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Record linkage studies of drug-related deaths among former adult prisoners who have been released to the community: a scoping review protocol

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Record linkage studies of drug-related deaths among former adult prisoners who have been released to the community: a scoping review protocol

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Abstract

Introduction

Prisoners often have a complex mix of health and care needs including needs relating to mental and physical ill-health conditions. In addition, substance use disorders are common in prisoners. The transition between prison and community poses risks in terms of a disruption to treatment and care and a deterioration in health. Studies have demonstrated an increased risk of drug-related deaths among former prisoners during the first weeks following release from custody. The aim of this scoping review is to provide an up-to-date account of evidence from record linkage studies about drug-related deaths among former adult prisoners.

Methods and analysis

This is a protocol for a scoping review. The framework for conducting scoping reviews by Arksey and O'Malley, in addition to the methodology and guidance developed by the Joanna Briggs Institute (JBI) and the JBI Collaboration (JBI-C) will be followed. MEDLINE, EMBASE, PsychINFO and Web of Science will be searched for studies from 2011 to 2021 using search terms relating to 'mortality', 'drugs' and 'ex-prisoner'. A preliminary search in MEDLINE identified at least 473 potentially eligible papers. Two authors will independently screen all titles and abstracts for eligibility using the inclusion and exclusion criteria. There will be no geographical restrictions but non-English language papers will be excluded. Data will be extracted using a piloted customised charting form and the findings will be mapped

(guided by the population, concept and context ('PCC') inclusion criteria) and grouped by main conceptual categories (including methodology, key findings and gaps in the research).

Discussion, ethics and dissemination

This scoping review will identify, map and summarise publicly available sources of research and therefore does not require ethical approval. The results will inform our empirical investigation of ex-prisoner mortality as well as being shared with key stakeholders, disseminated in a peer-reviewed journal and presented at relevant conferences.

Strengths and limitations of this study

- The proposed methodology for conducting our scoping review, including the use of the framework by Arksey and O'Malley, and methodology and guidance by the Joanna Briggs Institute is outlined by this protocol.
- The PRISMA-ScR (Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews) checklist and guidance will be used to report the proposed review.
- MEDLINE, EMBASE, PsychINFO and Web of Science will be searched for studies from 2011 to 2021 using search terms relating to 'mortality', 'drugs' and 'ex-prisoner'.
- There will be no geographical restrictions but non-English language papers will be excluded.
- The proposed scoping review will map research evidence in this area, and may help identify and profile former prisoners who are most at risk, and inform potential interventions and future research and policy.

Introduction

The world prison population is estimated to be more than 11 million [1]. Prison population rates vary by regions; the world prison population rate is 145 per 100,000, however, the highest rate of 655 per 100,000 is found in the United States of America with over 2.1 million prisoners incarcerated [1]. Prisoners often have a complex mix of health and care needs including needs relating to mental and physical ill-health conditions, homelessness, unemployment and substance addictions [2]. Compared with the general population, prisoners have more physical and mental health problems and prison confinement serves as an opportunistic setting for the health care of this population [3, 4]. The provision of care to this population is expected to be equivalent to the care that is delivered to the wider community, and according to the United Nations (1990) *Basic Principles for the Treatment of Prisoners*, prisoners are entitled to access health services available in their resident country without discrimination [5]. However, the transition between prison and community including the transfer of care poses risks in terms of a disruption to treatment and care and a deterioration in health [4].

Mortality risk among former prisoners has been extensively studied using epidemiological methodology. Previous systematic reviews and meta-analyses among ex-prisoners have found an increased risk of death following release from prison, however, reviews have been limited by high levels of heterogeneity. A systematic review, published in 2012, explored the use of record linkage methods to examine deaths in ex-prisoners between 1998 and 2011, finding 29 publications (based

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3 on 25 studies) [6]. The methodological review found limitations in both study quality and high levels
4 of heterogeneity in the study design, analysis and findings of eligible publications [6]. Furthermore,
5 most included studies were conducted in the United States of America, United Kingdom or Australia,
6 therefore limiting the generalisability of the findings [6]. The review found an elevated risk of all-cause
7 mortality, unnatural death, suicide and drug-related death among ex-prisoners for more than one year
8 after release [6]. A separate systematic review and meta-analysis of publications between 1980 and
9 2011, explored the literature on studies of mortality in released prisoners using linkage of prisoner
10 and mortality databases [7]. There is a high level of overlap in publications included in these systematic
11 reviews [6, 7]. The review, of 18 cohorts, totalling more than 400,000 released prisoners and 26,163
12 deaths, was again limited by high heterogeneity of death rates as a result of differences in the study
13 designs of primary publications [7]. The review found an increased risk of death from all causes, and
14 in particular from suicide, homicide and drugs, with approximately one-fifth of deaths caused by drugs
15 [7].
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20 Substance use disorders are common in prisoners with approximately a third of male and a half of
21 female prisoners entering prison with a drug use disorder [8]. Studies have demonstrated an increased
22 risk of drug-related deaths among ex-prisoners following release from custody [9-11]. A meta-analysis
23 of deaths among former prisoners (studies published between 1966 and 2009), including six studies
24 (n=1,033 deaths), reported that 59% of deaths within the first three months of release were due to
25 drug-related causes; this increased to 76% in the first two weeks after release [12]. The review focused
26 on exploring mortality during the first 12 weeks following release from prison only and data were
27 extracted from eligible publications for this period [12]. The meta-analysis reported a three to eight-
28 fold increase in risk of drug-related death in the first two weeks after release from prison compared
29 to the following 10 weeks (although the risk remained elevated for the first four weeks) [12]. However,
30 in the meta-analysis, heterogeneity was present between countries (United States of America, United
31 Kingdom or Australia) [12]. There is a high level of overlap in publications included in the meta-analysis
32 and in the reviews by Kinner *et al.* and Zlodre and Fazel [6, 7, 12]. A scoping review between 2010 and
33 2020, found 43 publications relating to opioid overdose prevention in justice-involved populations
34 (including correctional and community settings), of which 16 were cohort studies with data linkage
35 [13]. The scoping review identified five core domains regarding opioid overdose prevention:
36 acceptability, accessibility, effectiveness, feasibility and participant overdose risk [13]. The review
37 found evidence of an immediate risk of overdose following release from prison; with the risk factors
38 for opioid overdose including access to drugs, contact with drug using social groups and lack of social
39 and socio-economic support [13]. Often, this at-risk group had contact with community-based service
40 providers (after their release and before overdose) thereby pointing to opportunities for overdose
41 prevention interventions during this period [13].
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47 A recent systematic review found that interventions for prisoners with a mental health condition
48 improved the transition process from prison to the community in terms of sustained contact with
49 mental health services [14]. The interventions included in the review differed, for example, in stages
50 of prison release and content, and further evidence is required [14]. Further research of at-risk groups
51 on release from prison may help address their unmet needs, lead to more effective care, reduce
52 negative outcomes and improve public health. This scoping review will focus specifically on studies
53 that use record linkage methodology to investigate drug-related deaths in former prisoners as part of
54 the work programme that is being undertaken by the Administrative Data Research Centre, Northern
55 Ireland.
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Purpose of review

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3 The purpose of this scoping review is to perform an international review of the literature in record
4 linkage studies of drug-related deaths among former adult prisoners. This review will add to current
5 understanding by updating and mapping research evidence in this area, identify and profile former
6 prisoners who are most at risk, and inform potential interventions and future research and policy.
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9

10 **Methods and analysis**

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12 This is a protocol for a scoping review. The framework for conducting scoping reviews by Arksey and
13 O'Malley, in addition to the methodology and guidance developed by the Joanna Briggs Institute (JBI)
14 and the JBI Collaboration (JBIC) will be followed to ensure rigour and transparency in this review [15,
15 16]. Our methodology will follow the first five stages of the framework as detailed below. As
16 recommended by the JBI, population, concept and context ('PCC') will be incorporated into the
17 scoping review title and research questions and the inclusion criteria will provide clear details of the
18 PCC [16]. The PRISMA-ScR (Preferred Reporting Items for Systematic reviews and Meta-Analyses
19 extension for Scoping Reviews) checklist and guidance will be used to report this review [17].
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25 **Stage 1: identifying the research question**

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27 The research questions are:
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- 29 1. What is the scope of the literature on record linkage studies of drug-related deaths among
30 former adult prisoners who have been released to the community?
 - 31 2. How is research conducted on this topic?
 - 32 3. What methodologies are used?
 - 33 4. What are the findings in relation to mortality?
 - 34 5. Where are the knowledge gaps on this topic?
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40 **Stage 2: identifying relevant studies**

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42 MEDLINE, EMBASE, PsychINFO and Web of Science will be searched for studies from 2011 to date of
43 search using keywords and index headings (modified for searches in each database as required). The
44 start date of 2011 was chosen for this scoping review to summarise the most recent evidence in this
45 field of research. The search terms relate to one of the following three key areas: 'mortality', 'drugs'
46 and 'ex-prisoner' and their variants. The search terms for the strategy were identified from previously
47 published key literature and through discussion between JC and MD (with assistance from the Subject
48 Librarian for the School of Medicine, Dentistry and Biomedical Sciences in Queen's University Belfast).
49 A search strategy has been developed for MEDLINE by JC and MD with assistance from the Subject
50 Librarian. This search strategy has been provided with this protocol as supplementary material (see
51 Appendix 1). JC and MD will develop further search strategies for other databases to be searched.
52 Final search strategies will be provided with the published review. All reference lists of included
53 studies will be screened for the addition of any further publications. The search strategy will be limited
54 to publications available in English due to resources for translation.
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60 **Stage 3: study selection**

JC will perform all searches in the databases. The results across all of the databases will be combined in Mendeley Reference Manager and any duplicate publications will be removed. Two authors will independently screen all titles and abstracts for eligibility using the inclusion criteria. Any publications not eligible for inclusion will be excluded. If an abstract is not available or there is uncertainty over inclusion, the full publication will be screened. Full publication screening for inclusion will be performed independently by two authors. Any discrepancies between the two authors will be discussed with a third author. Authors of publications will be contacted for more information, if relevant.

Eligibility will be based on the pre-specified inclusion criteria in this protocol. The inclusion and exclusion criteria are as follows:

Population

The population will include adults (defined as 18 years and older) who have been imprisoned and released to the community. Individuals released from custodial placements such as young offender institutions will be excluded. Individuals remaining in prison custody (for example prisoners on remand and sentenced prisoners) will be excluded. There will be no exclusion on gender.

Concept

The key concepts revolve around record linkage of drug-related deaths in adults who have been imprisoned. Included studies must use data linkage (or similar meaning terms) to determine mortality outcomes following release from prison. Studies with no data linkage will be excluded. Only studies reporting cause-specific mortality (i.e. drug-related deaths) for either the entire study population or a subset of the study population will be included.

Context

All geographical locations will be included. The review will include research from peer-review journals. Qualitative studies, commentaries, editorials and conference abstracts will be excluded.

Stage 4: charting the data

Charting the data will allow extraction of the data from the eligible studies and a draft charting form has been developed to record key information (see Appendix 2). The development of the form has been informed by relevant previous literature, reviews and the content of RECORD (REporting of studies Conducted using Observational Routinely-collected health Data) statement [18]. This form has been piloted by JC and INO as part of the protocol development stage. The draft charting form may be refined by authors during the review, as required. The charting form will be tested by at least two authors to ensure that all relevant key information is extracted consistently and accurately. Two authors will independently extract information from the eligible publications using this form. Any discrepancies between the two authors will be discussed with a third author. Authors of publications will be contacted for more information, if necessary.

Stage 5: collating, summarising and reporting the results

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3 The data will be presented in relation to the purpose of the review (an international review of record
4 linkage studies of drug-related deaths among former adult prisoners) and in the format that will
5 answer the scoping review questions. The results will be presented as a map of the data (guided by
6 the PCC inclusion criteria). The extracted data will be summarised and presented in tables. The results
7 will also be organised according to the main conceptual categories (including methodology, key
8 findings and gaps in the research).
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11 12 13 **Patient and public involvement**

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15 Dr Richard Kirk is a core member of this review team. Dr Kirk is the Clinical Director of Healthcare in
16 Prison in Northern Ireland. No additional patient and public involvement.
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19 20 **Discussion, ethics and dissemination**

21
22 This review will identify, map and summarise publicly available sources of research and therefore does
23 not require ethical approval. This work will review the evidence in record linkage studies of drug-
24 related deaths among former adult prisoners and may be used to identify those most at risk, and
25 inform future research and policy. The results of the review will inform our empirical investigation of
26 ex-prisoner mortality as well as being shared with key stakeholders, disseminated in a peer-reviewed
27 journal and presented at relevant conferences.
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29

30 31 **Contributions**

32
33 JC, DO'R and MD conceived the scoping review idea. JC and MD developed the scoping review
34 protocol, scoping review title, research questions and methods. JC drafted the manuscript. MD edited
35 the first draft of the manuscript. JC and INO piloted the draft charting form as part of this protocol
36 development. All co-authors reviewed the manuscript and have given final approval for publication.
37
38

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41
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43 (ESRC) (grant number ES/S00744X/1).
44
45

46 47 **Competing interests**

48
49 The authors declare that they have no competing interests.
50
51

52 53 **Acknowledgements**

54
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56 Dentistry and Biomedical Sciences in Queen's University Belfast, for assisting in the development of
57 the search terms and search strategy to be used in this scoping review.
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Record linkage studies of drug-related deaths among former adult prisoners who have been released to the community: a scoping review protocol

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Supplementary material

Appendix 1

Ovid MEDLINE(R) ALL <1946 to August 17, 2021>

| | | |
|----|--|-------|
| 1 | Prisoners/ | 17290 |
| 2 | ex-prisoner*.mp. | 201 |
| 3 | former prisoner*.mp. | 262 |
| 4 | inmate*.mp. | 5441 |
| 5 | ex-inmate*.mp. | 17 |
| 6 | former inmate*.mp. | 102 |
| 7 | Criminals/ | 5440 |
| 8 | ex-criminal*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] | 0 |
| 9 | former criminal*.mp. | 0 |
| 10 | convict*.mp. | 7081 |
| 11 | ex-convict*.mp. | 12 |
| 12 | former convict*.mp. | 3 |
| 13 | detainee*.mp. | 989 |
| 14 | ex-detainee*.mp. | 8 |
| 15 | former detainee*.mp. | 8 |
| 16 | Prisons/ | 10227 |

1
2
3 17 Jails/ 66
4
5 18 gaol*.mp. 150
6
7 19 imprison*.mp. 2645
8
9 20 incarcerat*.mp. [mp=title, abstract, original title, name of substance word, subject heading
10 word, floating sub-heading word, keyword heading word, organism supplementary concept word,
11 protocol supplementary concept word, rare disease supplementary concept word, unique identifier,
12 synonyms] 12802
13
14 21 detention*.mp. 3423
15
16 22 correction*.mp. 235912
17
18 23 confinement.mp. 22002
19
20 24 Correctional Facilities/ 69
21
22 25 penal institution*.mp. 133
23
24 26 penitentiary*.mp. [mp=title, abstract, original title, name of substance word, subject heading
25 word, floating sub-heading word, keyword heading word, organism supplementary concept word,
26 protocol supplementary concept word, rare disease supplementary concept word, unique identifier,
27 synonyms] 693
28
29 27 remand.mp. 295
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31 28 offender*.mp. 12056
32
33 29 ex-offender*.mp. 102
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35 30 former offender*.mp. 4
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37 31 after release.mp. 4226
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39 32 prison release.mp. 136
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41 33 released prisoner*.mp. 134
42
43 34 following release.mp. 1117
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45 35 recently released.mp. 1911
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47 36 newly released.mp. 786
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49 37 postrelease.mp. 341
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51 38 post-release.mp. 787
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53 39 liberat*.mp. 38930
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55 40 "Cause of Death"/ or Death/ 69103
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57 41 Mortality/ 47259
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59 42 Fatal Outcome/ 65463
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61 43 fatal*.mp. 214521

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3 44 lethal*.mp. 163790
4
5 45 Substance-Related Disorders/ 99086
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7 46 Opioid-Related Disorders/ 17378
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9 47 drug abuse*.mp. 21345
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11 48 drug dependen*.mp. 6424
12
13 49 Drug Misuse/ or Prescription Drug Misuse/ or Substance Abuse, Intravenous/ 18137
14
15 50 Drug Overdose/12514
16
17 51 drug poisoning.mp. 705
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19 52 Drug Users/ or Injections, Intravenous/ 85588
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21 53 substance abuse*.mp. 55910
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23 54 substance dependen*.mp. 3072
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25 55 substance misuse*.mp. 3022
26
27 56 substance use*.mp. 42442
28
29 57 Illicit Drugs/ 11763
30
31 58 substance poisoning.mp. 17
32
33 59 street drug*.mp. 735
34
35 60 toxicity.mp. 750642
36
37 61 Opiate Overdose/ or Analgesics, Opioid/49884
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39 62 Heroin Dependence/ or Heroin/13437
40
41 63 drug withdrawal.mp. 3932
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43 64 accidental poisoning.mp. 912
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45 65 Benzodiazepines/ 22377
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47 66 Cocaine-Related Disorders/ or Cocaine/ or Crack Cocaine/ or Cocaine Smoking/ 30584
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49 67 Narcotics/ 16548
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51 68 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or
52 19 or 20 or 21 or 22 or 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
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Supplementary material

Appendix 2

DATA CHARTING FORM

| | | |
|---|----------------------|-----------------------|
| Study assessor initials | | |
| Date of completion of data charting form | | |
| Item | Notes on item | Data extracted |
| Study reference number | | |
| Study assessment number | | |
| Lead author | | |
| Title | | |

| | | |
|----------------------------------|--|--|
| Year of publication | | |
| Origin, country of origin | | |
| Journal name | | |
| Study design | | |
| Citation | | |
| Setting | <i>Stated setting</i> | |
| | <i>Stated locations</i> | |
| | <i>Stated relevant dates</i> | |
| Participants | <i>Stated study population</i> | |
| | <i>Stated type of prison</i> | |
| | <i>Stated age inclusions (or any stated age exclusions)</i> | |
| | <i>Stated methods of study population selection (type of prisoner data records)</i> | |
| | <i>Stated methods of follow-up (for example, record linkage or interview)</i> | |
| | <i>Stated rationale for the choice of cases and controls (case-control study only)</i> | |
| | <i>Stated matching criteria (case-control study only)</i> | |

| | | |
|----------------------------|--|--|
| | <i>Stated number of controls per case (case-control study only)</i> | |
| Data sources | <i>Stated sources of data</i> | |
| | <i>Stated sources of comparator data</i> | |
| Bias | <i>Stated bias</i> | |
| | <i>Stated efforts to address potential sources of bias</i> | |
| | <i>Stated methods for dealing with repeated incarcerations?</i> | |
| Study size | <i>Stated study size</i> | |
| Statistical methods | <i>Stated statistical methods</i> | |
| | <i>Stated methods controlling for confounders and methods for examining subgroups and interactions</i> | |
| | <i>Stated sensitivity analyses</i> | |
| | <i>Stated time period examined after prison release</i> | |
| | <i>Stated how missing data was addressed</i> | |
| | <i>Stated how loss to follow-up was addressed</i> | |

| | | |
|--|--|--|
| | <i>Stated how matching of case and controls was addressed (case-control study only)</i> | |
| Linkage | <i>Stated linkage i.e. if person-level, institution-level or other data linkage across two or more databases</i> | |
| | <i>Stated types of linked databases</i> | |
| | <i>Stated methods of linkage</i> | |
| Main outcomes | <i>Stated outcome events or summary measures</i> | |
| Main results | <i>Stated unadjusted estimate and, if applicable, confounder adjusted estimates, their precision, which confounders were adjusted for.</i> | |
| | <i>Reported for all cause and drug-related deaths</i> | |
| | <i>Stated age at release (mean/median/SD/range)</i> | |
| | <i>Stated length of incarceration (mean/median/SD/range)</i> | |
| Limitations | <i>Stated limitations of study including sources of potential bias or imprecision (are the results generalisable)</i> | |
| Quality assessment checklist or technique | <i>Stated if quality assessment checklist or technique was used</i> | |

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Record linkage studies of drug-related deaths among former adult prisoners who have been released to the community: a scoping review protocol

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Manuscripts

Record linkage studies of drug-related deaths among former adult prisoners who have been released to the community: a scoping review protocol

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Abstract

Introduction

Prisoners often have a complex mix of health and care needs including needs relating to mental and physical ill-health conditions. In addition, substance use disorders are common in prisoners. The transition between prison and community poses risks in terms of a disruption to treatment and care and a deterioration in health. Studies have demonstrated an increased risk of drug-related deaths among former prisoners during the first weeks following release from custody. The aim of this scoping review is to provide an up-to-date account of evidence from record linkage studies about drug-related deaths among former adult prisoners.

Methods and analysis

This is a protocol for a scoping review. The framework for conducting scoping reviews by Arksey and O'Malley, in addition to the methodology and guidance developed by the Joanna Briggs Institute (JBI) and the JBI Collaboration (JBI-C) will be followed. MEDLINE, EMBASE, PsychINFO and Web of Science will be searched for studies from 2011 to 2021 using search terms relating to 'mortality', 'drugs' and 'ex-prisoner'. A preliminary search in MEDLINE identified at least 473 potentially eligible papers. Two authors will independently screen all titles and abstracts for eligibility using the inclusion and exclusion criteria. There will be no geographical restrictions but non-English language papers will be excluded. Data will be extracted using a piloted customised charting form and the findings will be mapped

(guided by the population, concept and context ('PCC') inclusion criteria) and grouped by main conceptual categories (including methodology, key findings and gaps in the research).

Discussion, ethics and dissemination

This scoping review will identify, map and summarise publicly available sources of research and therefore does not require ethical approval. The results will inform our empirical investigation of ex-prisoner mortality as well as being shared with key stakeholders, disseminated in a peer-reviewed journal and presented at relevant conferences.

Strengths and limitations of this study

- The proposed methodology for conducting our scoping review, including the use of the framework by Arksey and O'Malley, and methodology and guidance by the Joanna Briggs Institute is outlined by this protocol.
- The PRISMA-ScR (Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews) checklist and guidance will be used to report the proposed review.
- MEDLINE, EMBASE, PsychINFO and Web of Science will be searched for studies from 2011 to 2021 using search terms relating to 'mortality', 'drugs' and 'ex-prisoner'.
- There will be no geographical restrictions but non-English language papers will be excluded.
- The proposed scoping review will map research evidence in this area, and may help identify and profile former prisoners who are most at risk, and inform potential interventions and future research and policy.

Introduction

The world prison population is estimated to be more than 11 million [1]. Prison population rates vary by regions; the world prison population rate is 145 per 100,000, however, the highest rate of 655 per 100,000 is found in the United States of America with over 2.1 million prisoners incarcerated [1]. Prisoners often have a complex mix of health and care needs including needs relating to mental and physical ill-health conditions, homelessness, unemployment and substance addictions [2]. Compared with the general population, prisoners have more physical and mental health problems and prison confinement serves as an opportunistic setting for the health care of this population [3, 4]. The provision of care to this population is expected to be equivalent to the care that is delivered to the wider community, and according to the United Nations (1990) *Basic Principles for the Treatment of Prisoners*, prisoners are entitled to access health services available in their resident country without discrimination [5]. However, the transition between prison and community including the transfer of care poses risks in terms of a disruption to treatment and care and a deterioration in health [4].

Mortality risk among former prisoners has been extensively studied using epidemiological methodology. Previous systematic reviews and meta-analyses among ex-prisoners have found an increased risk of death following release from prison, however, reviews have been limited by high levels of heterogeneity. A systematic review, published in 2012, explored the use of record linkage methods to examine deaths in ex-prisoners between 1998 and 2011, finding 29 publications (based

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3 on 25 studies) [6]. The methodological review found limitations in both study quality and high levels
4 of heterogeneity in the study design, analysis and findings of eligible publications [6]. Furthermore,
5 most included studies were conducted in the United States of America, United Kingdom or Australia,
6 therefore limiting the generalisability of the findings [6]. The review found an elevated risk of all-cause
7 mortality, unnatural death, suicide and drug-related death among ex-prisoners for more than one year
8 after release [6]. A separate systematic review and meta-analysis of publications between 1980 and
9 2011, explored the literature on studies of mortality in released prisoners using linkage of prisoner
10 and mortality databases [7]. There is a high level of overlap in publications included in these systematic
11 reviews [6, 7]. The review, of 18 cohorts, totalling more than 400,000 released prisoners and 26,163
12 deaths, was again limited by high heterogeneity of death rates as a result of differences in the study
13 designs of primary publications [7]. The review found an increased risk of death from all causes, and
14 in particular from suicide, homicide and drugs, with approximately one-fifth of deaths caused by drugs
15 [7].
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20 Substance use disorders are common in prisoners with approximately a third of male and a half of
21 female prisoners entering prison with a drug use disorder [8]. Studies have demonstrated an increased
22 risk of drug-related deaths among ex-prisoners following release from custody [9-11]. A meta-analysis
23 of deaths among former prisoners (studies published between 1966 and 2009), including six studies
24 (n=1,033 deaths), reported that 59% of deaths within the first three months of release were due to
25 drug-related causes; this increased to 76% in the first two weeks after release [12]. The review focused
26 on exploring mortality during the first 12 weeks following release from prison only and data were
27 extracted from eligible publications for this period [12]. The meta-analysis reported a three to eight-
28 fold increase in risk of drug-related death in the first two weeks after release from prison compared
29 to the following 10 weeks (although the risk remained elevated for the first four weeks) [12]. However,
30 in the meta-analysis, heterogeneity was present between countries (United States of America, United
31 Kingdom or Australia) [12]. There is a high level of overlap in publications included in the meta-analysis
32 and in the reviews by Kinner *et al.* and Zlodre and Fazel [6, 7, 12]. A scoping review between 2010 and
33 2020, found 43 publications relating to opioid overdose prevention in justice-involved populations
34 (including correctional and community settings), of which 16 were cohort studies with data linkage
35 [13]. The scoping review identified five core domains regarding opioid overdose prevention:
36 acceptability, accessibility, effectiveness, feasibility and participant overdose risk [13]. The review
37 found evidence of an immediate risk of overdose following release from prison; with the risk factors
38 for opioid overdose including access to drugs, contact with drug using social groups and lack of social
39 and socio-economic support [13]. Often, this at-risk group had contact with community-based service
40 providers (after their release and before overdose) thereby pointing to opportunities for overdose
41 prevention interventions during this period [13].
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47 A recent systematic review found that interventions for prisoners with a mental health condition
48 improved the transition process from prison to the community in terms of sustained contact with
49 mental health services [14]. The interventions included in the review differed, for example, in stages
50 of prison release and content, and further evidence is required [14]. Further research of at-risk groups
51 on release from prison may help address their unmet needs, lead to more effective care, reduce
52 negative outcomes and improve public health. This scoping review will focus specifically on studies
53 that use record linkage methodology to investigate drug-related deaths in former prisoners as part of
54 the work programme that is being undertaken by the Administrative Data Research Centre, Northern
55 Ireland.
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Purpose of review

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3 The purpose of this scoping review is to perform an international review of the literature in record
4 linkage studies of drug-related deaths among former adult prisoners. This review will add to current
5 understanding by updating and mapping research evidence in this area, identify and profile former
6 prisoners who are most at risk, and inform potential interventions and future research and policy.
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10 **Methods and analysis**

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12 This is a protocol for a scoping review. The framework for conducting scoping reviews by Arksey and
13 O'Malley, in addition to the methodology and guidance developed by the Joanna Briggs Institute (JBI)
14 and the JBI Collaboration (JBIC) will be followed to ensure rigour and transparency in this review [15,
15 16]. Our methodology will follow the first five stages of the framework as detailed below. As
16 recommended by the JBI, population, concept and context ('PCC') will be incorporated into the
17 scoping review title and research questions and the inclusion criteria will provide clear details of the
18 PCC [16]. The PRISMA-ScR (Preferred Reporting Items for Systematic reviews and Meta-Analyses
19 extension for Scoping Reviews) checklist and guidance will be used to report this review [17].
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25 **Stage 1: identifying the research question**

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27 The research questions are:
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- 30 1. What is the scope of the literature on record linkage studies of drug-related deaths among
31 former adult prisoners who have been released to the community?
 - 32 2. How is research conducted on this topic?
 - 33 3. What methodologies are used?
 - 34 4. What are the findings in relation to mortality?
 - 35 5. Where are the knowledge gaps on this topic?
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40 **Stage 2: identifying relevant studies**

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42 MEDLINE, EMBASE, PsychINFO and Web of Science will be searched for studies from January 2011 to
43 September 2021 using keywords and index headings (modified for searches in each database as
44 required). The start date of 2011 was chosen for this scoping review to summarise the most recent
45 evidence in this field of research. The search terms relate to one of the following three key areas:
46 'mortality', 'drugs' and 'ex-prisoner' and their variants. The search terms for the strategy were
47 identified from previously published key literature and through discussion between JC and MD (with
48 assistance from the Subject Librarian for the School of Medicine, Dentistry and Biomedical Sciences in
49 Queen's University Belfast). A search strategy has been developed for MEDLINE by JC and MD with
50 assistance from the Subject Librarian. This search strategy has been provided with this protocol as
51 supplementary material (see Appendix 1). JC and MD will develop further search strategies for other
52 databases to be searched. Final search strategies will be provided with the published review. All
53 reference lists of included studies will be screened for the addition of any further publications. The
54 search strategy will be limited to publications available in English due to resources for translation.
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60 **Stage 3: study selection**

JC will perform all searches in the databases. The results across all of the databases will be combined in Mendeley Reference Manager and any duplicate publications will be removed. Two authors will independently screen all titles and abstracts for eligibility using the inclusion criteria. Any publications not eligible for inclusion will be excluded. If an abstract is not available or there is uncertainty over inclusion, the full publication will be screened. Full publication screening for inclusion will be performed independently by two authors. Any discrepancies between the two authors will be discussed with a third author. Authors of publications will be contacted for more information, if relevant.

Eligibility will be based on the pre-specified inclusion criteria in this protocol. The inclusion and exclusion criteria are as follows:

Population

The population will include adults (defined as 18 years and older) who have been imprisoned and released to the community. Individuals released from custodial placements such as young offender institutions will be excluded. Individuals remaining in prison custody (for example prisoners on remand and sentenced prisoners) will be excluded. There will be no exclusion on gender.

Concept

The key concepts revolve around record linkage of drug-related deaths in adults who have been imprisoned. Included studies must use data linkage (or similar meaning terms) to determine mortality outcomes following release from prison. Studies with no data linkage will be excluded. Only studies reporting cause-specific mortality (i.e. drug-related deaths) for either the entire study population or a subset of the study population will be included.

Context

All geographical locations will be included. The review will include research from peer-review journals. Qualitative studies, commentaries, editorials and conference abstracts will be excluded.

Stage 4: charting the data

Charting the data will allow extraction of the data from the eligible studies and a draft charting form has been developed to record key information (see Appendix 2). The development of the form has been informed by relevant previous literature, reviews and the content of RECORD (REporting of studies Conducted using Observational Routinely-collected health Data) statement [18]. This form has been piloted by JC and INO as part of the protocol development stage. The draft charting form may be refined by authors during the review, as required. The charting form will be tested by at least two authors to ensure that all relevant key information is extracted consistently and accurately. Two authors will independently extract information from the eligible publications using this form. Any discrepancies between the two authors will be discussed with a third author. Authors of publications will be contacted for more information, if necessary.

Stage 5: collating, summarising and reporting the results

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3 The data will be presented in relation to the purpose of the review (an international review of record
4 linkage studies of drug-related deaths among former adult prisoners) and in the format that will
5 answer the scoping review questions. We will analyse and summarise reports of included studies that
6 used data linkage to determine mortality outcomes following release from prison in terms of, for
7 example, crude mortality rates and standardised mortality ratios. The results will be presented as a
8 map of the data (guided by the PCC inclusion criteria). The extracted data will be summarised and
9 presented in tables. The results will also be organised according to the main conceptual categories
10 (including methodology, key findings and gaps in the research).
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15 **Patient and public involvement**

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17 Dr Richard Kirk is a core member of this review team. Dr Kirk is the Clinical Director of Healthcare in
18 Prison in Northern Ireland. No additional patient and public involvement.
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22 **Discussion, ethics and dissemination**

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24 This review will identify, map and summarise publicly available sources of research and therefore does
25 not require ethical approval. This work will review the evidence in record linkage studies of drug-
26 related deaths among former adult prisoners and may be used to identify those most at risk, and
27 inform future research and policy. Where possible, time period examined after prison release and
28 information on specific drugs will be reported in relation to drug-related mortality. There are some
29 limitations in this planned scoping review. The search strategy is limited to publications available in
30 English due to resources for translation and the review does not include a search of the grey literature
31 which may limit the interpretation of the findings. The results of the review will inform our empirical
32 investigation of ex-prisoner mortality as well as being shared with key stakeholders, disseminated in
33 a peer-reviewed journal and presented at relevant conferences.
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39 **Contributions**

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41 JC, DO'R, RK and MD conceived the scoping review idea. JC and MD developed the scoping review
42 protocol, scoping review title, research questions and methods. JC drafted the manuscript. MD edited
43 the first draft of the manuscript. JC and INO piloted the draft charting form as part of this protocol
44 development. All co-authors reviewed the manuscript and have given final approval for publication.
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46
47

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49
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55 **Competing interests**

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57 The authors declare that they have no competing interests.
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4 **released to the community: a scoping review protocol**
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15

16 *corresponding author
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18 **Supplementary material**
19

20 **Appendix 1**
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24 Ovid MEDLINE(R) ALL <1946 to August 17, 2021>
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| 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | |
| | 1 | Prisoners/ | 17290 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2 | ex-prisoner*.mp. | 201 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3 | former prisoner*.mp. | 262 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 4 | inmate*.mp. | 5441 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 5 | ex-inmate*.mp. | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 6 | former inmate*.mp. | 102 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 7 | Criminals/ | 5440 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 8 | ex-criminal*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 9 | former criminal*.mp. | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 10 | convict*.mp. | 7081 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 11 | ex-convict*.mp. | 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 12 | former convict*.mp. | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 13 | detainee*.mp. | 989 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 14 | ex-detainee*.mp. | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 15 | former detainee*.mp. | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 16 | Prisons/ | 10227 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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7 19 imprison*.mp. 2645
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9 20 incarcerat*.mp. [mp=title, abstract, original title, name of substance word, subject heading
10 word, floating sub-heading word, keyword heading word, organism supplementary concept word,
11 protocol supplementary concept word, rare disease supplementary concept word, unique identifier,
12 synonyms] 12802
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20 24 Correctional Facilities/ 69
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24 26 penitentiary*.mp. [mp=title, abstract, original title, name of substance word, subject heading
25 word, floating sub-heading word, keyword heading word, organism supplementary concept word,
26 protocol supplementary concept word, rare disease supplementary concept word, unique identifier,
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49 37 postrelease.mp. 341
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51 38 post-release.mp. 787
52
53 39 liberat*.mp. 38930
54
55 40 "Cause of Death"/ or Death/ 69103
56
57 41 Mortality/ 47259
58
59 42 Fatal Outcome/ 65463
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43 fatal*.mp. 214521

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3 44 lethal*.mp. 163790
4
5 45 Substance-Related Disorders/ 99086
6
7 46 Opioid-Related Disorders/ 17378
8
9 47 drug abuse*.mp. 21345
10
11 48 drug dependen*.mp. 6424
12
13 49 Drug Misuse/ or Prescription Drug Misuse/ or Substance Abuse, Intravenous/ 18137
14
15 50 Drug Overdose/12514
16
17 51 drug poisoning.mp. 705
18
19 52 Drug Users/ or Injections, Intravenous/ 85588
20
21 53 substance abuse*.mp. 55910
22
23 54 substance dependen*.mp. 3072
24
25 55 substance misuse*.mp. 3022
26
27 56 substance use*.mp. 42442
28
29 57 Illicit Drugs/ 11763
30
31 58 substance poisoning.mp. 17
32
33 59 street drug*.mp. 735
34
35 60 toxicity.mp. 750642
36
37 61 Opiate Overdose/ or Analgesics, Opioid/49884
38
39 62 Heroin Dependence/ or Heroin/13437
40
41 63 drug withdrawal.mp. 3932
42
43 64 accidental poisoning.mp. 912
44
45 65 Benzodiazepines/ 22377
46
47 66 Cocaine-Related Disorders/ or Cocaine/ or Crack Cocaine/ or Cocaine Smoking/ 30584
48
49 67 Narcotics/ 16548
50
51 68 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or
52 19 or 20 or 21 or 22 or 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
53 or 37 or 38 or 39 353126
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Record linkage studies of drug-related deaths among former adult prisoners who have been released to the community: a scoping review protocol

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*corresponding author

DATA CHARTING FORM

| | | |
|---|----------------------|-----------------------|
| Study assessor initials | | |
| Date of completion of data charting form | | |
| Item | Notes on item | Data extracted |
| Study reference number | | |
| Study assessment number | | |
| Lead author | | |

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|----------------------------------|---|--|
| | | |
| Title | | |
| Year of publication | | |
| Origin, country of origin | | |
| Journal name | | |
| Study design | | |
| Citation | | |
| Setting | <i>Stated setting</i> | |
| | <i>Stated locations</i> | |
| | <i>Stated relevant dates</i> | |
| Participants | <i>Stated study population</i> | |
| | <i>Stated type of prison</i> | |
| | <i>Stated age inclusions (or any stated age exclusions)</i> | |
| | <i>Stated gender inclusions</i> | |
| | <i>Stated race/ethnicity inclusions</i> | |
| | <i>Stated methods of study population selection (type of prisoner data records)</i> | |
| | <i>Stated methods of follow-up (for example, record linkage or interview)</i> | |

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| | <i>Stated rationale for the choice of cases and controls (case-control study only)</i> | |
| | <i>Stated matching criteria (case-control study only)</i> | |
| | <i>Stated number of controls per case (case-control study only)</i> | |
| Data sources | <i>Stated sources of data</i> | |
| | <i>Stated sources of comparator data</i> | |
| Bias | <i>Stated bias</i> | |
| | <i>Stated efforts to address potential sources of bias</i> | |
| | <i>Stated methods for dealing with repeated incarcerations?</i> | |
| Study size | <i>Stated study size</i> | |
| Statistical methods | <i>Stated statistical methods</i> | |
| | <i>Stated methods controlling for confounders and methods for examining subgroups and interactions</i> | |
| | <i>Stated sensitivity analyses</i> | |
| | <i>Stated time period examined after prison release</i> | |
| | <i>Stated how missing data was addressed</i> | |

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| | | |
| | <i>Stated how loss to follow-up was addressed</i> | |
| | <i>Stated how matching of case and controls was addressed (case-control study only)</i> | |
| Linkage | <i>Stated linkage i.e. if person-level, institution-level or other data linkage across two or more databases</i> | |
| | <i>Stated types of linked databases</i> | |
| | <i>Stated methods of linkage</i> | |
| Main outcomes | <i>Stated outcome events or summary measures (include information on specific drugs)</i> | |
| Main results | <p><i>Stated unadjusted estimate and, if applicable, confounder adjusted estimates, their precision, which confounders were adjusted for.</i></p> <p><i>Reported for all cause and drug-related deaths</i></p> <p><i>For example, include crude mortality rates, standardised mortality ratios etc.</i></p> <p><i>Include reported for age, gender, race/ethnicity etc</i></p> | |

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| | <i>Stated age at release (mean/median/SD/range)</i> | |
| | <i>Stated length of incarceration (mean/median/SD/range)</i> | |
| Limitations | <i>Stated limitations of study including sources of potential bias or imprecision (are the results generalisable)</i> | |
| Quality assessment checklist or technique | <i>Stated if quality assessment checklist or technique was used</i> | |