer support intervention focused on the prevention of suicide and self-harm (see *Listener scheme*). Some peer support interventions involve group work, such as self-help groups on substance misuse.<sup>32</sup>

Six studies<sup>151–156</sup> contained quantitative evidence on the effects of peer interventions on prisoners. These all reported on the Canadian PST programme and used similar evaluation designs and outcome measures. The PST programme is a Canadian model that has been developed and delivered across a number of Canadian prisons. It is specifically targeted at women prisoners and is based on a holistic, women-centred approach to health care that aims to be culturally sensitive and to develop women's autonomy and self-esteem.<sup>138,141</sup> The evaluation designs comprised a before-and-after study using questionnaires for prisoners (peer deliverers and recipients) and a qualitative study using interviews and focus groups with peer deliverers, recipients, non-recipients and staff.

### Self-esteem/confidence

Three studies<sup>151,153,155</sup> used the Rosenberg Self-Esteem Scale to measure prisoners' self-esteem. No statistically significant effect of the peer intervention was seen when the findings from the three studies were pooled (weighted MD 1.51, 95% CI –0.84 to 3.86; three studies,  $n = 83$ ), although the sample size was small and there was substantial heterogeneity ( $I^2 = 81\%$ ), meaning that the result should be treated with caution (*Figure 12*).

Strong qualitative evidence was also apparent in relation to improvements in the peer deliverers' self-esteem, self-worth and confidence as a result of the role.<sup>38,151–154,156</sup> The sense of being trusted by the prison authorities to counsel and support prisoners in distress was reported to enable peer deliverers to regain their self-respect.<sup>25,152</sup> The notion that peers became more empowered consequentially was alluded to.<sup>151–153,155,156</sup>

### Perceptions of the prison environment

The Correctional Environment Status Inventory assesses prisoners' perceptions of the prison environment. Responses were measured before and after the PST intervention in three studies.<sup>151,153,155</sup> Domains assessed were staff involvement, staff treatment, staff cohesion, orientation and offender relationships. No statistically significant effect of the PST was seen in the pooled results of the three studies across any of the 16 questions asked.

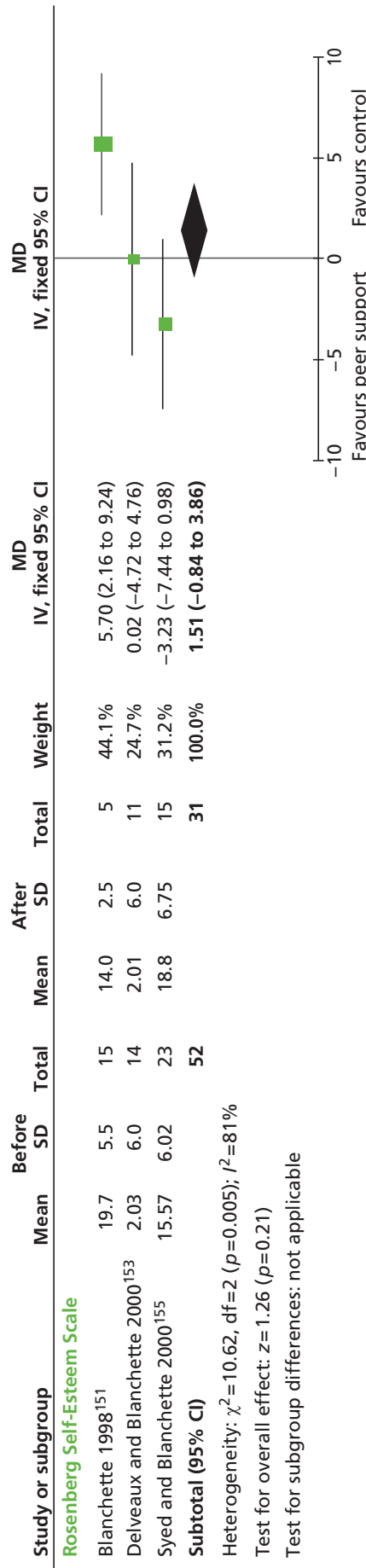


FIGURE 12 Peer Support Team intervention: self-esteem.

### **Satisfaction**

Two studies<sup>152,154</sup> reported quantitative findings on satisfaction with the PST model; data were not suitable for meta-analysis. One study<sup>152</sup> found that 81% of 35 respondents valued the existence of the PST even if they had never used a peer counsellor in a crisis situation. In this study the average rating for helpfulness of peer counsellors was 4 on a scale of 1–5.

The other study<sup>154</sup> reported that inmates in the intake unit were very satisfied with the quality of the information delivered by PST members during their weekly visits (mean = 4.05 on a 5-point scale) and rated PST members highly in terms of their listening skills (mean = 4.58), problem-solving skills (mean = 3.94), approachability (mean = 4.56) and communication skills (mean = 4.22). Expectations of the PST were also well met (mean = 4.28) and those who had previously requested peer support reported that the sessions were very useful (mean = 4.43) in helping them deal with their issues.

Staff reported that PST members were effective in handling crisis interventions (mean = 4.00), providing services to inmates (mean = 3.62) and serving as role models (mean = 3.73). It was also felt that the PST programme training was efficient in preparing PST members for PST duties (mean = 3.77) and in reinforcing the positive effects of other programmes for PST members (mean = 3.62) and for other inmates (mean = 3.62). Staff were moderately satisfied with the sharing of PST procedures (mean = 3.62) and PST activities and schedules (mean = 3.58) with key institutional personnel.

### **Hours of support delivered per week**

In one study<sup>154</sup> PST members estimated that they provided 3–5 hours of support to others per week on average.

### **Time to response**

In one study<sup>154</sup> staff responded to inmate calls for peer support within 11–30 minutes and PST members were reported to respond within the same timescale.

### **Level of trust**

In one study<sup>154</sup> a fairly high level of trust in PST members was reported (mean = 3.79 on a 5-point scale) and staff generally felt confident in referring an inmate to a PST member. However, 75% of staff surveyed indicated that their trust level varied depending on individual PST members.

### **Knowledge**

For prisoners trained to be peer support workers/counsellors, there were qualitative data from two studies<sup>151,153</sup> that showed reported increases in knowledge. Indeed, in one of these studies<sup>151</sup> a number of respondents noted that knowledge acquired from the training was applicable to improving relationships with their children, partners and others in the community.

### **Effects on recipients**

As well as the impacts on the trained peer support workers/counsellors, there were indications of positive effects for the recipients of the intervention. Peer support was reported to have helped prisoners practically, emotionally or both<sup>151</sup> and in one study<sup>140</sup> it was demonstrated that this type of intervention could be particularly beneficial for prisoners during the early part of their sentence. Those who had used peer support reported using it as an avenue to vent and to overcome feelings of anxiety, loneliness, depression and self-injury<sup>151,152,156</sup> and there were indications that this may be potentially beneficial in preventing suicides in prison.<sup>38</sup>

One study indicated attitudinal and behaviour changes in the recipients of a peer counselling intervention. Player and Martin's<sup>145</sup> research showed that a drug treatment intervention (that included the support of trained prison counsellors) had caused changes in prisoners' reported attitudes to drugs and alcohol. This translated to a self-reported reduction in drug and alcohol use. The one-to-one sessions with trained peer counsellors were regarded as the most 'helpful aspect' of the recovery process (p. 3).

### Additional themes from qualitative research

In several studies<sup>25,151–153,156</sup> there were indications of peer deliverers gaining a better self-awareness and perspective on their life as well as developing the skills to deal with their own health and offending issues. There was limited information on the impact that the role would have on future reoffending. Only in one study<sup>25</sup> was it suggested that the experiences of being a peer support worker would be beneficial in reducing the likelihood of reoffending.

The demands placed on peer support workers/counsellors by other prisoners gave individuals a sense of purpose in prison<sup>25,38,149</sup> and this was beneficial for combating boredom while serving the prison sentence.<sup>25,38</sup> However, there were indications that the role could be challenging and onerous and the burden of care of supporting many prisoners could be problematic.<sup>38</sup>

### Listener scheme

The Listener scheme is a UK-based prison suicide prevention intervention. The first Listener scheme was established in 1991 at HMP Swansea<sup>31</sup> and since then the scheme has grown rapidly, with there being an estimated 1400 listeners in 2006.<sup>22</sup> Listener schemes now operate across almost all prisons in England and Wales and all prisoners should have access to a listener at any time of day or night and in any setting, including segregation units.<sup>25</sup> The exception to this is for young prisoners as those aged < 18 years are not recruited as listeners.

Two studies<sup>37,146</sup> contained some quantitative evidence on the effects of Listener schemes on prisoner health. Both used questionnaires to conduct a cross-sectional survey among listeners.

Seven qualitative studies<sup>25,31,32,36,137,138,146</sup> included in the review examined Listener schemes.

### Effects on listeners

An area in which there was strong qualitative evidence was for individual health gains for those trained as listeners or befrienders. Trained individuals reported that they were 'giving something back', doing something constructive with their time in prison and being of benefit to the system; this consequently had an effect on their self-esteem, self-worth and confidence.<sup>25,31,32,36,137,138</sup> The study by Dhaliwal and Harrower<sup>137</sup> also demonstrated individual changes in those trained in the listener role. Being less judgemental and changing attitudes and behaviour towards help-seeking within the prison (i.e. from regarding it as a display of weakness to seeing it as a sensible coping strategy) were discussed. Moreover, having enhanced skills as a result of being a peer deliverer, such as better listening and communication skills, was mentioned by two studies<sup>137,138</sup> and there was evidence that prisoners felt able to put these skills into practice on release from the institution.<sup>137</sup>

There were some negative health effects reported in some studies<sup>31,137,138,146</sup> and these related to the emotional burden of listening to other prisoners' problems and issues. Discussions relating to suicidal intentions and other distressing topics could be particularly burdensome for peer deliverers to manage, as exemplified by this participant in Foster's study<sup>138</sup> of listeners:

*And that is quite challenging being a Listener and listening to someone who for instance his radio is telling him to have sex with it and stuff like that. . . . we're in there for twenty minutes listening to them and some of the things they do come out with, it can quite affect you.*

p. 22

There were also reports of peer deliverers experiencing 'burnout' and mental exhaustion as a result of the demands placed on their time by other prisoners.<sup>138,146</sup>

In one quantitative study<sup>146</sup> 64% of 22 prisoners claimed that, by becoming a listener, friends and family had noticed a difference in their demeanour, finding them more relaxed, responsible and optimistic, able to speak more and more able to listen. In total, 73% agreed that their new responsibilities would allow them to 'adjust better' on release and 55% agreed that the 'prison authorities' appreciated their work. In addition, 77% said that there was a difference in how immediate staff interacted with them (being trusted more, staff talking more to them, staff being grateful for the work they do) and 86% said that fellow prisoners behaved differently towards them.

### **Perceived benefits for service users**

One of the over-riding issues to emerge from the qualitative studies<sup>31,36,138</sup> is the reported impact that trained peers have on reducing depression and anxiety in distressed prisoners and improving their mental state. For example, prisoners interviewed in Foster's<sup>138</sup> comprehensive study of the Listener scheme suggested that, through talking to a trained peer, they had the opportunity to vent their frustration and anxieties and this was reported to have a calming and uplifting effect, making it much less likely that they would become violent towards themselves. Health-care professionals also acknowledged the role of listeners in improving the emotional health of prisoners.

Two of the qualitative studies that focused on the Listener scheme<sup>31,138</sup> provide anecdotal evidence that suicide and self-harm are reduced as a result of the support offered by peers acting in this role. A similar intervention model implemented in southern Alberta (SAMS in the Pen)<sup>36</sup> also shows the importance of the service not only for addressing suicide but also for helping those who are depressed, who are feeling alone, who are suffering from a loss, who have received bad news from outside or who are having problems adjusting to the institution. Indeed, this study showed evidence that trained prisoners had increased their knowledge of suicide and depression and had become better able to identify suicide risk in other people.<sup>36</sup>

In terms of perceived benefit, a quantitative study<sup>37</sup> found that 44% of users of the Listener scheme reported that they always felt better after confiding in a listener and 52% felt better at least sometimes. Furthermore, 84% said that they had always found the experience helpful (data collected from 28 users of the Listener scheme and 44 non-users).

### **Approachability and availability of listeners**

In one study<sup>37</sup> 61% of those surveyed said that they could talk to a listener about anything that was worrying them and 74% had no problems contacting a listener when they had requested help.

### **Future use of the Listener scheme**

One study<sup>37</sup> reported that 57% of users thought that they would seek the help of a listener if they faced a similar problem in the future. This was taken to be an indication that they were satisfied with the support that they had received.

## **Prison hospice volunteers**

Prison hospice volunteers provide companionship, practical assistance and social support to terminally ill patients. They may be involved in a range of activities as requested by patients including letter writing, reading, accompanying patients to religious services and other parts of the prison and sometimes maintaining a bedside vigil with dying patients.<sup>40</sup>

No studies presented quantitative evidence on prisoner hospice volunteers.

Qualitative studies of prison hospice programmes in which trained prison volunteers form part of the workforce show that volunteers experience increases in self-esteem and self-worth as a result of the service that they provide to others.<sup>40,133</sup> Evidence also suggests that prisoners gain an enhanced sense of

compassion for other people<sup>40,133</sup> and that being prison hospice volunteers allows individuals 'to give something back'.<sup>119</sup> In one study<sup>127</sup> prison volunteers described life enrichment, growth and coming to terms with their own mortality as a result of their involvement. Moreover, the recipients of one of the programmes suggested how the volunteers had supported them and enabled them to overcome states of depression.<sup>127</sup>

## Peer mentoring

Mentoring describes the development of a relationship between two individuals in which the mentee is able to learn from the mentor, model positive behaviour and gain experience, knowledge or skills.<sup>167,168</sup> Peer mentors, as defined by Finnegan and colleagues,<sup>168</sup> have a similar background or experiences to their mentee. Peer mentoring has been proposed as an approach to engage disadvantaged and excluded young people by offering role models to encourage and inspire them.<sup>169</sup> There are a number of peer mentoring schemes in UK prisons focused on education and training, such as the Learning Ladder,<sup>142</sup> and on resettlement and prevention of reoffending.

One study<sup>122</sup> reported quantitative findings relating to the effects of peer mentoring on prisoner health. The study used a one-group design and reported outcomes relating to substance use, employment and reoffending at 3, 6 and 12 months' follow-up.

One qualitative study<sup>147</sup> provided evidence on life coaches (many of whom were ex-offenders).

### Adherence

At 3 months, 38/44 participants (86%) were receiving outpatient psychiatric services and 40/44 (91%) were successfully managing their medication. At 6 months, 36/44 participants (82%) were medication compliant and 35/44 (80%) demonstrated symptom reduction. In total, 12/44 (27%) had not maintained sobriety at the 6-month time point.<sup>122</sup>

### Reoffending

In the study by Goldstein and colleagues,<sup>122</sup> 17/22 (77%) participants released for at least 12 months had not been rearrested.

A qualitative evaluation study of Routes out of Prison, which uses life coaches (many of whom were ex-offenders), showed positive effects on recipients' propensity to reoffend. Many attributed this change in attitude and behaviour to the relationship developed with the life coach and viewing the life coach as a credible role model.<sup>147</sup>

### Behaviour

In total, 16/22 participants (73%) in the study by Goldstein and colleagues<sup>122</sup> who had been released for at least 12 months were abstinent in the use of alcohol or illegal drugs or the misuse of prescription drugs.

### Employment

In total, 16/22 (73%) participants in the study by Goldstein and colleagues<sup>122</sup> who had been released for at least 12 months were employed, were enrolled in an educational programme or had completed the application process for disability benefits.

### Housing

In the study by Goldstein and colleagues,<sup>122</sup> 18/22 (82%) participants who had been released for at least 12 months had secured treatment, transitional housing or a permanent place to live.



## Health trainers

Health trainers are lay public health workers who use a client-centred approach to support individuals around health behaviour change and/or signpost them to other services, some of which are also free at the point of delivery (see Health Trainers England website: [www.healthtrainersengland.com](http://www.healthtrainersengland.com)). Health trainers work with disadvantaged communities and are often recruited from those communities. They receive training to reach standardised competencies and are usually employed by the NHS.<sup>170</sup> The health trainer role was introduced in the 2004 public health White Paper *Choosing Health*<sup>2</sup> as a means of tackling inequalities by providing peer support around lifestyle change and in 2006 a health trainer initiative was piloted across three adult prisons, one YOI and one probation service.<sup>28</sup> The service has since expanded and there are now health trainer services in a number of prisons across England and Wales. Prison health trainers receive standardised training on health promotion, healthy lifestyles and mental health, with the training adapted for the prison setting and client group.

One study<sup>136</sup> reported quantitative findings on the effect of health trainers on prisoner health. This was a multimethod evaluation, including interviews, questionnaires, focus groups and analysis of monitoring data.

### Confidence

Health trainers seemed most confident in signposting to exercise, smoking cessation and drugs services and least confident in signposting to self-harm, immunisation and dental services (*Table 6*).<sup>136</sup>

From qualitative research it was evident that training as a health trainer had been a huge boost to prisoners' confidence, self-esteem and self-worth,<sup>136</sup> although this was not specifically reported by prisoners themselves but by key staff involved in the programme. There was, however, evidence of health trainers bolstering other prisoners' reported self-esteem and confidence through listening and supporting individuals.<sup>136</sup>

### Knowledge

Two qualitative studies showed that the health trainer training programme appeared to have successfully increased individuals' knowledge on a variety of topics, including drugs, sexual health, nutrition, alcohol and mental health issues.<sup>136</sup> Attitudinal change, often as a result of increased knowledge, was seen primarily in the area of smoking and diet<sup>136</sup> and this resulted in behavioural changes.<sup>136,148</sup> For example, health trainers reported eating more fruit and vegetables and one health trainer had given up smoking.<sup>136,148</sup>

Improvements were seen in mean knowledge scores in all areas in one study<sup>136</sup> but it was not possible to ascertain whether or not these improvements were statistically significant as no measure of variance was given.

**TABLE 6** Numbers of health trainers stating that they were 'very confident' in signposting to services<sup>136</sup>

Service	n/N (%)
Exercise	12/17 (71)
Smoking cessation	11/17 (65)
Drugs	10/17 (59)
Healthy eating/diet	9/17 (53)
Sexual health	8/17 (47)
Alcohol	8/17 (47)
Mental health issues	7/17 (41)
Dental health	4/17 (24)
Self-harm	3/17 (18)
Immunisation	3/17 (18)

### Attitudes

In one study<sup>136</sup> > 50% of health trainers stated that their attitude had changed in the areas of healthy eating/diet, sexual health, smoking cessation, exercise and mental health. In total, 75% of health trainers stated that they would like to get a job as a health trainer on release from prison.

### Prisoner outcomes: issues discussed with health trainers

Issues most likely to be discussed with health trainers were reported in one study<sup>136</sup> to be exercise, weight and healthy eating (Table 7).

### Onward referrals

Health trainers in one study<sup>136</sup> were most likely to refer clients to gym staff or health-care staff (Table 8). Referrals were also made to Counselling, Assessment, Referral, Advice and Throughcare Services (CARATS), counsellors, dentists and opticians.

In total, 75% of clients stated that they would like another appointment with a health trainer.<sup>136</sup>

**TABLE 7** Issues that clients discussed with health trainers

Issue	Discussed by (%)
Exercise	68
Weight	50
Healthy eating	50
Smoking cessation	23
Stress	11
Drugs	9
Dental health	6
Alcohol	5
Poor sleep	4
Mental health	3
Sexual health	2
Cancer	1
STIs	0

**TABLE 8** Onward referrals from health trainers

Service	% of clients referred	No. of prisoners with no previous contact with any prison service
Gym staff	59	38
Health care	23	9
Walking programme	10	9
CARATS	7	7
Counsellor	4	4
Dentist	4	3
Optician	1	1

### **Additional themes from qualitative research**

Two qualitative studies examined health trainers in prisons.<sup>136,148</sup> Both studies had evidence of increased health knowledge and attitudinal and behavioural change in prisoners, although this was more frequently reported for the health trainers than for the recipients of the programme.

Participants suggested that the skills developed in the health trainer role were applicable outside of the prison context and could be transferable to the community. Both health trainers and health trainer tutors reported that health trainers had developed effective communication and listening skills as well as fostering attributes essential for team working and future employment after release from prison.<sup>136</sup> It was reported that, for those prisoners who completed the health trainer course, the recognised qualification that they attained could support efforts to find employment as a health trainer post release.<sup>136</sup>

### **Other peer interventions**

#### **Peer observers**

The impact of peer observers was examined in one study as part of a suicide prevention initiative.<sup>124</sup> Peer observers observed prisoners who were on suicide watch, that is, at risk of suicide. They undertook active listening but the role did not involve counselling.

This quantitative controlled study<sup>124</sup> found a statistically significant decrease [ $t(71.55) = 2.14, p = 0.036$ ] in the mean number of hours on watch following the implementation of the Inmate Observer Program.

No studies presented qualitative evidence on peer observers.

#### **Peer training (violence)**

The Alternatives to Violence Project (AVP) involves prisoners training and then facilitating training on conflict resolution techniques with young offenders. The project includes a formal five-step programme: basic training, advanced training, training for trainers, facilitation and management council membership.<sup>132</sup> Although it involves peer education in terms of using a cascade training model, it entails a high degree of involvement and is described as 'inmate run'.

One non-randomised controlled before-and-after study presented quantitative data on the effects of the AVP intervention on prisoner health.<sup>132</sup> No statistically significant effect of the intervention was seen on anger (MD  $-4.01$ , 95% CI  $-9.40$  to  $1.38$ ), measured with the Anger Expression Scale.

Small but statistically significant negative effects of the interventions were seen on self-esteem (MD  $-2.15$ , 95% CI  $-4.20$  to  $-0.10$ ), measured with the Rosenberg Self-Esteem Scale but not on optimism (MD  $1.30$ , 95% CI  $-0.83$  to  $3.43$ ), measured with the life orientation text.

In terms of behaviour, the incidence rate ratio for the number of confrontations post intervention, controlling for the number of confrontations pre intervention, was statistically significantly reduced at  $0.432$  (95% CI  $0.319$  to  $0.583, p < 0.0005$ ).

No studies presented qualitative data on peer training.

#### **Peer outreach (harm reduction)**

No included studies presented quantitative evidence on peer outreach.

A harm reduction programme in Moldovan prisons involved peer volunteers in distributing condoms, supplies for needle exchange and information booklets to fellow prisoners.<sup>163</sup> This qualitative study suggested that peer volunteers felt that their role was worthwhile and that they were making a difference to the health of the prison population.<sup>163</sup>

### Peer advisors (housing)

Peer advisors provide housing advice to fellow prisoners within prisons, particularly new prisoners and those planning for resettlement. Some peer advisors support prisoners 'through the gate'.

No studies presented quantitative evidence on peer advisors. Two studies<sup>135,139</sup> presented qualitative data on a peer-delivered housing advice service to support prisoners in keeping their accommodation whilst imprisoned. The studies reported the difference that the intervention had made to the trained peer advisors with regard to increased self-esteem and self-confidence through activities such as talking on the telephone with housing agencies or liaising with staff from prison and probation teams. This was coupled with peer deliverers reporting that they were building a work ethic and a sense of control over their lives. The role was perceived by the volunteers to be worthwhile and purposeful as well as enabling social interaction with others and offering 'structure' to the prison day:<sup>139</sup>

*I just thought it would be a good thing to do especially in prison because there's some pretty dead end jobs in prison . . . all the other jobs, cleaning and working in the laundry or in the store, you're not doing anything really. You're just passing the time. But with the peer advising job, I personally felt that I was helping and it was helping other people.*

p. 123<sup>139</sup>

There was qualitative evidence to suggest that the peer advisor role provided 'real-world' employment skills and this was regarded as being beneficial for future employment opportunities. However, both studies alluded to the difficulties that trained peer advisors could face on release from prison as a result of their status as ex-offenders.<sup>135,139</sup>

### Peer support and counselling

One study<sup>161</sup> looked at the effects of peer support (Narcotics Anonymous meetings) and counselling (12-step programme) compared with peer support alone (Narcotics Anonymous meetings only) on mental health, namely coherence, meaning in life, anxiety, depression and hostility. Improvements with the combined interventions were seen for all outcomes (coherence: MD -0.31, 95% CI -0.48 to -0.14; meaning in life: MD -0.42, 95% CI -0.65 to -0.19; anxiety: MD -0.42, 95% CI -0.66 to -0.18; depression: MD -0.35, 95% CI -0.52 to -0.18; hostility: MD -0.11, 95% CI -0.18 to -0.04).

## Summary

Most of the included studies were of poor or moderate internal validity, with only four qualitative or mixed-methods studies judged to be of high internal validity. Most studies had small sample sizes and the majority were not judged to be of high relevance to the review context. The majority of the evidence reports the effects on peer deliverers rather than on service recipients.

### Peer education

The evidence suggests that peer education can improve knowledge of HIV (although outcome measures need to be standardised) and literacy. Improved attitudes were seen in one of three peer education studies reporting this outcome. Improved intentions to use condoms after peer education were seen in one RCT but this was not reproduced in another study. Nevertheless, evidence from 11 studies showed positive effects on behaviour, including condom use, screening for STIs, safer injecting and tattooing behaviour and increased parental contact. Although one quantitative study showed no effect on self-esteem, strong qualitative evidence reported that peer deliverers found the role rewarding – it improved their skills, gave their time in prison meaning and purpose and provided a supportive network. In one study prisoners preferred to be taught by a HIV-positive peer than a professional; in another, prisoners scored higher on knowledge tests with a HIV-negative peer educator than with a HIV-positive peer educator or a professional.

### **Peer support**

There was strong evidence from qualitative studies that the peer support role led to increased self-esteem (although this was not seen when measured quantitatively), increased knowledge and improvements in wider relationships. No effect of the PST model was seen on perceptions of the prison environment, but two studies indicated that prisoners were satisfied with peer support interventions. Several qualitative studies also contributed evidence that peer deliverers gained a better self-awareness and perspective on their lives, and a sense of purpose inside prison, as well as developing the skills to deal with their own health and offending issues. However, the role could be challenging and burdensome.

### **Listeners**

There was evidence to suggest that listeners had improved self-esteem, self-worth and confidence. Other positive effects included enhanced listening and communication skills, which prisoners felt they could also use on release from prison, improved relationships with staff and changing attitudes and behaviour towards help seeking in the prison. There was good evidence from qualitative studies that listeners were able to reduce levels of depression and anxiety in distressed prisoners and improve their mental state. There was a suggestion that suicide and self-harm were reduced as a result of listener support, perhaps through listeners being better able to identify suicide risk in other people. Negative effects reported were the emotional burden on listeners.

### **Prisoner hospice volunteers**

Qualitative evidence suggested that volunteers experienced increases in self-esteem and self-worth, an enhanced sense of compassion for other people and a sense of 'giving something back'. Recipients felt supported and some had been enabled to overcome depression.

### **Peer mentoring**

Positive effects of peer mentoring were seen on reoffending, medication adherence, misuse of drugs, employment and housing.

### **Health trainers**

Improvements in health trainers' self-esteem, self-worth and confidence were noted by staff, whereas recipients' self-esteem and confidence were boosted by being supported by health trainers. Health trainers were confident in signposting to prison services. Improvements in knowledge and attitudes were noted, although more frequently for the health trainers than for the recipients.

Communication and listening skills developed by health trainers were thought to be potentially transferable to future employment on release from prison.

### **Peer observers**

The only outcome reported for peer observers was a decrease in the number of hours on suicide watch.

### **Peer training**

No effect of peer training on anger levels was seen but there was evidence of a reduction in confrontations. Small reductions were seen in self-esteem and optimism over the course of the evaluation.

### **Peer outreach**

Peer volunteers felt that their role was worthwhile and that they were making a difference to the health of prisoners.

### **Peer advisors**

There was evidence of increased self-esteem and self-confidence in peer advisors. Peer advisors reported building a work ethic and sense of control over their lives and the peer advisor role was seen as worthwhile and purposeful and offering 'structure' to the prison day.

*Peer support and counselling*

In one study peer counselling (12-step programme) combined with peer support (Narcotics Anonymous meetings) led to improvements in mental health over and above those seen in the Narcotics Anonymous meetings-only group.

# Chapter 6 Findings of the review of effectiveness: what is the effectiveness of peer delivery compared with that of professional delivery? (Review question 3)

## Introduction

Very few studies compared peer-led and professionally led interventions. Two of those that did were RCTs of the prevention of HIV infection. A small number of studies did, however, report results on prisoner preferences for peer or staff delivery. This chapter reports first on the quantitative studies that compared differences in outcomes and then goes on to present qualitative results on prisoner preferences.

## Quantitative results

Four studies<sup>23,123,124,126</sup> contained quantitative information relevant to review question 3. Three of these were about peer education for the prevention of HIV infection,<sup>23,123,126</sup> of which two were RCTs.<sup>123,126</sup> The fourth was a three-group experimental study of peer observers for suicide watch.<sup>124</sup> One of the HIV RCTs were judged to be of low internal validity<sup>123</sup> and one was of moderate internal validity.<sup>126</sup> Both were judged to be of moderate relevance; the other study on HIV<sup>23</sup> was judged to be not very relevant. The study on peer observers<sup>124</sup> was judged to be of low internal validity but of moderate relevance.

### Intentions

One study<sup>123</sup> found no significant difference between peer-led and professional-led groups for the outcome of intention to use a condom (RR 1.00, 95% CI 0.96 to 1.04) and intention to never use a condom (RR 0.99, 95% CI 0.79 to 1.24) (*Figure 13*). When intention to use a condom was broken down by ethnicity, no significant differences were seen between groups taught by peers and groups taught by professionals except for African American men's intention to always use a condom, which was statistically significantly greater in the peer-led than in the professional-led group (RR 1.12, 95% CI 1.01 to 1.24).

Intention to use bleach (for injecting drug users) in the same study<sup>123</sup> was not statistically significantly different between peer-led and professional-led groups (RR 1.01, 95% CI 0.96 to 1.05), nor was interest in taking a HIV test for the first time (RR 1.00, 95% CI 0.80 to 1.25) and interest in taking a HIV test 'now' (RR 1.02, 95% CI 0.82 to 1.27) (see *Figure 13*).

### Preference for teacher

In an American RCT on HIV<sup>123</sup> there was a strong preference among inmates for being taught by a HIV-positive inmate rather than an HIV/AIDS (professional) educator. This was most marked in the group who had received education from a peer (68% preferred to be taught by a HIV-positive inmate and 11% preferred to be taught by a HIV/AIDS educator).

### Behaviour

One RCT<sup>126</sup> compared 'standard practice' HIV education with a peer education DVD and found that peer education did have a positive effect on condom use but the effect was not statistically significant (RR 0.71, 95% CI 0.50 to 1.02).

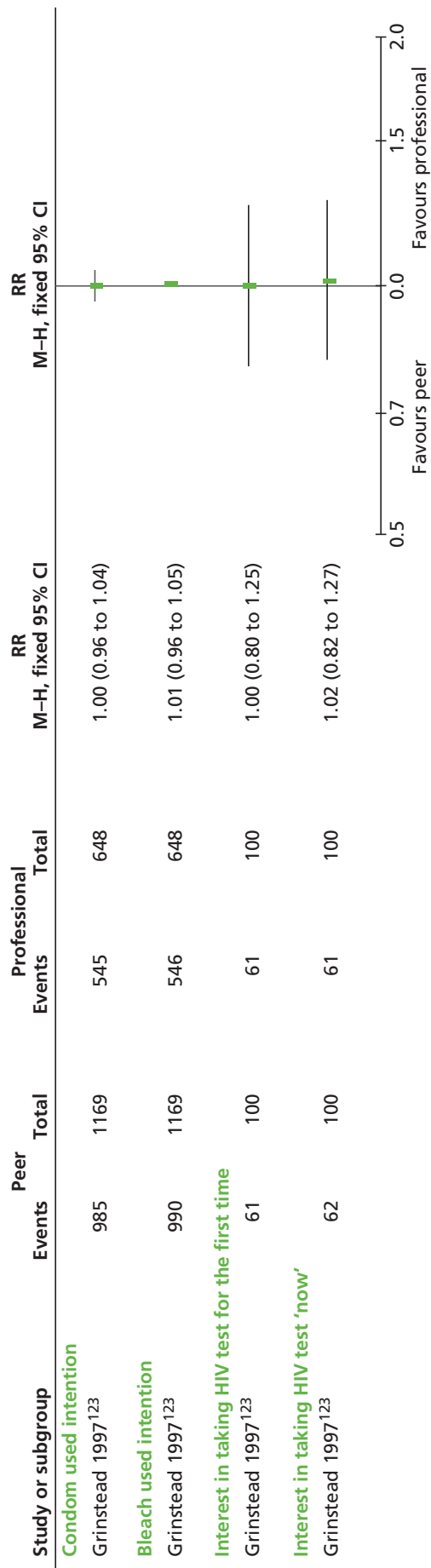


FIGURE 13 Intentions: peer-led vs. professional-led groups.



### Knowledge

Mean scores for HIV knowledge in one RCT<sup>123</sup> were 8.1 in the peer-led group and 8.3 in the professional-led group, but it was not possible to ascertain whether or not there was a statistically significant difference between groups as no measure of variance was provided. The study authors did not report a statistically significant difference between groups using the chi-squared test.

### Number of hours on suicide watch

The study of the impact of using peer observers for suicide watch<sup>124</sup> reported a significant decrease in the mean number of hours that inmates remained on watch following the implementation of the Inmate Observer Program, from 108.88 hours (SD 126.06 hours) using staff observers to 64.05 hours (SD 59.82 hours) using inmate observers ( $p = 0.036$ ). On subgroup analysis it was found that this effect was seen only in individuals with a psychotic diagnosis ( $p = 0.001$ ).

It was also reported that the number of suicide watches dropped by 31.25%, from 48 in the 12 weeks pre Inmate Observer Program to 33 in the 12 weeks post Inmate Observer Program; however, this difference was not found to be statistically significant ( $p = 0.096$ ).

It was also reported that there was a significant reduction in the number of people with personality disorders placed on suicide watch following the implementation of the Inmate Observer Program (25 vs. 12,  $p = 0.033$ ), although the reasons for this were unclear.

### Prisoner preferences: qualitative results

A strong theme to emerge in 10 studies<sup>25,135,136,138,139,147,151,153,155,156</sup> was that peers were able to show a greater sense of empathy than staff. Many peers had experienced first-hand many of the problems faced by prisoners and could relate to the challenges that they faced. The value of 'lived experience', therefore, was a crucial attribute that peers held over staff.

In three studies<sup>138,155,156</sup> prisoners reported that they preferred confiding in peer deliverers than in staff because they were less likely to be judged for the things that they said. A prisoner in Foster's study<sup>138</sup> described the reason why he had preferred to discuss issues with a peer rather than a member of staff:

*A lot of people do find it easier to talk to another con rather than an officer . . . and I think me personally my own experiences, it's the white shirt and the tie, the key, the whistle, it's just that power thing, isn't it? It's hard . . . if I talk to the officer then that officer is going to go back to the office and sit and joke about what I've told him and use my, what I've said to him as a weakness and you've got all that with officers as well.*

*p. 30*<sup>138</sup>

In four studies<sup>135,148,151,153</sup> it was reported that prisoners felt more comfortable and at ease talking with peers than with staff. Some studies suggested that prisoners had little trust in staff and were fearful that disclosures would be documented and noted on their file.<sup>151,155,156</sup> Other reasons why prisoners were more comfortable talking to peers than staff was that they were perceived to be more approachable<sup>136</sup> and credible<sup>128</sup> and had greater understanding.<sup>147</sup>

In comparison to staff, peers were perceived as being more accessible and could offer more time for discussion.<sup>138,151,156</sup> Prisoners in Foster's study,<sup>138</sup> for example, mentioned the difficulties of securing an appointment with a health professional in comparison to the 24-hour access of the Listener scheme. Furthermore, the confidentiality code that listeners adhered to was regarded in one study<sup>138</sup> as a primary reason why prisoners were more likely to approach a peer than a member of prison staff.

In two health trainer studies<sup>136,148</sup> it was suggested that peers may be better equipped than staff to recognise the early signs and symptoms of mental health problems in their peers and to offer advice regarding stress management techniques.

## Summary

Many studies reported a strong preference among prisoners for peer educators over professional educators, for various reasons including that peer educators had increased empathy and understanding, did not judge, were approachable, credible and trustworthy and had more time for prisoners. However, peer educators did not seem to be more effective than professional educators for most of the outcomes measured, except for the number of hours spent observing suicidal inmates and possibly in recognising and dealing with mental health problems in their peers. On the other hand, this could be expressed another way: that the peer educators were at least as effective as the professional educators for all of the outcomes measured and reported in the included studies.

## Chapter 7 Findings of the effectiveness review: what are the positive and negative impacts on health services within prison settings of delivering peer-based interventions? (Review question 2)

### Introduction

This chapter presents four thematic categories derived primarily from the qualitative analysis of included studies. These four categories emerged inductively from an overall set of descriptive codes ( $n = 99$ ), which were organised into a set of themes and then grouped into analytical categories. This process is presented in *Appendix 6*.

### Peer recruitment, training and support

The method of recruiting prisoners into peer interventions was not explicitly mentioned in the majority of included studies. Brooker and Sirdifield<sup>136</sup> reported how 'open adverts' across the prison were used to recruit prison health trainers and, in some cases, prisoners were directly targeted for peer delivery roles by staff. Foster<sup>138</sup> also noted how recruitment posters were used to attract prison listeners into the scheme. Finally, data from O'Hagan's<sup>143</sup> study of a peer reading scheme showed that more than half (52%) of mentors found out about the scheme from a teacher or educational services, with 15% finding out from a prison officer, 12% from another mentor, 9% from a poster, 6% from another prisoner, 3% from information on the wing and 1% from information at induction.

A primary motivation for prisoners wanting to engage in the delivery of peer-based schemes was an altruistic desire to support others.<sup>25,135,138</sup> Other motivations for undertaking the role, mentioned in three studies, were the increased opportunity for release or parole;<sup>136,138,151</sup> being put on 'hold', which would inhibit a transfer to another prison;<sup>138</sup> and potentially being allocated a single cell.<sup>138,146</sup>

The selection criteria employed for choosing peer deliverers were generally consistent across intervention modes. Security regulations, reported in seven studies,<sup>25,26,31,127,135,138,156</sup> often dictated whether or not a prisoner was eligible for undertaking a peer delivery role. For example, prisoners who were perceived to cause security risks (i.e. potentially passing drugs around or moving mobile telephones around the prison) were excluded on this basis. As a result, this meant that only lower-risk prisoners were eligible for selection in programmes.<sup>135,138</sup> Although security factors were an over-riding consideration, other issues were taken into account within the selection process. Providing a voluntary drugs test,<sup>135</sup> having knowledge of the system and 'jail craft',<sup>31</sup> having basic literacy skills<sup>135</sup> and the period of time the a prisoner was likely to be staying within the institution<sup>135,153,156</sup> were issues also considered during certain selection processes. Good interpersonal skills and enthusiasm to undertake the role were also taken into account in several interventions,<sup>25,135,136,140</sup> and to be a prison listener a level of maturity was regarded as a prerequisite.<sup>31,138</sup> In the majority of papers it was unclear who made the final selection decision; only within three studies that discuss the prison Listener scheme is this elaborated on.<sup>25,31,138</sup> In this scheme selection is made jointly between the local Samaritans branch responsible for the scheme and the prison,<sup>138</sup> with the prison governor having the final veto.<sup>31</sup>

The training of peer deliverers did vary across the included studies but again not all studies provided details of the training offered to peer deliverers. The training provided frequently varied in relation to its content, duration, frequency and intensity. As an example, the Canadian PST programme consisted of 17 3-hour training sessions<sup>151,155,156</sup> whereas other programmes implemented much shorter training packages to reflect the type of prison and the average stay of prisoners. Indeed, interviews with the tutors of the health trainer course emphasised the importance of flexibility of training within prisons rather than having a rigid and prescribed design.<sup>136</sup> Training packages were often delivered by a range of individuals including prison staff, health professionals, outside agencies and prisoners. There was little qualitative evidence to suggest which of these modes of training delivery were more or less successful. However, a recurring theme in three of the studies<sup>38,136,138</sup> was the need for more comprehensive training in mental health issues.

Accredited training, whereby prisoners received nationally relevant awards on completion, was reported in three studies<sup>25,135,136</sup> and was a future goal in a further study.<sup>157</sup> Accreditation was perceived as being particularly beneficial in providing prisoners with qualifications that could be usefully applied in the community after their prison sentence:

*I was really sick of disadvantaged people being given 'Mickey Mouse' qualifications that mean nothing in the real world. If we were going to use these guys [for peer advice service] give them a proper qualification. With the NVQ [National Vocational Qualification], at least they might get a chance for a proper job in the voluntary sector.*

p. 6<sup>135</sup>

Supervision within interventions was frequently provided to peer deliverers in a number of formats. In some interventions, supervision meetings (both one-to-one and group meetings) with prison staff took place on a regular basis<sup>25,135,136</sup> and this could be particularly useful when offloading difficult interactions with suicidal or self-harming prisoners.<sup>135</sup> In some instances, support was also provided by external agencies outside of the prison,<sup>121,135</sup> such as the Samaritans in the case of the Listener scheme:<sup>25,31,138</sup>

*A huge amount of support is provided by Samaritans volunteers to the Listeners. The volunteers that go into the prisons are extremely committed to what they're doing – most are doing it on top of their normal duties as Samaritans.*

p. 56<sup>25</sup>

In the studies that discussed supervision processes, there was general praise from prisoners for the amount and type of supervision provided. Only in one study<sup>149</sup> did participants report that there was inadequate support or supervision for them in their role.

A concern raised in eight of the studies<sup>25,121,135,136,153,155,156,159</sup> was the issue of attrition and the difficulties programmes faced in retaining peer deliverers. This was frequently because of prisoner turnover, that is, the sudden or unexpected movement of prisoners from institution to institution. This turnover of peer deliverers could lead to instability within programmes.<sup>25</sup> Indeed, Brooker and Sirdifield<sup>136</sup> noted that some peer-led programmes may be more successful in prisons with long-term prisoners, or those on 'hold', as they are less likely to be released/transferred after completing their training. Incentives were used in a minority of studies to ensure a consistent throughput of trained and engaged peer deliverers. Hoover and Jurgens,<sup>163</sup> for instance, reported that 'gift bags' (containing items such as cigarettes, food packages and hygiene supplies) were provided to trained prisoners on a regular basis.

## Prisoner relationships

The awareness and utilisation of peer-based interventions in prisons was raised in a number of the included studies. In one study it was reported that more than two-thirds of prisoners knew at least one peer educator.<sup>158</sup> However, in the study by Taylor,<sup>158</sup> 40% of prisoners questioned knew nothing about the

peer education programme on offer in the institution, and in four qualitative studies<sup>147,153,155,156</sup> the lack of awareness of peer-based interventions among the prisoner population was mentioned.

Suggestions were made in some of these studies to better advertise the programmes using pamphlets and posters around prison buildings, but data from O'Hagan's<sup>143</sup> study of a peer reading scheme showed that the majority (92%) of prisoner learners found out about the scheme through 'word of mouth' from teachers or educational services, with 7% and 1% of prisoners finding out about the scheme from a prison officer or another prisoner respectively.

Quantitative studies showed that prisoners were often 'satisfied' with peer deliverers;<sup>154</sup> however, within some studies there were qualitative data that reported the reasons why some prisoners did not utilise peer-based services despite being aware of them. These included:

- concerns over confidentiality and potential breaches of trust between the prisoner and the peer deliverer<sup>151,153,156</sup>
- no personal requirement for formal peer support services<sup>153,156</sup>
- preferring to discuss issues with trained staff, cell mates or family members<sup>138,153</sup>
- the presence of language barriers<sup>155,156</sup>
- not wanting to demonstrate weakness to other prisoners by utilising a peer support service.<sup>25,138</sup>

Awareness raising was not only an issue for prisoners; four studies<sup>38,135,153,154</sup> discussed the challenge of making prison staff more cognisant of interventions and the function that they can serve for prisoners. In one study<sup>158</sup> only 14/38 (37%) prison officers questioned knew about the peer education programme in the prison. The importance of refreshing staff's knowledge about the intervention and maintaining regular communication was emphasised in two studies.<sup>135,154</sup> Moreover, Scott and colleagues<sup>131</sup> reported that, as staff became more familiar with the purpose of a peer-led HIV/AIDS peer education programme within the prison, it operated more smoothly.

In some schemes, such as the Insiders scheme,<sup>38</sup> the relationship between peer deliverers and prisoners enabled the provision of very practical guidance and this was particularly beneficial for first-time prisoners unfamiliar with the prison regime. A caution raised in one study,<sup>138</sup> however, was the notion of prisoner dependency on certain peer deliverers as a result of initial interactions. In several studies it was apparent that peer deliverers had been adequately trained to recognise the boundaries of their relationships with other prisoners. In five studies<sup>38,138,148,151,154</sup> it was reported that peer deliverers knew when to 'pass on' issues to health-care professionals, counsellors or prison staff. Dhaliwal and Harrower's<sup>137</sup> study of listeners, however, did show that trained prisoners did occasionally find it difficult to disentangle their role from the roles of other staff within the institution. Moreover, one study<sup>153</sup> highlighted concerns from prison staff that peer deliverers may attempt to manage situations that are beyond their knowledge and capabilities.

## Organisational support

One of the most consistent themes in many of the included studies was the importance of managerial support within the prison for schemes to operate successfully and be sustained.<sup>25,31,135,138,140,145,151,154,156,159</sup> This was illustrated by a participant in the study by Boyce and colleagues:<sup>135</sup>

*I found it quite a struggle . . . we had a different deputy resettlement governor whom I had no contact with. But now that [new resettlement governor] is in place, he seems very keen and helps out wherever he can. I had some issues with the security department . . . but now that's all sorted out because [resettlement governor] got involved and the security issues have kind of ironed themselves out (service manager).*

p. 8

Moreover, supportive relationships with other external agencies, such as the POA, NOMS and third-sector agencies, were also reported to be beneficial.<sup>25,31,138</sup>

Having specific members of prison staff with responsibility for peer interventions was also seen as an important way of embedding any intervention within the prison.<sup>25,145,156,163</sup> The criticality of staff support at other levels within the prison was also emphasised in several studies;<sup>135,159</sup> this included support with logistics and the movement of prisoners around the institution. However, in some programmes, funding and staff resources made it difficult for staff to support interventions at all times.<sup>136,153</sup>

## Prison life

The included studies showed both the positive impacts and the negative impacts of peer interventions on prison life. These are outlined under several themes.

### *The integration of peer interventions into the prison setting*

In some cases the integration of peer interventions in prison was inhibited by an element of resistance from prison staff.<sup>31,40,131,135,155,156,163</sup> This could include delays in unlocking peer deliverers or other problems concerning prisoner movement around the institution.<sup>143</sup> In one study<sup>25</sup> staff were particularly resistant to the confidentiality protocol deployed by prison listeners, which staff suggested made the institution less safe. In another study<sup>145</sup> it was reported that staff felt that the peer intervention, which involved the presence of ex-offenders, caused security issues. In three studies<sup>31,131,135</sup> initial staff resistance did later recede after recognition of the valuable service provided by peers.

The difficulties of integrating peer interventions within prisons that hold sex offenders within a vulnerable prisoner unit was noted in two studies.<sup>25,138</sup>

### *The contribution of peers to the wider prison workforce and service delivery*

In 10 studies<sup>25,31,38,128,135,138-140,155,156</sup> reference was made to the way that prisoners in peer delivery roles can divert demand from paid staff and potentially allow staff time to be deployed elsewhere to conduct other duties: 'Once officers see it working, they see that it takes a lot of pressure off them. They know they can send prisoners to talk to the peer advisors, so the officers benefit' (p. 45).<sup>25</sup>

Moreover, in four studies<sup>38,137,155,156</sup> peers were seen as acting as mediators between the prison population and staff, often creating more effective communication processes, and in one further study<sup>136</sup> health trainers reported filling a gap in service provision in terms of offering advice to improve prisoners' self-esteem and to help with stress management and coping with a prison sentence.

### *Peer interventions contributing to prison performance targets*

In one study of health trainers in prisons<sup>136</sup> there was a suggestion that the intervention could be contributing to addressing the prisons' key performance indicators and targets. These targets included time purposefully active outside of the cell, reducing self-inflicted injuries, reducing suicides, reducing the number of serious assaults and ensuring that prisoners have a job, training or education outcome on release. It was acknowledged in several studies that measuring these kinds of effects is problematic,<sup>25,26,135,136</sup> but Hall and Gabor<sup>36</sup> reported that in the 5 years before the SAMS in the Pen intervention began there were four completed suicides (rate 131.0/100,000), which reduced to two (rate 65.5/100,000) in the next 5 years (while the intervention was in place). There were a further two suicides in the next 2 years (rate 164.9/100,000) after the intervention had finished.

### *Power and risk*

Peer deliverers were often seen as being in positions of trust and power and often had close relationships with staff. Because of this, two studies suggested that peer deliverers were often susceptible to criticism and abuse from other prisoners by virtue of their role and their alignment to staff.<sup>146,151</sup>

Eleven studies<sup>25,31,36,135,136,138,148,151,153,155,156</sup> described either possible opportunities that prisoners in peer delivery roles had to abuse their position of trust or actual instances when they had abused their position of trust. The distribution of drugs, tobacco and mobile telephones was reported as a primary concern as peer deliverers often had enhanced freedom and access around the institution.<sup>25,31,36,135,138,155</sup> In three studies<sup>36,38,135</sup> these security threats had an effect on how interventions were managed and delivered. In three studies<sup>25,31,135</sup> the challenge for prison staff of facilitating peer interventions and managing risks at the same time was noted, emphasised here by a participant in the study by Davies:<sup>31</sup> 'Every now and again people are going to become Listeners for the wrong reasons, and they will get involved in drug trafficking. I see that as an acceptable risk in the whole business' (p. 130).

### Impact on prison ethos and culture

In three studies<sup>25,135,136</sup> there was evidence that peer interventions were providing more fulfilling work opportunities within the prison setting, offering individuals the chance to gain real-world skills and, in some instances, qualifications. This was in stark contrast to other prison work such as cleaning or working in the laundry room. One prisoner in the study by Boyce and colleagues<sup>135</sup> commented:

*I just thought it would be a good thing to do especially in prison because there's some pretty dead end jobs in prisons . . . all the other jobs, cleaning and working in the laundry or in the store, you're not doing anything really. You're just passing the time. But with the peer advising job, I personally felt that I was helping and it was helping other people.*

p. 13

The positive impact on institutional culture and ethos of peer interventions being delivered within prison settings was reported in seven studies.<sup>25,31,40,133,138,151,156</sup> This impact included creating a more caring and humane atmosphere; peer deliverers being able to diffuse volatile situations, preventing the escalation of minor problems into potentially serious disorder; and creating more cohesion between staff and prisoners. The introduction of a peer-led hospice programme was regarded as providing a transformative impact on the institutional climate.<sup>133</sup> Two studies,<sup>136,153</sup> however, suggested that peer interventions had very little impact (positive or negative) on the prison regime.

## Summary

This chapter has outlined the positive and negative impacts of delivering peer-based interventions on health services within prison settings. The chapter demonstrates how peers are recruited, trained and supported in the role with these processes frequently reflecting the institution's function and remit. For example, the content, duration, frequency and intensity of training on offer to peers were contingent on the average stay of prisoners. A recurring theme in many of the included studies was the importance of managerial support within the prison for schemes to operate successfully and be sustained. Moreover, the criticality of support from staff at other levels within the prison was also emphasised. It was clear that peer interventions make both a positive and a negative contribution to prison life. From a positive aspect, peers were reported to contribute to health service delivery within prison settings and, in some instances, to act as mediators between the prison population and staff. There was also evidence to suggest that peer interventions delivered within prison settings made a positive impact on the institutional culture and ethos. Conversely, studies described either possible opportunities that prisoners in peer delivery roles had to abuse their position of trust or actual instances when they had abused their position of trust. The distribution of drugs, tobacco and mobile telephones was reported as a primary concern as peer deliverers often had enhanced freedom and access around the institution.





## Chapter 8 Findings: what is the cost-effectiveness of peer-based interventions in prison settings?

### Introduction

A total of 1158 titles or abstracts were identified by the searches conducted for the cost or cost-effectiveness analysis of prison-based peer interventions. Of these, 26 full-text papers were retrieved for assessment, of which one<sup>171</sup> was eligible for the review (*Figure 14*). All of the 25 studies excluded were excluded on methodological grounds as none met the inclusion criteria for measuring/reporting costs or cost-effectiveness.

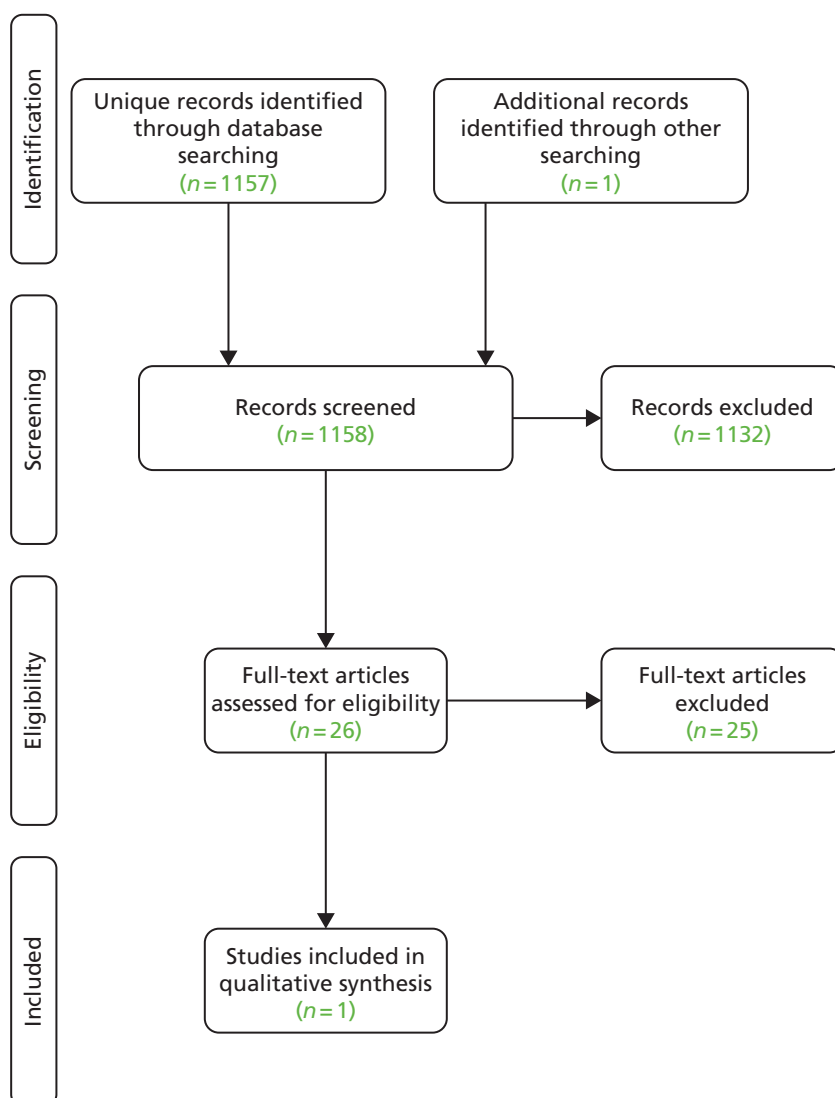


FIGURE 14 Study selection process.

## Study characteristics and population

The only study to meet the review criteria was a cost analysis that evaluated the impact of the introduction of a TC programme in a male adult substance abuse treatment facility in California, USA.<sup>171</sup> TCs are 'typically drug free settings that rely heavily on peer influence and mentoring activities' (p. 389);<sup>171</sup> indeed, the aim of this study was to assess the impact on management costs (these included inmate infractions, inmate grievances and major incidents) in a prison-based substance abuse programme. The analysis uses a group of similar inmates housed in a non-TC yard as the comparator. All inmates were classified as level II based on the US prison classification system. Level II facilities consist primarily of open dormitories with a secure perimeter, which may include armed coverage (see [www.cdcr.ca.gov/ombuds/entering\\_a\\_prison\\_faqs.html](http://www.cdcr.ca.gov/ombuds/entering_a_prison_faqs.html)).

As noted above, the TC programme relies heavily on peer influence and group dynamics to increase and reward participants' levels of personal and social responsibility. The TC prison yards were completely self-contained and separated from the general prison population. Structured activities included group sessions with peers, confrontation, role-playing and individual and group therapy. Treatment services were provided by two local contractors with the same basic TC philosophy and structure. Participation in the programme was mandatory for eligible inmates. Eligible inmates were defined as 'inmates with a history of substance use or abuse' (p. 390);<sup>171</sup> exclusion criteria included gang affiliations, a history of assault and holds from the Immigration or Naturalization Service. Treatment lasted up to 18 months in prison and involved three phases (orientation, primary treatment and pre-release transitioning). The programme included up to 20 hours weekly of substance abuse activities and  $\geq 10$  hours of structured optional activities.

The analysis reports the incremental costs of providing TC treatment (programme delivery) and the marginal costs and savings in terms of reductions in inmate infractions, inmate grievances and major incidents. An inmate infraction was defined as a violation of prison rules (e.g. violence or threat of violence, non-participation in assigned programmes, personal grooming, non-violent disruptive behaviour or possession of controlled substances or contraband); an inmate grievance was the formal filing of a complaint by a prisoner; and major incidents included widespread lockdowns as a result of misbehaviour (e.g. because of yard melees, assault or suicide).

Data were collected between 2003 and 2004. Using a price year of 2005, the costs (reported in US dollars) of programme delivery and management are presented. The costs assigned to delivery of the programme were estimated using the Drug Abuse Treatment Cost Analysis Program (DATCAP) from 2000 and adjusted to 2005 values using the consumer price index. The costs associated with infractions were based on serious infractions, which the authors describe as requiring immediate attention. Costs were based on staff time and valued using established salary schedules (2005). The authors were unable to obtain accounting figures such as yearly bonuses, longevity pay and remote location incentives that correctional officers receive in most state prisons. Therefore, it was noted that the actual costs of staff time were most likely underestimated. Details of the calculations are reported elsewhere. Inmate grievances were based on the cost of the grievance review at one of the three formal levels of review. The authors state that the complexity and diversity of major events and the lack of specific data for them meant that they were able to analyse differences between the TC and comparison housing facilities only in the distribution of major incidents. No discounting rate was applied.

The analysis accounts for non-random differences between allocation to the TC and allocation to the comparator using a logistic regression of yard membership on individual characteristics such as age, ethnicity, type of crime and previous incarcerations. The estimated parameters are used to calculate the likelihood of being assigned to the TC. The propensity score is then used as a control variable in tests of group differences in misconduct and cost differences.

## Results

Estimates of the cost of the TC programme, based on DATCAP data, were similar. The incremental cost of TC treatment compared with standard incarceration was US\$7.86 per day.

In total, 6773 inmates were in the TC yard and 4504 were in the comparator yard. The average age in the two groups was 38.1 years and 37.8 years respectively. Differences were apparent between the two groups with regard to race/ethnicity and the principal offence committed; however, after controlling for group differences in yard assignment propensity and inmate background characteristics, the risk-adjusted per capita costs of administrative infractions were US\$13.83 lower in the TC yard (US\$20.61 vs. US\$34.44) and the risk-adjusted per capita costs of serious infractions were US\$2.85 lower in the TC yard (US\$167.29 vs. US\$170.15).

The TC group was less likely to file a grievance (26.1%) than the comparator group (43.8%). The per capita cost of grievances was US\$46.02 in the TC group and US\$78.13 in the comparator group. Total savings from infractions and grievances were estimated at US\$45,694 and US\$217,481, respectively, over the 2-year observation period.

Fewer major incidents were observed in the TC group than in the comparator group (2.4 per 100 inmates compared with 9.4 per 100). No costs were assigned to these incidents.

## Commentary

There is a growing body of economic evidence which suggests that correctional interventions show economic benefits that often exceed the economic costs.<sup>172</sup> Economic studies in this field consistently find robust results related to the positive net economic benefits of crime reduction (i.e. avoided incarceration and victimisation costs). A recent review of pre-release substance abuse treatment programmes concluded that 'in-prison treatment can be both effective and cost-effective in reducing recidivism, possibly with greatest impact for the most serious offenders. Moreover, in-prison treatment coupled with aftercare in the community returns the greatest clinical and economic outcomes' (p. 40).<sup>172</sup> However, such studies were outside the scope of this systematic review given that the remit of the study was peer-based interventions to improve and maintain *health* in prisons and YOIs rather than a focus on recidivism per se. Similarly, the majority of correctional interventions were delivered by trained professionals not peers and therefore did not meet the said remit.

One of the most widely applied treatment models for substance misuse is the TC. The informal measures of social control, as promoted through the group processes and peer-to-peer confrontation, are believed to promote prosocial attitudes and behaviour.<sup>173</sup> Many studies attest to the effectiveness of prison-based TC programmes in reducing recidivism and drug use among participants.<sup>174</sup> Although the effectiveness review excluded TCs post hoc, for the cost-effectiveness review the decision was made to include TC programmes, in part because of the paucity of cost-effectiveness data and given the importance placed on the role of peers in TCs. It is noteworthy that the role of community care and follow-up after release does seem to have a large influence on the results of evaluations of TCs. McCollister and colleagues<sup>175</sup> found 'that offenders who participated in prison-based TC treatment followed by community aftercare had better outcomes than those who received no treatment or that received prison-based treatment alone' (p. 406).<sup>175</sup>

The cost analysis included in this review attempts to contribute to an understanding of whether or not a therapeutic environments result in lower management costs as a result of improved prisoner behaviour. Although the study does not explicitly refer to health outcomes, this is implicit in both the *raison d'être* of the TC and the body of evidence cited by the authors, which points to reduced drug use among TC participants together with potential costs savings that could offset the cost of the TC programme. Zhang and colleagues<sup>171</sup> are interested in the shorter-term benefits – the impact on disruptive behaviour, prisoner–staff conflict and management costs – which appear to be a more neglected area of research. They highlight a previous study<sup>176</sup> which found that a TC environment was thought to promote fewer inmate disciplinary problems. Although the intervention was described, clarity on the anticipated health

outcome(s) would have been useful. Indeed, there was no clear statement of the aim of the TC under investigation in this study.

The study in this review uses three indicators or proxies for disruptive behaviour: infractions, grievances and major incidents. All of these appear to be reasonable; however, further discussion around why they were chosen would have been beneficial. The source of measurement and valuation of the costs for the first two indicators are presented but for major incidents no costs are assigned because of a lack of appropriate data. The authors also acknowledge that there are important areas of cost that have not been captured within this analysis, particularly health-care costs resulting from inmate-on-inmate violence.

The results are presented in a disaggregated manner that lacks clarity. It is difficult to draw conclusions from, for example, the total savings accrued from fewer infractions and grievances compared with the apportioned total cost of provision of the TC programme. It would have been useful if the costs savings had been compared directly with the cost of providing the TC programme, albeit this is referred to briefly in the discussion, in which the authors highlight that the savings are relatively small in the context of the overall TC cost. In addition, no statistical comparisons are undertaken.

The authors mention that costs such as staff bonuses were not included and, although they control for characteristics associated with disruptive behaviour (demographics), the issue of uncertainty in their estimates was not addressed. There is, however, a short discussion regarding bias. The authors point to the greater proportion of serious infractions in the TC group. The explanation for this may lie in the more confrontational environment of the TC but the authors also suggest that this might be influenced by the extra surveillance by trained counsellors in the TC. Further research would be needed to explore the dynamics between staff and inmates in the TC yard and their impact on inmate misconduct, or to tease out whether or not the observed differences in prison infractions were due to increased staff surveillance.

Overall, the study included in the review is limited in its generalisability as the costs and resources are likely to be specific to a specialist US facility setting and funding model. The study is set in a dedicated substance abuse facility rather than a 'general' prison and there may be economies of scale associated with this. Similarly, the TC programme was provided by two large not-for-profit health-care providers specialising in addiction, which might not be available in other settings.

The population covered may also be context specific. For example, the TC programme itself was not rolled out across all categories of prisoners (only those classified at level II). In addition, the race/ethnicity of participants is likely to differ from the race/ethnicity of the prison population in the UK.

## Summary

Only one study was identified in which the cost or cost-effectiveness of peer-based interventions to improve and maintain health in prisons and YOIs was assessed. For this study the focus of analysis was costs rather than the health outcomes and the aim of the programme was poorly described. Evidence from the study shows cost savings in terms of management costs through the use of a TC programme in the short term, although these were relatively small compared with the overall costs. The findings suggest that TC activities or the existence of the TC environment may help to reduce or control prison management costs.

The review highlighted a shortage of robust evidence on the cost-effectiveness of peer-based interventions to improve and maintain the health of inmates, with few economic evaluations carried out, even of schemes with evidence of effectiveness.

In conclusion, although this cost study met the review criteria, the results, for the reasons outlined, are unlikely to be generalisable to a UK prison setting. Thus, to develop an economic model of peer interventions we look to the evidence from the effectiveness review presented in *Chapter 5*.

## Chapter 9 Economic model

### Introduction

It was anticipated that the results of the cost-effectiveness review, together with the results of the effectiveness review, would be used to undertake additional work that would provide an example of an economic model of a peer-based intervention in the prison setting relevant to the UK. The model would draw on evidence from a range of sources including papers identified in the effectiveness and cost-effectiveness reviews, other clinical evidence and professional opinion when data/evidence are not available. However, as only one paper was identified in the cost-effectiveness review,<sup>171</sup> and this paper was unlikely to be generalisable to the UK, we focused our attention on evidence from the effectiveness review.

The paucity of studies identified in the cost-effectiveness review, while prompting the issue of the reliability of a model built on such limited data, highlights the compelling need for economic models of peer-based interventions in prison settings that can assist decision-making for resource allocation. According to the criteria laid out in a report of the ISPOR Good Research Practices Task Force:<sup>177</sup>

*to reject the model because of incomplete evidence would imply that a decision with neither the data nor the model is better than a decision with the model but without the data. With the model, the available evidence can be used in a logical way to inform the decision; without the model, an opportunity to utilize the available evidence within the logical framework will have been forgone.*

p. 13

Abiding by this principle we choose to construct a pilot model to aid imminent decision-making on the allocation of health-care resources in prison settings, with the caveat that the model could be elaborated with better source data in the future.

With this in mind we looked into modelling a health concern relevant to the prison population and for which there was evidence of peer intervention effectiveness. The focus lay on the prevention of HIV infection. The results of the effectiveness review show that peer interventions have been widely applied in the prison setting, particularly in relation to the prevention of HIV infection and risk reduction, although little research was evident in the UK setting.

In total, 20 studies considered the prevention of HIV/AIDS/hepatitis C or other blood-borne viral infections or STIs;<sup>23,27,101,106,120,121,123,125,126,128,130,131,134,144,150,158,160,162–164</sup> 12 considered general health and/or hygiene;<sup>25,32,38,40,119,127,133,136,140,148,149,157,159</sup> four looked at issues affecting prisoners on release, such as employment or housing;<sup>135,139,141,147</sup> seven looked at the prevention of suicide or self-harm;<sup>22,26,31,36,124,137,138</sup> two considered mental health or substance abuse;<sup>122,145</sup> two looked at improving educational skills;<sup>142,143</sup> one considered parenting skills;<sup>129</sup> and one looked at violence reduction.<sup>132</sup> As reported in *Chapter 5*, 12 studies<sup>23,27,101,106,123,126,130,131,158,160,162,164</sup> reported quantitative findings from educational programmes on HIV/AIDS prevention, three of which were RCTs,<sup>27,123,126</sup> and a further study<sup>23</sup> reported the findings of a RCT among other study designs. Our choice was thus informed by the qualitative and quantitative evidence on HIV/AIDS prevention, particularly RCT evidence, found in the effectiveness review. This body of evidence links with the UK national strategy for sexual health,<sup>178</sup> which states that 'Some groups need targeted sexual health information and HIV/STI prevention because they are at higher risk, are particularly vulnerable or have particular access requirements' (p. 18). Prisoners are identified among these vulnerable groups of people.

The prevalence of HIV infection at population level in the UK is in line with that in other Western European countries such as Germany and the Netherlands but is lower than that in Eastern and Southern European countries such as Portugal and Spain. The estimated prevalence of HIV infection in 2011 was 0.15% (95% credible interval 0.15% to 0.16%) of the overall population, 0.21% (95% credible interval 0.19% to 0.23%) of the male population and 0.10% (95% credible interval 0.10% to 0.11%) of the female population.<sup>179</sup> The picture within the prison population, though, is very different. In Estonia, four studies revealed HIV prevalence in prisons ranging from 8.8% to 23.9%.<sup>180</sup> The last official estimates available for England and Wales date back to 1997 when the Department of Health conducted an anonymous survey of HIV in prisons.<sup>181</sup> This revealed a much lower prevalence of 0.3% among male prisoners and 1.0% among female prisoners. More recent estimates revealed a far more critical scenario. The Health Protection Agency and St George's Healthcare NHS Trust carried out a survey of 138 prisons in England in 2012, which aimed to gain a better understanding of the provision of health services to prisoners.<sup>182</sup> Among other results the report states that 2.7% of prisoners were known to be HIV positive.

It is evident that the prison setting provides an ideal opportunity for education and prevention because of the concentration of high-risk individuals who would otherwise be difficult to reach in their own communities.<sup>123</sup> Despite this, there is a perceived lack of education and prevention programmes in prisons worldwide (see [www.avert.org/prisons-hiv-aids.htm](http://www.avert.org/prisons-hiv-aids.htm)).

Interventions based on educating people on sexual behaviour can prevent new HIV infections and consequently improve quality of life. To be effective these interventions need to be devised to tackle a number of barriers. Many prisoners are from groups of society who are disadvantaged in many respects and who may be very different in terms of their culture and language. For these reasons peer education may be the most appropriate and accessible method of providing information for prison inmates.<sup>182,183</sup> Peer educators, coming from the same background as other inmates, can better assess risky behaviours and have specific knowledge on how to reduce risks.

### **Aim**

The economic model aimed to establish the cost-effectiveness of a peer-led educational intervention compared with two relevant alternatives, a 'do nothing' (no intervention) scenario and a professionally led educational intervention, to prevent future HIV infections among offenders in prison settings and their partners when they are released from prison.

The structure of the model is informed by the results of a literature review of cost-effectiveness models of HIV prevention interventions. This review differs to the review reported in *Chapter 8* as it includes economic models of the prevention of HIV transmission in various settings.

## **Literature review of economic modelling of the prevention of human immunodeficiency virus transmission**

The aim of the review of economic modelling of the prevention of HIV transmission reported in this section was to identify and assess any existing model structures potentially provide parameter estimates for our model.

The search was undertaken in January 2013; databases searched for this review were MEDLINE, MEDLINE-in-Process & Other Non-Indexed Citations, The Cochrane Library (NHS EED), EMBASE, EconLit and RePEc. Full details of all search strategies are can be found in *Appendix 8*.

References identified in the searches were assessed for eligibility by two reviewers independently. Studies were included if they considered the costs and cost-effectiveness of HIV prevention programmes in any setting (schools, prisons, health-care facilities, etc.), in any country, for all ages and sex. Studies on HIV treatments were excluded.

The literature search identified 956 references. These were screened by title and abstract and 37 references were included in the review.<sup>184–220</sup>

The data extracted from the studies included the type of model used to estimate the effectiveness of HIV prevention interventions, type of economic evaluation carried out, intervention, comparator, perspective, population and country, time horizon, discounting, cost-effectiveness results and sensitivity analysis.

Among the 37 studies included in the review we identified a comprehensive literature review of the modelling aspects of cost-effectiveness studies on HIV prevention published in 2003.<sup>207</sup> This section first reports the results of this study and then provides a review of the included studies published from 2002 onwards.

Johnson-Masotti<sup>207</sup> identified two main types of model used to evaluate the cost-effectiveness of HIV prevention interventions: probabilistic and decision-analytic models. The models assessed various types of interventions: those intended to reduce sexual and drug risk behaviour, condom social marketing, counselling and testing, post-exposure prophylaxis, antiretroviral drug therapies to prevent vertical transmission and needle exchange. The majority of studies (22/41) adopted a probabilistic model to estimate the number of infections averted by the intervention at stake. Specifically, the Bernoulli model was the most widely used specification in sexual behaviour programmes. The Bernoulli model translates behaviour change pre and post intervention (e.g. increase in condom use, decrease in the number of partners, decrease in sharing needles) into number of HIV infections averted. This type of model is defined as static because it rests on the main assumption that infectivity rates do not vary between stages of the disease.<sup>216</sup> The estimate of 'cases of infection averted' is then used in a cost-effectiveness and/or cost-utility deterministic framework to give a ratio of net programme (or intervention) cost to the number of quality-adjusted life-years (QALYs) saved by the intervention. Uncertainty is typically addressed through one-way sensitivity analysis on a set of parameters.

Decision-analytic models in the form of decision trees have been used mainly to model the cost-effectiveness of interventions to prevent the vertical transmission of HIV (from mother to child) and counselling and testing interventions. The probabilities of each possible event are attached to every branch of the decision tree stemming from a 'chance node' (e.g. the probability of acquiring HIV infection for an uninfected individual who has undergone counselling). Typically, the number of future infections averted is calculated by subtracting the number of future infections that occur following an intervention from the number of infections deriving from no intervention.<sup>218,219</sup> This type of modelling is also 'static' as the infectivity rate does not vary across stages of the disease.

Only one Markov model was identified and it was used, like the decision tree, to model the cost-effectiveness of interventions to prevent the vertical transmission of HIV.<sup>221</sup> The model simulates the progress of a cohort through the health states identified; in this case, unborn children were assumed to move from an uninfected state to an infected state to a dead state.

Results from the Johnson-Masotti review across model types show that most studies combined data from clinical trials and other sources or extrapolation (e.g. number of sexual partners in 12 months can be extrapolated from self-reported data for a 3-month period). All studies addressed 'primary prevention' (i.e. they measure the impact of the intervention on the intervention participants only); they differed, though, with respect to whether they included 'secondary infections' or 'infections on a bigger scale'. 'Secondary prevention' measures the impact of the intervention on preventing infections among partners of already HIV-infected participants. A 'bigger scale' perspective looks at calculating the impact of the intervention on the entire community.

A major assumption of all studies was that the interventions actually prevent rather than merely delay HIV infection in the future. As already noted, an assumption is also made in most studies of constant infectivity between partners throughout the disease.

Parameter uncertainty has been dealt with through simple one-way or multiway sensitivity analyses with cost-effectiveness estimates found to be most sensitive to the probability of HIV transmission and the discount rate. Uncertainty was also observed in the costs of the interventions (values typically estimated retrospectively). Infectivity rates have been estimated in terms of infectivity per partner and per-act probability of transmission.

The review of the studies published after 2002 confirms the results of the review by Johnson-Masotti.<sup>207</sup> Only one decision-analytic model<sup>188</sup> and one Markov model<sup>190</sup> were found. The majority of studies adopted probabilistic models (mainly adaptations of the Bernoulli model) to estimate the number of cases of infection (primary and secondary) averted by sexual behaviour interventions (*Table 9*).<sup>184,187,191,193,200,208,216</sup> This estimate is then used in conjunction with the cost of the intervention, lifetime savings in health-care costs and QALYs saved from averted infection to calculate a cost-utility ratio. Typically, parameter uncertainty is addressed by one-way or multiway sensitivity analysis.

Shepherd and colleagues<sup>216</sup> conducted a cost-effectiveness analysis of school-based behavioural interventions for the prevention of STIs in young people. They also used a Bernoulli model to estimate the number of cases of infection averted; unlike other studies, though, they modelled a cohort of children aged 15 years and conducted a probabilistic sensitivity analysis (PSA).

The assumption of constant infectivity was relaxed only in two studies. Tuli and Kerndt<sup>217</sup> conducted a cost-effectiveness analysis to evaluate a screening, treatment and condom provision intervention to prevent STIs among incarcerated men who have sex with men at the Los Angeles County Men's Jail. The authors used a different probabilistic model (derived from Hethcote and Yorke's<sup>222</sup> model for gonorrhoea transmission) in which the infectivity rate varies across states of the disease and which estimates the number of infections averted by a 10-year intervention. This is unlike the majority of studies, which most commonly use a 1-year time horizon to capture both costs and benefits of the intervention (although savings in health-care use are estimated over a lifetime).

Enns and colleagues<sup>196</sup> developed a dynamic stochastic network for evaluating the impact of changes in concurrent sexual partnerships on reducing the spread of HIV in sub-Saharan countries. This type of model requires much more detailed data than a static model; it is termed dynamic because it uses different infectivity rates for various stages of the disease but also requires further information such as the duration of partnerships and the frequency of sexual intercourse.

The economic model presented within this report uses a static probabilistic model, mirroring the majority of the previously published studies that used static probabilistic models in a cost-effectiveness framework. The model explores the cost-effectiveness of peer-led and professionally led educational programmes compared with a 'do nothing' scenario, and peer-led and professionally led educational programmes compared with each other, to prevent future HIV infections. Dynamic models are considerably more complicated, require more data and, because of their complexity, are more difficult to understand. In addition, we decided to opt for a simpler model because of time and budget constraints.



TABLE 9 Characteristics of probabilistic Bernoulli models in the literature

Characteristic	Ateka 2008 <sup>184</sup>	Bedimo 2002 <sup>187</sup>	Chesson 2002 <sup>191</sup>	Cohen2004 <sup>193</sup>	Holtgrave 2012 <sup>200</sup>	Johnson-Masotti 2005 <sup>208</sup>	Shepherd 2010 <sup>216</sup>
Type of economic evaluation	Cost-utility analysis	Cost-utility analysis	Cost-utility analysis	Cost-effectiveness analysis	Cost-utility analysis	Cost-utility analysis	Cost-utility analysis
Population	Students in school (USA)	Men and women throughout Louisiana (USA)	Urban women at high risk of HIV infection (USA)	Various settings and populations (USA)	Men and women in areas with a high prevalence of HIV infection (USA)	Women living in low-income housing developments (USA)	Young people of school age (UK)
Intervention	School-based HIV/STD prevention intervention	Condom distribution	HIV risk-reduction intervention	26 HIV prevention interventions	Female condom distribution in health and non-health locations	Community-level HIV risk reduction intervention	School-based behavioural interventions: peer and professionally led
Comparator	No intervention	No intervention	1 hour session on nutrition	Relative evaluation	No intervention	Standard care (pamphlet and condom distribution)	Standard sexual health education
Perspective	Third-party payer perspective	Public health system	Societal perspective	Public health system	Societal and payer perspective	Societal perspective	NHS perspective
Time horizon	1 year for costs and benefits of the intervention but lifetime in terms of QALYs saved	3 years for costs and benefits of the intervention but lifetime in terms of QALYs saved	1 year for costs and benefits of the intervention but lifetime in terms of QALYs saved	1 year	1 year for costs and benefits of the intervention plus lifetime health-care cost of one HIV infection	1 year for costs and benefits of the intervention but lifetime in terms of QALYs saved	1 year for costs and benefits of the intervention but lifetime in terms of QALYs saved
Discounting	0%, 3% and 5% applied to lifetime costs and QALYs	3% applied to lifetime costs and QALYs	3% applied to lifetime costs and QALYs	3% applied to lifetime costs and QALYs	3% applied to lifetime costs and QALYs	0%, 3% and 5% applied to lifetime costs and QALYs	3.5% applied to lifetime costs and QALYs
Sensitivity analysis	One-way sensitivity analysis	One-way sensitivity analysis	One-way and multiway sensitivity analysis	One-way and two-way sensitivity analysis	One-way sensitivity analysis	One-way sensitivity analysis	One-way sensitivity analysis plus probabilistic sensitivity analysis

## Methods

As already stated we used a static probabilistic model, a Bernoulli model, to estimate the total number of HIV infections prevented by an intervention. These models are described as static because the major assumption on which they rest, namely the infectivity rate, does not vary between stages of the disease. Dynamic models, which allow the infectivity rate to vary, are considerably more complicated, require more data and, because of their complexity, are more difficult to understand. In addition, given the time and budget constraints, we decided to opt for a simpler model. We estimate the effectiveness of the interventions by adapting the Bernoulli equation for behavioural interventions given in the study by Cohen and colleagues<sup>193</sup> (see *Appendix 13*).

The parameters used for our model were derived from one of the RCTs identified in the effectiveness review<sup>123</sup> and from a range of other sources. The purpose of the RCT was to evaluate the effectiveness of a peer-led HIV prevention intervention (provided by HIV-positive inmates) compared with a professionally led intervention (conducted by professional educators). The prevention programme was designed to increase HIV knowledge and perceived risk for HIV infection at the time that inmates enter the prison and to decrease intentions to engage in risky behaviour once out of prison. Another RCT<sup>126</sup> included in the effectiveness review also compared a peer-led intervention with a professionally led interventions. However, Martin and colleagues<sup>126</sup> do not report condom use at baseline whereas Grinstead and colleagues<sup>123</sup> report condom use for the no intervention group and assume that this represents baseline use. The study by Grinstead and colleagues<sup>123</sup> scored lowly in the effectiveness review assessment of validity and risk of bias; nevertheless, our choice is dictated by the fact that this is the only study that can provide baseline and post-intervention estimates.

Parameter estimates and values are shown in *Table 10*. Specifically, the prevalence of HIV infection in the general population,  $\pi^*$ , and in prison,  $\pi$ , are taken from the annual report of the Health Protection Agency<sup>179</sup> and from a short survey of prisons in England carried out by the Health Protection Agency and St George's Healthcare NHS Trust<sup>182</sup> respectively. The per-contact infectivity rates with condom use,  $\alpha'$ , and with no condom use,  $\alpha$ , are taken from Pinkerton and Abramson.<sup>223</sup> As already noted, these infectivity rates are constant and do not change with the stage of the disease. Condom use pre and post intervention,  $f_1$  and  $f_2$ , are taken from the RCT. The number of episodes of sex per year,  $n$ , was extrapolated from an estimate of the number of episodes in a month.<sup>224</sup> Finally, a weighted average was used to estimate the mean number of partners,  $m$ .<sup>225</sup>

The effectiveness estimates in our model, together with the parameter estimates of costs and QALYs, are used to explore the cost-effectiveness of a peer-led intervention compared with 'do nothing' and a professionally led intervention to prevent future HIV infections.

The cost-effectiveness model adopts the perspective of the service provider including both the costs of the health sector and the costs of the educational provision of the intervention. A societal perspective was considered not to be appropriate in this case because the range of costs that might be included is more constrained or limited in a prison setting.

The intervention was modelled for 1 year and therefore no discounting was applied to intervention costs and to the number of infections averted by the intervention over this time.

Grinstead and colleagues<sup>123</sup> did not collect cost data; therefore, for the purpose of our model, costs were derived ex post using cost items provided by the study and unit costs provided by national (UK) databases. In the study, men entering the prison were randomly assigned to an intervention group: peer-led education, professionally led education or no intervention. The no intervention group represents baseline knowledge and behavioural intentions given that time constraints prevented conducting pre- and post-intervention surveys. The intervention consisted of a 1-hour class on HIV prevention. Peer educators were HIV-positive inmates who trained for 30 hours over 5 days. The professional was an educator with a degree and 4 years'

TABLE 10 Parameter estimates and values

Parameters	Definition	Estimate/value	Source
$\pi$	Prevalence of HIV infection in prison (male intervention participants)	2.7%	Short survey of prisons in England in May 2012 carried out by the Health Protection Agency and St George's Healthcare NHS Trust <sup>182</sup>
$\pi^*$	Prevalence of HIV infection in intervention participants' sex partners (general population)	0.15%	Annual report of the Health Protection Agency 2012 <sup>179</sup>
$\alpha$	Probability of HIV transmission per sexual act with no condom	0.001	Pinkerton and Abramson <sup>223</sup>
$\alpha'$	Probability of HIV transmission per condom-protected sexual act	0.0001	Pinkerton and Abramson <sup>223</sup>
$f_1$	Proportion of sexual encounters in which a condom was used, pre intervention	55.3%	Grinstead <i>et al.</i> <sup>123</sup>
$f_2$	Proportion of sexual encounters in which a condom was used, post intervention	68.3% (peer educator group) and 64.1% professional educator group	Grinstead <i>et al.</i> <sup>123</sup>
$n_1$	Number of acts of intercourse per partner, pre intervention, per year	6.4 is the average frequency of heterosexual intercourse per month for men. Extrapolation to 1 year = 76.8 (assume that it does not vary pre and post intervention)	Family Planning Association factsheet <sup>224</sup>
$n_2$	Number of acts of intercourse per partner, post intervention, per year		
$m_1$	Number of sex partners, pre intervention, per year	1.1 weighted average male population	Office for National Statistics <sup>225</sup>
$m_2$	Number of sex partners, post intervention, per year		
$N$	Number of participants reached by intervention	Peer educator group = 1169; professional educator group = 648	Grinstead <i>et al.</i> <sup>123</sup>

experience of HIV education. On average, 33 men attended each session. Considering that there were 1169 men in the peer educator group and 648 in the professionally led intervention group, on average peer educators delivered 35 classes whereas the professional delivered 20 classes.

For the peer intervention we costed the professional time of a prevention worker training the inmates for 30 hours (unit cost per hour £29).<sup>226</sup> The actual delivery of the intervention (the 35 classes) does not have a cost attached as peer inmates do not get paid for their involvement and information on overhead capital costs was not available. For the professional intervention we costed each 1-hour class using an average unit cost across prison-based programmes.<sup>226</sup> Table 11 illustrates the costs of the interventions.

Although the intervention was modelled for 1 year, the model estimates lifetime costs and QALYs associated with one HIV infection. Shepherd and colleagues<sup>216</sup> re-estimated an earlier model of the cost-effectiveness of highly active antiretroviral therapy for HIV-positive adults. They used a lower life expectancy for people living with HIV, adopted a 3.5% discount rate for costs and benefits, updated the health-care costs and ran the model for 50 years. They estimated that individuals with HIV would have 8.4 less QALYs than uninfected individuals, with a lifetime discounted cost of £408,654 associated with

**TABLE 11** Costs of the interventions

Intervention	Training	No. of 1-hour classes delivered	Unit cost per hour (£)	Source	Total cost (£)
Peer led	30 hours of instruction over 5 days	35	29 (per hour of training)	Professional time: prevention worker <sup>226</sup>	870
Professionally led	Not applicable	20	50.50 (per 1-hour class)	Average unit cost across programmes <sup>226</sup>	1010

one HIV infection. In our model we updated the health-care cost from 2005/6 prices to 2011/12 prices to give £484,654.<sup>227</sup>

### One-way sensitivity analysis and probabilistic sensitivity analysis

It is important to highlight that the findings of the model might be surrounded by considerable uncertainty because of the quality of the data that populated it. We conducted a one-way sensitivity analysis to examine how costs saved and QALY loss averted change over a range of values for each parameter. When available, the range was identified using the CIs of the parameters (e.g. HIV prevalence at population level and QALYs); in other cases ranges were chosen as appropriate.

The uncertainty surrounding the cost-effectiveness dominance of the peer-led intervention compared with the two alternatives was also explored using PSA. We made probabilistic all of the parameters for which it was possible to assign a probabilistic distribution. The model was run for 1000 iterations with values sampled from the probability distributions assigned to each parameter.

## Results

The Bernoulli model, which was populated with the parameters shown in *Table 10*, estimates that 0.40 cases of HIV infection would be prevented by the peer-led intervention compared with 0.15 cases averted by the professionally led intervention; thus, the former would prevent the loss of 3.34 ( $8.4 \times 0.40$ ) QALYs whereas the latter would prevent the loss of 1.26 ( $8.4 \times 0.15$ ) QALYs.

By preventing cases of infections the interventions also save the health-care costs attached to them; therefore, both are cost-saving interventions. Even after considering intervention costs, the professional intervention saves nearly £72K whereas the peer intervention saves nearly £192K.

We ranked the interventions from the least effective to the most effective in terms of QALY loss averted (*Table 12*). The least effective was no intervention followed by the professionally led intervention and the peer-led intervention. In the case of no intervention we assume that the QALY loss averted is zero and that the NHS would need to bear the lifetime cost of an infection, nearly £485K.

Before calculating the incremental cost-effectiveness ratio we need to eliminate the dominated interventions. 'No intervention' is dominated by the professionally led intervention, with the latter averting

**TABLE 12** Costs and QALYS

Intervention	Cost (£)	QALY loss averted	Cost-effectiveness
No intervention	484,654.65	0.00	Dominated
Professionally led	-71,960.87	1.26	Dominated
Peer led	-191,873.08	3.34	Dominates

some QALY loss and saving money. In turn, the professionally led intervention is dominated by the peer intervention as the latter avoids more QALYs being lost and saves more money. Given this dominance scenario the ICER calculation is redundant as the peer-led intervention is the only cost-effective alternative.

The peer-led intervention always dominates the professionally led intervention (thus also no intervention) in the one-way sensitivity analysis for all parameters of the Bernoulli model and for the parameter estimates of lifetime health-care costs and QALYs associated with one HIV infection. A summary of the one-way sensitivity analysis results is provided in *Table 13*.

The results of the PSA are shown in the cost-effectiveness plane (*Figure 15* and *Table 14*). The 'do nothing scenario' is clearly dominated, being more costly and less effective. The point clouds for the other two interventions are partly overlapping but the mean total cost and mean total QALYs saved are clearly distinct. The simulation results show that, on average, the professionally led intervention would save just over £77,000 and would avoid losing 1.34 QALYs whereas the peer-led intervention would save nearly £209,000 and 3.58 QALYs.

Cost-effectiveness acceptability curves were derived and the curve corresponding to the peer intervention displays a constant probability of 1 on the vertical axis (graph not provided), confirming that this is the only cost-effective intervention, dominating all of the others.

## Discussion

The economic model presented in this chapter has assessed the cost-effectiveness of a peer-led educational intervention compared with two relevant alternatives, a 'do nothing' (no intervention) scenario and a professionally led educational intervention, to prevent future HIV infections among offenders in prison settings and their partners when they are released from prison.

We adapted a Bernoulli equation to estimate the total number of cases of HIV infection averted by the interventions. We then used these estimates in the calculation of total costs and total QALYs saved for each intervention. We find that 'no intervention' is dominated by the professionally led intervention, with the latter actually averting some QALY loss and saving money. In turn, the professionally led intervention is dominated by the peer-led intervention as the latter saves more QALYs and more money.

The results of the one-way sensitivity analysis confirm that the peer-led intervention always dominates the professionally led intervention (thus also no intervention). The cost-effectiveness model was run for 1000 iterations and the results of the PSA confirmed that the peer intervention is the only cost-effective alternative.

A number of assumptions were made in the study, which is one of the study limitations. The main one is the assumption embedded in Grinstead and colleagues,<sup>123</sup> whereby the proportion of people using condoms in the no intervention group was assumed to be baseline use. We acknowledge this limitation but we also argue that the study by Grinstead and colleagues is the only RCT in the effectiveness review that could provide estimates of condom use at baseline and post intervention.

Another limitation is that the lifetime cost of HIV treatment was based on a figure estimated using 2005/6 prices. Even if the cost was updated to 2011/12 prices we acknowledge that we have not taken into consideration the substantial change in resource use associated with HIV/AIDS treatment in this period. However, sensitivity analysis conducted on the lifetime cost parameter shows that it does not change the dominance scenario.

TABLE 13 One-way sensitivity analyses

Analysis	Base case	Range	Total cost (professional) (£)	Total cost (peer) (£)	Total QALYs saved (professional)	Total QALYs saved (peer)	Source
1. Lifetime cost	£484,654	£300,000	-44,158	-118,437	1.26	3.34	Shepherd <i>et al.</i> <sup>2,16</sup>
2. QALYs	8.4	£600,000	-89,327	-237,744	1.26	3.34	Shepherd <i>et al.</i> <sup>2,16</sup>
5. No. of sexual partners	1.1	5.9	-71,960	-71,960	0.89	2.35	Shepherd <i>et al.</i> <sup>2,16</sup>
6. HIV prevalence, general population	0.15%	10.92	-191,873	-191,873	1.64	4.34	Office for National Statistics <sup>225</sup>
7. HIV prevalence, prison	2.70%	2	-131,665	-349,571	2.30	6.07	Health Protection Agency <sup>179</sup>
8. Infectivity of protected intercourse	0.0001	3	-198,002	-524,790	3.45	9.11	Weid <i>et al.</i> <sup>181</sup> and the Health Protection Agency <sup>179</sup>
9. No. of episodes of sex	76.8	0.15%	-71,960	-191,873	1.26	3.34	Pinkerton and Abramson <sup>223</sup>
10. Condom use pre intervention	0.55	0.16%	-72,203	-192,514	1.27	3.35	Family Planning Association <sup>224</sup>
11. Condom use post intervention	0.683 (peer)	0.30%	-10,520	-29,588	0.20	0.53	Grinstead <i>et al.</i> <sup>123</sup>
	0.641 (professional)	3.10%	-82,200	-218,920	1.44	3.81	Grinstead <i>et al.</i> <sup>123</sup>
		0.0001	-71,960	-191,873	1.26	3.34	
		0.001	-537,035	-1,443,680	9.33	25.04	
		70.8	-66,439	-177,265	1.17	3.09	
		82.8	-77,452	-206,405	1.36	3.59	
		0.4	-191,026	-406,668	3.33	7.06	
		0.6	-31,935	-119,667	0.57	2.09	
		0.6	-39,013	-71,335	0.69	1.25	
		0.7	-119,573	-216,665	2.09	3.77	

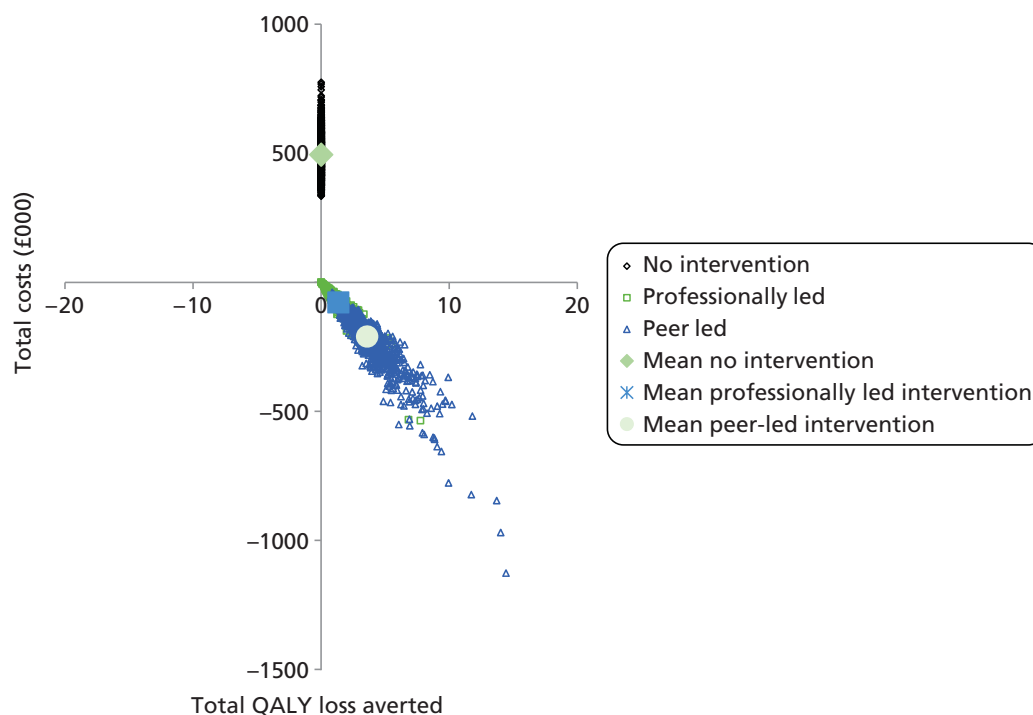


FIGURE 15 Cost-effectiveness plane.

TABLE 14 Parameters used in the PSA

Parameter name	Base-case mean	95% CI	Distribution	Total QALYs saved (peer)
HIV prevalence, general population ( $\pi^*$ )	0.15%	0.15% to 0.16%	Log-normal	$\sigma = 0.063$ , $\mu = -6.50$
Infectivity of unprotected intercourse ( $\alpha$ )	0.001	0.0003 to 0.0018	Log-normal	$\sigma = 1.756$ , $\mu = -6.91$
Infectivity of protected intercourse ( $\alpha'$ )	0.0001	0.00003 to 0.00018	Log-normal	$\sigma = 1.756$ , $\mu = -9.21$
Condom use pre intervention ( $f_1$ )	0.553	–	Beta	$\sigma = 264.3$ , $\beta = 213.6$ , $\sigma = 0.023$ , $\mu = 0.525$
Condom use post intervention (peer) ( $f_2$ )	0.683	–	Beta	$\alpha = 798.4$ , $\beta = 370.5$ , $\sigma = 0.014$ , $\mu = 0.675$
Condom use post intervention (professional) ( $f_2$ )	0.641	–	Beta	$\alpha = 415.3$ , $\beta = 232.6$ , $\sigma = 0.019$ , $\mu = 0.677$
QALY loss averted	8.4	6.72 to 10.80	Log-normal	$\sigma = 0.397$ , $\mu = 2.13$
Lifetime cost	£484,654	£339,258 to £630,051	Log-normal	$\sigma = 13.8$ , $\mu = 334,615$

It is also important to note that the model used within the analysis is static rather than dynamic, assuming that infectivity is constant over time and unaffected by the interventions. Previous studies on other infectious diseases have found robust results using both static and dynamic models (see, for example, the study by Lugnér and colleagues<sup>228</sup>). However, as Lugnér and colleagues point out, although their two models both showed the intervention to be cost-effective, they did produce differing cost-effectiveness ratios and outcomes may differ depending on the cost-effectiveness threshold. They also point out the difficulty of accounting for infectivity in different age and risk groups. This is likely to be of importance given the different risks of acquiring HIV within different groups. For example, within the UK the highest rates of HIV infection are reported in men who have sex with men (47 per 1000) and in the black African community (37 per 1000).<sup>179</sup>

Interestingly, Lugnér and colleagues<sup>228</sup> found their dynamic model to be far more sensitive than their static model to infection attack rates, thus creating large uncertainty about future attack rates. Although their findings may be context specific, it is an area for consideration when modelling HIV prevention given the increasing use of antiretroviral therapy (in the UK 87% of people receiving care were virally suppressed and unlikely to be infectious) and the ongoing development of treatments such as the antiretroviral combination drug Truvada and the role of pre-exposure prophylaxis.<sup>179</sup>

## Summary

The economic model showed that both peer-led and professionally led educational interventions to prevent future HIV infections among offenders in prison settings were cost saving. In the case of 'no intervention' we assume that the QALY loss averted is zero and that the NHS would need to bear the whole lifetime cost of an infection. We find that 'no intervention' is dominated by the professionally led intervention, with the latter actually averting some QALY loss and saving money. In turn, the professionally led intervention is dominated by the peer-led intervention as the latter avoids more QALYs being lost and saves more money. The dominance scenario is confirmed in one-way sensitivity analysis and PSA.



# Chapter 10 Expert symposium

## Introduction

The purpose of the symposium was to gather expert opinion on whether or not and how peer-based interventions work within prisons, with the evidence heard at the symposium supplementing data obtained from the systematic review. The expert symposium brought together individuals with relevant expertise in offender health or prison management with interests in peer-based approaches in prison settings.

## Methodology

It is recognised that expert opinion can offer valuable information in terms of understanding the process and mechanisms of implementing an intervention.<sup>229</sup> Expert hearings or symposia are designed to facilitate the process of deliberation on an issue or series of issues<sup>230,231</sup> and the symposium in this study was used to stimulate dialogue and to gather expert opinion on peer-based approaches in prison settings. Additionally, it was a means of identifying other sources of evidence, but particularly grey literature. To our understanding this was the first time that experts had been brought together specifically to discuss whether or not and how peer-based approaches can contribute to improving health within prisons and YOIs in England and Wales.

The paucity of literature on the application of expert hearings as a research method in terms of optimum format and structure, sampling strategy, methods of data gathering, analysis and evaluation has been noted previously.<sup>97</sup> There is, however, useful literature on deliberative methods, which had been considered and drawn on.<sup>232</sup>

## Sampling strategy

The process of sampling experts to contribute to the symposium comprised two stages. In the first stage direct contact was made with individuals with known expertise in policy or practice and/or with academic expertise concerning peer interventions in prison. A list of possible experts was drawn up through the contacts made through the systematic review of literature, through personal contacts and through individuals identified by the project steering and advisory group. This approach followed what Patton<sup>233</sup> describes as 'critical case sampling' whereby critical cases are selected as they offer particularly important insights or knowledge on the issue being studied. Experts were targeted from different fields including prison health services, NOMS, academic research and third-sector organisations.

The second phase of the sampling strategy consisted of contacting experts through e-mail networks, websites and organisations. Those individuals who responded were asked to express their interest in participating and to then complete a proforma that asked participants to briefly indicate their particular expertise. The final sample was drawn up in consultation with the research team and steering group with the aim of purposively selecting individuals who could provide expert insight into peer-based interventions in prison. The invited experts represented a variety of organisations including NOMS, the NHS, CLINKS, User Voice and the Shannon Trust as well as academic institutions. A small number of ex-prisoners from organisations representing service users participated as lay experts. A total of 58 delegates (including 16 members of the research team and partners) were present at the expert symposium.

## Process

During the symposium, four keynote presentations were delivered with the aim of stimulating discussion and dialogue amongst the delegates around the key theme of the use and effectiveness of peers in prison to maintain and improve health. In between these presentations experts were divided into three separate

discussion groups. The composition of each discussion group was formulated to ensure representation of individuals with various types of expertise. The groups were facilitated by members of the research team and participants were encouraged to discuss specific issues, drawing on expert opinion and experience, relating to two key questions:

1. What factors affect whether or not and how well peer-based interventions work in prison?
2. What are the positive and negative impacts of peer-based interventions for prisoners, the prison service, the NHS and NOMS?

The discussion groups were audio-recorded after permission had been gained from the participants. Individuals were assured that they would not be identified directly and no direct quotations would be used in the presentation of the emerging themes.

### **Data analysis**

The verbatim transcripts of the discussion groups along with the accompanying notes were analysed using framework analysis. Framework analysis was considered an appropriate method given the applied nature of this element of the study and the emphasis on policy and practice.<sup>234</sup> The term 'framework' relates to the central part of the analytical process, that is, the development of a framework or matrix. Concepts and themes in the data are then summarised and charted in the matrix. The matrix was constructed using five main thematic categories and several subthemes. All of the data were charted and the final matrix and themes were agreed by members of the research team (JW, KK, JS). A narrative account summarising the themes was produced and this was checked for authenticity<sup>114</sup> by symposium facilitators and note takers. A short accessible summary of the findings from the expert symposium was later produced.<sup>235</sup>

## **Findings**

### **Nature and types of peer intervention in UK practice**

The expert symposium highlighted a variety of ways of involving prisoners (and ex-prisoners) in peer interventions and delegates discussed a plethora of peer schemes that they had either directly or indirectly experienced (*Box 1*). Delegates highlighted the distinctions between different peer models currently in operation. The nuances between 'peer support' (seen as a 'passive' intervention, i.e. listening) and 'peer mentoring' (regarded as an active role, i.e. advising, educating) were outlined by delegates and caution was raised about using such terms interchangeably.

#### **BOX 1** The range of peer interventions in prison identified by experts

- Prison listeners.
- Health trainers.
- Toe by Toe scheme.
- St Giles Trust – Peer Advice Project.
- Health-care representatives – supporting prisoners to access health services and to improve service delivery.
- Ex-offenders supporting prisoners 'through the gate'.
- Prisoner information desk workers.
- Prisoner council representatives.
- Recovery champions.
- Resettlement champions.

### **Factors affecting whether or not and how well peer interventions work**

Many experts spoke about the prison environment as a major factor in the success or otherwise of peer interventions. The need for interventions to be flexible with regard to contextual factors and the specific environment of the prison was critical for success. The variability of prison establishments in terms of governance (public vs. private prisons), function (remand, training, YOI, etc.) and security (category A, B, C or D, etc.) was consistently mentioned and the need for peer interventions to fit accordingly within those contexts was made clear. Prisoner 'turnover' was raised as a particular issue for remand prisons and those institutions serving the courts, resulting in these institutions facing difficulties in retaining trained peer workers (both volunteers and paid). Such contextual issues can affect the continuity of service provided, but delegates suggested that this may be mediated by placing 'holds' on prisoners, thus enabling peer workers to stay in post for longer. YOIs were also discussed as a specific environment that was not always conducive to peer-based models of delivery. Delegates noted how young offenders may not always be emotionally ready to mentor others and may lack the attributes required to be successful in this role, such as maturity and experience.

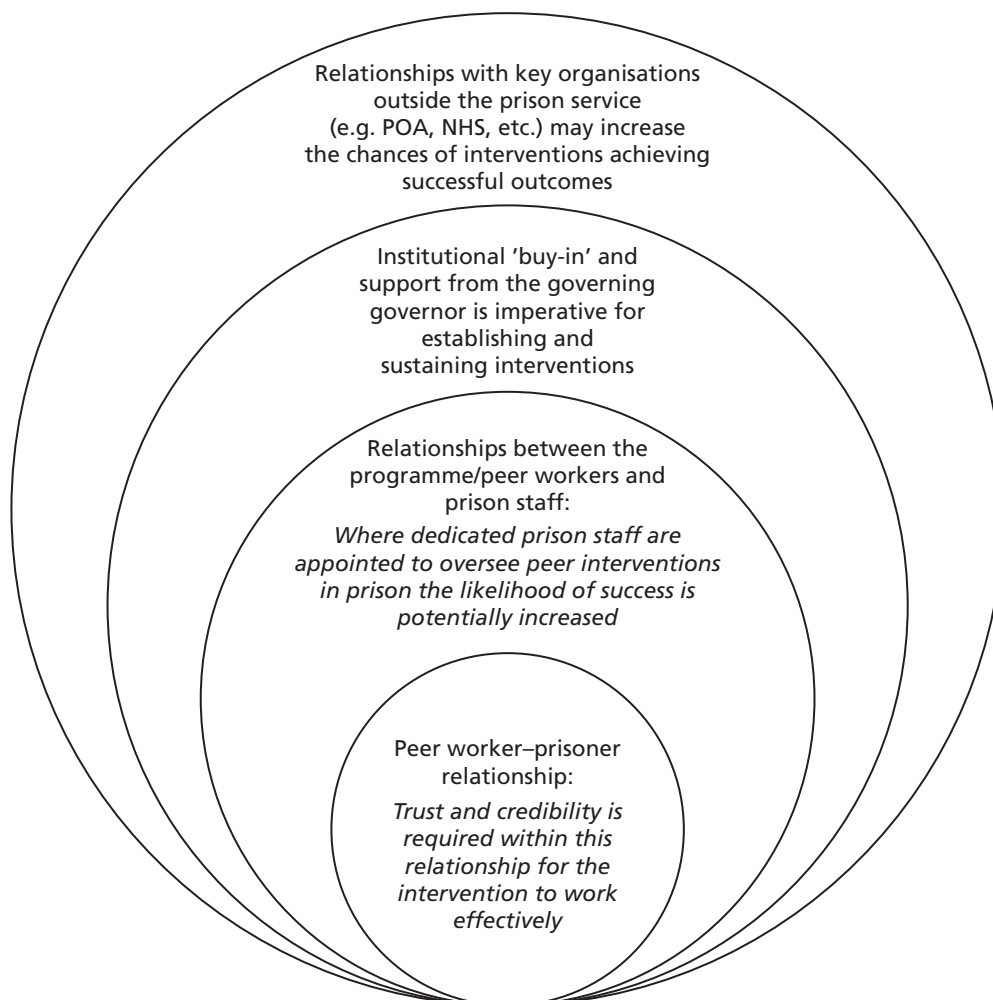
Effective recruitment, training and support processes were seen as prerequisites for successful peer interventions in prison settings. Key points of good practice identified by delegates are highlighted in *Box 2*.

#### **BOX 2** Recruitment, training and support processes for peer interventions in prison: good practice guidance identified by delegates

- Recruitment and selection processes should enable a diverse representation of peer workers (deliverers).
- Training programmes need to be tailored to the environmental context of the prison. Lengthy training programmes are not appropriate in prisons with a high turnover rate but may be appropriate in longer-stay prisons.
- Training programmes will reflect the specific aims of the peer intervention; however, when possible, training should be standardised to cover the core training needs of peer workers (e.g. listening skills, empathy, understanding boundaries). Prisoners completing the training programme should be awarded with a recognised qualification to support post-release employment opportunities.
- Formal mechanisms should be put in place to support peer workers. These may consist of the following:
  - regular support sessions for peer workers – these should be supervised by a member of staff responsible for the intervention as a whole and should, when appropriate, be documented
  - opportunities should be made available for immediate debriefing and support of peer workers when necessary, especially if a prisoner has shared potentially distressing information
  - scheduling of times when peer workers come together as a community to share experiences and knowledge.

Finally, delegates suggested that relationships at various levels, both within and outside the prison, were critical for effective peer-based interventions. These relationships are summarised below and represented diagrammatically in *Figure 16*.

1. Effective relationships are needed between peer workers (peer deliverers) and prisoners. Those in positions as peer workers must be seen as credible and trustworthy by other prisoners if an intervention is to work.
2. The relationships between peer workers and prison staff (uniformed and non-uniformed) are critical. Prison staff can make an intervention run smoothly by assisting with unlocking doors and escorting prisoners and generally managing the logistics of the intervention on the wing. When dedicated prison staff are appointed to oversee interventions, the likelihood of success is increased.
3. Institutional 'buy-in' and support from the governor in the prison is a major factor in whether or not peer interventions are successful. Progressive management teams inside the prison are needed for interventions to be established and flourish. Delegates suggested that interventions would be unsustainable and would struggle to have any level of success without this support.
4. When relationships are established with key organisations such as the POA and NHS, interventions are more likely to prosper.



**FIGURE 16** The importance of relationships for the sustainability and success of peer interventions in prison.

### Expert views of positive and negative impacts

The positive and negative impacts of peer interventions for prisoners, the prison service and the NHS were discussed by delegates. There was a strong consensus that peer interventions in the prison setting make a positive contribution not only to the individuals concerned (i.e. mentor and mentee) but also to the overall culture and ethos of the prison. The positive and negative aspects of peer interventions in prison settings that were reported by the delegates are summarised in *Boxes 3* and *4*, respectively.

### Expert views on costs

There was general agreement that peer-based interventions in prison are not cost free. Several delegates suggested that effective peer-based schemes often have dedicated resources, including staff time, to support the delivery of the service. Even without dedicated staff with this remit, peer-based interventions have implications for staffing in terms of unlocking and escorting prisoners. There was, however, a sense that peer interventions could be cost saving to the NHS and the prison service through improved health outcomes for prisoners and the potential for peers to absorb some of the duties that prison staff would otherwise have to undertake.

#### BOX 3 Positive impacts of peer interventions

- *Increased confidence, self-esteem and self-worth* – delegates reported that many peer workers and recipients experience positive mental health outcomes through participation in peer-based interventions.
- *An additional resource* – peer workers can often absorb queries and issues that would otherwise be directed at prison staff. This potentially enables staff to use their time more effectively in the workplace.
- *Improved prison culture* – providing prisoners with responsibility as mentors potentially allows for a more positive atmosphere on the wings, including less violence and disruption.
- *Empowerment of prisoners* – peer interventions often take an assets-based approach (i.e. identifying and utilising the strengths of individuals) rather than a deficit-based approach (i.e. focusing on prisoners' problems). This can lead to prisoners feeling more empowered and responsible.
- *Post-release opportunities* – peer interventions can lead to opportunities for career development when peer mentors realise that they are good at something.

#### BOX 4 Negative impacts of peer interventions

- *Setting prisoners up to fail* – there was a view from some delegates that peer-based interventions in prison can potentially increase self-esteem and self-worth for peer workers and can provide a sense of hope for future employment opportunities, but that these feelings can quickly diminish on release and prisoners may feel a sense of helplessness.
- *Possible prison staff resistance* – peer workers are often given more freedom and responsibility within the prison and this power shift can be a problematic notion for some prison staff.
- *Security threats* – peer interventions can potentially jeopardise the safe running of the institution if peer workers abuse their power and responsibility.
- *Perceived to replace the role of paid staff* – delegates suggested that prison staff can feel threatened by a peer intervention when it is perceived as a strategy to replace staff.
- *Exploitation* – delegates raised concerns that peer workers could potentially be exploited within the prison, perhaps being asked to fulfil too many roles or duties outside their expertise.
- *Tokenistic engagement of peers* – there is a potential for prisoners to be used in programmes in tokenistic ways without fully being engaged or consulted in the process.
- *Jealousy between prisoners* – given that peer workers are often given additional responsibility, this can create resentment amongst prisoners.



# Chapter 11 Public involvement

## Methods

Service user involvement was a key aspect of the research and means were found of involving serving prisoners and their families. 'Listening exercises' were held in three prisons with serving prisoners, HMP Leeds, a male category B local prison, HMP Wakefield, a male high-security prison, and HMP New Hall, a women's prison, and with serving prisoners working as volunteers at the Jigsaw Visitors' Centre at HMP Leeds. These prisons were selected on geographical grounds and because they broadly reflected the different 'types' and functions of institutions in the prison estate.

The listening exercises were organised working closely with project partners and through health fora or similar meetings already in existence. The samples were small (approximately eight in each prison) and non-representative (prisoners were chosen by prison staff). The listening exercises took the form of discussion groups facilitated by an experienced researcher and a note taker and each lasted between 1 and 2 hours. The aim of these listening exercises was to ask prisoners to comment on the practical application of our emerging findings from the systematic review. The purpose of the listening exercises was explained and consent forms were obtained from each participant. Each discussion group comprised a mix of offenders who were themselves peers in some way or who were recipients of peer-provided services.

## Key issues

- Peer activities were found in all three prisons. Health-care representatives, listeners, prison information desk workers and Toe by Toe mentors were mentioned, as well as the more informal role of carer.
- Prisoners felt strongly that they had both more time and more insight than prison officers and thus were key to the welfare of other prisoners. Their 'peerness' meant that they could empathise more fully, and those receiving peer support concurred that they had found other prisoners more helpful than (most) officers. Peer workers spoke of playing a 'bridging' role between prisoners and staff and suggested that they could be more flexible, providing information and support as and when it was needed. Peer workers felt that they 'cared' more genuinely than staff, who had little real point of connection with offenders.
- The health-care representatives helped prisoners to negotiate access to health-care services, keeping them company and 'sitting and listening'. They felt that they had a particular role to play with vulnerable prisoners and that their work could reduce rates of self-harm and suicide.
- The Samaritans train listeners in a completely confidential service. This confidentiality could cause tensions as staff sometimes asked listeners what the issues were for a particular prisoner and did not appear to understand the confidentiality contract. Listeners felt that their work had huge benefits for offenders and for themselves and that they received adequate training and support.
- Prisoner information desk workers provide advice and support and play a role, for example, in the first night or induction centre and in making appointments for prisoners to access other drop-in services.
- Carers provide support to those unable to cope fully with eating, washing and so on, thus plugging a gap in services, especially for elderly prisoners. Toe by Toe workers felt that they could empathise as they had had a poor educational experience and they gained huge satisfaction from helping others with literacy.

- Peer workers reported high levels of satisfaction in carrying out their role as it gave a sense of purpose, boosted self-esteem and could result in transferable skills. Being a peer meant greater ease of movement around the prison and certain other 'perks' such as being paid (prison information desk workers), although all stressed altruistic motivation. Peers did not feel that they were in danger of burnout and agreed that they had adequate support.
- Service user involvement through peer working had transformed the health-care service provided through incorporation of users on various committees and boards.



# Chapter 12 Discussion

## Limitations of the review

### Scope of the review

The systematic review set out to examine the effects of peer-based interventions on prisoner health. Studies that reported non-health outcomes, such as reoffending, were included only if they reported health outcomes as well. The body of literature on the effects of peer interventions on reoffending and other non-health outcomes (such as housing and employment) is therefore not represented in this review. The review also did not examine the effects of non-prisoner volunteers on prisoner health, the effects of peer interventions in the probation service or the effects of staff-to-staff peer interventions, although there is a body of literature on each of these.

In total, 37 studies within the review were conducted outside the UK and therefore some caution is needed when considering the application of some of the findings to English and Welsh prisons. This may especially be the case when considering studies from countries such as Mozambique,<sup>164</sup> where there are substantial variations in the way that the judicial and health systems operate. Indeed, others have described how the experience of prison does differ considerably country by country by virtue of cultural and historical influences.<sup>236</sup> However, there was a large proportion of studies included in the review that have high relevance for health services operating within prisons in England and Wales. For example, 20 studies included in the review came from the USA and, like the prison system in England and Wales, in the USA prisoners are categorised into institutions based on the gravity of their offence and level of risk. When information about a study institution was provided by authors, comparisons to the prison system in England and Wales could be made; however, these details were rarely given within the included studies.

### Methodology

A decision was made to limit inclusion to studies published in 1985 or later as this is the date that the Listener scheme was introduced in the UK. Earlier studies might have included, for example, peer education interventions in the UK (which were not prominent in the search results) but, for pragmatic reasons of limited time and funding, this was a straightforward way to limit the search. Studies of interventions delivered by non-professionals and studies of prison health are not well indexed in electronic databases and early pilot searches returned impractically large numbers of hits. The searches were made more manageable by use of medical subject headings (or equivalents in other databases) and adjacent terms but this more specific search strategy may have lost some sensitivity and therefore it is possible that some relevant studies may have been missed. The cut-off date for inclusion of August 2012 may also have resulted in more recent relevant studies not being included in the review.

It was not possible to undertake much meta-analysis of the quantitative results because of clinical heterogeneity in the outcomes and interventions between the included studies. When meta-analysis was possible, often SDs or numbers of people in each group were not reported. When possible we imputed SDs using the method recommended in the *Cochrane Handbook*<sup>108</sup> and, for one study, with two groups in three different prisons, we estimated the number in each group by dividing the total number of participants by six. These methods give numbers that can be used in the meta-analysis but are unlikely to be absolutely correct. If we had been able to pool more data we would have undertaken sensitivity analyses of the findings based on these imputed results to see whether or not removing these studies affected the overall result. However, as very few pooled-effect estimates were presented, we have instead indicated in the text when a result is based on imputed values and have advised caution in the interpretation of these findings.

The checklists chosen to assess the validity of the included studies have been widely used in previous systematic reviews but the quantitative checklist contained many items that were not relevant to non-randomised studies. Previous research has identified the lack of useful validity checklists for non-randomised studies.<sup>237</sup> There is debate over the correctness of using any checklist for the assessment of qualitative research;<sup>107</sup> one of the reasons given is that decisions are subjective and there has been very low inter-rater reliability when empirical research has been carried out.<sup>238</sup>

The approach taken to qualitative synthesis was decided after discussion with methodological experts in the UK and was based on finding a method that would best fit the type of data that we obtained, which was in many cases thin. However, the approach that we took to this, and the approach that we took to combining the qualitative and quantitative findings, were not the only approaches that could have been taken and, although we do not expect that the findings of this review would be substantially different had another approach been used, we cannot be sure of this.

### **Protocol changes**

The large number of records retrieved from the electronic searches, in addition to the necessity of searching extensively for grey literature, meant that we did not have time to perform all of the searches listed in the protocol. Specifically, we did not check the reference lists of all excluded studies and we did not carry out citation searches on all included studies. A post hoc decision was made, after looking at the retrieved studies, to exclude studies of group therapy and of therapeutic communities, as these all seemed to be professionally led. We agreed to include studies of therapeutic communities if peer-to-peer interventions were mentioned in the abstract, but no studies met this criteria.

### **Limitations of the studies**

The included studies were, on the whole, of poor methodological quality, with < 10% judged to be of good internal validity or highly relevant to the review context, although a substantial proportion were carried out in the UK. The main problems with internal validity were small sample size, lack of comparators and/or lack of adjustment for potential confounding factors, poor reporting of study methodology and poor reporting of results. This could be due in part to space restrictions in journal articles, as full reports tended to score more highly in the validity assessment, but the small number of RCTs or ethnographically rich/thick qualitative studies suggests that there is much room for improvement in the quality of research in this area. Most studies did not report an underpinning theoretical model and only two defined what was meant by 'peer'.

Included studies reported outcomes for peer deliverers much more often than for service recipients.

The dominance of positive findings and lack of negative findings reported in the quantitative data strongly suggests publication bias, although it was not possible to generate a funnel plot because of wide variation in the outcomes measured. Alternatively, or in addition, selection bias may be affecting the results, as most studies were not randomised and there was much greater representation from peer deliverers than service recipients. This may be because peer deliverers pose fewer security risks than other prisoners and are therefore potentially more likely to be authorised by the institutional authorities to participate in research. This makes these individuals unlikely to be representative of the prison population as a whole. Indeed, those studies included in the review failed to investigate the use of peer schemes for more marginal prisoner groups, for example prisoners based on vulnerable prisoner units or in sex offender wings. In many cases the effectiveness of such approaches for these groups was not ascertained by this review. Furthermore, those peer deliverers who volunteered to take part in the research studies could also be expected to have more positive feelings and have experienced positive changes as a result of being a peer deliverer than those who did not volunteer to take part in the research.

## Summary of the evidence

This section discusses the evidence in relation to the original review questions and highlights key findings that cross all review questions, including the development of a typology of peer-based interventions and the impact on peer deliverers. Review findings are discussed in terms of relevance to health services, but particularly those services that are operating within and in partnership with prisons in England and Wales. Key issues for policy and practice identified through the expert symposium and listening exercises with serving prisoners are discussed in relation to the review findings.

### *Developing a typology of peer-based interventions in prison settings*

This study has confirmed that there is considerable heterogeneity in the range of peer-based interventions in the prison setting, in terms of both the health issues addressed and the mode of delivery (see *Chapter 4*). To group studies to review and summarise evidence it was necessary to develop a new categorisation of peer-based interventions in prison settings. The original role categories for community-based lay health workers developed through the People in Public Health study<sup>97</sup> did not provide a good fit for the interventions described in studies included in this review, although some of the roles reflected dimensions identified in that study. For example, peer advisors, who provide housing and resettlement advice, demonstrated some aspects of bridging roles in terms of helping prisoners to access welfare services.

A new classification for peer interventions was developed that provided a better fit with the data (*Table 15* and see *Appendix 7*).

The typology includes a number of intervention models that are currently operating in the prison system in England and Wales, including the Listener scheme, which covers most prisons in England and Wales, insiders, peer advisors and health trainers. The typology broadly reflects the range of peer support schemes identified by Levenson and Farrant<sup>32</sup> in 2002 and Edgar and colleagues<sup>25</sup> in 2011. The range of intervention types undoubtedly reflects the review strategy, with the inclusion of an expert symposium and the emphasis on identifying UK grey literature. A limitation is that these models may not be transferable to other contexts.

The final typology is not necessarily comprehensive. The review found that there are few standard models and there is much variation in intervention design, peer roles, recruitment, training and implementation. Some of the included studies reported that peers may undertake additional roles outside of the intervention.<sup>38</sup> Developing the classification inductively from reported definitions limits the extent to which we have been able to group interventions. For example, it can be argued that on a theoretical level peer mentoring is not a distinct intervention but is a form of peer support as it provides appraisal support.<sup>94</sup> However, for the purposes of the review the typology provided a useful framework and offers a basis for further analysis of intervention modes.

### *Review question 1: what are the effects of peer-based interventions on prisoner health?*

#### Peer education

Peer education in the prison setting involves prisoners receiving training and then acting as educators, communicating information and encouraging the uptake of healthy (or less risky) behaviours.<sup>24</sup> The review confirmed that there is a body of literature reporting the effects of prison-based peer education interventions; most of these refer to the prevention of HIV/hepatitis C virus infection.<sup>24,35</sup> Although a sizeable number of peer education studies were included ( $n = 18$ ), they were of variable quality, with only a small number of studies having a strong design, which limits the conclusions that can be drawn. There was moderate evidence from quantitative studies that peer education interventions can result in changes in HIV/hepatitis C virus knowledge, but equivocal results for effects on behaviour change intentions and health beliefs. For health behaviours there was consistent evidence of peer education resulting in the reduction of risky behaviours, for example sharing needle equipment or not using a condom at first

**TABLE 15** Typology of intervention modes

Intervention mode	Definition
Peer education	Communication, education and skills development occurring between individuals who share similar attributes or types of experience with the aim of increasing knowledge and awareness of health issues or effecting health behaviour change. Prison peer educators can deliver formal educational interventions to fellow prisoners and/or engage in awareness raising through social interactions within the prison
Peer support	Support provided and received by those who share similar attributes or types of experience. Peer support in a prison setting involves peer support workers providing either social or emotional support or practical assistance to other prisoners on a one-to-one basis or through informal social networks
Prison peer support interventions	Specific forms of prison peer support include listeners, insiders, the PST programme and prison hospice volunteers
Listeners	A suicide prevention scheme in which prisoners provide confidential emotional support to fellow prisoners who are experiencing distress. Listeners are selected, trained and supported by the Samaritans and the scheme operates across most prisons in England and Wales
Insiders	Volunteer peer support workers who provide reassurance, information and practical assistance to new prisoners on arrival in prison
PST programme	A Canadian model in which women prisoners provide emotional support on a one-to-one basis to other women prisoners. The model uses a holistic, culturally sensitive approach that aims to develop women's autonomy and self-esteem
Prison hospice volunteers	Prison hospice volunteers provide companionship, practical assistance and social support to terminally ill prisoners. They work as part of a multidisciplinary hospice team
Peer mentors	Peer mentors develop supportive relationships with and act as role models for mentees who share similar attributes or types of experience. Prison peer mentoring involves prisoners or ex-prisoners working one-to-one with offenders both in the prison setting and 'through the gate'. Prison peer mentoring schemes focus on education and training and/or resettlement and the prevention of reoffending
Health trainers	Health trainers are lay public health workers who use a client-centred approach to support individuals around health behaviour change and/or to signpost them to other services. Prison health trainers work with fellow prisoners around healthy lifestyles and mental health issues. Prison health trainer schemes are adapted from the community-based health trainer model
Peer advisors	Peer advisors provide housing and/or welfare benefits advice to other prisoners, particularly new prisoners and those planning for resettlement. Some peer advisors support prisoners 'through the gate' when prisoners leave prison
Other intervention modes	Other specific interventions identified in the review: peer training (violence reduction), peer outreach (harm reduction), peer counsellors (substance misuse) and peer observers (suicide prevention)

intercourse post release. Additionally, there was weak evidence indicating an association between the uptake of screening/HIV testing and peer health education programmes.<sup>125,144</sup> These findings support rationales for peer education as a means of increasing social influence and positive social norms,<sup>24,95</sup> but further research is needed to explore the relative importance of peer education as a factor in the uptake of these health services.

Although there was limited evidence on peer education from qualitative studies, the study by Scott and colleagues<sup>131</sup> reported an interesting finding that peer education was diffused outside of the prison to family and friends. This is an area that would merit further exploration in future intervention studies and may have implications for cost-effectiveness. The development and empowerment of peer educators can be an important component in some peer education approaches,<sup>166</sup> and there was moderate evidence from qualitative studies that peer educators benefited through rewarding experiences, the acquisition of skills, the development of supportive networks and improved mental health.

Overall, the findings on peer education support the conclusions of earlier reviews, including the systematic review on peer health promotion conducted by Wright and colleagues,<sup>35</sup> which was based on a smaller number of included studies. Interpreting the findings within a harm reduction approach,<sup>104,105</sup> the review provides evidence that peer education interventions are effective at reducing risky behaviours, which can be regarded as intermediate health outcomes.<sup>102</sup> Despite the moderate evidence of effects for peer education, the review findings have low relevance for health services operating in prisons in England and Wales. Two descriptive reviews of volunteering in prison<sup>25,32</sup> and the results from the expert symposium suggest that peer education programmes are not prominent in current practice. There are, however, some promising results for Toe by Toe, the peer-based literacy scheme widely implemented across the prison service in England and Wales. A high proportion of learners reported positive educational outcomes and had high levels of satisfaction with the programme. Education is a social determinant of health that may be associated with other positive outcomes for the prison population.<sup>3</sup> As the review identified only one poor-quality cross-sectional study on this initiative, there is insufficient evidence to draw conclusions and further research is recommended on this specific scheme.

### Peer support

Peer support in a prison setting involves prisoners providing practical help, social and emotional support and advice to other prisoners in a paid or voluntary capacity.<sup>22,25</sup> The review has confirmed that the focus of the intervention and the role of the peer support worker vary considerably between different interventions. The review did not examine evidence about the value of informal peer support and natural social networks in the prison setting,<sup>94</sup> which may be a considerable protective factor for prisoners' mental health.<sup>103</sup>

Quantitative evidence on peer support was exclusively drawn from the Canadian PST model. All six included studies were based on a common model of peer support within women's prisons, which allows some tentative conclusions to be drawn. The PST programme had no demonstrable effects on prisoners or the prison environment, but the programme was rated highly in terms of satisfaction across a number of variables including the usefulness of peer support sessions, the approachability of PST members, levels of trust and handling crisis interventions. The model, which is described as a women-centred approach aiming for greater prisoner empowerment,<sup>153,155</sup> has some similar features to other schemes in operation in England and Wales, such as Insiders and Listeners, with its focus on befriending and emotional support to meet the needs of prisoners on an individual basis.

Across the range of peer support interventions, there was moderate qualitative evidence from 10 studies on the positive effects of peer support and this triangulated with some of the survey data on satisfaction from the evaluations of the Canadian PST model. The review found that peer support was beneficial in terms of both practical assistance and helping prisoners overcome mental health problems such as anxiety, loneliness, depression and self-injury. This supports rationales for peer support as a mechanism to support coping when faced with external stressors.<sup>94,239</sup> The timing of the intervention may be a critical factor. Jacobsen and colleagues,<sup>140</sup> reporting on the Insiders scheme, suggested that the provision of peer support in the early days of custody was particularly valuable. There was strong qualitative evidence of the positive effects for peer deliverers, including enhanced self-awareness and life perspective, increased knowledge and skills, increased sense of purpose and relief of boredom. Negative effects were related to the burden of care, which is discussed below in relation to listeners and in the section on review question 2.

On balance, and taking into account some of the triangulation of the results, there is moderate evidence that peer support services can provide an acceptable source of help within the prison environment and can have a positive effect on recipients and peer deliverers, but there is scope for more research to obtain definitive evidence of effectiveness in terms of mental health outcomes.

### The Listener scheme

The Listener scheme is a specific type of peer support intervention focusing on the prevention of suicide and self-harm. Listeners are volunteers who provide confidential emotional support to fellow prisoners who

are experiencing distress. The review team decided that the distinctive focus of the intervention, the specific role of the listener and the relatively standardised model whereby training and supervision are managed by a single organisation (the Samaritans)<sup>22,31</sup> all meant that studies on listeners and similar interventions could most usefully be reviewed separately from studies on other peer support interventions.

The review found consistent evidence from three qualitative studies and one quantitative study which strongly suggests that contact with a listener (or similar role) at a time of need was helpful in reducing anxiety, depressive thoughts and intention to self-harm, improving emotional health and helping with adjustment to the institution. There was evidence that the Listener scheme was acceptable and accessible to prisoners, from the perspective of both users and non-users. For the impact on incidence of suicide and self-harm, there was only weak, mainly anecdotal evidence.

There was consistent qualitative evidence from six studies on the benefits for the peer deliverer of becoming a listener; this was seen across a number of areas of well-being including relationships with staff, other prisoners and their families; self-esteem, self-worth and confidence; changing attitudes; social skills; and knowledge and awareness of mental health issues. There was some evidence of negative effects because of the emotional burden of care.

Overall, there was a large and consistent body of qualitative evidence which suggested that the Listener scheme is an effective means of providing targeted emotional support for individual prisoners who identify need. There is weak evidence on the impact of the scheme on the incidence of suicide and self-harm. There are positive effects in terms of mental health and well-being for those who take on the listener role, although there can be an associated emotional burden. The results from the review of listeners have high relevance to health services as Listener schemes are in operation across most prisons in England and Wales.

### Peer-based interventions for behaviour change

Two intervention modes, health trainers and peer mentors, focused on changing behaviours. Peer mentoring interventions in prison settings are based on the development of an affirmative relationship between a mentor and a mentee, with the mentor offering support, education and encouragement based on his/her own life experience of being in custody. These types of interventions predominantly take place in the pre-release period and mentoring can continue outside the prison gate. The review found weak evidence that mentoring can result in positive effects in terms of health behaviours, treatment adherence, abstinence from drug taking and propensity to reoffend.

Health trainers are lay public health workers who use a client-centred approach to support individuals around health behaviour change. The model has been adapted for the prison setting and some other criminal justice settings in England and Wales. There was moderate qualitative evidence that the process of training and then becoming a health trainer had a positive effect on peer deliverers, with reported effects including increased knowledge about healthy lifestyles, attitudinal and behaviour change, increased self-esteem and development of transferable skills. There was a lack of evidence of effects on health trainer recipients; however, there was some limited evidence showing that health trainers discussed a range of lifestyle issues with clients and referred individuals to other services. The results have high relevance for health services as the health trainer is an established community model with standardised competencies with the potential for transferability into the prison setting. Given the high prevalence of long-term conditions and risky health behaviours in the prison population,<sup>3,57,58</sup> the finding that health trainers are connecting with prisoners on a range of lifestyle issues is positive; however, there is insufficient evidence on impact and more research is needed to determine the outcomes for prisoners and health services.

### Positive outcomes for peers

There was consistent evidence from a large number of studies, predominantly those reporting qualitative findings, that being a peer worker was associated with positive effects on mental health and the

determinants of mental health and well-being (see Barry<sup>240</sup>). Reported effects included increased self-worth and self-esteem, enhanced self-awareness and understanding, increased knowledge, having a purposeful role, relief from boredom, development of social support networks, an enhanced sense of compassion and empathy, life enrichment and improved social and communication skills. The findings that taking up a peer role could lead to positive outcomes was consistent across a number of different models, including peer education, peer support, the Listener scheme, prison hospice volunteers, health trainers and peer advisers (housing). Skills development, including having transferable employment skills, was also identified in relation to peer advisors and health trainers. Although there were some negative effects in relation to experiencing a burden of care, particularly for those roles involving emotional support, the emphasis in the evidence was on positive effects. These findings support the findings of other research on the positive impact of the act of volunteering on mental health and well-being and individual capacity.<sup>241,242</sup> Much of the evidence comes from interventions that are well established and feature across prisons in England and Wales; therefore, the results have high relevance for health services. The review findings were also reflected in the experiences of prisoners attending the listening exercises.

### **Review question 2: what are the positive and negative impacts on health services in prison settings of delivering peer-based interventions?**

A number of factors influencing the delivery and maintenance of peer-based interventions were identified in the review. Most of this evidence came from qualitative or mixed-method studies. The issues can be grouped into process issues, which are internal to the delivery of the intervention, and contextual factors, which are external to the intervention.

#### **Process issues**

The review found that factors relating to the maintenance of security and the management of risk are often represented in selection criteria for the recruitment of peers. Other selection criteria included interpersonal skills, levels of knowledge and the time that a prisoner is likely to be staying in that institution. There was very little evidence about selection procedures and how the criteria were applied, the exception being for the Listener scheme. None of the included studies examined the relationship between recruitment and selection processes and any outcomes, even qualitatively. This finding is somewhat surprising given the theoretical basis of peer interventions<sup>95,96</sup> and the questions raised in the expert symposium on the contextual nature of peer identity. Further research is needed to explore assumptions about the attributes of peers in relation to the effectiveness of peer-based interventions.

The results show that training processes vary between interventions in terms of content, duration and intensity. There were some examples of standardised models, for example the Canadian PST training. However, there was no evidence on the relative effectiveness of different training packages. There was only weak qualitative evidence suggesting that mental health topics should be covered in training and, in relation to health trainers, that training should be flexible. The qualitative evidence on the benefits to peer deliverers would suggest that there is a link between participation in training and individual benefits, such as the development of skills and confidence, but it is difficult to separate out training from other aspects of the peer experience. The added value of gaining accreditation was identified and this confirms one of the themes in the expert symposium.

There was strong and consistent qualitative evidence that retention of peer deliverers was an important process issue and that attrition because of prisoner movement between prisons was a negative factor. This finding was also reflected in the expert symposium. No studies examined the issue of incentives in depth and there is scope for more process evaluations on the factors that support retention.

The importance of role boundaries was a recurring theme and overall the review provides some insight into factors affecting relationships between peer deliverers, fellow prisoners and staff. Peers overlap two distinct cultures (prisoner culture and staff culture) and this has implications for issues such as confidentiality. There is moderate evidence that peer deliverers can recognise role boundaries and when to refer to staff or other professionals, but problems such as dependency may arise. In many studies this

dynamic is rarely considered. For the peer deliverers ongoing supervision, in both one-to-one and group meetings, was found to be helpful. This was an issue that was specifically identified for the Listener scheme, in which supervision and support are provided by the Samaritans. This issue was also reflected in both the expert symposium and the listening exercises. Overall, there was a range of process issues that have high relevance for current practice in the prison system in England and Wales.

### Contextual factors in the prison system

A range of factors that may influence whether or not prisoners choose to utilise peer-based interventions was identified in the review. These included a lack of awareness amongst prisoners and staff; personal need; concerns about confidentiality and breaches of trust; preference for support from other sources such as staff; language barriers; and fear of demonstrating weakness by using a peer service. Many of the included studies focused on the views of peer deliverers and staff and there was more limited evidence on the views of service recipients. More research is needed to examine issues of acceptability from the perspective of recipients and those who choose not to receive peer support.

There was strong and consistent evidence, mostly drawn from qualitative studies, on the importance of organisational support within the prison, including building acceptance and support amongst staff. Resistance from staff was identified as a negative factor inhibiting the implementation of peer-based interventions. This theme is likely to have relevance for the management of peer-based interventions. The problem of staff resistance and the need for support from prison governors and service managers was also highlighted in the expert symposium.

The review found that there are modifying factors within the prison system, such as organisational support, that influence the delivery of peer-based interventions and potentially impact on outcomes. At the same time, the results indicate that peer interventions can impact on the prison environment and service provision. There was equivocal evidence that peer interventions had a positive impact on prison culture and ethos, with the most positive effects being reported in relation to peer support, prison hospice volunteers and the Listener scheme. A number of studies reported that having a cadre of peer workers can increase service capacity and reduce demand from paid staff, but there was only limited evidence on the reported impact on the prison workforce or health services. The review identified that peer interventions may increase security risks through peers distributing drugs, tobacco and mobile phones as peers often have enhanced freedoms to move and associate with other prisoners. Potential abuses of trust by peer deliverers was a process issue that programme managers needed to be aware of. The expert symposium also highlighted that security concerns and risks require active management.

Overall, the review findings indicate that peer interventions cannot be considered 'stand-alone' interventions that are independent of the organisation and culture of the prison. Instead, there are multiple interactions between the intervention and different levels of the prison system, in line with understandings of complex interventions.<sup>46</sup> This also relates to sociological understandings of prisons as 'total institutions'.<sup>243</sup>

### **Review question 3: what is the effectiveness of peer delivery compared with professional delivery?**

Overall, only a limited number of studies compared peer delivery with professional delivery and it was not possible to triangulate the quantitative and qualitative results as the qualitative evidence related only to prisoner preferences. However, there was consistent evidence across 10 qualitative studies that peer delivery was preferred to professional delivery, with cross-cutting themes including peer deliverers demonstrating empathy because of lived experiences, being non-judgemental, being trusted by prisoners and being able to offer more time than staff. Accessibility was also a theme, with prisoners feeling more at ease talking to peer deliverers. Results support the rationales advanced for lay involvement and peer support, which emphasise lay designation and the role of peers in connecting with the community of interest.<sup>94,244,245</sup> The review findings were confirmed by prisoners attending the listening exercises.



Reported preferences for peers in some studies could not be linked to the four quantitative studies in which a direct comparison was made, as the intervention modes were different. There was consistent evidence from four quantitative studies that peer educators were as effective as (but not more effective than) professional educators in the prevention of HIV transmission for all of the outcomes measured. Although the peer observer intervention showed some positive effects for peers compared with professionals, this was only one study about a single intervention and there is therefore insufficient evidence to draw any conclusions.

#### **Review question 4: what is the cost-effectiveness of peer-based interventions in prison settings?**

There were two components to the economic analysis in this study, namely the systematic review of economic evaluations of peer-based interventions in prison settings and the development of an economic model. Overall, there was a dearth of robust evidence on the cost-effectiveness of peer-based interventions to improve and maintain the health of prisoners, with little economic evaluation even of schemes with evidence of effectiveness. The systematic review of economic evaluations identified only one study that assessed cost-effectiveness and here the focus of analysis was costs rather than health outcomes.<sup>171</sup> Evidence from this study suggests that TC activities involving peers may help to reduce or control prison management costs; however, it is difficult to draw further conclusions based on a single study. The review points to the need for more and better-quality research to estimate the economic value of peer-based interventions in prison settings. Despite the limitations of current studies, economic analysis has high relevance to the prison system in England and Wales, and to the wider criminal justice system. The expert symposium highlighted a number of resource issues and the potential for cost savings from peer delivery.

The prison setting provides an ideal opportunity for education and prevention because of the high concentration of high-risk individuals.<sup>123</sup> Using the review findings and an additional literature review on economic modelling of the prevention of HIV infection, it was possible to develop a limited economic model that estimated the total number of cases of HIV infection averted by a peer-led intervention compared with a professionally led intervention and a 'do nothing' scenario. The results, although based on data of variable quality and a number of assumptions, indicate that both peer-led and professionally led interventions prevent HIV infections and are cost saving for all parameter values implemented in the sensitivity analyses. The peer-led intervention is dominant compared with the professionally led intervention for all parameter values implemented in the sensitivity analyses. The results are most sensitive to changes in the lifetime cost of HIV treatment and to changes in QALY estimates. The model has limitations because of the assumptions made about health behaviours and costs; nonetheless, it represents an important contribution to the evidence base on the cost-effectiveness of peer education.

#### **Revised logic model**

A preliminary logic model was developed to guide the study implementation, including development of the search strategy and the inclusion/exclusion criteria.<sup>45</sup> This linked the wider determinants of prison health, types of peer-based interventions, the mechanisms of change and likely outcomes, both intermediate and long term.<sup>102</sup> The study did not use a single theoretical framework as peer interventions have been linked to a range of different theories. Instead, the logic model was an attempt to draw together theoretical perspectives based on a social model of prison health and understandings of peer support.

The review results have been used to revise the logic model to provide a better fit with the quantitative and qualitative findings and expert evidence on contextual matters. Specific areas to be incorporated were:

- delivery to include voluntary and community sector organisations
- peer intervention modes to be changed to reflect the new typology of intervention modes
- outcomes identified through the review for peer deliverers cross-referenced to intervention modes
- outcomes identified through the review for the target population cross-referenced to intervention modes

- contextual relationships and the place of the intervention in the prison system – this should reflect the four overarching thematic categories derived from the qualitative synthesis: peer recruitment, training and support; prisoner relationships; organisational support; and prison life.

Two logic models were then developed based on the study findings. The first is the logic model for the effects of peer-based interventions on the prison population (*Figure 17*). This uses the same programme logic as in the original model but with the additions as described above. It explains how peer-based interventions work for service recipients or prisoners in general and what outcomes result. Outcomes have been grouped into (1) harm reduction outcomes focused on health behaviour change; (2) mental health and well-being outcomes relating both to the alleviation of individual mental health needs and to the development of positive mental health, for example better coping; and (3) improvements in social determinants, for example education, skills, housing and access to services, that enable individuals to exercise healthy choices. Outcomes at an organisational level are also represented and these are grouped into (4) the uptake of services and (5) improvements in the culture and ethos of the prison.

The logic model shows how the interventions link to intermediate outcomes and the possible links with long-term health goals. *Figure 17* represents the different mechanisms of change but these are not explicitly linked to types of intervention mode as the review showed that peer interventions may be based on more than one mechanism of change, for example insiders provide both social support and improved access to other services. The logic model, together with the typology, will help in future research as it provides the basis for the generation of specific hypotheses to test the effectiveness of peer-based interventions using the most appropriate measures and can be matched, when appropriate, by the behaviour change technique taxonomy of Michie and colleagues.<sup>246</sup>

The second logic model (*Figure 18*) was developed to reflect the strong evidence around the positive effect on peer deliverers and the need to account for the wider impacts on the prison system. The original logic model was based on the assumption that effects on peer deliverers were part of a linear intervention chain. The review results show that becoming a peer health worker is associated with a range of benefits to the individual, and broadly similar positive effects are reported across different intervention types. There was very little evidence making a direct link between the effects on peer deliverers and the effects on service recipients. The implications are that the development of peer deliverers needs to be considered as a distinct component of an intervention, requiring an additional, non-linear logic model. This logic model also needed to take account of the thematic categories derived from the qualitative synthesis and the finding that peer interventions could not be considered 'stand-alone' interventions as there were multiple interactions between peer interventions and aspects of the prison setting. The evidence indicated that features of the context could not be represented solely as modifying factors as peer-based interventions also impacted on the wider prison as an institution. The final model has been termed a health capacity logic model as it attempts to show the inter-relationships between developing individual capacity to act as a change agent and organisational capacity to create a supportive environment for that change. It also acknowledges that peer-based interventions are ultimately coconstructed with staff. The review findings are clear that both strands need to be considered in developing and implementing peer interventions in prison. The model can be used as a platform for developing research looking at the wider impact of prisoner involvement in prison settings, as well as for process evaluations.

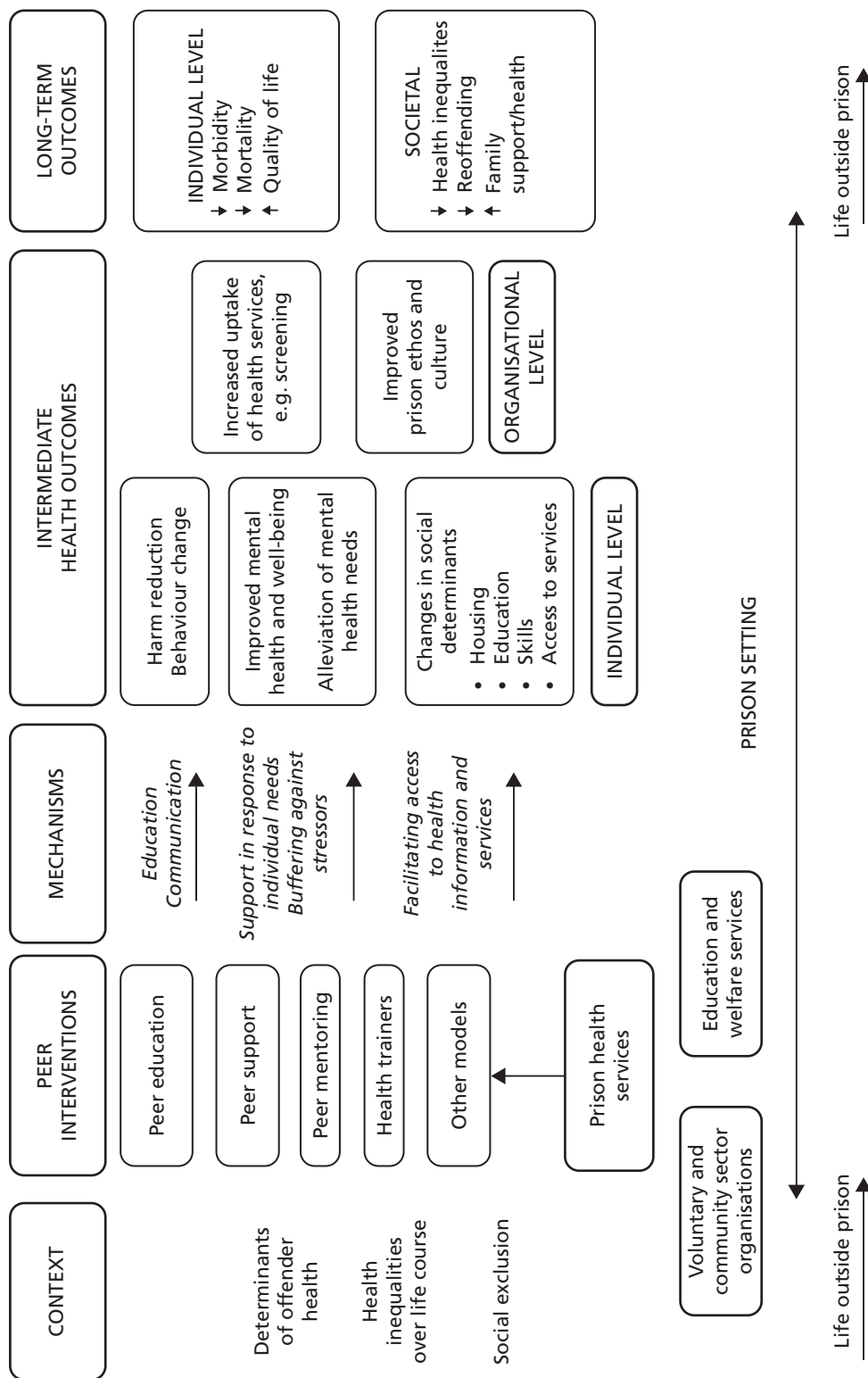
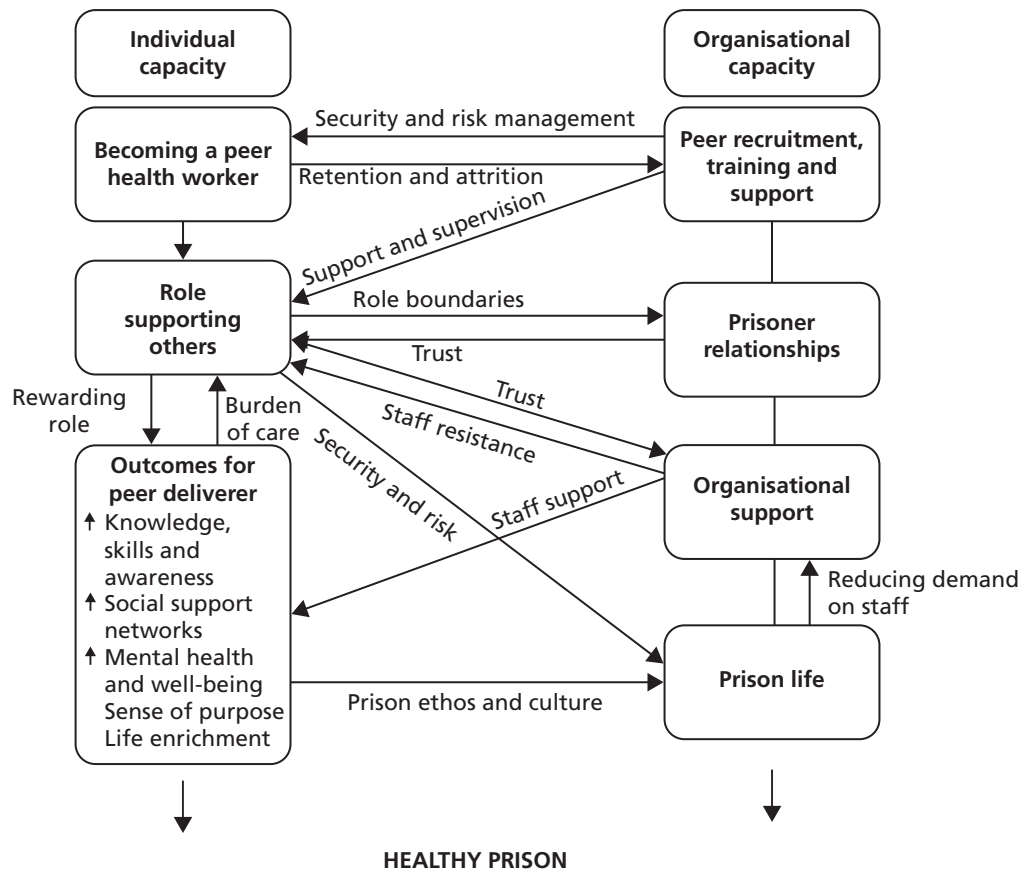


FIGURE 17 Revised logic model for peer-based interventions in prison settings.



**FIGURE 18** A health capacity logic model for peer-based interventions in prison settings.

## Chapter 13 Conclusions

To our knowledge this is the first study to conduct a systematic review of the effectiveness and cost-effectiveness of both peer education and peer support interventions to improve or maintain health in prison settings. Undertaking a review and synthesis of both quantitative and qualitative evidence across a range of intervention modes, including peer support, peer education, the Listener scheme, peer mentoring and health trainers, has resulted in a comprehensive set of findings that have high relevance for health services operating within prisons in England and Wales. Many included studies were drawn from outside the UK and therefore specific interventions may have limited transferability. The review results add to existing knowledge about the effects of peer-based interventions and the way that these types of interventions interact with the prison environment, which is a unique setting for health. The methodological limitations of the published research, however, reduce the authority of the findings for practice and increase the importance of carrying out robust research in the future. The development of an economic model to assess the cost-effectiveness of peer education for the prevention of HIV infection represents a major contribution. Other outputs from this study include a new typology of peer-based interventions applicable to the prison setting and two logic models, one representing the effects of peer-based interventions and the other a health capacity logic model. The evidence collected through the expert symposium adds an important dimension as it has provided contextual information on the practice and management of peer schemes.

### Implications for future research

This study has demonstrated that there is an evidence base for peer-based interventions in prison settings but that there are also areas in which the evidence base needs strengthening. This section discusses the implications for future research across a number of areas and concludes with some recommendations for priority research areas.

Many of the studies included in the effectiveness review were of poor methodological quality because of the small sample size, lack of comparators, lack of adjustment for potential confounding factors, poor reporting of study methodology and poor reporting of results. This undoubtedly limits the extent to which evidence-based conclusions can be drawn. Future research should include control/comparator groups when appropriate. There is scope for larger-scale studies across different types of prison establishment and for study designs that use quantitative measures to assess health outcomes. In general, there was a lack of standardised measures, even in HIV peer education interventions, and this limited evidence synthesis. Future research should use standardised outcome measures, especially knowledge scales.

A diverse range of peer approaches was identified and this heterogeneity limited the ability to make comparisons. Interventions were often poorly described with little detail provided that might help replication. Most studies did not report an underpinning theoretical model and/or define what was meant by 'peer'. There needs to be better, more detailed reporting of peer interventions. The typology developed through this study provides a framework for mapping and categorising interventions, which may aid comparison. It is also essential that study reports include a full description of the intervention, including the recruitment, selection and training of peers.

There is a notable lack of evidence on cost-effectiveness. Only one paper was identified that reported a cost analysis. Although there are clear implications for the potential benefits of peer approaches in respect of the costs and benefits associated with future health outcomes, the use of health and social care services, employment and those costs associated with social justice, and indeed myriad potential cross-sector flows, the analysis in this paper was confined to the perspective of the service provider.

The study results indicate that the health and social impacts on those who are trained and supported in peer roles can be profound, but few studies carried out long-term follow-up. There is a need for longitudinal studies to assess long-term health and social outcomes for peer deliverers, including the impact on reintegration, reoffending and health service utilisation outside of prison. Diffusion of lay knowledge and skills may occur in families and through social networks, but the review did not find any studies that measured these effects in any systematic way. There is scope to undertake economic evaluations that examine the costs and benefits over time.

Qualitative evidence points to the wider impacts on prisons and health services. Given the incidental place of peer-based interventions in the prison setting, tracing effects on service provision in the prison would be helpful. The logic model (see *Figure 17*) provides a diagrammatic representation of hypotheses about the relationships between services, interventions and populations, which could be tested through empirical research. Additionally, the results of the literature searches and the expert evidence together indicate that there are other types of lay/peer interventions in the criminal justice system. There is scope for a systematic review of studies of the impact of non-prisoner volunteers on offender health and of peer interventions across the whole criminal justice system, including probation services.

Overall, the current evidence base is strongest in terms of evaluating effects of peer interventions on peer deliverers, with some evidence on the impact on staff and prison culture. There is much less evidence on outcomes for recipients of peer interventions and more generally for the prison population. More research is needed to examine issues of reach, utilisation and acceptability from the perspective of recipients and those who choose not to receive peer support. The review has revealed research gaps in relation to specific population groups, for example there were very few studies on the effectiveness of peer interventions with young offenders. Although health inequalities are manifest in the prison population, it is less clear what the impacts of peer interventions are on inequalities. The issue of peer identity is pertinent here and this is particularly important as there has been an increase in the numbers of older prisoners, foreign nationals and sex offenders. If we are to understand what works, for whom and in what context, then further research is needed to explore assumptions about the attributes of peers in relation to the effectiveness of peer-based interventions. This issue has implications for the design and evaluation of peer interventions.

The evidence reviewed through this study only partially maps to current practice, meaning that there is considerable scope for more evaluative research on common UK models. Despite the prominence of peer support schemes in prisons in England and Wales, there is little quantitative evidence of effectiveness. There is a need for well-designed intervention studies that use measurable outcomes to complement the rich data gathered from qualitative studies on schemes such as the Listener scheme and the Insiders scheme. Although attribution in relation to trends in the prevalence of suicide and self-harm may not be possible as multiple factors influence these events,<sup>1</sup> there is scope for assessing the impact of peer support on mental health needs, and the determinants of mental health, as qualitative evidence has illuminated the potential range of effects resulting from peer-based interventions.

The study results indicate a lack of research evaluating peer interventions focused on some of the major health issues facing the prison population in England and Wales, including poor physical functioning, health behaviours such as smoking and self management of long-term conditions.<sup>2-5</sup> A notable research gap concerns prison-based health trainers as this is a role focused specifically on health improvement and health behaviour. Early pilots have shown some promising results in terms of the effects on peer deliverers, but more research is needed to determine the outcomes for prisoners (recipients) and health services.

This study contributes to the body of research on the effectiveness of peer-based interventions in primary care and community settings. The range of outcomes identified, including increased knowledge and awareness, the uptake of preventative and treatment services, health behaviour change and psychosocial outcomes, mirror those found in other reviews of peer educators/lay health advisors.<sup>34,247-249</sup> There remains scope for more robust quantitative research studies on the effects of peer support, which is well justified

theoretically.<sup>94</sup> In terms of contributing to the evidence base for lay-led NHS models, although there was some limited evidence on prison health trainers, there were no studies in the review on lay-led self-care interventions to complement research on the English Expert Patient Programme.<sup>138,250</sup> The strong qualitative evidence on the personal benefits of taking on a peer or volunteer role supports other evidence on volunteering in non-prison settings.<sup>241,251</sup> The review has highlighted the factors that make prison a unique context for peer interventions and therefore it is important to have a distinct evidence base to support this work.

In summary, this study has highlighted various research gaps and also ways in which the evidence base for peer-based interventions in prison settings could be strengthened. In determining research priorities, it is vital that future studies are methodologically robust and sufficiently broad to capture outcomes for different stakeholder groups and assess costs and benefits both within and outside the prison system. There is scope for research to explore the impact across the criminal justice system in line with the Department of Health's focus on offender health and understandings of the wider determinants of health in this vulnerable group. Our recommendations for priority research areas are therefore twofold:

1. A large-scale, longitudinal research programme to develop and evaluate a peer support or mentoring programme(s) with a health focus implemented across a sample of different prison establishments. This programme should be capable of providing sufficiently robust evidence of effectiveness to be able to inform decision-making and should include various research strands to address the gaps identified in this review, including assessing individual, organisational and economic impacts.
2. An additional systematic review of the effectiveness and cost-effectiveness of peer and volunteer (non-peer) interventions outside the prison setting but within the wider criminal justice system. This review would complement the current review in assessing evidence on both short-term and long-term impacts across offender health settings, including 'through the gate' services, primary health care and probation services.

## Implications for practice

This study has focused on the question of whether peer-based interventions are effective and cost-effective at maintaining or improving health in prison settings. Although there are evident limitations with both the review and the quality of the studies, which reduces their applicability for practice, the 58 included studies represent the best available evidence. The overall conclusion is that peer-based interventions have positive effects for both peer deliverers and recipients. Furthermore, such interventions can impact positively on the prison as an organisation, for example through improvements in prison culture or reduced demands on staff. There were very few negative outcomes reported, with the major exceptions being increased security risks and the burden of care reported by some peer workers. Although the review overall has high relevance for health services in prisons in England and Wales, many included studies were drawn from outside the UK and therefore specific interventions may have limited transferability.

One of the implications for practice is that peer-based interventions can be considered a valuable mechanism to maintain or improve health and well-being in the prison setting. Although the study results are broadly positive about peer delivery, it cannot be assumed that all peer interventions will be effective in all types of prison establishment. The study results confirm that there is considerable heterogeneity in the range of peer interventions, the health issues addressed, the mode of delivery and reported outcomes. Although there is undoubtedly some overlap between different intervention types, for example peer support, peer mentoring and peer education, the transferability of results from one intervention group to another is limited. The exception is the finding that taking part in a peer delivery role has positive effects, as this occurred consistently across interventions, including those that were not primarily focused on health. The implication for practice is that offering prisoners opportunities to become peer workers will enhance their individual health and well-being, as long as adequate recruitment, training and support processes are in place.

The expert symposium highlighted the variety of peer support and peer mentoring schemes in operation in the prison system in England and Wales. These inevitably reflect historical and geographical patterns of provision and many of these schemes were initiated in response to specific needs. The study provides some evidence to support the use of peer support schemes that offer prisoners social, emotional or practical support during their time in prison. Although more research is needed on the effects on recipients and the prison as an organisation, in general peer support services are valued by prisoners and may address mental health needs. Health services may wish to consider the points at which support is most usefully accessed by those experiencing distress or anxiety. For example, the study found some evidence on the value of first night schemes.

Although there are no prison-based hospices currently operating in England and Wales, the evidence on prison hospice volunteers suggests that prisoners can perform a caring role and complement professional health services in this area. This may offer a model for service user involvement in health and social care in prisons, particularly for older prisoners or those with social care needs. Finally, the Listener scheme, which is well established across most prisons in England and Wales, offers a standardised intervention in which peer workers are trained and supported to provide confidential emotional support to individual prisoners at times of need. The rationale for listeners as peers who share the experience of imprisonment is supported by the qualitative evidence reviewed in the study.

Peer education is less evident in prisons in England and Wales and this perhaps reflects more general trends with regard to traditional health education approaches. The finding that peer education can be effective at increasing knowledge and reducing risky health behaviours, particularly in relation to the prevention of HIV infection, has implications for the development of practice. Consideration should be given to whether or not it is of value to include a peer education component in other health behaviour change interventions. There is some limited evidence showing that health trainers discussed a range of lifestyle issues with clients and referred individuals to other services.

The question of the skill mix in services is an important issue in designing services. There was strong quantitative evidence that peer educators are as effective as professional educators in the prevention of HIV transmission, and the economic model, also based on the prevention of HIV transmission, showed that peers were marginally more cost-effective than professionals. The transferability of these results to other contexts is not clear; nonetheless, the implication is that peer workers can be considered a viable complementary 'workforce' for health services. There was also strong qualitative evidence on prisoner preferences for peer delivery. Recognising the value of peer health workers as a resource in prison does not negate the value of professional staff; indeed, many interventions were predicated on an integrated approach. There was no evidence in the review about the relative merits of paid peer worker compared with volunteer peer worker models. The expert symposium highlighted that, although there may be cost savings, peer interventions are not cost free.

The study identified a number of process issues concerning the implementation of peer schemes within a prison setting. The health capacity logic model (see *Figure 18*) illustrates the main factors, identified through the review, that need to be considered at an individual and organisational level and could provide a framework for developing, implementing and evaluating peer interventions with the prison setting.

The recruitment of peer workers requires consideration, and retention was identified as a significant problem in some contexts. Some evidence suggested that training should be flexible, but the value of accreditation for training was also highlighted. This may help peer deliverers when moving to different prisons and when leaving prison. Overall, it was clear that training and support packages for peer interventions need to be adapted to contextual factors specific to the environment to achieve success. The dilemma, it seems, is whether training for these roles should be localised, based on prison function and average length of prisoner stay, or whether a more standardised programme across the prison estate is required so that individual prisoners can transfer their skills between institutions.



There was strong qualitative evidence that the burden of care could be a potential problem for those working in a peer role. Ongoing support and regular supervision, such as that provided by the Samaritans in the Listener scheme, may help to mitigate the stress that can be attached to this role.

The qualitative evidence on role boundaries and security concerns indicates that both personal and operational risks need to be proactively managed to prevent unintended negative effects of peer-based interventions. There is also strong evidence about the need for institutional buy-in and for staff at all levels to embrace interventions to ensure smooth delivery, for example allowing movement of peer deliverers. Overall, the study findings suggest that peer interventions cannot be considered to be independent of the organisation and culture of a prison. This has implications for the management and implementation of peer schemes.

Critically, peer-based interventions, although premised on prisoner-to-prisoner relationships, ultimately have to be co-constructed with prison staff to be effective. Peer delivery is one means of achieving greater service user or patient involvement that is based on values of autonomy, equality and respect. The prison setting presents some unique challenges for health services, but this study has shown that there is an evidence base for engaging prisoners in peer-based health prevention and support.



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## Contributions of authors

**Professor Jane South** (Director, Centre for Health Promotion Research, Institute for Health & Wellbeing, Leeds Metropolitan University) was the principal investigator for the study and is responsible for the integrity of the report as a whole.

**Dr Anne-Marie Bagnall** (Senior Research Fellow, Centre for Health Promotion Research, Institute for Health & Wellbeing, Leeds Metropolitan University) was the lead for the systematic review of effectiveness (see *Chapters 4–6*).

**Professor Claire Hulme** (Director, Academic Unit of Health Economics, Leeds Institute of Health Sciences, University of Leeds) was the lead for the cost-effectiveness review and model (see *Chapters 8 and 9*).

**Dr James Woodall** (Senior Lecturer, Institute for Health & Wellbeing, Leeds Metropolitan University) was the lead for the expert symposium, public involvement and the qualitative synthesis (see *Chapters 7 and 10*).

**Dr Roberta Longo** (Research Fellow, Academic Unit of Health Economics, Leeds Institute of Health Sciences, University of Leeds) contributed to the economic modelling.

**Professor Rachael Dixey** (Professor of Health Promotion, Institute for Health & Wellbeing, Leeds Metropolitan University) led on the reporting of the listening exercises (see *Chapter 11*).

**Karina Kinsella** (Research Assistant, Centre for Health Promotion Research, Institute for Health & Wellbeing, Leeds Metropolitan University) contributed to the systematic review and qualitative synthesis.

**Dr Gary Raine** (Research Assistant, Centre for Men's Health, Institute for Health & Wellbeing, Leeds Metropolitan University) contributed to the systematic review and meta-analysis.

**Dr Karen Vinal-Collier** (Research Fellow, Academic Unit of Health Economics, Leeds Institute of Health Sciences, University of Leeds) contributed to the economic review.

**Judy Wright** (Senior Information Specialist, Academic Unit of Health Economics, Leeds Institute of Health Sciences, University of Leeds) developed the search strategies for the review.

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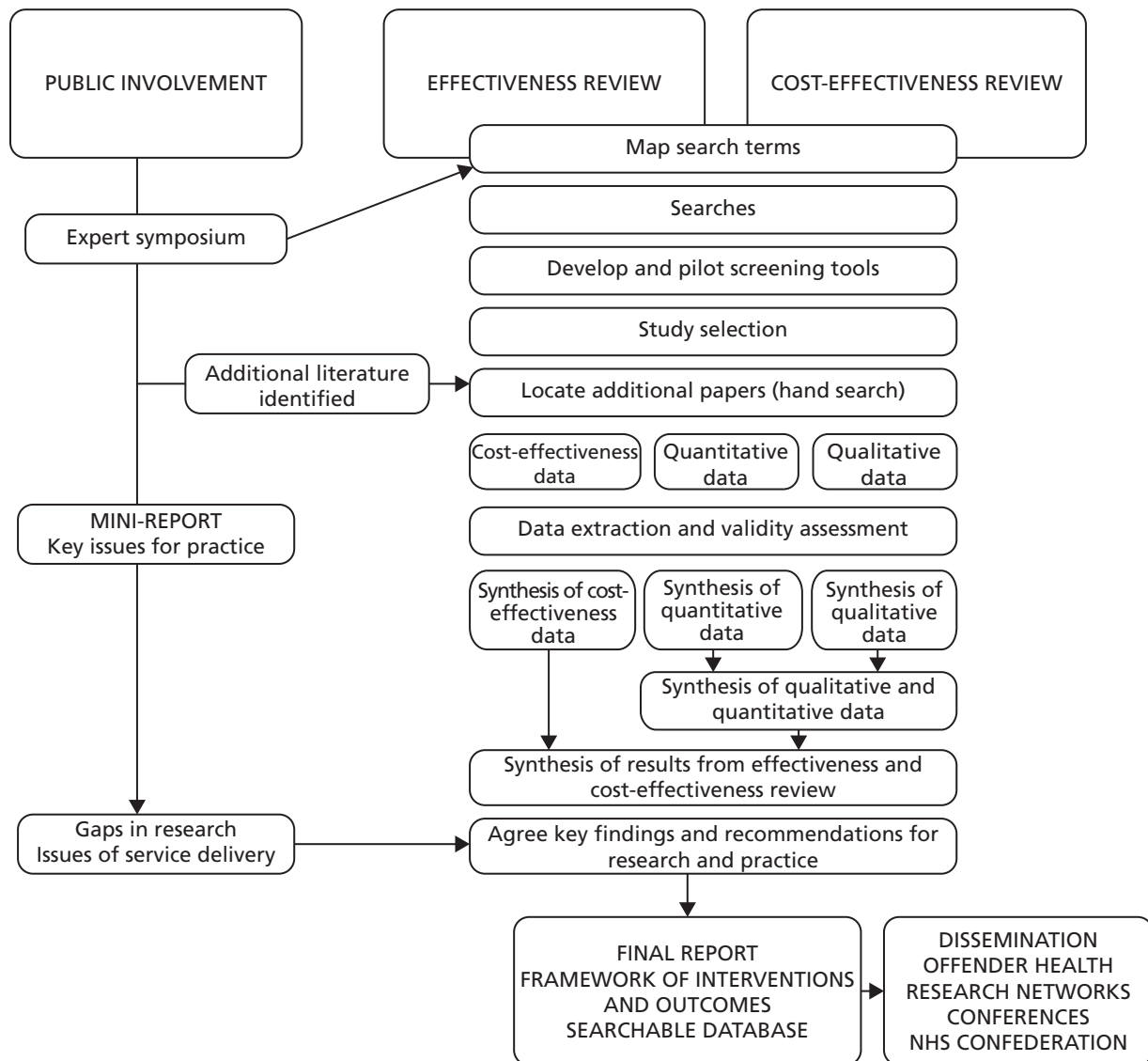
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## Appendix 1 Evidence synthesis on peer interventions in prison settings





## Appendix 2 Search strategy for the effectiveness review

### Search strategy

The potential language that can be used to describe prisons, prisoners and peer-based interventions is highly diverse and to some extent lacking in commonly used standard terms. Therefore, a great deal of care was taken to ensure that the search strategy included all of the possible search terms for the interventions that were of interest to the study. The systematic review team developed an initial list of keywords, which was then presented to the steering group for comments. Additional terms were added based on the steering group's insight into prisons and knowledge of peer-based interventions.

An early free-text search was then conducted to test the search terms in the key databases, which identified around 170,000 references. In consultation with the information professionals at the Leeds Institute of Health Sciences, the strategy was refined by making a greater use of proximity searching (e.g. terms appearing within six words of text in the reference) and also by using database subject headings [such as medical subject headings (MeSH)]. The aim of this was to make the strategy more specific to the subject of study. The result was a greatly reduced and much more relevant list of references. Pilot searching using this strategy took place in March 2012 with small refinements made to the approach when keywords that produced an excess of irrelevant hits were identified.

### Searches

The final searches mostly took place in mid-April 2012 with searches of some of the smaller databases taking place in late April and early May. The databases that were searched and the numbers of references retrieved are provided in *Table 16*.

The search strategies used in each database mostly followed the approach taken for MEDLINE in that relevant subject headings were identified in each database's own thesaurus (when available), the same keywords were used in the text search and the results of the subject search and the text search were combined before they were downloaded into EndNote (version 14; Thomson Reuters, CA, USA). *Table 16* shows where the search strategy deviates substantially from that approach, either because of the subject focus of the database (e.g. the strategy used in the National Criminal Justice Reference Service Abstracts database excluded some terms that are so prevalent that they would significantly reduce relevance) or because the search facility of the database required a much simpler strategy. The search strategies used for MEDLINE (Ovid) and ASSIA (ProQuest CSA) are presented below as examples. Once all of the references had been placed in EndNote, duplicates were removed, leaving 16,741 references to be screened.

TABLE 16 Search results

Database and dates covered	Date searched	Concept search strategy	Date limit	No. of references retrieved
Ovid MEDLINE(R), 1946 to April Week 1 2012	18 April 2012	Prisons or prisoners and counselling or 'health education' or 'peer group' or mentor* or train*	None	2115
MEDLINE(R) In-Process & Other Non-Indexed Citations, 17 April 2012	18 April 2012	As MEDLINE	None	41
EMBASE Classic + EMBASE, 1947 to 17 April 2012	18 April 2012	As MEDLINE	None	3822
PsycINFO, 1806 to April Week 2 2012	18 April 2012	As MEDLINE	None	4477
The Campbell Library, 2000–12	18 April 2012	Prison terms and peer intervention terms	None	90
The Cochrane Library, 1994–2012	24 April 2012	Prison terms and peer intervention terms	None	416
CINAHL, 1985–2012	18 April 2012	As MEDLINE	None	771
ASSIA, 1987–present	18 April 2012	As MEDLINE	None	1465
IBSS, 1995–2012	18 April 2012	As MEDLINE	None	783
National Criminal Justice Reference Service Abstracts, 1995–2012	23 April 2012	As MEDLINE with modifications	None	4024
Social Services Abstracts, 1985–2012	20 April 2012	As MEDLINE	None	994
Sociological Abstracts, 1985–2012	18 April 2012	As MEDLINE	None	1901
Web of Science: Social Sciences Citation Index and Conference Proceedings Citation Index – Social Science & Humanities, 1985–2012	23 April 2012	As MEDLINE	None	1557
Academic Search Complete, 1985–2012	24 April 2012	As MEDLINE	None	2086
TRoPHI/DoPHER, 2000–2012	19 May 2012	Prison terms and peer intervention terms	None	61
Social Care Online	17 May 2012	As MEDLINE	None	1221
Offender Health Research Network (www.ohrn.nhs.uk/policy), 2004–2012	8 May 2012	Prison terms and peer intervention terms	None	0
Volunteering England, searched May 2012	8 May 2012	Prison terms and peer intervention terms	None	0



**MEDLINE(R) (OvidSP), 1946 to April Week 1 2012**

1. prisons/ or concentration camps/ (7003)
2. Criminals/ (433)
3. Prisoners/ (10,890)
4. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*)).tw. (299)
5. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities)).tw. (963)
6. or/1-5 (16,788)
7. Counseling/ (25,061)
8. Social Support/ (43,650)
9. motivation/ or life style/ (79,924)
10. Therapeutic Community/ (1923)
11. Psychotherapy, Group/ (11,093)
12. Health Education/ (48,750)
13. Friends/ (1942)
14. self efficacy/ (9437)
15. Role Playing/ (1888)
16. Peer Group/ (11,707)
17. Self-Help Groups/ (7209)
18. Focus Groups/ (12,804)
19. health promotion/ or healthy people programs/ or weight reduction programs/ (44,939)
20. or/7-19 (265,924)
21. ((prison\* or jail\* or penitentiary\* or bastille\* or offender\* or reoffend\* or convict or convicts or convicted or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) adj6 ((group\* adj2 therap\*) or (group\* adj2 intervention\*) or (group\* adj2 treatment\*) or (group\* adj2 education\*) or (group\* adj2 work\*) or (group\* adj2 meeting\*) or (group\* adj2 session\*))).tw. (76)
22. (juvenile adj1 delinquent\* adj6 ((group adj2 intervention\*) or (group\* adj2 treatment\*) or (group\* adj2 education\*) or (group\* adj2 work\*) or (group\* adj2 meeting\*) or (group\* adj2 session\*) or (group\* adj2 therap\*))).tw. (6)
23. ((prison\* or jail\* or penitentiary\* or bastille\* or offender\* or reoffend\* or convict or convicts or convicted or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) adj6 (mentor\* or support\* or training or "self help" or volunt\* or program\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")).tw. (1445)
24. (juvenile adj1 delinquent\* adj6 (mentor\* or support\* or training or "self help" or volunt\* or program\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")).tw. (25)
25. te\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) adj40 peer\*).tw. (84)
26. (juvenile adj1 delinquent\* adj40 peer\*).tw. (17)
27. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*) adj6 ((group\* adj2 therap\*) or (group\* adj2 intervention\*) or (group\* adj2 treatment\*) or (group\* adj2 education\*) or (group\* adj2 work\*) or (group\* adj2 meeting\*) or (group\* adj2 session\*))).tw. (1)
28. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*) adj6 (mentor\* or support\* or training or "self help" or volunt\* or program\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")).tw. (14)
29. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) adj6 ((group\* adj2 therap\*) or (group\* adj2 intervention\*) or (group\* adj2 treatment\*) or (group\* adj2 education\*) or (group\* adj2 work\*) or (group\* adj2 meeting\*) or (group\* adj2 session\*))).tw. (0)
30. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) adj6 (mentor\* or support\* or training or "self help" or volunt\* or program\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")).tw. (62)

31. or/21-30 (1674)
32. 6 and 20 (1347)
33. 31 or 32 (2776)
34. limit 33 to yr="2010" (176)

### *Searches in Applied Social Sciences Index and Abstracts (ProQuest CSA), 1987–present*

Subject search 1:

EXACT("Offenders" OR "Dangerous offenders" OR "Recidivists" OR "Drunken offenders" OR "War criminals" OR "Juvenile offenders" OR "Young offenders" OR "Young adult offenders" OR "Violent offenders" OR "Sex offenders" OR "Remand offenders" OR "Prisoners") (8559)

EXACT("Penal institutions" OR "Maximum security prisons" OR "Prisons" OR "Remand prisons" OR "Secure units") OR EXACT("Prison sociology" OR "Prison service") (2076)

EXACT("Long term prisoners") (15)

all(correctional NEAR/6 (unit OR units OR facilit\* OR institution\* OR centre\* OR center\*)) (440)

Subject search 2:

EXACT("Therapeutic communities") (700)

EXACT("Selfcounselling" OR "Cognitive behavioural counselling" OR "Peer group counselling" OR "Counselling" OR "Crosscultural counselling" OR "Pretest counselling" OR "Re-evaluation counselling" OR "Rehabilitation counselling" OR "Educational guidance" OR "Group counselling" OR "Long term counselling" OR "Multicultural counselling") (3609)

EXACT("Counsellors") (537)

EXACT("Social support" OR "Perceived social support") (3237)

EXACT("Analytical group psychotherapy" OR "Psychodynamic group psychotherapy" OR "Group psychotherapy") (902)

EXACT("Lifestyle" OR "Health Promoting Lifestyle Profile") (1106)

EXACT("Intrinsic motivation" OR "Motivation" OR "Extrinsic motivation") (3113)

EXACT("Friends") (646)

EXACT("Peer supervision" OR "Peer instruction" OR "Peer helping programmes" OR "Peer groups") (548)

EXACT("Selfhelp programmes" OR "Selfhelp groups") (488)

EXACT("Focus groups" OR "Discussion groups" OR "Fitness groups") (483)

EXACT("Selfefficacy") (1695)

EXACT("Role models") (150)

EXACT("Role play") (100)

EXACT("Listening therapy" OR "Listening") (230)

Search 1 and search 2 = 307

Text searches:

all((prison\* or jail\* or penitentiari\* or bastile\* or offender\* or reoffend\* or convict or convicts or convicted or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) near/6 ((group\* near/2 therap\*) or (group\* near/2 intervention\*) or (group\* n/2 treatment\*) or (group\* n/2 education\*) or (group\* n/2 work\*) or (group\* n/2 meeting\*) or (group\* n/2 session\*))) (199)

all((juvenile n/1 delinquen\*) n/6 ((group\* NEAR/2 therap\*) OR (group\* NEAR/2 intervention\*) OR (group\* NEAR/2 treatment\*) OR (group\* NEAR/2 education\*) OR (group\* NEAR/2 work\*) OR (group\* NEAR/2 meeting\*) OR (group\* NEAR/2 session\*))) (3)

all((prison\* OR jail\* OR penitentiari\* OR bastile\* OR offender\* OR reoffend\* OR convict OR convicts OR convicted OR inmate\* OR detainee\* OR cellmate\* OR incarcerated OR incarceration OR felon\*) NEAR/40 peer\*) (196)

all((juvenile n/1 delinquen\*) NEAR/40 peer\*) (42)

all((secure n/2 (unit or units or facility or institution\* or facilities or centre\* or center\*)) NEAR/6 ((group\* NEAR/2 therap\*) OR (group\* NEAR/2 intervention\*) OR (group\* NEAR/2 treatment\*) OR (group\* NEAR/2 education\*) OR (group\* NEAR/2 work\*) OR (group\* NEAR/2 meeting\*) OR (group\* NEAR/2 session\*))) (1)

all((correctional n/2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities)) NEAR/6 ((group\* NEAR/2 therap\*) OR (group\* NEAR/2 intervention\*) OR (group\* NEAR/2 treatment\*) OR (group\* NEAR/2 education\*) OR (group\* NEAR/2 work\*) OR (group\* NEAR/2 meeting\*) OR (group\* NEAR/2 session\*))) (2)

all((secure NEAR/2 (unit OR units OR facility OR institution\* OR facilities OR centre\* OR center\*)) NEAR/40 peer\*) (4)

all((correctional n/2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities)) NEAR/40 peer\*) (11)

all((prison\* OR jail\* OR penitentiari\* OR bastile\* OR offender\* OR reoffend\* OR convict OR convicts OR convicted OR inmate\* OR detainee\* OR cellmate\* OR incarcerated OR incarceration OR felon\*) NEAR/6 (mentor\* OR support\* OR training OR "self help" OR volunt\* OR "focus group" OR listen\* OR buddy OR buddies OR friend\* OR befriend\* OR bridging OR "lay people")) (815)

all((juvenile NEAR/1 delinquen\*) NEAR/6 (mentor\* OR support\* OR training OR "self help" OR volunt\* OR "focus group" OR listen\* OR buddy OR buddies OR friend\* OR befriend\* OR bridging OR "lay people")) (15)

all((correctional NEAR/2 (units OR unit OR facility OR institution\* OR centre\* OR center\* OR system OR facilities)) NEAR/6 (mentor\* OR support\* OR training OR "self help" OR volunt\* OR "focus group" OR listen\* OR buddy OR buddies OR friend\* OR befriend\* OR bridging OR "lay people")) (12)

all((secure NEAR/2 (unit OR units OR facility OR institution\* OR facilities OR centre\* OR center\*)) NEAR/6 (mentor\* OR support\* OR training OR "self help" OR volunt\* OR "focus group" OR listen\* OR buddy OR buddies OR friend\* OR befriend\* OR bridging OR "lay people")) (25)

Subject searches + text searches = 1465



## Appendix 3 Data extraction form template for the effectiveness review

Reviewer:

Checked by:

Agreed (date):

Bibliographic details:

Relevant to review questions:

Study design:

Method of data collection, *e.g. 15 semistructured interviews and two focus groups*

### **Intervention**

Nature of the intervention/scheme, *e.g. peer counselling*

Theoretical model (if given)

Health or other issue, *e.g. self-harm*

Comparator

Setting

Peer trainer/facilitator, etc. (who delivered it), *e.g. ex-prisoners*

Definition of peer

Recruitment of peer trainers/facilitators

Implementation – *details about what the scheme involved, how often it ran, etc.*

Details of training and provider

Reward/incentive for peer

Support given/ level of supervision

When was intervention delivered/prisoner pathway – *what stage intervention takes place, e.g. first night in prison*

Where was intervention delivered, *e.g. cell/education centre/health centre*

### **Population**

Target recipients (who it was aimed at), *e.g. age, sex, length of sentence, health condition, recruitment methods, on remand or sentenced*

Individual outcomes for health or determinants of health – *list outcomes, how each was measured (e.g. scale), who measured it and when it was measured; use another form for actual results*

Service delivery, organisational outcomes – *list outcomes*

Views of the prison population/prison stakeholders, *e.g. prison staff, governors – list whose views, if any, are reported*

Costs/economic matters – *state whether paper contains any economic information*

Key process issues – influences on outcomes (enablers, constraints)

Any negative impacts reported? *Yes/no, individual/ organisational, etc.*

Limitations/weaknesses of the study – *as reported by authors*

Any other comments



## Appendix 4 Data extraction forms for the effectiveness review

This appendix provides example data extraction forms. To see the full appendix please go to [www.leedsmet.ac.uk/pips](http://www.leedsmet.ac.uk/pips).

### Dhaliwal and Harrower 2009

Dhaliwal R, Harrower J. Reducing prisoner vulnerability and providing a means of empowerment: evaluating the impact of a listener scheme on the listeners. *Br J Forensic Pract* 2009;**11**:35–43

Relevant to review questions: 1; possibly 2

Study design: Cross-sectional qualitative study. Qualitative interviews (intervention group only) using interpretative phenomenological analysis

Method of data collection, e.g. *15 semistructured interviews and two focus groups* 50- to 60-minute semistructured interviews. Nine individuals met the inclusion criteria of having been a listener for a minimum of 6 months and seven agreed to take part

#### Intervention

Nature of the intervention/scheme, e.g. <i>peer counselling</i>	Listener (peer listening) scheme: volunteer prisoners are trained to provide confidential listening support to prisoners who are distressed or vulnerable
Theoretical model (if given)	None given
Health or other issue, e.g. <i>self-harm</i>	Suicide, self-harm, mental distress
Comparator	No comparison group
Setting	A Midlands prison (UK)
Peer trainer/facilitator, etc. (who delivered it), e.g. <i>ex-prisoners</i>	Current prisoners. Seven of nine prisoners who had been a listener for $\geq 6$ months agreed to take part. Mean age was 42 years (range 26–60 years). Six were in prison for sexual offences and one for attempted murder. Participants had been listeners for a mean of 17 months (range 8–34 months)
Definition of peer	'Listener' – no definition of peer given
Recruitment of peer trainers/facilitators	Prisoners are selected and trained by the Samaritans
Implementation – <i>details about what the scheme involved, how often it ran, etc.</i>	The Listener scheme was established in 1991 and involves joint working between the prison service and the Samaritans. Very little information is provided on the implementation of the scheme as the paper is evaluating the impact of the scheme on the listeners
Details of training and provider	The Samaritans provide the training for prisoners to enable them to provide a confidential listening support to fellow prisoners in distress or who may be at risk of suicide  [Study results: <i>Listeners have requested further in-depth training to cover 'mental health, suicide, child abuse, drugs, diversity and new crimes. Participants also requested opportunities to role-play and to shadow other Listeners' (p. 41)</i> ]
Reward/incentive for peer	None reported  (Results section reports benefits such as <i>personal satisfaction and gaining trust with staff, personal growth, changes in attitudes</i> )

Support given/level of supervision	Little information was provided around specific support provided for listeners  [ <i>Study results: Indication that more support could be provided, especially around suicide with regard to the feeling of blame for the listener: 'Interviewer: Were you blaming yourself? Listener: You have to, don't you, you feel like you do, and well I did, you know, I'd spent two weeks talking to him and if I didn't know he was going to kill himself you think well you've failed' (p. 41)</i> ]
When was intervention delivered/prisoner pathway – <i>what stage intervention takes place, e.g. first night in prison</i>	Not reported
Where was intervention delivered, e.g. <i>cell/education centre/health centre</i>	In cells (not stated but assumed by reviewer)
<b>Population</b>	
Target recipients (who it was aimed at), e.g. <i>age, sex, length of sentence, health condition, recruitment methods, on remand or sentenced</i>	Vulnerable or distressed prisoners or those at risk of suicide
Individual outcomes for health or determinants of health – <i>list outcomes, how each was measured (e.g. scale), who measured it and when it was measured; use another form for actual results</i>	Study aimed to explore listeners' own experiences and the impact on them as individuals. This includes what skills and/or benefits they acquire from being involved. Themes that emerged provide a coherent framework in which to identify the costs and benefits of Listener schemes for vulnerable prisoners, listeners, prison staff and prison management. Six themes were identified: benefits of being a listener, personal growth, changes, challenges, resilience and needs  [ <i>Study results: Individual outcomes were reported such as gaining the trust of prison staff, having responsibility, feeling respected and valued by others – service users, prison staff and listeners, increase in self-efficacy and self-esteem/confidence. (1) Personal growth: all participants reported developing new skills or enhancing existing skills such as communication, perspective taking, assertiveness, empathy, patience and problem solving; (2) all participants expressed a sense of achievement and personal satisfaction from being a listener; (3) another benefit of being a listener is that it gave some participants the opportunity to gain the trust of officers and service users and have more responsibility</i> ]
Service delivery, organisational outcomes – <i>list outcomes</i>	Presents findings in relation to what the prison service can do to support the scheme  [ <i>Study results: Listeners want to be recognised as doing something for the prison. Identified support and training needs will have implications for the resources of prisons and the Samaritans</i> ]
Views of the prison population/prison stakeholders, e.g. <i>prison staff, governors – list whose views, if any, are reported</i>	Not included; only the views of the listeners providing the role within the prison are included in the paper
Costs/economic matters – <i>state whether or not paper contains any economic information</i>	None (although see above re. increased resource use)  [ <i>Study results: 'the potential benefits would seem to far outweigh the costs, most specifically in relation to the reduction of suicides in prison, and an unforeseen benefit in relation to the major focus of the correctional system, rehabilitation' (p. 43)</i> ]



Key process issues – influences on outcomes (enablers, constraints)	<p>Some training and support needs were identified</p> <p><i>[Study results: Listeners requested further training and support from the prison service. ‘The participants wanted longer training sessions to discuss specific topics in depth and how to manage them as a Listener. These topics included mental health, suicide, child abuse, drugs, diversity and new crimes. Participants also requested opportunities to role-play and to shadow other Listeners’ (p. 41). Listener schemes need to be robust in providing intensive training to listeners which can empower them to manage difficult situations they encounter. ‘The provision of such support and training inevitably presents a resource issue and has practical implications for both the Samaritans and the Prison Service’ (p. 43)]</i></p>
Any negative impacts reported? Yes/no, individual/organisational, etc.	<p>Yes – challenges of being a listener</p> <p><i>[Study results: Some negative impacts for the individual are reported – the demands of the role and it’s impact on individuals and others such as family members as well as emotional impacts. ‘... demands include long hours, being approached at any time and any place, dealing with a diverse range of people with assorted problems, observing people self-harm and experiencing burnout. ... listening to specific topics that may be emotionally distressing ... . Consequently, ... some participants had had thoughts about giving up’]</i></p>
Limitations/weaknesses of study – as reported by authors	<p>As this is a small-scale study in one prison it has limited generalisability to the wider population. The authors do not report any limitations</p>
Any other comments	<p>This paper looks only at the issues for and impacts on the listeners, not the recipients. It would have been useful for information to have been provided around implementation and training and who the intervention is delivered to, but this is not the focus of the paper</p>

## Sifunda and colleagues 2008

Sifunda S, Reddy PS, Braithwaite R, Stephens T, Bhengu S, Ruiters RA, *et al.* The effectiveness of a peer-led HIV/AIDS and STI health education intervention for prison inmates in South Africa. *Health Educ Behav* 2008;**35**:494–508

Relevant to review questions: 1

Study design: Non-randomised comparative (two-group) before-and-after study. Within each of four selected prisons there was both a control group and an experimental group. Additionally, in each prison the experimental group was divided into those who were instructed by an HIV-positive peer educator and those who were instructed by an HIV-negative peer educator. The study used a pre test (T1), a post test prior to release from prison (T2) and a 3- to 6-month community follow-up test (T3) as evaluation measurements for all of the participating inmates

Method of data collection, *e.g.* 15 semistructured interviews and two focus groups

Questionnaires at baseline (T1) and post intervention prior to release from prison (T2) and an interview 3–6 months after release from prison (T3)

### Intervention

Nature of the intervention/scheme, *e.g.* peer counselling

Peer educators delivering a health intervention to other inmates

Theoretical model (if given)

The questionnaire was based on the theory of planned behaviour<sup>252</sup> (Ajzen 1991) and social cognitive theory<sup>253,254</sup> (Bandura 1986, 1999), as well as on information from focus group interviews. The curriculum was adapted and developed based on the work of Braithwaite and colleagues.<sup>255</sup> The intervention was developed following preliminary focus groups with inmates and staff in four prisons similar to those selected for this study

Health or other issue, *e.g.* self-harm

AIDS/HIV awareness and STI health education

Comparator

Two health educators with no history of incarceration ran all of the sessions for the comparison groups. Participants were shown videos covering health issues such as cholera, malaria and tuberculosis and were given copies of HIV and STI information materials that were produced by the government for the general public. Intervention groups taught by HIV-positive and HIV-negative peer educators were also compared with each other

Setting

Four medium-sized correctional facilities (male) in South Africa. The numbers housed were comparable the numbers housed in UK prisons

Peer trainer/facilitator, etc. (who delivered it), *e.g.* ex-prisoners

Four former inmates were recruited. Two were HIV positive and agreed to disclose their status to participants in the intervention group

Definition of peer

'Peer educators' (not defined)

Recruitment of peer trainers/facilitators

Not clear how they were recruited. All were selected from the same areas as the selected prisons and all spoke isiZulu as their first language. Implies that there was an interview process

Implementation – *details about what the scheme involved, how often it ran, etc.*

The intervention programme was called Ubudoda Abukhulelwa and was translated into isiZulu and piloted among isiZulu-speaking inmates, as isiZulu was the most predominant language in the selected provinces. Two sessions per week were provided over 6 weeks, with each session lasting 1.5 hours (total 18 hours). The following topics were covered: HIV and AIDS, STIs, nutrition and tuberculosis prevention and management, alcohol and other drug abuse, sexuality and gangsterism, manhood and general life skills. All sessions took place in the mornings and were delivered in isiZulu

Details of training and provider	Former inmates were trained as peer educators (unclear who did the training, presumably study authors) to deliver the sessions in the prisons. The intervention was modified during the training process to reflect the prison culture. Peer educators received refresher training and evaluation sessions periodically, as the intervention took place over 2 years
Reward/incentive for peer	None reported
Support given/level of supervision	Periodic refresher training and evaluation over a 2-year period
When was intervention delivered/prisoner pathway – <i>what stage intervention takes place, e.g. first night in prison</i>	Within 6 months of release (pre-release), whether for parole or sentence completion
Where was intervention delivered, e.g. <i>cell/education centre/health centre</i>	In one prison (KZN1) sessions were held in the custodial section of the prison. It is implied that in the other prisons the sessions were held in the educational section. The custodial section of the prison was considered to be inappropriate and not conducive to teaching as it was next to the courtyard and was also used as the recreational hall and dining hall for all of the inmates. Because of this all sessions had to be shortened and the facility also did not have audio-visual equipment to show the educational materials that were part of the curriculum. For the purposes of testing the effectiveness of the programme, the 94 participants from that prison were excluded from the analysis

### Population

Target recipients (who it was aimed at), e.g. <i>age, sex, length of sentence, health condition, recruitment methods, on remand or sentenced</i>	Prisoners within 6 months of release (parole or sentence completion). Most were African black men who were Nguni speakers and it was assumed that most also spoke isiZulu. $n = 63$ in the control group, 193 in the intervention group; 86 had a peer HIV-negative instructor and 107 had a peer HIV-positive instructor). Mean age was 27 years (range 17–55 years). Mean period of incarceration was 2 years (range 6 months–17 years). In total, 65% were first-time offenders. It was not explicitly stated but presumed that all were sentenced. In total, 50% were unemployed at the time of arrest and after release from prison and only 31% were employed at the time of the follow-up interview. About 93% of the participants reported that they were living in their own home with their family or living with relatives after being released from prison
Individual outcomes for health or determinants of health – <i>list outcomes, how each was measured (e.g. scale), who measured it and when it was measured; use another form for actual results</i>	The questionnaires delivered at baseline, post intervention prior to release from prison and 3–6 months after release used the following categories: knowledge and beliefs about the spread and transmission of HIV and AIDS and other STIs (averaged score of nine-item scale); attitudes: (i) attitudes towards condom use (averaged score of three-item scale), (ii) attitudes towards people living with HIV/AIDS (averaged score of eight-item scale); sexual communication, social norms about gender relations and sexual violence (averaged score of five-item scale); self-efficacy (perceived skills for practising safer sex) (averaged score of nine-item scale); intention to perform activities that result in reduced risk behaviour after release from prison, in particular using condoms and negotiating condom use with all sexual partners, asking sexual partners about past STIs and sexual history, asking partners about HIV status and testing and avoiding mixing sexual activity with substance use (averaged score of five-item scale)
Service delivery, organisational outcomes – list outcomes	None reported

Views of the prison population/prison stakeholders, e.g. prison staff, governors – list whose views, if any, are reported	Only prisoners' views reported, using a structured questionnaire, although concurrent qualitative studies were conducted
Costs/economic matters – state whether or not paper contains any economic information	None reported
Key process issues – influences on outcomes (enablers, constraints)	None reported, except the change of management that led to the exclusion of one of the prisons from the analysis, as the intervention was moved from an educational facility to a custodial facility. The new venue was not appropriate for teaching as it was next to the courtyard and also used as the recreation hall and dining hall for all of the inmates. The HIV status of the peer educators had an impact on prisoner outcomes, with prisoners taught by HIV-negative peers having better outcomes. It was suggested that, because of the stigma attached to spending time in prison, the additional stigma of being HIV positive might make it difficult for prisoners to look up to someone who has that extra burden to deal with. Some negativity and scepticism were expressed towards the peer HIV-positive educator. The HIV-positive role model may also reflect a condition that also causes fear and represents a situation that people may not wish for themselves. Short-term measurements were taken immediately after the programme was provided and while the participants were still in prison and therefore had not had an opportunity to apply any of the skills that the programme was targeting. Money was given to participants at T2 and T3. The MP2 prison showed a generally higher impact of the intervention than the other two facilities. It was suggested that one reason for this could have been because the peer educator in this prison was a former inmate, which may have made him a more trustworthy and credible figure for the participants in those groups. He had also graduated with his high-school diploma certificate while still an inmate and participants might have been aware of this and looked up to him even before he became part of the intervention team. Therefore, it is likely that using ex-inmate peer educators whose claims of prison experience are easily verifiable by the participants may lead to a greater impact of prison-based programmes. The intervention curriculum had to be completely adapted into isiZulu to address the issue of low literacy levels among inmates as well as linguistic and cultural differences. This process posed a great challenge and might have slightly compromised the accuracy of the measuring instruments as well as the application of Western-based constructs in an indigenous language setting. Some of these dynamics might have been partly responsible for the study showing marginal differences between the intervention groups and the control group
Any negative impacts reported? Yes/no, individual/organisational, etc.	None reported

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**Limitations/weaknesses of study – as reported by authors**

Prison parole conditions are very strict and inmates are supposed to adhere to them while they are serving their sentences in the community corrections wing of the Department of Correctional Services. Most of the behaviour-related questions, such as the use of drugs and alcohol and other risk-taking practices, relate to things that people on parole are not supposed to engage in. Realising the potential for the under-reporting of these behaviours, the intervention was assessed mostly on psychosocial determinants with low reliance on actual reported behaviour. There was a possibility of contamination of the control group and also of subsequent intervention groups as information was shared from previous participants. This could have led to higher baseline scores and thus artificially lower the measured effect of the intervention. No process evaluation was carried out to gain insight into the reasons for the marginal impact of the evaluation

**Any other comments**

One of the four prisons was excluded from the final analysis as sessions were not conducted as planned. The T3 follow-up was at 6–9 months rather than at the planned 3–6 months. Qualitative studies were conducted at the same time (listed as Sifunda in press)

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**Data extraction table: quantitative results**

Bibliographic details	Sifunda S, Reddy PS, Braithwaite R, Stephens T, Bhengu S, Ruiter RA, <i>et al.</i> The effectiveness of a peer-led HIV/AIDS and STI health education intervention for prison inmates in South Africa. <i>Health Educ Behav</i> 2008; <b>35</b> :494–508
Comments	All outcomes are reported for recipients only (no information on peer educators). Numbers in groups not given. There were significant interaction effects between the intervention and prison for knowledge and intention at T2 and for self-efficacy and intention at T3. Significant interaction effects between the peer educator and prison were found for knowledge and intention at T2 and for attitudes to condom use and sexual communication at T3. HIV-negative peer educators achieved better results than HIV-positive peer educators. Detailed results are reported in the paper

Outcome	Intervention group	Comparison group	Differences between groups?
<b>ANOVA at T2 (post intervention, pre release), mean (SD)</b>			
Knowledge (n = 231)	Prison KZN2: 2.70 (0.48); prison MP1: 2.54 (0.52); prison MP2: 2.54 (0.61)	Prison KZN2: 1.72 (0.12); prison MP1: 2.29 (0.63); prison MP2: 2.21 (0.62)	The effect of the intervention was significant in the KZN2 [ $F(1,228) = 13.25, p < 0.001$ ] and MP2 [ $F(1,228) = 5.64, p < 0.05$ ] prisons, with participants in the experimental group showing more knowledge than participants in the control group. For the MP1 prison all results were non-significant
Attitudes towards condom use (n = 231)	Prison KZN2: 4.50 (0.94); prison MP1: 3.99 (1.02); prison MP2: 4.45 (0.75)	Prison KZN2: 4.51 (0.75); prison MP1: 4.36 (0.76); prison MP2: 4.28 (0.86)	No significant differences
Attitudes towards people living with HIV infection or AIDS (n = 227)	Prison KZN2: 2.75 (0.45); prison MP1: 2.74 (0.43); prison MP2: 2.78 (0.47)	Prison KZN2: 2.73 (0.36); prison MP1: 2.55 (0.30); prison MP2: 2.68 (0.61)	No significant differences
Sexual communication (n = 228)	Prison KZN2: 4.64 (0.80); prison MP1: 4.36 (0.71); prison MP2: 4.45 (0.58)	Prison KZN2: 4.41 (1.16); prison MP1: 4.43 (0.69); prison MP2: 4.37 (0.61)	No significant differences
Self-efficacy (n = 226)	Prison KZN2: 4.68 (0.45); prison MP1: 4.39 (0.69); prison MP2: 4.50 (0.66)	Prison KZN2: 4.74 (0.35); prison MP1: 4.45 (0.50); prison MP2: 4.68 (0.44)	No significant differences
Intention (n = 228)	Prison KZN2: 4.79 (0.48); prison MP1: 4.56 (0.68); prison MP2: 4.65 (0.61)	Prison KZN2: 4.12 (0.87); prison MP1: 4.51 (0.40); prison MP2: 4.10 (0.74)	The effect of the intervention was significant in the KZN2 [ $F(1,225) = 12.72, p < 0.001$ ] and MP2 [ $F(1,225) = 11.79, p < 0.001$ ] prisons, with people in the intervention group showing a more positive intention to reduce risky sexual behaviour than people in the control group. There was no significant effect of the intervention in the MP1 prison on either knowledge or intention
<b>ANOVA at T3 post release, mean (SD)</b>			
Knowledge (n = 142)	Prison KZN2: 2.92 (0.13); prison MP1: 2.90 (0.15); prison MP2: 2.91 (0.16)	Prison KZN2: 2.94 (0.09); prison MP1: 2.75 (0.72); prison MP2: 2.83 (0.46)	No significant differences
Attitudes toward condom use (n = 140)	Prison KZN2: 4.82 (0.62); prison MP1: 4.28 (0.92); prison MP2: 4.66 (0.48)	Prison KZN2: 4.69 (0.38); prison MP1: 4.22 (0.74); prison MP2: 4.30 (1.12)	No significant differences

Attitudes toward people living with HIV infection or AIDS ( $n = 136$ )	Prison KZN2: 4.51 (0.62); prison MP1: 4.14 (0.40); prison MP2: 4.23 (0.45)	Prison KZN2: 4.66 (0.49); prison MP1: 4.10 (0.49); prison MP2: 4.32 (0.25)	No significant differences
Sexual communication ( $n = 138$ )	Mean 4.68 (0.61). Prison KZN2: 4.78 (0.37); prison MP1: 4.56 (0.61); prison MP2: 4.65 (0.81)	Mean 4.34 (0.84). Prison KZN2: 4.70 (1.46); prison MP1: 4.32 (0.28); prison MP2: 4.04 (1.05)	The intervention group agreed more than the control group with statements supporting communication about sex with future partners [ $F(1,131) = 6.61, p < 0.01$ ]
Self-efficacy ( $n = 139$ )	Prison KZN2: 4.80 (0.33); prison MP1: 4.64 (0.54); prison MP2: 4.78 (0.30)	Prison KZN2: 4.78 (0.30); prison MP1: 4.70 (0.34); prison MP2: 4.71 (1.59)	The effect of the intervention on self-efficacy was significant only for the MP2 prison [ $F(2,136) = 17.50, p < 0.001$ ], with participants in the experimental group having more positive self-efficacy beliefs
Intention ( $n = 138$ )	Prison KZN2: 4.83 (0.34); prison MP1: 4.63 (0.65); prison MP2: 4.80 (0.47)	Prison KZN2: 4.65 (0.36); prison MP1: 4.73 (0.46); prison MP2: 4.07 (1.15)	The effect of the intervention on intention was significant only for the MP2 prison [ $F(1,135) = 11.07, p < 0.001$ ], with participants in the experimental group having more positive intentions regarding practising safe sex

#### HIV status of the instructor (T3 long-terms effects) ( $n = 135$ ), mean (SD)

Attitude towards condom use (overall)	Peer HIV -ve: 4.64 (0.60); peer HIV +ve: 4.56 (0.84)	4.37 (0.82)	The main effects of the peer educator were found for attitude towards condom use [ $F(2,130) = 3.66, p < 0.05$ ] and sexual communication [ $F(2,128) = 4.50, p < 0.05$ ]. Post hoc comparisons on these measures showed that the HIV-negative peer educator intervention group had higher average scores than both the HIV-positive peer educator group and the control group for both attitude towards condom use and sexual communication. The main effects of the peer educator on self-efficacy and intention were qualified by interaction effects with the prison [ $F(4,129) = 6.57, p < 0.001$ , and $F(4,128) = 3.73, p < 0.01$ , respectively]. On these variables the effect of the peer educator was significant only for the MP2 prison for self-efficacy [ $F(2,135) = 14.41, p < 0.001$ ] and intention [ $F(2,134) = 8.18, p < 0.0001$ ]
Sexual communication (overall)	Peer HIV -ve: 4.76 (0.46); peer HIV +ve: 4.61 (0.70)	4.34 (0.84)	
Attitude towards condom use (individual prisons)	Prison KZN2: peer HIV -ve: 4.93 <sup>a</sup> (0.22), peer HIV +ve: 4.79 <sup>b</sup> (0.70); prison MP1: peer HIV -ve: 4.51 <sup>a</sup> (0.70), peer HIV +ve: 3.43 <sup>b</sup> (1.21); prison MP2: peer HIV -ve: 4.71 <sup>a</sup> (0.43), peer HIV +ve: 4.53 <sup>b</sup> (0.51)	Prison KZN2: 4.70 <sup>c</sup> (0.38); prison MP1: 4.22 <sup>a</sup> (0.73); prison MP2: 4.31 <sup>c</sup> (1.12)	
Sexual communication (individual prisons)	Prison KZN2: peer HIV -ve: 4.88 <sup>a</sup> (0.33), peer HIV +ve: 4.76 <sup>b</sup> (0.39); prison MP1: peer HIV -ve: 4.86 <sup>a</sup> (0.28), peer HIV +ve: 4.05 <sup>b</sup> (0.72); prison MP2: peer HIV -ve: 4.80 <sup>a</sup> (0.42), peer HIV +ve: 4.59 <sup>b</sup> (0.93)	Prison KZN2: 4.70 <sup>c</sup> (0.46); prison MP1: 4.70 <sup>c</sup> (0.50); prison MP2: 4.04 <sup>c</sup> (1.05)	
Skills for practising safe sex (self-efficacy)	Prison MP2: peer HIV -ve: 4.79 <sup>a</sup> (0.34), peer HIV +ve: 4.78 <sup>a</sup> (0.29)	Prison MP2: 3.70 <sup>c</sup> (1.59)	
Intention	Prison MP2: peer HIV -ve: 4.73 <sup>a</sup> (0.41), peer HIV +ve: 4.83 <sup>a</sup> (0.33)	Prison MP2: 4.07 <sup>c</sup> (1.15)	

ANOVA, analysis of variance.

a  $p < 0.01$ .

b  $p < 0.001$ .

c  $p < 0.05$ .





## Appendix 5 Validity assessment form templates for the effectiveness review

Note: the results of the validity assessment are presented in *Appendix 12*.

### Quality assessment checklist for quantitative studies

Reviewer ID:

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Study identification (include full citation details)

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**Section 1: Population**

1.1 *Is the source population or source area well described?* ++ Comments

Was the country, setting, location, population demographics, etc. adequately described? +  
–  
NR  
NA

1.2 *Is the recruited population representative of the source population?* ++ Comments

Peers: Was the recruitment of peer helpers well defined? Was the eligible population representative of all prisoners? Were important groups under-represented? +  
–

Study participants: Was the method of selection of participants well described? NR  
What % of selected individuals agreed to participate? Were there any sources of bias? Were the inclusion/exclusion criteria explicit and appropriate? NA

---

**Section 2: Method of allocation to intervention (and comparison)**

2.1 *How was selection bias minimised?* ++ Comments

Was allocation to the intervention and comparison randomised (++)? If not randomised, was significant confounding likely (–) or not (+)? +  
–  
NR  
NA

2.2 *Were interventions (and comparisons) well described and appropriate?* ++ Comments

Were intervention/s and comparison/s described in sufficient detail (i.e. enough for study to be replicated)? +  
–

Was the comparison/s appropriate (e.g. usual practice rather than no intervention)? NR  
NA

2.3 *Was the allocation concealed?* ++ Comments

Could the person(s) determining allocation of participants to the intervention or comparison groups have influenced the allocation? +  
–

*Adequate allocation concealment (++) would include centralised allocation or computerised allocation systems* NR  
NA

---

<i>2.4 Was the exposure to the intervention and comparison adequate?</i>	++	Comments
Within the study population (i.e. prison) was the intervention implemented as planned or did some prisoners who should have received the intervention not receive it? If not, could this bias the results (e.g. was there systematic bias)?	+ - NR NA	
<i>2.5 Was contamination acceptably low?</i>	++	Comments
Did any in the comparison group receive the intervention or vice versa?	+	
If so, was it sufficient to cause important bias?	-	
If a crossover trial, was there a sufficient washout period between interventions?	NR NA	
<i>2.6 Were other interventions similar in both groups?</i>	++	Comments
Did either group receive additional interventions or have services provided in a different manner?	+	
Were the groups treated equally by researchers or other professionals?	- NR	
Was this sufficient to cause important bias?	NA	
<i>2.7 Were all participants accounted for at study conclusion?</i>	++	Comments
Were the numbers lost to follow-up acceptably low (i.e. typically < 20%)?	+	
Did the proportion dropped differ by group?	- NR NA	
<b>Section 3: Outcomes</b>		
<i>3.1 Were outcome measures reliable?</i>	++	Comments
Were outcome measures subjective or objective?	+	
How reliable were outcome measures (e.g. inter- or intra-rater reliability scores for scales)?	- NR	
Was there any indication that scales had been validated (e.g. validated against a gold standard measure or assessed for content validity)?	NA	
<i>3.2 Were all important outcomes assessed?</i>	++	Comments
Were all important benefits and harms assessed?	+	
Was it possible to determine the overall balance of benefits and harms of the intervention compared with the comparison?	- NR NA	
<i>3.3 Were there similar follow-up times in the intervention and comparison groups?</i>	++	Comments
Analyses can be adjusted to allow for differences in length of follow-up (e.g. using person-years)	+	
	- NR NA	

3.4 Was the follow-up time meaningful?	++	Comments
Was follow-up long enough to assess long-term benefits/harms?	+	
Was it too long, e.g. participants lost to follow-up?	-	
	NR	
	NA	
<b>Section 4: Analyses</b>		
4.1 Were intervention and comparison groups similar at baseline? If not, were these adjusted?	++	Comments
	+	
Were there any differences between groups in important confounders at baseline?	-	
If so, were these adjusted for in the analyses?	NR	
	NA	
4.2 Was intention to treat analysis conducted?	++	Comments
Were all participants (including those who dropped out or did not fully complete the intervention course) analysed in the groups to which they were originally allocated?	+	
	-	
	NR	
	NA	
4.3 Was the study sufficiently powered to detect an intervention effect (if one exists)?	++	Comments
A power of 0.8 (i.e. likely to see an effect of a given size, if one exists, 80% of the time) is the conventionally accepted standard.	+	
	-	
Is a power calculation presented? Is the sample size adequate?	NR	
	NA	
4.4 Were the estimates and precision of intervention effects given or calculable? Were they meaningful?	++	Comments
	+	
Were effect estimates (e.g. relative risks, absolute risks) given or possible to calculate?	-	
Were confidence intervals and/or <i>p</i> -values for effect estimates given or possible to calculate?	NR	
	NA	
4.5 Were the analytical methods appropriate?	++	Comments
Were important differences in follow-up time and likely confounders adjusted for?	+	
Were subgroup analyses prespecified?	-	
	NR	
	NA	

**Section 5: Summary**

5.1 Are the study results internally valid (i.e. unbiased)?	++	Comments
How well did the study minimise sources of bias (i.e. adjusting for potential confounders)?	+ –	
Were there significant flaws in the study design?	Can't tell (not enough details)	
5.2 Are the findings generalisable to the source population (i.e. externally valid)?	++	Comments
Are there sufficient details given about the study to determine if the findings are generalisable to the source population?	+ –	
Consider: participants, interventions and comparisons, outcomes, resource and policy implications. Was the sample size adequate?	Can't tell (not enough details)	
5.3 What weight would you assign to this study in terms of its contribution to this review?	++	Comments
Consider:	+ –	
<ul style="list-style-type: none"> <li>• The match between the study aims and findings and the aims and purpose of the synthesis;</li> <li>• Its conceptual depth/explanatory power</li> </ul>	Can't tell (not enough details)	

++, criteria are all met; +, some criteria are met; –, criteria are not met or are poorly met; NR, not reported; NA, not applicable.

## Qualitative studies: criteria used for appraisal of study quality

Study ID:

Reviewer ID:

<p>1. <i>Were steps taken to increase rigour in the sampling?</i></p> <p>Consider whether the sampling strategy was appropriate to the questions posed in the study (e.g. was the strategy well reasoned and justified?); attempts were made to obtain a diverse sample of the population in question (think about who might have been excluded, who might have had a different perspective to offer); characteristics of the sample critical to the understanding of the study context and findings were presented (i.e. do we know who the participants were in terms of, for example, basic sociodemographics, characteristics relevant to the context of the study)</p>	<p>Yes, a fairly thorough attempt was made (++)</p> <p>Yes, several steps were taken (+)</p> <p>No, not at all (-)</p> <p>Not reported/ can't tell</p> <p>NA</p>
<p>2. <i>Were steps taken to increase rigour in the data collected?</i></p> <p>Consider whether data collection tools were piloted; data collection was comprehensive, flexible and/or sensitive enough to provide a complete and/or vivid and rich description of people's perspectives and experiences (e.g. Did the researchers spend sufficient time at the site/ with participants? Did they keep 'following up'? Was more than one method of data collection used?); steps were taken to ensure that all participants were able and willing to contribute (e.g. processes for consent, language barriers, power relations between prisoners and staff/researchers)</p>	<p>Yes, a fairly thorough attempt was made (++)</p> <p>Yes, several steps were taken (+)</p> <p>No, not at all (-)</p> <p>Not stated/ can't tell</p> <p>NA</p>
<p>3. <i>Were steps taken to increase rigour in the analysis of the data?</i></p> <p>Consider whether data analysis methods were systematic (e.g. was a method described/ can a method be discerned?); diversity in perspective was explored; the analysis was balanced in the extent to which it was guided by preconceptions or by the data; the analysis sought to rule out alternative explanations for findings (in qualitative research this could be carried out by, for example, searching for negative cases/exceptions, feeding back preliminary results to participants, asking a colleague to review the data, or reflexivity)</p>	<p>Yes, a fairly thorough attempt was made (++)</p> <p>Yes, several steps were taken (+)</p> <p>No, not at all (-)</p> <p>Not stated/ can't tell</p> <p>NA</p>
<p>4. <i>Were the findings of the study grounded in/supported by the data?</i></p> <p>Consider whether enough data are presented to show how the authors arrived at their findings; the data presented for the interpretation support claims about patterns in data; the data presented illuminate/illustrate the findings; quotes are numbered or otherwise identified and the reader can see that they don't come from just one or two people</p>	<p>Good grounding/support (++)</p> <p>Fair grounding/support (+)</p> <p>Limited grounding/support (-)</p>
<p>5. <i>Please rate the findings of the study in terms of their breadth and depth</i></p> <p>Consider whether (NB: it may be helpful to consider 'breadth' as the extent of description and 'depth' as the extent to which data have been transformed/analysed) a range of issues is covered; the perspectives of participants are fully explored in terms of breadth (contrast of two or more perspectives) and depth (insight into a single perspective); richness and complexity have been portrayed (e.g. variation explained, meanings illuminated); there has been theoretical/conceptual development</p>	<p>Good/fair breadth and depth</p> <p>Good/fair breadth but very little depth</p> <p>Good/fair depth but very little breadth</p> <p>Limited breadth and depth</p>
<p>6. <i>To what extent does the study privilege the perspectives and experiences of prisoners?</i></p> <p>Consider whether there was a balance between open-ended and fixed-response options; whether prisoners were involved in designing the research; whether there was a balance between the use of an a priori coding framework and induction in the analysis; the position of the researchers (did they consider it important to listen to the perspectives of prisoners?); whether steps were taken to assure confidentiality and put prisoners at ease</p>	<p>A lot</p> <p>To some extent</p> <p>Not at all</p>

---

7. Overall, what weight would you assign to this study in terms of the reliability/trustworthiness of its findings?	High
	Medium
Guidance: Think (mainly) about the answers you have given to questions 1–4	Low
8. What weight would you assign to this study in terms of the usefulness of its findings for this review?	High
	Medium
Guidance: Think (mainly) about the answers you have given to questions 5 and 6 and consider the match between the study aims and findings and the aims and purpose of the synthesis; its conceptual depth/explanatory power	Low

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NA, not applicable.

## Appendix 6 Grouped codes: review questions 1, 2 and 3

### Codes mapped to review question 1

Initial code	Organising code
<b>Thematic category: knowledge, attitude and behavior</b>	
Increased knowledge (pd)	Increased knowledge
Increased knowledge (r)	
Attitudinal change (pd)	Attitudinal change
Attitudinal change (r)	
Raised self-awareness and understanding	Raised self-awareness and understanding
The role helps peers to accept their own issues/problems	
Behavioural change (pd)	Behaviour change
Behavioural change (r)	
Changes in offending behaviour (pd)	
Changes in offending behaviour (r)	
Impact on parole (r)	
<b>Thematic category: improved mental health</b>	
Increased self-esteem and self-worth (pd)	Increased self-esteem and self-worth
Increased self-esteem and self-worth (r)	
Regarded as a positive role model	
Empowerment (pd)	Sense of empowerment
Empowerment (r)	
Increased confidence (pd)	Increased confidence
Increased confidence (r)	
Life enrichment	Life enrichment
Personal growth (pd)	
Being able to 'give something back'	
Improving prisoners' mood, reducing depression and anxiety and preventing suicide (r)	Improving prisoners' mood
	Reduced depression and anxiety
	Reduction in suicide and parasuicide
<b>Thematic category: social relationships</b>	
Relationship or friendship with the peer worker	Improved social network
Empathy	Empathy and compassion
Enhances capacity to feel compassion for others	

Initial code	Organising code
<b><i>Thematic category: stress and coping</i></b>	
Multi-role peers and burnout	Burnout
Manage boredom	Peer role enables individuals to cope with adverse institutional stressors
Sense of normality/given a role/purpose	
Professional identity	
Increased stress and emotional burden	Emotional burden and coping mechanisms
Coping mechanisms to manage stress and emotional burden	
Peer relationships – support or friendship from other peer workers	
The role diverts attention away from the peers' own issues	
Who provides peer support for the peer deliverers	
<b><i>Thematic category: skills and employment</i></b>	
Improved skills (pd)	Skill development
Improved skills (r)	
Increased teamworking skills (pd)	
Improved communication skills (pd)	
Future employment post prison	Employment prospects
Setting prisoners up to fail	

## Codes mapped to review question 2

Initial code	Organising code
<b><i>Thematic category: references for health service delivery</i></b>	
Less likely to judge	Peer communication
More comfortable talking to peers than staff	
Value of lived experience	
Accessibility	Accessibility of peers
Waiting times to access peers	
Confidentiality arrangements	Confidentiality
Peers better able to recognise signs of stress than staff	Detection of mental health issues



### Codes mapped to review question 3

Initial code	Organising code
<b><i>Thematic category: peer recruitment, training and support</i></b>	
Training	Training and support mechanisms
Accredited training	
Training the (non-prison-based) trainers	
The danger of medicalising the role	
Support systems for pd	
Recruitment and selection process	Recruitment and selection
Diversity and lack of representation	
Retention and managing prisoner turnover	Retaining peer deliverers
Payment/privileges	Payment and privileges
Motivation for the role of pd	Motivation for the role
<b><i>Thematic category: prisoners relationships</i></b>	
Providing practical support to prisoners	Providing practical support to prisoners
Prisoner dependency on peer deliverers	Dependency
Role boundaries	Role tensions
Stigma	
Ambiguity of peer role	
Awareness of peer-based intervention	Awareness and utilisation
Reasons for prisoners not using the peer-based intervention	
<b><i>Thematic category: organisational support</i></b>	
Peers and partnerships with staff	Partnerships
Role of voluntary sector organisations (e.g. Samaritans)	
Managerial support (from governor, NOMS, NHS, etc.)	Institutional 'buy-in'
Prison staff support	
Importance of dedicated members of staff overseeing the scheme	
Funding and resource implications	Funding and resources
Lack of prison staff to support scheme	
Peer interventions raising awareness of the lack of services in prison	

Initial code	Organising code
<b>Thematic category: prison life</b>	
Abuse of position (including drugs, mobile phones)	Power and risk
Power imbalance	
Security issues	
Access within prison (i.e. keys)	
Risk management	
Peers diverting demand from paid staff	Contribution of peers to the wider prison workforce and service delivery
Extra support to staff	
Mediators between prisoners and staff	
Peers filling a gap in service provision	
Number of contacts with prisoners	
Lack of progression within the role	
Peers increasing prisoners' access to services	
Improved ethos of prison/less violence	Impact on prison ethos and culture
Offering prisoners an alternative role of employment in the prison	
Interventions contributing to prison performance targets	Peer interventions contributing to prison performance targets
Evidencing impact	
Integrating the scheme as the 'norm' within the prison	Integration of peer interventions into the prison
Vulnerable prisoner tensions	
Staff resistance	
Hierarchy of peer-led schemes	
Location of intervention	Location of intervention
Reception	
YOI	
Working arrangements including monitoring	Intervention arrangements and monitoring

pd, peer deliverer; r, recipient.

## Appendix 7 Peer intervention definitions

Intervention mode	Definition	Application to prison setting
Peer education	Peer education involves the teaching and communication of health information, values and behaviours between individuals who are of equal social status, or who share similar characteristics, or who have common experiences. <sup>94,95</sup> There are various rationales advanced for peer education including accessing 'hard-to-reach' or socially excluded populations; <sup>165</sup> the influence of social networks and opportunities for positive social modelling and reinforcement of social norms; <sup>95</sup> and personal development and empowerment of peer educators <sup>166</sup>	Peer education has been widely applied in the prison setting, particularly in relation to the prevention of HIV infection and risk reduction. Peer educators typically undertake formal training to equip them with the knowledge and skills to undertake the role. They then deliver (a) formal educational/behaviour change interventions, e.g. risk reduction planning, <sup>27</sup> and/or (b) engage in informal education and awareness raising through social interactions with fellow prisoners within the prison. <sup>106</sup> The case for peer education in the prison setting is broadly based on the same understandings of the powerful effect of social influences as for other peer education approaches. Although prisoners have good functional access to health care, the nature of the prison population (marginalised groups often with low levels of literacy) <sup>27</sup> and the boundaries between professional staff and prisoners can result in resistance to a health agenda. <sup>101</sup> In this context, peer education can be seen as a means to engage prisoners when there might be barriers to professional advice, etc. A further benefit may be the transmission of health information in the prison, between prisons as prisoners move and outside to partners and families <sup>131</sup>
Peer support	Peer support is the support provided and received by those who share similar attributes or types of experience. Peer support can be an informal process between individuals and/or can be provided through formalised interventions in which peer supporters seek to promote health and/or build people's resilience to different stressors <sup>94</sup>	There is a range of different peer support interventions reported in the prison literature. As an overview, peer support in a prison setting involves peer support workers providing practical help and/or social support to other prisoners in a paid or voluntary capacity. <sup>25</sup> Peer support roles can include befriending, carrying out domestic duties for other prisoners (e.g. fetching meals), liaison with prison staff, translation, providing basic information and signposting to other services. <sup>25,149</sup> Some peer support interventions, such as the PST programme in Canada, involve peers providing emotional support to alleviate stress. <sup>153</sup> In the UK, the Listener scheme is a specific peer support intervention focused on the prevention of suicide and self-harm (see below). Some peer support interventions involve group work, such as self-help groups on substance misuse <sup>32</sup>

Intervention mode	Definition	Application to prison setting
PST programme	The PST programme trains women prisoners to provide emotional support on a one-to-one basis to other prisoners who request their support. Delveaux and Blanchette <sup>153</sup> describe the peer support workers as 'pseudo-counselors' (p. iii)	The PST programme is a Canadian model that has been developed and delivered across a number of Canadian prisons. It is specifically targeted at women prisoners and is based on a holistic, women-centred approach to health care that aims to be culturally sensitive and to develop the women's autonomy and self-esteem <sup>153,156</sup>
Insiders	Insiders are volunteer peer support workers who provide reassurance, information and practical assistance to new prisoners on arrival in prison. Insiders are also referred to as buddies <sup>38</sup>	The Insiders scheme is a UK-based intervention that aims to alleviate the stress of arrival in prison and is delivered in settings such as reception and the first night suite. <sup>140</sup> Insiders are volunteer prisoners and receive some training but, unlike listeners, the role is not designed to offer emotional support and insiders are not bound by the same strict rules of confidentiality <sup>22,38</sup>
Listeners	Listeners are volunteers who provide confidential emotional support to fellow prisoners who are experiencing distress. They are selected, trained and supported by the Samaritans and use the same principles of confidential, sympathetic listening to alleviate distress and reduce self-harm and suicide <sup>22,31</sup>	The Listener scheme is a UK-based prison suicide prevention intervention. The first Listener scheme was established in 1991 at HMP Swansea. <sup>31</sup> The scheme has grown rapidly and in 2006 there were an estimated 1400 listeners. <sup>22</sup> Listener schemes now operate across almost all prisons in England and Wales and all prisoners should have access to a listener at any time of day or night and in any setting, including segregation units. <sup>25</sup> The exception to this is young prisoners as listeners are not recruited under the age of 18 years
Prison hospice volunteers	Prison hospice volunteers provide companionship, practical assistance and social support to terminally ill patients. They may be involved in a range of activities as requested by patients including letter writing, reading, accompanying patients to religious services and other parts of the prison and sometimes maintaining a bedside vigil with dying patients <sup>40</sup>	Prison hospices aim to meet the physical, emotional, social, and spiritual needs of terminally ill prisoners who are not able to get compassionate release. <sup>40,127</sup> Hospices were initially introduced in the USA to deal with the high incidence of HIV/AIDS-related deaths and are based on the concept of a 'decent prison'. <sup>40</sup> Prison hospice volunteers are considered to form part of the multidisciplinary hospice team and often work alongside nursing staff
Peer mentoring	Mentoring describes the development of a relationship between two individuals in which the mentee is able to learn from the mentor, model positive behaviour and gain experience, knowledge or skills. <sup>167,168</sup> Peer mentors, as defined by Finnegan <i>et al.</i> , <sup>168</sup> have a similar background as or experiences to their mentee (p. 6)	Peer mentoring has been proposed as an approach to engage disadvantaged and excluded young people by offering role models to encourage and inspire them. <sup>169</sup> There are a number of peer mentoring schemes in UK prisons focused on education and training, such as the Learning Ladder, <sup>142</sup> and on resettlement and prevention of reoffending

Intervention mode	Definition	Application to prison setting
Health trainers	Health trainers are lay public health workers who use a client-centred approach to support individuals around health behaviour change and/or to signpost them to other services (Health Trainers England). Health trainers work with disadvantaged communities and are often recruited from those communities. They receive training to reach standardised competencies and are usually employed by the NHS <sup>170</sup>	The health trainer role was introduced in the 2004 public health White Paper <sup>2</sup> as a means of tackling inequalities by providing peer support around lifestyle change, and in 2006 a health trainer initiative was piloted across three adult prisons, one YOI and one probation service. <sup>28</sup> The service has since expanded and there are now health trainer services in a number of prisons across England and Wales. Prison health trainers receive standardised training on health promotion, healthy lifestyles and mental health, which is adapted for the prison setting and client group
Peer advisors	Peer advisors provide housing advice to fellow prisoners within prisons, particularly new prisoners and those planning for resettlement. Some peer advisors support prisoners 'through the gate'	In response to the issues around resettlement, employment and reoffending, the St Giles Trust established the Peer Advice Project in a number of prisons in London and the south-east of England. <sup>135</sup> Peer advisors receive training and complete an NVQ Level 3 in Advice and Guidance. The role involves assessing housing needs, finding accommodation, support with welfare benefits and signposting/referral to other sources of help. The Peer Advice Project also offers employment experience to peer advisors who volunteer/work with the project following release. <sup>135,139</sup> Peer advisors can be seen as offering both peer support <sup>25</sup> and acting in a bridging role, <sup>97</sup> assisting prisoners to access services/accommodation outside the prison setting
Life coaches	Life coaches are peer support workers who provide low-intensity support to prisoners during the transition between prison and the community. The role is a bridging role that aims to connect prisoners to other community services and sources of support	Life coaches are part of the Routes out of Prison initiative based in Scotland. Life coaches are usually ex-prisoners but some are recruited from similar disadvantaged groups (these individuals are described as peer mentors). Life coaches see prisoners in the prison setting and also outside the gate, to allow some continuity of support. The aim is to 'provide a 'bridge' between the prison and the community'. <sup>147</sup> Life coaches can be seen as offering both peer support and a bridging role, assisting prisoners to access services <sup>97</sup>

Intervention mode	Definition	Application to prison setting
<b>Other intervention modes</b>		
Peer observers (suicide prevention)	Peer observers were identified in one study as part of a suicide prevention initiative. <sup>124</sup> Peer observers observed prisoners who were on suicide watch, i.e. at risk of suicide. They undertook active listening but the role did not involve counselling	
Peer training (violence)	The AVP involves prisoners training and then facilitating training on conflict resolution techniques with young offenders. The project involves a formal five-step programme moving from basic training to train the trainers, to facilitation and involvement in the management council. <sup>132</sup> Although it involves peer education in terms of using a cascade training model, it reflects a high degree of involvement and is described as 'inmate run'	
Peer outreach (harm reduction)	A harm reduction programme in Moldovan prisons involved peer volunteers in distributing condoms, supplies for needle exchange and information booklets to fellow prisoners <sup>163</sup>	
Peer counsellors (substance misuse)	The peer counsellor role was found in one study, <sup>145</sup> with peer counsellors assisting in the delivery of a formal substance abuse treatment programme	
NVQ, National Vocational Qualification.		

## Appendix 8 Search strategy and results for the cost-effectiveness review

### Applied Social Sciences Index and Abstracts (ProQuest CSA), 1987–present

Searched 2 May 2012.

#### Search strategy

((prison\* OR jail\* OR penitentiary\* OR bastille\* OR offender\* OR reoffend\* OR convict OR convicts OR convicted OR inmate\* OR detainee\* OR cellmate\* OR incarcerated OR incarceration OR felon\*) NEAR/6 ((group\* NEAR/2 therap\*) OR (group\* NEAR/2 intervention\*) OR (group\* NEAR/2 treatment\*) OR (group\* NEAR/2 education\*) OR (group\* NEAR/2 work\*) OR (group\* NEAR/2 meeting\*) OR (group\* NEAR/2 session\*))) OR

all((juvenile NEAR/1 delinquen\*) NEAR/6 ((group\* NEAR/2 therap\*) OR (group\* NEAR/2 intervention\*) OR (group\* NEAR/2 treatment\*) OR (group\* NEAR/2 education\*) OR (group\* NEAR/2 work\*) OR (group\* NEAR/2 meeting\*) OR (group\* NEAR/2 session\*))) OR

all((prison\* OR jail\* OR penitentiary\* OR bastille\* OR offender\* OR reoffend\* OR convict OR convicts OR convicted OR inmate\* OR detainee\* OR cellmate\* OR incarcerated OR incarceration OR felon\*) NEAR/40 peer\*) OR

all((juvenile NEAR/1 delinquen\*) NEAR/40 peer\*) OR

all((secure NEAR/2 (unit OR units OR facility OR institution\* OR facilities OR centre\* OR center\*)) NEAR/6 ((group\* NEAR/2 therap\*) OR (group\* NEAR/2 intervention\*) OR (group\* NEAR/2 treatment\*) OR (group\* NEAR/2 education\*) OR (group\* NEAR/2 work\*) OR (group\* NEAR/2 meeting\*) OR (group\* NEAR/2 session\*))) OR

all((correctional NEAR/2 (units OR unit OR facility OR institution\* OR centre\* OR center\* OR system OR facilities)) NEAR/6 ((group\* NEAR/2 therap\*) OR (group\* NEAR/2 intervention\*) OR (group\* NEAR/2 treatment\*) OR (group\* NEAR/2 education\*) OR (group\* NEAR/2 work\*) OR (group\* NEAR/2 meeting\*) OR (group\* NEAR/2 session\*))) OR

all((secure NEAR/2 (unit OR units OR facility OR institution\* OR facilities OR centre\* OR center\*)) NEAR/40 peer\*) OR

all((correctional NEAR/2 (units OR unit OR facility OR institution\* OR centre\* OR center\* OR system OR facilities)) NEAR/40 peer\*) OR

all((prison\* OR jail\* OR penitentiary\* OR bastille\* OR offender\* OR reoffend\* OR convict OR convicts OR convicted OR inmate\* OR detainee\* OR cellmate\* OR incarcerated OR incarceration OR felon\*) NEAR/6 (mentor\* OR support\* OR training OR "self help" OR volunt\* OR "focus group" OR listen\* OR buddy OR buddies OR friend\* OR befriend\* OR bridging OR "lay people")) OR

all((juvenile NEAR/1 delinquen\*) NEAR/6 (mentor\* OR support\* OR training OR "self help" OR volunt\* OR "focus group" OR listen\* OR buddy OR buddies OR friend\* OR befriend\* OR bridging OR "lay people")) OR

all((correctional NEAR/2 (units OR unit OR facility OR institution\* OR centre\* OR center\* OR system OR facilities)) NEAR/6 (mentor\* OR support\* OR training OR "self help" OR volunt\* OR "focus group" OR listen\* OR buddy OR buddies OR friend\* OR befriend\* OR bridging OR "lay people")) OR

all((secure NEAR/2 (unit OR units OR facility OR institution\* OR facilities OR centre\* OR center\*)) NEAR/6 (mentor\* OR support\* OR training OR "self help" OR volunt\* OR "focus group" OR listen\* OR buddy OR buddies OR friend\* OR befriend\* OR bridging OR "lay people")) OR

(correctional NEAR/2 (units OR unit OR facility OR institution\* OR centre\* OR center\* OR system OR facilities) NEAR/6 ((program\* NEAR/2 therap\*) OR (program\* NEAR/2 intervention\*) OR (program\* NEAR/2 educat\*) OR (program\* NEAR/2 group\*) OR (program\* NEAR/2 commun\*) OR (program\* NEAR/2 parent\*))) OR

(secure NEAR/2 (unit OR units OR facility OR institution\* OR facilities OR centre\* OR center\*) NEAR/6 ((program\* NEAR/2 therap\*) OR (program\* NEAR/2 intervention\*) OR (program\* NEAR/2 educat\*) OR (program\* NEAR/2 group\*) OR (program\* NEAR/2 commun\*) OR (program\* NEAR/2 parent\*))) OR

(juvenile NEAR/1 delinquen\* NEAR/6 ((program\* NEAR/2 therap\*) OR (program\* NEAR/2 intervention\*) OR (program\* NEAR/2 educat\*) OR (program\* NEAR/2 group\*) OR (program\* NEAR/2 commun\*) OR (program\* NEAR/2 parent\*))) OR

((prison\* OR jail\* OR penitentiary\* OR bastille\* OR offender\* OR reoffend\* OR convict OR convicts OR convicted OR inmate\* OR detainee\* OR cellmate\* OR incarcerated OR incarceration OR felon\*) NEAR/6 ((program\* NEAR/2 Therap\*) OR (program\* NEAR/2 Interventon\*) OR (program\* NEAR/2 educat\*) OR (program\* NEAR/2 group\*) OR (program\* NEAR/2 commun\*) OR (program\* NEAR/2 parent\*)))

AND

all((cost\* OR economic\* OR financ\* OR budget\* OR price\* OR pricing\* OR monetary OR fee\*) AND (medic\* OR health\* OR clinic\* OR psych\* OR mental\*)) OR all((qaly OR hui\* OR hrqol OR eq5d OR "quality adjusted life" OR "value of life" sf36 OR sf6d OR "short form\*" OR markov\*) OR (utility OR utilities OR preference\* OR instrument\*) NEAR/5 (hrql OR qol OR "quality of life" OR health\* OR score\* OR weight\*)) OR ti(Cost\*)

## The Campbell Library, 2000–present

URL: [www.campbellcollaboration.org/library.php](http://www.campbellcollaboration.org/library.php)

Searched 19 April 2012.

### Search strategy

1. (prison\* or jail\* or penitentiary\* or bastille\* or offender\* or reoffend\* or convict or convicts or convicted or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\* or secure unit\* or secure facilit\* or correctional institution\* or correctional unit\* or correctional facilit\* or correctional cent\* or juvenile delinquen\*) in all text (90)
2. (peer\* or mentor\* or support\* or train\* or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or lay person or lay people or self help) in all text (205)
3. (group and (therap\* or intervention\* or treatment\* or educat\* or work\* or meeting\* or session\*)) in all text (205)
4. (groups and (therap\* or intervention\* or treatment\* or educat\* or work\* or meeting\* or session\*)) in all text (189)



5. 2 or 3 or 4 (207)
6. 1 and 5 (90)
7. (cost\* or economic\* or financ\* or budget\* or price\* or pricing or monetary or qaly or hui\* or hrqol or eq5d or utility or utilities or preference\* of sf36 or sf6d) in all text (165)
8. 6 and 7 (79)

## Cumulative Index to Nursing and Allied Health Literature (EBSCOhost), 1981–present

Searched 14 May 2012.

### Search strategy

S74 S73 and S71

S73 S72 or S55

S72 S1 or S2 or S3 or S4 or S5 or S6 or S7 or S8 or S9 or S10 or S11 or S12 or S13 or S14 or S15 or S16 or S17 or S18 or S19 or S20 or S21 or S22 or S23 or S24 or S25 or S26 or S27 or S28 or S29 or S30 or S31 or S32

S71 S56 or S57 or S58 or S59 or S60 or S61 or S62 or S63 or S64 or S65 or S66 or S67 or S68 or S69 or S70

S70 TI ( hql or hqol or h qol or hrqol or hr qol or pqol or qls ) or AB ( hql or hqol or h qol or hrqol or hr qol or pqol or qls )

S69 AB (value n2 (money or monetary)) or economic model\* or markov\* or quality adjusted life or qaly\* or qald\* or qale\* or qtime\* or disability adjusted life or daly\* or SF6D or sf 6d or short form 6d or shortform6d or health\* year\* equivalent\* or hye or hyes or health utilit\* or hui or hui1 or hui2 or hui3 or disutil\* or standard gamble\* or time trade off or time tradeoff or tto

S68 AB (cost\* n2 (effective\* or utilit\* or benefit\* or minimi\* or evaluat\* or analy\* or study or studies or consequenc\* or compar\* or efficienc\*))

S67 AB pharmacoeconomic\* or pharmaco-economic\* or economic\* or price\* or pricing\* or budget\* or euroquol\* or eq5d or eq-5d or finance\* or financial\* or fee or fees

S66 TI (value n2 money) or (value n2 monetary) or ("economic model\*" or markov\* or "quality adjusted life" or qaly\* or qald\* or qale\* or qtime\* or "disability adjusted life" or daly\*) or ("health\* year\* equivalent\*" or hye or hyes or hui or hui1 or hui2 or hui3 or disutil\* or "standard gamble\*" or "time trade off" or "time tradeoff" or tto)

S65 TI cost\* or pharmacoeconomic\* or pharmaco-economic\* or economic\* or price\* or pricing\* or budget\* or euroquol\* or eq5d or eq-5d or finance\* or financial\* or fee or fees

S64 (MH "Costs and Cost Analysis+") or (MH "Fees and Charges+") or (MH "Health Resource Utilization") or (MH "Health Resource Allocation")

S63 (MH "Economics") or (MH "Economic Value of Life") or (MH "Economics, Dental") or (MH "Economics, Pharmaceutical") or (MH "Economic Aspects of Illness")

S62 (MH "Health Status Indicators") OR (MH "Severity of Illness Indices") OR (MH "Trauma Severity Indices") OR (MH "Apache")

S61 TI ( ((instrument or instruments) n5 (hrql or qol or "quality of life" or health\* or score\* or weight\*)) ) OR AB ( ((instrument or instruments) n5 (hrql or qol or "quality of life" or health\* or score\* or weight\*)) )

S60 TI ( "nottingham health profile\*" or "sickness impact profile\*" ) OR AB ( "nottingham health profile\*" or "sickness impact profile\*" )

S59 TI ( "quality of wellbeing" or "quality of well being" or qwb ) OR AB ( "quality of wellbeing" or "quality of well being" or qwb )

S58 TI ( (sf6d or "sf 6d" or "sf sixd" or "sf six d" or sf36 or "sf 36" or "short form" or shortform or "sf thirtysix" or "sf thirty six" or "short from thirty\*" or "short from six\*") ) OR AB ( (sf6d or "sf 6d" or "sf sixd" or "sf six d" or sf36 or "sf 36" or "short form" or shortform or "sf thirtysix" or "sf thirty six" or "short from thirty\*" or "short from six\*") )

S57 TI ( ((preference\*) n5 ("quality of life" or health\* or score\* or weight\*)) ) OR AB ( ((preference\*) n5 ("quality of life" or health\* or score\* or weight\*)) )

S56 TI ( ((utility or utilities) n5 ("quality of life" or health\* or score\* or weight\*)) ) OR AB ( ((utility or utilities) n5 ("quality of life" or health\* or score\* or weight\*)) )

S55 S54 and S53

S54 S48 or S46 or S45 or S44 or S43 or S42 or S41 or S40 or S39 or S38 or S37 or S36 or S35 or S34 or S33

S53 S52 or S51 or S50 or S49

S52 SU "Juvenile Offenders"

S51 SU "Public Offenders"

S50 SU "Correctional Facilities"

S49 SU Prisoners

S48 SU "Sexual Counseling"

S47 SU "Peer Counseling"

S46 SU Counseling

S45 SU "Support Groups"

S44 SU "Role Models"

S43 SU "Focus Groups"

S42 SU "Peer Group"

S41 SU "Health Behavior"

S40 SU "Life Style"

S39 SU "Social Support Iowa NOC"

S38 SU motivation

S37 SU "Psychotherapy, Group"

S36 SU "Health Education"

S35 SU "Self-Efficacy"

S34 SU "Role Playing"

S33 SU "Health Promotion"

S32 TI (juvenile) n1 ((delinquen\*) n6 (group\*N2 therap\*) or (group\* N2 treatment\*) or (group n2 intervention\*) or (group\* N2 education\*) OR (group\* N2 work\*) OR (group\* N2 meeting\*) OR (group\* N2 session\*) or (group N2 support) or (group N2 training))

S31 AB (juvenile) n1 ((delinquen\*) n6 (group\*N2 therap\*) or (group\* N2 treatment\*) or (group n2 intervention\*) or (group\* N2 education\*) OR (group\* N2 work\*) OR (group\* N2 meeting\*) OR (group\* N2 session\*) or (group N2 support) or (group N2 training))

S30 AB (juvenile) n1 ((delinquen\*) n6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people"))

S29 TI (juvenile) n1 ((delinquen\*) n6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people"))

S28 AU (juvenile) n1 ((delinquen\*) n6 (program\* n2 educat\*) or (program\* n2 group\*) or (program\* n2 commun\*) or (program\* n2 parent\*))

S27 TI (juvenile) n1 ((delinquen\*) n6 (program\* n2 educat\*) or (program\* n2 group\*) or (program\* n2 commun\*) or (program\* n2 parent\*))

S26 TI (juvenile) n1 ((delinquen\*) n40 (peer))

S25 AB (juvenile) n1 ((delinquen\*) n40 (peer))

S24 AB (correctional) n2 ((units or unit or facility or institution\* or centre\* or center\* or system or facilities) n40 (peer))

S23 TI (correctional) n2 ((units or unit or facility or institution\* or centre\* or center\* or system or facilities) n40 (peer))

S22 TI (correctional) n2 ((units or unit or facility or institution\* or centre\* or center\* or system or facilities) n6 (program\* n2 educat\*) or (program\* n2 group\*) or (program\* n2 commun\*) or (program\* n2 parent\*))

S21 AB (correctional) n2 ((units or unit or facility or institution\* or centre\* or center\* or system or facilities) n6 (program\* n2 educat\*) or (program\* n2 group\*) or (program\* n2 commun\*) or (program\* n2 parent\*))

S20 AB (correctional) n2 ((units or unit or facility or institution\* or centre\* or center\* or system or facilities) n6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people"))

S19 TI (correctional) n2 ((units or unit or facility or institution\* or centre\* or center\* or system or facilities) n6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people"))

S18 AB (correctional) n2 ((units or unit or facility or institution\* or centre\* or center\* or system or facilities) n6 (group\*N2 therap\*) or (group\* N2 treatment\*) or (group n2 intervention\*) or (group\* N2 education\*) OR (group\* N2 work\*) OR (group\* N2 meeting\*) OR (group\* N2 session\*) or (group N2 support) or (group N2 training))

S17 TI (correctional) n2 ((units or unit or facility or institution\* or centre\* or center\* or system or facilities) n6 (group\*N2 therap\*) or (group\* N2 treatment\*) or (group n2 intervention\*) or (group\* N2 education\*) OR (group\* N2 work\*) OR (group\* N2 meeting\*) OR (group\* N2 session\*) or (group N2 support) or (group N2 training))

S16 AB (secure) n2 ((unit or units or facility or institution\* or facilities or centre\* or center\*) n6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people"))

S15 TI (secure) n2 ((unit or units or facility or institution\* or facilities or centre\* or center\*) n6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people"))

S14 AB (secure) n2 ((unit or units or facility or institution\* or facilities or centre\* or center\*) n6 (program\* n2 therap\*) or (program\* n2 intervention\*) or (program\* n2 educat\*) or (program\* n2 group\*) or (program\* n2 commun\*) or (program\* n2 parent\*))

S13 TI (secure) n2 ((unit or units or facility or institution\* or facilities or centre\* or center\*) n6 (program\* n2 therap\*) or (program\* n2 intervention\*) or (program\* n2 educat\*) or (program\* n2 group\*) or (program\* n2 commun\*) or (program\* n2 parent\*))

S12 AB (secure) n2 ((unit or units or facility or institution\* or facilities or centre\* or center\*) n40 (peer))

S11 TI (secure) n2 ((unit or units or facility or institution\* or facilities or centre\* or center\*) n40 (peer))

S10 AB (secure) n2 ((unit or units or facility or institution\* or facilities or centre\* or center\*) n6 (group\*N2 therap\*) or (group\* N2 treatment\*) or (group n2 intervention\*) or (group\* N2 education\*) OR (group\* N2 work\*) OR (group\* N2 meeting\*) OR (group\* N2 session\*) or (group N2 support) or (group N2 training))

S9 TI (secure) n2 ((unit or units or facility or institution\* or facilities or centre\* or center\*) n6 (group\*N2 therap\*) or (group\* N2 treatment\*) or (group n2 intervention\*) or (group\* N2 education\*) OR (group\* N2 work\*) OR (group\* N2 meeting\*) OR (group\* N2 session\*) or (group N2 support) or (group N2 training))

S8 AB (prison\* OR jail\* OR penitentiary\* OR bastille\* OR offender\* OR reoffend\* OR convict OR convicts OR convicted OR inmate\* OR detainee\* OR cellmate\* OR incarcerated OR incarceration OR felon\*) n6 ((program\* n2 therap\*) or (program\* n2 intervention\*) or (program\* n2 educat\*) or (program\* n2 group\*) or (program\* n2 commun\*) or (program\* n2 parent\*))

S7 TI (prison\* OR jail\* OR penitentiari\* OR bastile\* OR offender\* OR reoffend\* OR convict OR convicts OR convicted OR inmate\* OR detainee\* OR cellmate\* OR incarcerated OR incarceration OR felon\*) n6 ((program\* n2 therap\*) or (program\* n2 intervention\*) or (program\* n2 educat\*) or (program\* n2 group\*) or (program\* n2 commun\*) or (program\* n2 parent\*))

S6 TI (prison\* OR jail\* OR penitentiari\* OR bastile\* OR offender\* OR reoffend\* OR convict OR convicts OR convicted OR inmate\* OR detainee\* OR cellmate\* OR incarcerated OR incarceration OR felon\*) n40 ((peer))

S5 AB (prison\* OR jail\* OR penitentiari\* OR bastile\* OR offender\* OR reoffend\* OR convict OR convicts OR convicted OR inmate\* OR detainee\* OR cellmate\* OR incarcerated OR incarceration OR felon\*) n40 ((peer))

S4 AB (prison\* OR jail\* OR penitentiari\* OR bastile\* OR offender\* OR reoffend\* OR convict OR convicts OR convicted OR inmate\* OR detainee\* OR cellmate\* OR incarcerated OR incarceration OR felon\*) n6 ((mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people"))

S3 TI (prison\* OR jail\* OR penitentiari\* OR bastile\* OR offender\* OR reoffend\* OR convict OR convicts OR convicted OR inmate\* OR detainee\* OR cellmate\* OR incarcerated OR incarceration OR felon\*) n6 ((mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people"))

S2 AB (prison\* OR jail\* OR penitentiari\* OR bastile\* OR offender\* OR reoffend\* OR convict OR convicts OR convicted OR inmate\* OR detainee\* OR cellmate\* OR incarcerated OR incarceration OR felon\*) n6 ((group\*N2 therap\*) or (group\* N2 treatment\*) or (group n2 intervention\*) or (group\* N2 education\*) OR (group\* N2 work\*) OR (group\* N2 meeting\*) OR (group\* N2 session\*) or (group N2 support) or (group N2 training))

S1 TI (prison\* OR jail\* OR penitentiari\* OR bastile\* OR offender\* OR reoffend\* OR convict OR convicts OR convicted OR inmate\* OR detainee\* OR cellmate\* OR incarcerated OR incarceration OR felon\*) n6 ((group\*N2 therap\*) or (group\* N2 treatment\*) or (group n2 intervention\*) or (group\* N2 education\*) OR (group\* N2 work\*) OR (group\* N2 meeting\*) OR (group\* N2 session\*) or (group N2 support) or (group N2 training))

## Conference Papers Index (ProQuest CSA), 1987–present

Searched 2 May 2012.

Same as ASSIA (ProQuest CSA).

## Cost-effectiveness Analysis Registry (Center for the Evaluation of Value and Risk in Health, Tufts Medical Centre), 2001–present

URL: <https://research.tufts-nemc.org/cear4/SearchingtheCEARegistry/SearchtheCEARegistry.aspx>

Searched 17 April 2012.

### Search strategy

prison

## Dissertations & Theses (ProQuest CSA), 1861–present

Searched 2 May 2012.

Same as ASSIA (ProQuest CSA), 1987–present.

## EMBASE Classic + EMBASE (OvidSP), 1947 to 24 April 2012

Searched 26 April 2012.

### Search strategy

1. health economics/ (31,627)
2. exp economic evaluation/ (183,857)
3. exp health care cost/ (176,539)
4. exp pharmacoeconomics/ (152,535)
5. socioeconomics/ (100,703)
6. cost\*.ti. (90,919)
7. (cost\$ adj2 (effective\$ or utilit\$ or benefit\$ or minimi\$ or evaluat\$ or analy\$ or study or studies or consequenc\$ or compar\$ or efficienc\*)).ab. (106,887)
8. (price\* or pricing).tw. (29,351)
9. (economic\$ or pharmacoeconomic\$ or pharmaco-economic\$).tw. (175,422)
10. budget\$.tw. (21,434)
11. (value adj2 (money or monetary)).tw. (1461)
12. (finance\$ or financia\$).tw. (63,470)
13. quality adjusted life year/ (9012)
14. (eq-5d or eq5d or euroquol\*).tw. (3233)
15. economic model\*.tw. (1949)
16. markov\*.tw. (12,369)
17. quality adjusted life.tw. (6316)
18. (qaly\$ or qald\$ or qale\$ or qtime\$).tw. (6070)
19. disability adjusted life.tw. (1103)
20. daly\$.tw. (1226)
21. health\* year\* equivalent\*.tw. (41)
22. (hye or hyes).tw. (62)
23. (hui or hui1 or hui2 or hui3).tw. (942)
24. disutil\$.tw. (261)
25. (hql or hqol or h qol or hrqol or hr qol).tw. (8079)
26. standard gamble\$.tw. (681)
27. (time trade off or time tradeoff or tto).tw. (1259)
28. (pqol or qls).tw. (310)
29. exp animals/ not (exp animals/ and exp humans/) (1,331,362)
30. exp nonhuman/ not (exp nonhuman/ and exp human/) (3,110,154)
31. exp experimental animal/ (433,785)
32. exp veterinary medicine/ (30,569)
33. animal experiment/ (1,614,542)
34. ((energy or oxygen\$ or metaboli\*) adj3 cost\$).tw. (5833)
35. ((utility or utilities) adj5 ("quality of life" or health\* or score\* or weight\*)).tw. (4780)
36. (preference\* adj5 ("quality of life" or health\* or score\* or weight\*)).tw. (3872)
37. (sf36 or sf 36 or short form 36 or shortform 36 or sf thirtysix or sf thirty six or shortform thirtysix or shortform thirty six or short from thirtysix or short form thirty six).tw. (17,373)

38. (sf6d or sf 6d or short form 6d or shortform 6d or sf sixd or sf six d).tw. (446)
39. ("quality of wellbeing" or "quality of well being" or qwb).tw. (365)
40. "nottingham health profile\*" .tw. (1123)
41. ((instrument or instruments) adj5 (hrql or qol or "quality of life" or health\* or score\* or weight\*)).tw. (9580)
42. "sickness impact profile" .tw. (1073)
43. "health status indicator\*" .tw. (323)
44. APACHE/ (4904)
45. exp "severity of illness index"/ (175,389)
46. sickness impact profile/ (1681)
47. exp animal/ not (exp animal/ and exp human/) (1,331,362)
48. exp Veterinary Medicine/ (30,569)
49. exp Animal Experimentation/ (1,618,007)
50. (cost\$ adj2 metaboli\$).tw. (1220)
51. (cost\$ adj2 energy).tw. (3529)
52. (cost\* adj1 oxygen).tw. (803)
53. or/47-52 (2,963,761)
54. or/1-46 (5,920,862)
55. 54 not 53 (2,959,163)
56. offender/ (7651)
57. prison/ (11,113)
58. prisoner/ (11,123)
59. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*)).tw. (499)
60. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities)).tw. (1227)
61. or/56-60 (27,090)
62. counseling/ or peer counseling/ (34,957)
63. social support/ (48,002)
64. motivation/ (61,808)
65. lifestyle/ (60,350)
66. therapeutic community/ (2875)
67. group therapy/ (17,797)
68. health education/ (73,650)
69. friend/ (5437)
70. role playing/ (15,080)
71. peer group/ (10,259)
72. self help/ (10,452)
73. health promotion/ (60,369)
74. health program/ (74,773)
75. weight reduction/ (76,347)
76. or/62-75 (491,638)
77. ((prison\* or jail\* or penitentiary\* or bastille\* or offender\* or reoffend\* or convict or convicts or convicted or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) adj6 ((group\* adj2 therap\*) or (group\* adj2 intervention\*) or (group\* adj2 treatment\*) or (group\* adj2 educat\*) or (group\* adj2 work\*) or (group\* adj2 meeting\*) or (group\* adj2 session\*))).tw. (127)
78. ((prison\* or jail\* or penitentiary\* or bastille\* or offender\* or reoffend\* or convict or convicts or convicted or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) adj6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")).tw. (911)
79. ((prison\* or jail\* or penitentiary\* or bastille\* offender\* or reoffend\* or convict or convicted or convicts or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) adj40 peer\*).tw. (94)

80. ((prison\* or jail\* or penitentiary\* or bastille\* or offender\* or reoffend\* or convict or convicts or convicted or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) adj6 ((program\* adj2 therap\*) or (program\* adj2 intervention\*) or (program\* adj2 educat\*) or (program\* adj2 group\*) or (program\* adj2 commun\*) or (program\* adj2 parent\*))).tw. (164)
81. (juvenile adj1 delinquen\* adj6 ((group adj2 intervention\*) or (group\* adj2 treatment\*) or (group\* adj2 educat\*) or (group\* adj2 work\*) or (group\* adj2 meeting\*) or (group\* adj2 session\*) or (group\* adj2 therap\*))).tw. (7)
82. (juvenile adj1 delinquen\* adj6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")).tw. (19)
83. (juvenile adj1 delinquen\* adj40 peer\*).tw. (23)
84. (juvenile adj1 delinquen\* adj6 ((program\* adj2 therap\*) or (program\* adj2 intervention\*) or (program\* adj2 educat\*) or (program\* adj2 group\*) or (program\* adj2 commun\*) or (program\* adj2 parent\*))).tw. (6)
85. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*) adj6 ((group\* adj2 therap\*) or (group\* adj2 intervention\*) or (group\* adj2 treatment\*) or (group\* adj2 educat\*) or (group\* adj2 work\*) or (group\* adj2 meeting\*) or (group\* adj2 session\*))).tw. (1)
86. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*) adj6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")).tw. (10)
87. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*) adj6 ((program\* adj2 therap\*) or (program\* adj2 intervention\*) or (program\* adj2 educat\*) or (program\* adj2 group\*) or (program\* adj2 commun\*) or (program\* adj2 parent\*))).tw. (1)
88. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*) adj6 peer\*).tw. (0)
89. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) adj6 ((group\* adj2 therap\*) or (group\* adj2 intervention\*) or (group\* adj2 treatment\*) or (group\* adj2 educat\*) or (group\* adj2 work\*) or (group\* adj2 meeting\*) or (group\* adj2 session\*))).tw. (3)
90. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) adj6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")).tw. (36)
91. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) adj6 ((program\* adj2 therap\*) or (program\* adj2 intervention\*) or (program\* adj2 educat\*) or (program\* adj2 group\*) or (program\* adj2 commun\*) or (program\* adj2 parent\*))).tw. (6)
92. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) adj6 peer\*).tw. (1)
93. or/77-92 (1342)
94. 61 and 76 (2753)
95. 93 or 94 (3828)
96. 55 and 95 (427)

## IDEAS (Research Papers in Economics), 1997–present

URL: <http://ideas.repec.org/>

Searched 17 April 2012.

### Search strategy

1. prison and peer\* not dilemma
2. prison and group\* not dilemma
3. prison\* and educat\* not dilemma



## International Bibliography of the Social Sciences (ProQuest CSA), 1951–present

Searched 2 May 2012.

Same as ASSIA (ProQuest CSA).

## MEDLINE(R) (OvidSP), 1946 to April Week 2 2012

Searched 26 April 2012.

### Search strategy

1. Economics/ (26,255)
2. exp Economics, Dental/ (3850)
3. exp Economics, Nursing/ (3860)
4. exp Economics, Medical/ (13,242)
5. exp Economics, pharmaceutical/ (2316)
6. exp Economics, Hospital/ (17,845)
7. exp "Costs and Cost Analysis"/ (163,753)
8. exp "Fees and Charges"/ (25,744)
9. exp budgets/ (11,381)
10. exp "Value of Life"/ec [Economics] (214)
11. budget\$.tw. (15,206)
12. cost\$.ti. (67,775)
13. (cost\$ adj2 (effective\$ or utilit\$ or benefit\$ or minimi\$ or evaluat\$ or analy\$ or study or studies or consequenc\$ or compar\$ or efficienc\*)).ab. (75,610)
14. (economic\$ or pharmaco-economic\$ or pharmaco-economic\$.tw. (120,600)
15. (price\$ or pricing\$.tw. (19,873)
16. (finance\$ or financial\$.tw. (45,336)
17. (fee or fees).tw. (10,354)
18. (value adj1 (money or monetary)).tw. (278)
19. quality-adjusted life years/ (5584)
20. (eq-5d or eq5d or euroqol\*).tw. (1899)
21. exp models, economic/ (8524)
22. economic model\*.tw. (1304)
23. markov chains/ (7834)
24. markov\*.tw. (9125)
25. quality adjusted life.tw. (4462)
26. (qaly\$ or qald\$ or qale\$ or qtime\$.tw. (3727)
27. disability adjusted life.tw. (836)
28. daly\$.tw. (854)
29. health\* year\* equivalent\*.tw. (36)
30. (hye or hyes).tw. (51)
31. (hui or hui1 or hui2 or hui3).tw. (689)
32. disutil\$.tw. (164)
33. standard gamble\$.tw. (575)
34. (time trade off or time tradeoff or tto).tw. (926)
35. (hqj or hqol or h qol or hrqol or hr qol).tw. (5437)
36. (pqol or qols).tw. (202)
37. ((utility or utilities) adj5 ("quality of life" or health\* or score\* or weight\*)).tw. (3284)
38. (preference\* adj5 ("quality of life" or health\* or score\* or weight\*)).tw. (2922)

39. (sf36 or sf 36 or short form 36 or shortform 36 or sf thirtysix or sf thirty six or shortform thirtysix or shortform thirty six or short from thirtysix or short form thirty six).tw. (12,234)
40. (sf6d or sf 6d or short form 6d or shortform 6d or sf sixd or sf six d).tw. (277)
41. ("quality of wellbeing" or "quality of well being" or qwb).tw. (313)
42. "nottingham health profile".tw. (919)
43. ((instrument or instruments) adj5 (hrql or qol or "quality of life" or health\* or score\* or weight\*)).tw. (7112)
44. "sickness impact profile".tw. (942)
45. health status indicators/ (17,682)
46. apache/ (3979)
47. exp "severity of illness index"/ (141,772)
48. sickness impact profile/ (5326)
49. or/1-48 (611,804)
50. exp animals/ not (exp animals/ and exp humans/) (3,702,877)
51. exp Veterinary Medicine/ (19,229)
52. exp Animal Experimentation/ (5300)
53. (cost\$ adj2 metaboli\$).tw. (995)
54. (cost\$ adj2 energy).tw. (2615)
55. (cost\* adj1 oxygen).tw. (599)
56. or/50-55 (3,719,960)
57. 49 not 56 (583,388)
58. prisons/ or concentration camps/ (7091)
59. Criminals/ (454)
60. Prisoners/ (11,077)
61. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*)).tw. (303)
62. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities)).tw. (973)
63. or/58-62 (17,046)
64. Counseling/ (25,356)
65. Social Support/ (44,313)
66. motivation/ or life style/ (80,946)
67. Therapeutic Community/ (1925)
68. Psychotherapy, Group/ (11,134)
69. Health Education/ (49,071)
70. Friends/ (2001)
71. self efficacy/ (9636)
72. Role Playing/ (1897)
73. Peer Group/ (11,914)
74. Self-Help Groups/ (7296)
75. Focus Groups/ (13,103)
76. health promotion/ or healthy people programs/ or weight reduction programs/ (45,937)
77. or/64-76 (269,542)
78. ((prison\* or jail\* or penitentiary\* or bastille\* or offender\* or reoffend\* or convict or convicts or convicted or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) adj6 ((group\* adj2 therap\*) or (group\* adj2 intervention\*) or (group\* adj2 treatment\*) or (group\* adj2 educat\*) or (group\* adj2 work\*) or (group\* adj2 meeting\*) or (group\* adj2 session\*))).tw. (78)
79. ((prison\* or jail\* or penitentiary\* or bastille\* or offender\* or reoffend\* or convict or convicts or convicted or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) adj6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")).tw. (616)
80. ((prison\* or jail\* or penitentiary\* or bastille\* offender\* or reoffend\* or convict or convicted or convicts or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) adj40 peer\*).tw. (86)

81. ((prison\* or jail\* or penitentiary\* or bastille\* or offender\* or reoffend\* or convict or convicts or convicted or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) adj6 ((program\* adj2 therap\*) or (program\* adj2 intervention\*) or (program\* adj2 educat\*) or (program\* adj2 group\*) or (program\* adj2 commun\*) or (program\* adj2 parent\*))).tw. (123)
82. (juvenile adj1 delinquen\* adj6 ((group adj2 intervention\*) or (group\* adj2 treatment\*) or (group\* adj2 educat\*) or (group\* adj2 work\*) or (group\* adj2 meeting\*) or (group\* adj2 session\*) or (group\* adj2 therap\*))).tw. (6)
83. (juvenile adj1 delinquen\* adj6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")).tw. (13)
84. (juvenile adj1 delinquen\* adj40 peer\*).tw. (17)
85. (juvenile adj1 delinquen\* adj6 ((program\* adj2 therap\*) or (program\* adj2 intervention\*) or (program\* adj2 educat\*) or (program\* adj2 group\*) or (program\* adj2 commun\*) or (program\* adj2 parent\*))).tw. (1)
86. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*) adj6 ((group\* adj2 therap\*) or (group\* adj2 intervention\*) or (group\* adj2 treatment\*) or (group\* adj2 educat\*) or (group\* adj2 work\*) or (group\* adj2 meeting\*) or (group\* adj2 session\*))).tw. (1)
87. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*) adj6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")).tw. (6)
88. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*) adj6 ((program\* adj2 therap\*) or (program\* adj2 intervention\*) or (program\* adj2 educat\*) or (program\* adj2 group\*) or (program\* adj2 commun\*) or (program\* adj2 parent\*))).tw. (0)
89. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*) adj6 peer\*).tw. (0)
90. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) adj6 ((group\* adj2 therap\*) or (group\* adj2 intervention\*) or (group\* adj2 treatment\*) or (group\* adj2 educat\*) or (group\* adj2 work\*) or (group\* adj2 meeting\*) or (group\* adj2 session\*))).tw. (0)
91. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) adj6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")).tw. (22)
92. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) adj6 ((program\* adj2 therap\*) or (program\* adj2 intervention\*) or (program\* adj2 educat\*) or (program\* adj2 group\*) or (program\* adj2 commun\*) or (program\* adj2 parent\*))).tw. (4)
93. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) adj6 peer\*).tw. (1)
94. or/78-93 (923)
95. 63 and 77 (1364)
96. 94 or 95 (2121)
97. 57 and 96 (167)

## MEDLINE(R) In-Process & Other Non-Indexed Citations (OvidSP), 26 April 2012

Searched 26 April 2012.

### Search strategy

1. ((prison\* or jail\* or penitentiary\* or bastille\* or offender\* or reoffend\* or convict or convicts or convicted or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) adj6 ((group\* adj2 therap\*) or (group\* adj2 intervention\*) or (group\* adj2 treatment\*) or (group\* adj2 educat\*) or (group\* adj2 work\*) or (group\* adj2 meeting\*) or (group\* adj2 session\*))).tw. (1)

2. ((prison\* or jail\* or penitentiary\* or bastille\* or offender\* or reoffend\* or convict or convicts or convicted or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) adj6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")).tw. (30)
3. ((prison\* or jail\* or penitentiary\* or bastille\* offender\* or reoffend\* or convict or convicted or convicts or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) adj40 peer\*).tw. (5)
4. ((prison\* or jail\* or penitentiary\* or bastille\* or offender\* or reoffend\* or convict or convicts or convicted or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) adj6 ((program\* adj2 therap\*) or (program\* adj2 intervention\*) or (program\* adj2 educat\*) or (program\* adj2 group\*) or (program\* adj2 commun\*) or (program\* adj2 parent\*))).tw. (6)
5. (juvenile adj1 delinquen\* adj6 ((group adj2 intervention\*) or (group\* adj2 treatment\*) or (group\* adj2 educat\*) or (group\* adj2 work\*) or (group\* adj2 meeting\*) or (group\* adj2 session\*) or (group\* adj2 therap\*))).tw. (0)
6. (juvenile adj1 delinquen\* adj6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")).tw. (1)
7. (juvenile adj1 delinquen\* adj40 peer\*).tw. (1)
8. (juvenile adj1 delinquen\* adj6 ((program\* adj2 therap\*) or (program\* adj2 intervention\*) or (program\* adj2 educat\*) or (program\* adj2 group\*) or (program\* adj2 commun\*) or (program\* adj2 parent\*))).tw. (0)
9. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*) adj6 ((group\* adj2 therap\*) or (group\* adj2 intervention\*) or (group\* adj2 treatment\*) or (group\* adj2 educat\*) or (group\* adj2 work\*) or (group\* adj2 meeting\*) or (group\* adj2 session\*))).tw. (0)
10. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*) adj6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")).tw. (0)
11. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*) adj6 ((program\* adj2 therap\*) or (program\* adj2 intervention\*) or (program\* adj2 educat\*) or (program\* adj2 group\*) or (program\* adj2 commun\*) or (program\* adj2 parent\*))).tw. (0)
12. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*) adj6 peer\*).tw. (0)
13. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) adj6 ((group\* adj2 therap\*) or (group\* adj2 intervention\*) or (group\* adj2 treatment\*) or (group\* adj2 educat\*) or (group\* adj2 work\*) or (group\* adj2 meeting\*) or (group\* adj2 session\*))).tw. (0)
14. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) adj6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")).tw. (1)
15. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) adj6 ((program\* adj2 therap\*) or (program\* adj2 intervention\*) or (program\* adj2 educat\*) or (program\* adj2 group\*) or (program\* adj2 commun\*) or (program\* adj2 parent\*))).tw. (0)
16. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) adj6 peer\*).tw. (0)
17. or/1-16 (40)
18. exp "Costs and Cost Analysis"/ (0)
19. exp "Value of Life"/ec [Economics] (0)
20. cost\$.ti. (3491)
21. (cost\$ adj2 (effective\$ or utilit\$ or benefit\$ or minimi\$ or evaluat\$ or analy\$ or study or studies or consequenc\$ or compar\$ or efficienc\*)).ab. (5519)
22. (economic\$ or pharmaco-economic\$ or pharmaco-economic\$).tw. (9172)
23. quality-adjusted life years/ (0)
24. (eq-5d or eq5d or euroquol\*).tw. (155)
25. exp models, economic/ (0)
26. economic model\*.tw. (120)
27. markov chains/ (0)

28. markov\*.tw. (1667)
29. quality adjusted life.tw. (336)
30. (qaly\$ or qald\$ or qale\$ or qtime\$).tw. (286)
31. ec.fs. (1)
32. ((utility or utilities) adj5 ("quality of life" or health\* or score\* or weight\*)).tw. (248)
33. (preference\* adj5 ("quality of life" or health\* or score\* or weight\*)).tw. (186)
34. (sf36 or sf 36 or short form 36 or shortform 36 or sf thirtysix or sf thirty six or shortform thirtysix or shortform thirty six or short from thirtysix or short form thirty six).tw. (705)
35. (sf6d or sf 6d or short form 6d or shortform 6d or sf sixd or sf six d).tw. (20)
36. ("quality of wellbeing" or "quality of well being" or qwb).tw. (11)
37. "nottingham health profile\*".tw. (19)
38. ((instrument or instruments) adj5 (hrql or qol or "quality of life" or health\* or score\* or weight\*)).tw. (424)
39. "sickness impact profile".tw. (30)
40. "health status indicators".tw. (9)
41. apache.tw. (245)
42. "sickness impact profile\*".tw. (30)
43. "severity of illness index\*".tw. (2)
44. (animal\* and human\*).tw. (7167)
45. "Veterinary Medicine\*".tw. (267)
46. "Animal Experimentation\*".tw. (58)
47. (cost\$ adj2 metaboli\$).tw. (67)
48. (cost\$ adj2 energy).tw. (240)
49. (cost\* adj1 oxygen).tw. (16)
50. or/44-49 (7743)
51. or/18-43 (18999)
52. 51 not 50 (18730)
53. 52 and 17 (1)

## National Criminal Justice Reference Service Abstracts (ProQuest CSA), 1987–present

Searched 1 May 2012.

### Search strategy

((all(cost\* OR economic\* OR financ\* OR budget\* OR price\* OR pricing\* OR monetary OR fee\*) AND all(medic\* OR health\* OR clinic\* OR psych\* OR mental\*)) OR (all(qaly OR hui\* OR hrqol OR eq5d OR "quality adjusted life" OR "value of life" sf36 OR sf6d OR "short form\*" OR markov\*) OR all((utility OR utilities OR preference\* OR instrument\*) NEAR/5 (hrql OR qol OR "quality of life" OR health\* OR score\* OR weight\*))) OR (ti(cost) OR ab(cost\* NEAR/2 (effective\* OR utilit\* OR benefit\* OR minimi\* OR evaluat\* OR analys\* OR study OR studies OR consequenc\* OR compar\* OR efficien\*))))

AND

(all(((prison\* OR jail\* OR penitentiary\* OR bastille\* OR offender\* OR reoffend\* OR convict OR convicts OR convicted OR inmate\* OR detainee\* OR cellmate\* OR incarcerated OR incarceration OR felon\*) NEAR/6 ((group\* NEAR/2 therap\*) OR (group\* NEAR/2 intervention\*) OR (group\* NEAR/2 treatment\*) OR (group\* NEAR/2 education\*) OR (group\* NEAR/2 work\*) OR (group\* NEAR/2 meeting\*) OR (group\* NEAR/2 session\*) OR (group NEAR/2 support) OR (group NEAR/2 training)))) OR

((juvenile NEAR/1 delinquen\*) NEAR/6 ((group\* NEAR/2 therap\*) OR (group\* NEAR/2 intervention\*) OR (group\* NEAR/2 treatment\*) OR (group\* NEAR/2 education\*) OR (group\* NEAR/2 work\*) OR

((group\* NEAR/2 meeting\*) OR (group\* NEAR/2 session\*) OR (group NEAR/2 support) OR (group NEAR/2 training))) OR

all((prison\* OR jail\* OR penitentiary\* OR bastille\* OR offender\* OR reoffend\* OR convict OR convicts OR convicted OR inmate\* OR detainee\* OR cellmate\* OR incarcerated OR incarceration OR felon\*) NEAR/40 peer\*) OR

((juvenile NEAR/1 delinquent\*) NEAR/6 peer\*) OR

((secure NEAR/2 (unit OR units OR facility OR institution\* OR facilities OR centre\* OR center\*)) NEAR/6 ((group\* NEAR/2 therap\*) OR (group\* NEAR/2 intervention\*) OR (group\* NEAR/2 treatment\*) OR (group\* NEAR/2 education\*) OR (group\* NEAR/2 work\*) OR (group\* NEAR/2 meeting\*) OR (group\* NEAR/2 session\*) OR (group NEAR/2 support) OR (group NEAR/2 training))) OR

all((correctional NEAR/2 (units OR unit OR facility OR institution\* OR centre\* OR center\* OR system OR facilities)) NEAR/6 ((group\* NEAR/2 therap\*) OR (group\* NEAR/2 intervention\*) OR (group\* NEAR/2 treatment\*) OR (group\* NEAR/2 education\*) OR (group\* NEAR/2 work\*) OR (group\* NEAR/2 meeting\*) OR (group\* NEAR/2 session\*) OR (group NEAR/2 support) OR (group NEAR/2 training))) OR

((secure NEAR/2 (unit OR units OR facility OR institution\* OR facilities OR centre\* OR center\*)) NEAR/40 peer\*) OR

((correctional NEAR/2 (unit OR units OR facility OR institution\* OR facilities OR centre\* OR center\*)) NEAR/40 peer\*) OR

((prison\* OR jail\* OR penitentiary\* OR bastille\* OR offender\* OR reoffend\* OR convict OR convicts OR convicted OR inmate\* OR detainee\* OR cellmate\* OR incarcerated OR incarceration OR felon\*) NEAR/6 (mentor\* OR "self help" OR volunt\* OR "focus group" OR listen\* OR buddy OR buddies OR friend\* OR befriend\* OR bridging OR "lay people")) OR

((juvenile NEAR/1 delinquent\*) NEAR/6 (mentor\* OR "self help" OR volunt\* OR "focus group" OR listen\* OR buddy OR buddies OR friend\* OR befriend\* OR bridging OR "lay people")) OR

((correctional NEAR/2 (units OR unit OR facility OR institution\* OR centre\* OR center\* OR system OR facilities)) NEAR/6 (mentor\* OR "self help" OR volunt\* OR "focus group" OR listen\* OR buddy OR buddies OR friend\* OR befriend\* OR bridging OR "lay people")) OR

((secure NEAR/2 (units OR unit OR facility OR institution\* OR centre\* OR center\* OR system OR facilities)) NEAR/6 (mentor\* OR "self help" OR volunt\* OR "focus group" OR listen\* OR buddy OR buddies OR friend\* OR befriend\* OR bridging OR "lay people"))

## NHS Economic Evaluation Database, The Cochrane Library Issue 2 or 4, April 2012 (Wiley)

Searched 14 May 2012.

### Search strategy

#1 MeSH descriptor Prisoners explode all trees (173)

#2 MeSH descriptor Prisons explode all trees (66)

#3 MeSH descriptor Criminals explode all trees (12)

- #4 (secure near/2 (unit or units or facility or institution\* or facilities or centre\* or center\*)):ti,ab,kw (7)
- #5 (correctional near/2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities)):ti,ab,kw (30)
- #6 (#1 OR #2 OR #3 OR #4 OR #5) (248)
- #7 MeSH descriptor Counseling, this term only (2368)
- #8 MeSH descriptor Social Support, this term only (1940)
- #9 MeSH descriptor Motivation, this term only (2518)
- #10 MeSH descriptor Life Style, this term only (1618)
- #11 MeSH descriptor Therapeutic Community, this term only (53)
- #12 MeSH descriptor Psychotherapy, Group, this term only (1281)
- #13 MeSH descriptor Health Education, this term only (2551)
- #14 MeSH descriptor Friends, this term only (62)
- #15 MeSH descriptor Self Efficacy, this term only (1212)
- #16 MeSH descriptor Role Playing, this term only (126)
- #17 MeSH descriptor Peer Group, this term only (653)
- #18 MeSH descriptor Focus Groups, this term only (231)
- #19 MeSH descriptor Health Promotion, this term only (2791)
- #20 MeSH descriptor Healthy People Programs, this term only (11)
- #21 MeSH descriptor Weight Reduction Programs, this term only (10)
- #22 (#7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21) (13,954)
- #23 ((prison\* or jail\* or penitentiary\* or bastille\* or offender\* or reoffend\* or convict or convicts or convicted or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) near/6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")):ti,ab,kw (64)
- #24 ((prison\* or jail\* or penitentiary\* or bastille\* offender\* or reoffend\* or convict or convicted or convicts or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) near/40 peer\*):ti,ab,kw (8)
- #25 (juvenile near/1 delinquent\* near/6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")):ti,ab,kw (9)
- #26 (juvenile near/1 delinquent\* near/40 peer\*):ti,ab,kw (26)

#27 (secure near/2 ((unit or units or facility or institution\* or facilities or centre\* or center\*)) near/6 ((program\* or therap\* or intervention\* or educat\* or commun\*)):ti,ab,tw (2)

#28 (secure near/2 (unit or units or facility or institution\* or facilities or centre\* or center\*) near/6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")):ti,ab,kw (0)

#29 (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*) near/6 peer\*):ti,ab,kw (0)

#30 (correctional near/2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) near/6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")):ti,ab,kw (0)

#31 (correctional near/2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) near/6 peer\*):ti,ab,kw (0)

#32 ((prison\* or jail\* or penitentiary\* or bastille\* or offender\* or reoffend\* or convict or convicts or convicted or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) near/6 ((group or groups))):ti,ab,kw (81)

#33 ((juvenile near/1 delinquent\*) near/6 ((group or groups))):ti,ab,kw (16)

#34 (secure near/2 ((unit or units or facility or institution\* or facilities or centre\* or center\*)) near/6 ((group or groups))):ti,ab,kw (0)

#35 ((correctional near/2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) near/6 (group or group))):ti,ab,kw (0)

#36 (secure near/2 ((unit or units or facility or institution\* or facilities or centre\* or center\*)) near/6 ((program\* or therap\* or intervention\* or educat\* or commun\*)):ti,ab,tw (2)

#37 (correctional near/2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) near/6 ((program\* or therap\* or intervention\* or educat\* or commun\*)):ti,ab,tw (4)

#38 ((juvenile near/1 delinquent\*) near/6 ((program\* or therap\* or intervention\* or educat\* or commun\*)):ti,ab,tw (16)

#39 ((prison\* or jail\* or penitentiary\* or bastille\* or offender\* or reoffend\* or convict or convicts or convicted or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) near/6 ((program\* or therap\* or intervention\* or educat\* or commun\*)):ti,ab,tw (215)

#40 (#23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32 OR #33 OR #34 OR #35 OR #36 OR #37 OR #38 OR #39) (361)

#41 (#6 AND #22) (60)

#42 (#41 OR #40) (385)



## PsycINFO (OvidSP), 1806 to April Week 3 2012

Searched 26 April 2012.

### Search strategy

1. exp health care economics/ (281)
2. exp "costs and cost analysis"/ (15,441)
3. exp "cost containment"/ (432)
4. exp pharmacoeconomics/ (182)
5. (economic\$ adj2 (evaluat\$ or analy\$ or study or studies or effectiv\$ or utilit\$ or benefit\$ or consequenc\$ or compar\$ or compari\$ or saving\$ or efficienc\$)).tw. (3957)
6. (pharmcoeconomic\$ or pharmaco-economic\$ or "pharmaco economic\$").tw. (15)
7. budget\$.tw. (4806)
8. economic\$.ti. (8798)
9. (price\$ or pricing\$).tw. (9836)
10. ((finance\$ or financial\$) adj2 (evaluat\$ or analy\$ or study or studies or effectiv\$ or utilit\$ or benefit\$ or consequenc\$ or compar\$ or compari\$ or saving\$ or efficienc\$)).tw. (1061)
11. (fee or fees).tw. (2425)
12. (value adj1 (money or monetary)).tw. (260)
13. cost\$.ti. (8462)
14. (cost\$ adj2 (effective\$ or utilit\$ or benefit\$ or minimi\$ or evaluat\$ or analy\$ or study or studies or consequenc\$ or compar\$ or efficienc\$)).ab. (14,383)
15. (eq-5d or eq5d or euroquol\*).tw. (548)
16. quality adjusted life.tw. (552)
17. (qaly\$ or qald\$ or qale\$ or qtime\$).tw. (484)
18. disability adjusted life.tw. (147)
19. daly\$.tw. (410)
20. economic model\*.tw. (559)
21. markov\*.tw. (2184)
22. markov chains/ (764)
23. (SF6D or sf 6d or short form 6d or shortform6d).tw. (102)
24. health\* year\* equivalent\*.tw. (5)
25. (hye or hyes).tw. (22)
26. (hui or hui1 or hui2 or hui3).tw. (365)
27. disutil\$.tw. (102)
28. standard gamble\$.tw. (152)
29. (time trade off or time tradeoff or tto).tw. (203)
30. (hql or hqol or h qol or hrqol or hr qol).tw. (1876)
31. (pqol or qls).tw. (124)
32. ((utility or utilities) adj5 ("quality of life" or health\* or score\* or weight\*)).tw. (1337)
33. (preference\* adj5 ("quality of life" or health\* or score\* or weight\*)).tw. (2328)
34. (sf36 or sf 36 or short form 36 or shortform 36 or sf thirtysix or sf thirty six or shortform thirtysix or shortform thirty six or short from thirtysix or short form thirty six).tw. (2975)
35. (sf6d or sf 6d or short form 6d or shortform 6d or sf sixd or sf six d).tw. (102)
36. ("quality of wellbeing" or "quality of well being" or qwb).tw. (186)
37. "nottingham health profile\*".tw. (202)
38. ((instrument or instruments) adj5 (hrql or qol or "quality of life" or health\* or score\* or weight\*)).tw. (3855)
39. "sickness impact profile".tw. (304)

40. "health status indicator\*" .tw. (69)
41. apache/ (0)
42. "severity of illness index\*" .tw. (5)
43. "sickness impact profile\*" .tw. (304)
44. exp animals/ not (exp animals/ and exp human males/ and exp human females/) (243,722)
45. exp Veterinary Medicine/ (178)
46. "Animal Experimentation\*" .tw. (256)
47. (cost\$ adj2 metaboli\$).tw. (118)
48. (cost\$ adj2 energy).tw. (278)
49. (cost\* adj1 oxygen).tw. (23)
50. or/44-49 (244,282)
51. or/1-42 (65,535)
52. 51 not 50 (63,181)
53. prisons/ or concentration camps/ (4903)
54. Criminals/ (9477)
55. Incarceration/ or Correctional Institutions/ (4643)
56. Prisoners/ (7744)
57. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*)).tw. (580)
58. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities)).tw. (2275)
59. or/53-58 (23,216)
60. Social Support/ (23,843)
61. Group Psychotherapy/ (15,791)
62. motivation/ or life style/ (31,597)
63. Peers/ or Peer Relations/ (17,906)
64. Group Discussion/ (3120)
65. Group Counseling/ or Self Help Techniques/ or Support Groups/ (10,349)
66. Therapeutic Community/ (2395)
67. Health Education/ (8513)
68. Friends/ (6462)
69. Role Playing/ (2006)
70. Group Intervention/ (605)
71. health promotion/ or healthy people programs/ or weight reduction programs/ (11,401)
72. or/60-71 (126,367)
73. ((prison\* or jail\* or penitentiary\* or bastille\* or offender\* or reoffend\* or convict or convicts or convicted or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) adj6 ((group\* adj2 therap\*) or (group\* adj2 intervention\*) or (group\* adj2 treatment\*) or (group\* adj2 educat\*) or (group\* adj2 work\*) or (group\* adj2 meeting\*) or (group\* adj2 session\*))).tw. (415)
74. ((prison\* or jail\* or penitentiary\* or bastille\* or offender\* or reoffend\* or convict or convicts or convicted or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) adj6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")).tw. (2139)
75. ((prison\* or jail\* or penitentiary\* or bastille\* or offender\* or reoffend\* or convict or convicts or convicted or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) adj40 peer\*).tw. (240)
76. ((prison\* or jail\* or penitentiary\* or bastille\* or offender\* or reoffend\* or convict or convicts or convicted or inmate\* or detainee\* or cellmate\* or incarcerated or incarceration or felon\*) adj6 ((program\* adj2 therap\*) or (program\* adj2 intervention\*) or (program\* adj2 educat\*) or (program\* adj2 group\*) or (program\* adj2 commun\*) or (program\* adj2 parent\*))).tw. (504)
77. (juvenile adj1 delinquen\* adj6 ((group adj2 intervention\*) or (group\* adj2 treatment\*) or (group\* adj2 educat\*) or (group\* adj2 work\*) or (group\* adj2 meeting\*) or (group\* adj2 session\*) or (group\* adj2 therap\*))).tw. (53)

78. (juvenile adj1 delinquen\* adj6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")).tw. (142)
79. (juvenile adj1 delinquen\* adj40 peer\*).tw. (175)
80. (juvenile adj1 delinquen\* adj6 ((program\* adj2 therap\*) or (program\* adj2 intervention\*) or (program\* adj2 educat\*) or (program\* adj2 group\*) or (program\* adj2 commun\*) or (program\* adj2 parent\*))).tw. (54)
81. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*) adj6 ((group\* adj2 therap\*) or (group\* adj2 intervention\*) or (group\* adj2 treatment\*) or (group\* adj2 educat\*) or (group\* adj2 work\*) or (group\* adj2 meeting\*) or (group\* adj2 session\*))).tw. (1)
82. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*) adj6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")).tw. (14)
83. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*) adj6 ((program\* adj2 therap\*) or (program\* adj2 intervention\*) or (program\* adj2 educat\*) or (program\* adj2 group\*) or (program\* adj2 commun\*) or (program\* adj2 parent\*))).tw. (3)
84. (secure adj2 (unit or units or facility or institution\* or facilities or centre\* or center\*) adj6 peer\*).tw. (0)
85. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) adj6 ((group\* adj2 therap\*) or (group\* adj2 intervention\*) or (group\* adj2 treatment\*) or (group\* adj2 educat\*) or (group\* adj2 work\*) or (group\* adj2 meeting\*) or (group\* adj2 session\*))).tw. (20)
86. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) adj6 (mentor\* or support\* or train\* or "self help" or volunt\* or focus or listen\* or buddy or buddies or friend\* or befriend\* or bridging or "lay people")).tw. (86)
87. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) adj6 ((program\* adj2 therap\*) or (program\* adj2 intervention\*) or (program\* adj2 educat\*) or (program\* adj2 group\*) or (program\* adj2 commun\*) or (program\* adj2 parent\*))).tw. (41)
88. (correctional adj2 (units or unit or facility or institution\* or centre\* or center\* or system or facilities) adj6 peer\*).tw. (5)
89. or/73-88 (3586)
90. 59 and 72 (1263)
91. 89 or 90 (4478)
92. 52 and 91 (89)

## Social Services Abstracts (ProQuest CSA), 1987–present

Searched 2 May 2012.

Same as ASSIA (ProQuest CSA).

## Sociological Abstracts (ProQuest CSA), 1952–present

Searched 2 May 2012.

Same as ASSIA (ProQuest CSA).

## Science Citation Index Expanded (Thomson Reuters Web of Science), 1899–present

Searched 14 May 2012.

### Search strategy

#31 #30AND#13

#30 #29 OR #28 OR #27 OR #26 OR #25 OR #24 OR #23 OR #22 OR #21 OR #20 OR #19 OR #18 OR #17 OR #16 OR #15 OR #14

#29 Topic = ("severity of illness index\*")

#28 Topic = ((apache))

#27 Topic = (("health status indicators"))

#26 Topic = (("sickness impact profile"))

#25 Topic = (((instrument or instruments) near/5 (hrql or qol or "qualityoflife" or health\* or score\* or weight\*))))

#24 Topic = (("Nottingham health profile\*"))

#23 Topic = (("quality of wellbeing" or "quality of wellbeing" or qwb))

#22 Topic = ((sf6d or "sf6d" or "shortform6d" or "sfsixd" or sf or "sixd"))

#21 Topic = ((sf36 or sf36 or shortform36 or shortform36 or sfthirtysix or sfthirtysix or shortformthirtysix or shortformthirtysix or shortfromthirtysix or shortformthirtysix))

#20 Topic = (((preference\* near/5 ("quality of life" or health\* or score\* or weight\*))))

#19 Topic = (((ec or utility or utilities) near/5 ("quality of life" or health\* or score\* or weight\*))))

#18 Topic = (("economic model\*" or markov\* or "qualityadjustedlife" or qaly\* or qald\* or qale\* or qtime\*))

#17 Topic = ((eq-5d or eq5d or euroqol\*))

#16 Topic = ((economic\* or pharmacoeconomic\* or pharmaco-economic\*))

#15 Topic = (((cost\* near/2 (utilit\* or benefit\* or minimi\* or evaluat\* or analy\* or study or studies or consequenc\* or compar\* or efficienc\*))))

#14 Topic = ((cost\* near/2 effective\*))

#13 #12 OR #11 OR #10 OR #9 OR #8 OR #7 OR #6 OR #5 OR #4 OR #3 OR #2 OR #1

#12 Topic = (((secure NEAR/2 ((unit OR units OR facility OR institution\* OR facilities OR centre\* OR center\*)) NEAR/6 (mentor\* OR support\* OR training OR "selfhelp" OR volunt\* OR "focusgroup" OR listen\* OR buddy OR buddies OR friend\* OR befriend\* OR bridging OR "laypeople"))))

#11 Topic = (((correctional NEAR/2 (units OR unit OR facility OR institution\* OR centre\* OR center\* OR system OR facilities)) NEAR/6 (mentor\* OR support\* OR training OR "selfhelp" OR volunt\* OR "focusgroup" OR listen\* OR buddy OR buddies OR friend\* OR befriend\* OR bridging OR "laypeople"))))

#10 Topic = (((juvenile NEAR/1 delinquen\*) NEAR/6 (mentor\* OR support\* OR training OR "selfhelp" OR volunt\* OR "focusgroup" OR listen\* OR buddy OR buddies OR friend\* OR befriend\* OR bridging OR "laypeople"))))

#9 Topic = (((prison\* OR jail\* OR penitentiary\* OR bastille\* OR offender\* OR reoffend\* OR convict OR convicts OR convicted OR inmate\* OR detainee\* OR cellmate\* OR incarcerated OR incarceration OR felon\*) NEAR/6 (mentor\* OR support\* OR training OR "selfhelp" OR volunt\* OR "focusgroup" OR listen\* OR buddy OR buddies OR friend\* OR befriend\* OR bridging OR "laypeople"))))

#8 Topic = (((correctional NEAR/2 (units OR unit OR facility OR institution\* OR centre\* OR center\* OR system OR facilities)) NEAR/40 peer\*))

#7 Topic = (((secure NEAR/2 ((unit OR units OR facility OR institution\* OR facilities OR centre\* OR center\*)) NEAR/40 peer\*))

#6 Topic = (((correctional NEAR/2 (units OR unit OR facility OR institution\* OR centre\* OR center\* OR system OR facilities)) NEAR/6 ((group\* NEAR/2 therap\*) OR (group\* NEAR/2 intervention\*) OR (group\* NEAR/2 treatment\*) OR (group\* NEAR/2 education\*) OR (group\* NEAR/2 work\*) OR (group\* NEAR/2 meeting\*) OR (group\* NEAR/2 session\*)))))

#5 Topic = (((secure NEAR/2 ((unit OR units OR facility OR institution\* OR facilities OR centre\* OR center\*)) NEAR/6 ((group\* NEAR/2 therap\*) OR (group\* NEAR/2 intervention\*) OR (group\* NEAR/2 treatment\*) OR (group\* NEAR/2 education\*) OR (group\* NEAR/2 work\*) OR (group\* NEAR/2 meeting\*) OR (group\* NEAR/2 session\*)))))

#4 Topic = (((juvenile NEAR/1 delinquen\*) NEAR/40 peer\*))

#3 Topic = Topic = (((prison\* OR jail\* OR penitentiary\* OR bastille\* OR offender\* OR reoffend\* OR convict OR convicts OR convicted OR inmate\* OR detainee\* OR cellmate\* OR incarcerated OR incarceration OR felon\*) NEAR/40 peer\*))

#2 Topic = (((juvenile NEAR/1 delinquen\*) NEAR/6 ((group\* NEAR/2 therap\*) OR (group\* NEAR/2 intervention\*) OR (group\* NEAR/2 treatment\*) OR (group\* NEAR/2 education\*) OR (group\* NEAR/2 work\*) OR (group\* NEAR/2 meeting\*) OR (group\* NEAR/2 session\*)))))

#1 Topic = (((prison\* OR jail\* OR penitentiary\* OR bastille\* OR offender\* OR reoffend\* OR convict OR convicts OR convicted OR inmate\* OR detainee\* OR cellmate\* OR incarcerated OR incarceration OR felon\*) NEAR/6 ((group\* NEAR/2 therap\*) OR (group\* NEAR/2 intervention\*) OR (group\* NEAR/2 treatment\*) OR (group\* NEAR/2 education\*) OR (group\* NEAR/2 work\*) OR (group\* NEAR/2 meeting\*) OR (group\* NEAR/2 session\*)))))

## Social Sciences Citation Index Expanded (Thomson Reuters Web of Science), 1899–present

Searched 14 May 2012.

Same as Science Citation Index Expanded.

## Conference Proceedings Citation Index – Science (Thomson Reuters Web of Science), 1990–present

Searched 14 May 2012.

Same as Science Citation Index Expanded.

## Conference Proceedings Citation Index – Social Science & Humanities (Thomson Reuters Web of Science), 1990–present

Searched 14 May 2012.

Same as Science Citation Index Expanded.

**TABLE 17** Search results

Database and date covered	Date searched	Concept search strategy	Hits	Notes
ASSIA, 1987–present	2 May 2012	Prisons AND Peer Interventions AND (Health Economics/Utilities OR Cost effectiveness studies)	4	
The Campbell Library (The Campbell Collaboration of Systematic Reviews), <a href="http://www.campbellcollaboration.org/library.php">www.campbellcollaboration.org/library.php</a> , 2000–present	19 April 2012	As MEDLINE	79	
Cost-effectiveness Analysis Registry (Center for the Evaluation of Value and Risk in Health, Tufts Medical Centre), <a href="https://research.tufts-nemc.org/cear4/SearchingtheCEARegistry/SearchtheCEARegistry.aspx">https://research.tufts-nemc.org/cear4/SearchingtheCEARegistry/SearchtheCEARegistry.aspx</a> , 2001–present	17 April 2012	prison	3	Not used – nothing relevant
CINAHL, 1981–present	14 May 2012	As MEDLINE	31	Added CINAHL subject headings
Conference Papers Index, 1987–present	2 May 2012	As ASSIA	0	
Dissertations & Theses, 1861–present	2 May 2012	As ASSIA	13	
EMBASE Classic + EMBASE, 1947 to 24 April 2012	26 April 2012	As MEDLINE	427	Added EMBASE subject headings

TABLE 17 Search results (continued)

Database and date covered	Date searched	Concept search strategy	Hits	Notes
IDEAS (RePEc), 1997–present	17 April 2012	(1) Prison and peer* not dilemma; (2) prison and group* not dilemma; (3) prison* and educat* not dilemma	(1) 9; (2) 6; (3) 1	Not used – nothing relevant
IBSS, 1951–present	2 May 2012	As ASSIA	4	
MEDLINE(R), 1946 to April Week 2 2012	26 April 2012	Prisons or prisoners and counselling or “health education” or “peer group” or mentor* or train* and econ* or qaly or finan* or cost*	167	
MEDLINE(R) In-Process & Other Non-Indexed Citations, 26 April 2012	26 April 2012	As MEDLINE. Text words only	1	
National Criminal Justice Reference Service Abstracts (ProQuest CSA), 1987–present	1 May 2012	Prisons AND Peer Interventions AND (Health Economics/Utilities OR Cost effectiveness studies)	439	Prison and peer search is more specific than other ProQuest strategies. Record will not download well into EndNote so any records selected for full-text acquisition need to be edited
NHS EED, The Cochrane Library Issue 2 or 4, April 2012	14 May 2012	Prisons AND Peer Interventions	3	As MEDLINE but did not include health economics filter
PsycINFO, 1806 to April Week 3 2012	26 April 2012	As MEDLINE	89	Added PsycINFO subject headings
Social Services Abstracts, 1987–present	2 May 2012	As ASSIA	6	
Sociological Abstracts, 1952–present	2 May 2012	As ASSIA	4	
Web of Science databases: Science Citation Index Expanded (1899–present), Social Sciences Citation Index (1898–present), Conference Proceedings Citation Index – Science (1990–present), Conference Proceedings Citation Index – Social Science & Humanities (1990–present)	14 May 2012	Prisons AND Peer Interventions AND (Health Economics/Utilities OR Cost effectiveness studies)	61	





## Appendix 9 Data extraction form for the cost-effectiveness review

Reference	Zhang SX, Roberts REL, McCollister KE. An economic analysis of the in-prison therapeutic community model on prison management costs. <i>J Crim Justice</i> 2009; <b>37</b> :388–95
Aim/objective	To estimate the impact of an in-prison, TC substance abuse treatment programme on management costs in a prison
Duration of study/time horizon/follow-up	2003 and 2004
Population, country and perspective	Offenders with a documented history of substance use or abuse in a prison in California, USA (control $n = 4504$ , mean age 37.8 years vs. intervention $n = 6773$ , mean age 38.1 years)
Intervention and comparison(s)	In-prison TC programme
Source of cost data	Non-treatment costs (administrative costs) and treatment costs ( <i>Table 4</i> )
Currency, cost year and discounting	US dollars, 2005
Results – cost calculations	Incremental cost of TC over standard care was \$7.86 per day per inmate, unadjusted estimated cost saving was \$6.65 per capita, adjusted estimated cost saving was \$16.68 per capita
Authors' conclusions	In general, TC yards had fewer infractions, grievances and major incidents (fewer disciplinary problems, greater proportion of serious infractions); the cost saving was relatively small compared with the cost of providing the in-prison programme



## Appendix 10 List of excluded studies in the effectiveness review

### List of excluded studies ( $n = 237$ ) and studies that were unobtainable ( $n = 63$ ) (total $n = 300$ )

#### Not a research study ( $n = 97$ )

Adair D. *Peer Support Programs within Prisons*. Hobart, TAS: University of Tasmania, School of Sociology and Social Work; 2005.

Allen R. *Involving Community in Youth Justice*. From the United Nations Asia and Far East Institute Annual Report for 2000 and Resource Material Series No. 59, pp. 164–82. NCJ 200221. Tokyo: United Nations Asia and Far East Institute for the Prevention of Crime and Treatment of Offenders; 2002.

Anderson M. Brazil operates on basis of inmate trust. *Correct Today* 1991;**53**:96–103.

Anon. Inmate peer education program focuses on confronting denial. *AIDS Alert* 1994;**9**:47–8.

Appleton GM, Barkley KG, Katz J. Creative interventions for DWI offenders. *Alcohol Treat Q* 1986;**3**:67–87.

Awofeso N. Prison health advocacy and its changing boundaries. *Int J Prison Health* 2008;**4**:175–83.

Awofeso N. Prisons as social determinants of hepatitis C virus and tuberculosis infections. *Public Health Rep* 2010;**125**:25–33.

Awofeso N. Preventing suicides in prison settings: the role of mental health promotion policies and programs. *Adv Ment Health* 2011;**9**:255–62.

Beeler A. Palliative care volunteers: a program of compassion. *Correct Today* 2006;**68**:38–40.

Behrens-Peters O. HIV education strategies within correctional services: the South Australian experience. In Norberry J, Gaughwin M, Gerull S-A, editors. *HIV/AIDS and Prisons: Proceedings of a Conference Held 19–21 November 1990*. Canberra: Australian Institute of Criminology; 1991. pp. 199–209.

Boudin K, Carrero I, Clark J, Flournoy V, Loftin K, Martindale S, et al. ACE: a peer education and counseling program meets the needs of incarcerated women with HIV/AIDS issues. *J Assoc Nurses AIDS Care* 1999;**10**:90–8.

Bowman VE, Lowrey L, Purser J. Two-tiered humanistic pre-release interventions for prison inmates. *J Offender Rehabil* 1997;**25**:115–28.

Cacanas Z. Peer inside. *Community Care* 2004;**9**:34–5.

Colman A, Crombie I. *Hepatitis C Awareness Workshop at Port Augusta Prison for Indigenous Inmates*, October 2001.

Commons K. Mentoring is on the map, let's take it nationwide. *Times Educational Supplement*, 12 July 2007, Issue 4766, special section, p. 4.

Conly C. *Women's Prison Association: Supporting Women Offenders and Their Families. Program Focus*. Washington: National Institute of Justice, US Department of Justice; 1998.

Cook C. The power of peer support. *Straight Talk* 2010;**25**:20–1.

Cook J, McClure S, Koutsenok I, Lord S. The implementation of inmate mentor programs in the correctional treatment system as an innovative approach. *J Teach Addict* 2008;**7**:123–32.

Cook, McClure S, Koutsenok I, Lord S. An innovative approach to prison-based substance use treatment: the implementation of inmate peer mentor programs. In Browne-Miller A, editor. *The Praeger International Collection On Addictions: Characteristics and Treatment Perspectives*. Volume 3. Santa Barbara, CA: Praeger/ABC-CLIO: US; 2009. pp. 349–58.

Crossey P. The rise (and fall) of offender mentoring: where next? *Prison Serv J* 2009;**82**:33–39.

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## Appendix 12 Validity assessment tables from the effectiveness review

**B**lank copies of the forms used, with criteria, are presented in *Appendix 5*.

## Qualitative studies

Study	Sampling <sup>a</sup>	Data collection <sup>a</sup>	Data analysis <sup>a</sup>	Grounding <sup>b</sup>	Breadth (B)/depth (D) <sup>c</sup>	Privilege prisoners' perspectives <sup>d</sup>	Reliability <sup>e</sup>	Usefulness <sup>e</sup>
Ashton 2010 <sup>150</sup>	Not reported	Not stated	Not stated	-	B+, D-	Can't tell	-	+
Betts-Symonds 2011 <sup>159</sup>	Not reported	Not stated	+	-	B-, D-	+	-	+
Blanchette 1998 <sup>151</sup>	++	+	+	+	B+, D-	+	+	+
Boothby 2011 <sup>38</sup>	++	+	++	++	B+, D+	++	++	++
Boyce 2009 <sup>135</sup>	+	Not stated	Not stated	++	B+, D+	++	+	++
Brooker 2007 <sup>136</sup>	++	+	+	++	B+, D+	++	++	++
Cichowlas 2010 <sup>119</sup>	Not reported	Not stated	Not stated	-	B-, D-	-	-	-
Collica 2010 <sup>121</sup>	++	+	+	++	B+, D+	++	++	+
Correctional Service of Canada 2009 <sup>152</sup>	Not reported	Not stated	Not stated	-	B-, D-	++	-	+
Davies 1994 <sup>31</sup>	+	+	Not stated	+	B+, D-	++	+	+
Delveaux 2000 <sup>153</sup>	+	Not stated	Not stated	+	B+, D+	+	-	-
Dhaliwal 2009 <sup>137</sup>	+	+	+	++	B+, D+	+	+	+
Edgar 2011 <sup>25</sup>	Not reported	Not stated	Not stated	+	B+, D+	+	+	+
Farrin n.d. <sup>157</sup>	Not reported	Not stated	Not stated	-	B-, D-	Not stated	-	-
Foster 2011 <sup>138</sup>	++	+	+	++	B+, D+	++	++	++
Hall 2004 <sup>36</sup>	+	Not stated	Not stated	-	B-, D-	-	-	-
Hoover 2009 <sup>163</sup>	Not reported	Not stated	Not stated	Not stated	B-, D-	-	Can't tell	-
Hunter 2009 <sup>139</sup>	++	+	++	++	B+, D+	++	+	+
Jacobson 2008 <sup>140</sup>	Not reported	Not reported	Not stated	-	B-, D-	+	+	-
Levenson 2002 <sup>32</sup>	+	Not stated	Not stated	+	B+, D-	+	+	+
Maull 1991 <sup>127</sup>	Not reported	Not stated	+	+	B+, D-	+	+	+
Mentor2work 2005 <sup>41</sup>	Not reported	Not stated	Not stated	-	B-, D-	+	-	-
Munoz-Plaza 2005 <sup>128</sup>	+	+	+	+	B+, D+	+	+	+

Study	Sampling <sup>a</sup>	Data collection <sup>a</sup>	Data analysis <sup>a</sup>	Grounding <sup>b</sup>	Breadth (B)/depth (D) <sup>c</sup>	Privilege prisoners' perspectives <sup>d</sup>	Reliability <sup>e</sup>	Usefulness <sup>e</sup>
Peek 2011 <sup>144</sup>	Not reported	Not stated	Not stated	-	B-, D-	-	-	-
Penn State Erie 2001 <sup>129</sup>	++	+	Not stated	+	B+, D+	+	-	-
Player 1996 <sup>145</sup>	+	Not stated	Not stated	-	B-, D-	+	-	-
Richman 2004 <sup>146</sup>	Not reported	Not stated	Not stated	+	B-, D-	+	-	+
Schinkel 2012 <sup>147</sup>	Not reported	Not stated	Not stated	+	B+, D-	+	+	+
Scott 2004 <sup>131</sup>	+	Not stated	+	-	B-, D+	+	+	-
Sirdifield 2006 <sup>148</sup>	-	+	+	+	B+, D-	++	+	+
Stewart 2011 <sup>149</sup>	Not reported	Not stated	-	-	B-, D-	Can't tell	-	-
Syed 2000 <sup>155</sup>	++	+	Not stated	+	B+, D+	+	++	+
Syed 2000 <sup>156</sup>	++	+	+	-	B+, D+	+	+	+
The Learning Ladder 2010 <sup>142</sup>	Not reported	Not stated	Not stated	-	B-, D-	+	-	-
Wright 2007 <sup>40</sup>	+	Not stated	+	+	B-, D+	+	+	-

a ++, yes, a fairly thorough attempt was made; +, yes, several steps were taken; -, no, not at all.  
b ++, good grounding/support; +, fair grounding/support; -, limited grounding/support.  
c +, good/fair; -, limited.  
d ++, a lot; +, to some extent; -, not at all.  
e ++, high; +, medium; -, low.

## Quantitative studies

Study	1.1	1.2	2.1	2.2	2.3	2.4	2.5	2.6	2.7	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	4.5	5.1	5.2	5.3
Blanchette 1998 <sup>151</sup>	+	NR	NA	-	NA	+	NA	NA	NR	+	+	NA	+	NA	NA	NR	+	+	+	?	+
Bryan 2006 <sup>106</sup>	+	-	NA	+	NA	NA	NA	NA	+	+	++	NA	-	NA	NA	NA	+	+	+	+	+
Chen 2006 <sup>161</sup>	+	-	-	+	-	+	+	+	+	+	-	+	+	+	-	NR	+	+	+	+	-
Collica 2007 <sup>120</sup>	-	NR	NA	-	NA	NA	NA	NR	NA	-	-	++	NR	NR	NA	NR	-	+	?	?	-
Correctional Service of Canada 2009 <sup>152</sup>	-	-	NA	-	NA	-	NA	NA	NA	NR	NR	NA	NA	NA	NR	NR	-	NA	?	?	-
Delveaux 2000 <sup>153</sup>	+	-	NA	-	NA	-	NA	NA	NA	++	NR	NA	-	NA	NA	NA	++	+	?	?	-
Dolan 2004 <sup>160</sup>	+	-	NA	-	NA	-	NA	NA	NR	NR	-	NA	+	NA	NR	NR	-	-	-	?	-
Eamon 2012 <sup>154</sup>	-	NR	NA	-	NA	NR	NA	NA	NA	+	NR	NA	-	NA	NA	NR	-	NR	?	+	+
Goldstein 2009 <sup>122</sup>	+	+	NA	+	-	NR	NA	NA	NR	+	-	NA	+	NA	NA	NA	NA	NA	?	-	-
Grinstead 1999 <sup>27</sup>	-	-	+	+	-	-	NR	NR	-	-	+	+	-	+	+	-	+	-	?	-	-
Grinstead 1997 <sup>123</sup>	++	NR	++	+	NR	NR	NR	NR	NR	NR	+	NA	NA	-	NR	NR	-	-	?	+	+
Hall 2004 <sup>36</sup>	+	+	+	NA	NA	NA	NA	NA	NA	+	NA	NA	NA	NA	NA	NA	NA	NA	?	+	-
Junker 2005 <sup>124</sup>	+	+	-	-	NA	NR	NA	NR	NA	+	-	++	NA	NR	NA	NA	++	++	-	-	+
Levenson 2002 <sup>32</sup>	-	-	NA	NA	NA	NA	NA	NA	NR	NR	NA	NA	NA	NA	NA	NA	NR	NR	?	?	+
MacGowan 2006 <sup>125</sup>	+	-	+	-	NR	NA	NA	NA	+	+	NA	NA	NA	NA	NR	NR	NA	+	?	-	-
Martin 2008 <sup>126</sup>	+	NR	++	+	NR	NR	NR	NR	-	-	++	++	NR	-	NR	+	+	+	+	?	+
O'Hagan 2011 <sup>143</sup>	+	-	NA	NA	NA	NA	NA	NA	NA	-	+	NA	-	NA	NA	NA	NA	-	?	?	?

Study	1.1	1.2	2.1	2.2	2.3	2.4	2.5	2.6	2.7	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	4.5	5.1	5.2	5.3
Penn State Erie 2012 <sup>129</sup>	+	-	+	+	NA	NR	NR	NR	-	+	+	+	+	+	NR	NR	+	+	+	+	+
Ross 2006 <sup>101</sup>	+	+	NA	+	NA	NR	NA	NA	-	+	+	NA	+	NA	-	NR	+	+	+	+	+
Schlapman 2000 <sup>130</sup>	+	-	NA	+	NA	NA	NA	NA	-	+	-	NA	+	NA	NR	NR	+	NR	?	?	-
Scott 2004 <sup>131</sup>	+	-	-	++	NA	NA	NA	NA	+	NR	+	NA	+	NA	-	NR	++	+	+	-	+
Sifunda 2008 <sup>162</sup>	+	+	NR	+	-	NR	-	NR	-	+	-	++	+	NR	-	NR	-	-	+	-	-
Syed 2000 <sup>155</sup>	+	-	NA	-	NA	+	NA	NA	NA	++	+	NA	+	NA	NA	NA	++	NR	?	-	+
Syed 2000 <sup>156</sup>	+	-	NA	-	NA	NA	NA	NA	NA	++	+	NA	NA	NA	NA	NA	++	NA	?	-	+
Taylor 1994 <sup>158</sup>	+	-	NA	+	NA	NA	NA	NA	-	+	+	NA	?	+	NA	NA	NA	+	?	?	+
Vaz 1996 <sup>164</sup>	+	+	NA	+	NA	NR	NA	NA	+	+	+	NA	+	NA	NA	NR	-	NR	?	+	+
Walrath 2001 <sup>132</sup>	+	+	+	+	-	+	+	+	-	+	+	+	+	+	-	NR	-	+	+	-	+
Zack 2004 <sup>23</sup>	+	-	++	+	NR	NR	NR	NR	NR	NR	-	+	+	NR	NR	NR	NR	NR	-	+	+
Zucker 2009 <sup>134</sup>	-	-	-	-	NA	NA	NA	NA	-	+	-	NA	-	NA	-	-	+	+	-	-	-

++, criteria are all met; +, some criteria are met or are poorly met; NR, not reported; NA, not applicable.



## Appendix 13 Adaptation of the Bernoulli equation

We estimate the effectiveness of the interventions by adapting the Bernoulli equation for behavioural interventions given in Cohen and colleagues.<sup>256</sup> The total number of HIV infections prevented by an intervention is:

$$A = A_P + A_S \quad (1)$$

where  $A_P$  is the total number of primary infections prevented by an intervention and  $A_S$  is the total number of secondary infections prevented.

$$A_P = (P_1 - P_2)[(1 - \pi)N] \quad (2)$$

where  $P_1 = 1 - [(1 - \pi^*) + \pi^*(1 - \alpha)^{(1-f)n'}(1 - \alpha')^{(1-f)n'}]^{m'}$  is the preintervention probability of uninfected intervention participants becoming infected and  $P_2 = 1 - [(1 - \pi^*) + \pi^*(1 - \alpha)^{(1-f)n''}(1 - \alpha')^{(1-f)n''}]^{m''}$  is the postintervention probability of uninfected intervention participants becoming infected.

Similarly,

$$A_S = (S_1 - S_2)(\pi N) \quad (3)$$

where  $S_1 = (1 - \pi^*)^{m'}[1 - (1 - \alpha)^{(1-f)n'}(1 - \alpha')^{(1-f)n'}]$  is the preintervention probability of secondary infections arising from the sexual behaviour of already-infected participants and  $S_2 = (1 - \pi^*)^{m''}[1 - (1 - \alpha)^{(1-f)n''}(1 - \alpha')^{(1-f)n''}]$  is the postintervention probability of secondary infections arising from the sexual behaviour of already-infected participants.

The parameter estimates and measures are shown in *Chapter 9, Table 10*.







A decorative graphic consisting of numerous thin, parallel green lines that curve from the left side of the page towards the right, creating a sense of movement and depth.

**EME**  
**HS&DR**  
**HTA**  
**PGfAR**  
**PHR**

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