Appendices for Systematic review on active case finding of communicable diseases in prison settings

The main report to which the appendices refer to can be found here https://ecdc.europa.eu/en/publications-data/systematic-review-active-case-finding-communicable-diseases-prison-settings

Appendix 1. Search and selection strategy for MA1, MA2 and MA3

This appendix covers the general methodology used for all three macro areas (MA). It is important to get an overview of this overall process since the search and selection phases were carried out jointly for all three MAs. This appendix is attached to each one of the systematic review reports of each individual MA, while the methods section of the systematic review reports only information relevant to a specific MA, and a summary of the process is presented.

Review objectives and questions

The following three review objectives were defined:

Macro area 1: Active case finding

To gain insight into the evidence base (peer-reviewed as well as grey literature) for active case finding (i.e. at entrance and during stay) for communicable diseases in prisons, jails and other custodial settings which function as prisons.

Macro area 2: Vaccination

To gain insight into the evidence base (peer-reviewed as well as grey literature) for vaccination (i.e. at entrance and during stay) against communicable diseases in prisons, jails and other custodial settings which function as prisons.

Macro area 3: TB prevention and care

To gain insight into the evidence base (peer-reviewed as well as grey literature) for diagnosis, treatment, care and prevention of TB in prisons, jails and other custodial settings which function as prisons.

The PICO method was used to develop specific research questions from these review objectives

1	**Active case finding for selected communicable diseases at entrance and during prison stay**
P	Adult individuals (≥18 years) in prison settings (i.e. those detained and those who work in prison settings ("going through the gate"))
I	Active case finding for communicable diseases at entrance and during prison stay
C	- Comparison with no intervention; - Comparison with alternative intervention; - No comparison; - Comparison between populations in prison settings (e.g. between different prison types, risk groups, etc.) - Comparison with community setting
O	*Qualitative outcomes:* Accessibility Feasibility and acceptability of active case finding at entrance and during prison stay Qualitative description of interventions/modes of service delivery *Quantitative outcomes:* Uptake (number of persons screened) Positivity rate Measures of effectiveness (e.g. change in communicable disease incidence or prevalence) Cost-effectiveness
S	Prisons, jails and other custodial settings with a function as prison (excluding migrant centres and police detention rooms)
2	**Vaccination interventions, including vaccination at entrance and in outbreak situations**
P	Adult individuals (≥18 years) in prison settings (i.e. those detained and those who work in prison settings ("going through the gate"))
I	Vaccination against communicable diseases at entrance and during prison stay (including outbreak situations)
C	- Comparison with no intervention; - Comparison with alternative intervention; - No comparison; - Comparison between populations in prison settings (e.g. between different prison types, risk groups, etc.) - Comparison with community setting
O	*Qualitative outcomes:* Accessibility Feasibility and acceptability of vaccination at entrance and during prison stay Qualitative description of interventions/modes of service delivery *Quantitative outcomes:*

	Acceptance/uptake (number of persons vaccinated) Measures of effectiveness (e.g. change in communicable disease incidence or prevalence) Cost-effectiveness
S	Prisons, jails and other custodial settings with a function as prison (excluding migrant centres and police detention rooms)
3	**Prevention, diagnosis, treatment and care of TB**
P	Adult individuals (≥18 years) in prison settings (i.e. those detained and those who work in prison settings ("going through the gate"))
I	Diagnosis, treatment, care and prevention of TB
C	- Comparison with no intervention; - Comparison with alternative intervention; - No comparison; - Comparison between populations in prison settings (e.g. between different prison types, risk groups, etc.) - Comparison with community setting
O	*Qualitative outcomes:* Accessibility Feasibility and acceptability of interventions Qualitative description of interventions/modes of service delivery *Quantitative outcomes:* Uptake (number of persons using a certain intervention or number of persons reached by a certain intervention) Measures of effectiveness (e.g. change in TB incidence or prevalence, number of people who have completed treatment, number of people who are linked to care – including community care after release) Cost-effectiveness
S	Prisons, jails and other custodial settings with a function as prison (excluding migrant centres and police detention rooms)

For each of these macro areas specific review questions were defined and formulated:

Macro area 1: Active case finding

- What are the communicable diseases that should be covered by active case finding?
- Which types of active case finding methods are effective?
- Which service models of active case finding are effective?
- Which types of active case finding methods are cost-effective?
- Which service models of active case finding are cost-effective?
- What is the uptake of active case finding?
- How to improve the uptake of active case finding testing?
- Who should be targeted for active case finding, when and how often?

Macro area 2: Vaccination

- What are the communicable diseases that should be covered by vaccination?
- Which vaccination interventions are effective?
- Which service models of vaccination are effective?
- Which vaccination interventions are cost-effective?
- Which service models of vaccination are cost-effective?
- What is the acceptance/uptake of vaccination?
- How to improve the acceptance/uptake of vaccination?
- Who should be targeted for vaccination?

Macro area 3: TB prevention and care

- Which prevention interventions for TB are effective?
- Which care and/or treatment interventions aimed at control of TB are effective?
- Which service models for prevention, diagnosis, care and/or treatment of TB are effective?
- Which prevention interventions for TB are cost-effective?
- Which diagnosis, care and/or treatment interventions aimed at control of TB are cost-effective?
- Which service models for prevention, diagnosis, care and/or treatment of TB are cost-effective?
- What is the uptake of prevention, diagnosis, care and/or treatment of TB?
- How to improve the uptake of prevention, diagnosis, care and/or treatment of TB?
- Who should be targeted for prevention, diagnosis, care and/or treatment of TB?

Peer reviewed literature search

The search strategy was developed building on the scoping phase by ECDC with respect to using PubMed and Embase (Embase.com) as peer-reviewed data sources. Additionally, the Cochrane Library database was searched for systematic reviews and economic evaluations.

Search strings

In order to find relevant articles for the macro areas in PubMed and Embase.com, search strings were developed for each of the following concepts:

- Prisons, jails and other custodial settings
- Active case finding
- Vaccination
- TB prevention and care

It was decided not to add a search string on outcomes, to prevent missing relevant articles. In PubMed and Embase.com search string #1 was combined using "AND" with each of the macro area specific search strings (i.e. #1 AND (#2 OR #3 OR #4)).

For Cochrane Library one generic search using the terms for prisons was used to search for all relevant systematic reviews and economic evaluations.

PUBMED

#1 Prisons and other custodial settings

"Prisons"[Mesh] OR "Prisoners"[Mesh] OR prison*[tw] OR penal[tw] OR jail*[tw] OR reformator*[tw] OR custodial[tw] OR custody[tw] OR gaol*[tw] OR remand*[tw] OR penitentiar*[tw] OR detention*[tw] OR correctional[tw] OR detainee*[tw] OR inmate*[tw] OR imprison*[tw] OR confinement[tw] OR incarcerat*[tw] OR cellmate*[tw]

#2 Active case finding

"Mass Screening"[Mesh] OR "Mandatory Testing"[Mesh] OR screen*[tw] OR "case finding"[tw] OR "case-finding"[tw] OR casefinding[tw] OR "cases finding"[tw] OR "case identification"[tw] OR "cases identification"[tw] OR testing[tw] OR "rapid test"[tw] OR "rapid tests"[tw] OR "Early diagnosis"[Mesh] OR early diagnos*[tw] OR early detect*[tw] OR early test*[tw] OR "clinical evaluation"[tw] OR "clinical evaluations"[tw]

#3 Vaccination

"Vaccines"[Mesh] OR vaccin*[tw] OR jab[tw] OR "Immunization"[Mesh] OR "Immunization Programs"[Mesh] OR immuniz*[tw] OR immunis*[tw] OR immune[tw] OR immunity[tw] OR inoculat*[tw] OR innoculat*[tw] OR "active immunotherapy"[tw] OR "active immunotherapies"[tw]

#4 TB prevention and care

"Tuberculosis"[Mesh] OR "Mycobacterium tuberculosis"[Mesh] OR "Mycobacterium avium"[Mesh] OR "Mycobacterium bovis"[Mesh] OR tuberc*[tw] OR "Kochs Disease"[tw] OR "Koch's Disease"[tw] OR "Koch Disease"[tw] OR TB[tw] OR LTB[tw] OR LTBI[tw] OR DRTB[tw] OR "DR-TB"[tw] OR XDRTB[tw] OR "XDR-TB"[tw] OR MDRTB[tw] OR "MDR-TB"[tw] OR "Mycobacterium bovis"[tw] OR "M. bovis"[tw] OR "Mycobacterium avium"[tw] OR "M. avium"[tw]

EMBASE.COM

#1 Prisons and other custodial settings

'prison'/exp OR 'prisoner'/exp OR prison*:ti,ab OR penal:ti,ab OR jail*:ti,ab OR reformator*:ti,ab OR custodial:ti,ab OR custody:ti,ab OR gaol*:ti,ab OR remand*:ti,ab OR penitentiar*:ti,ab OR detention*:ti,ab OR correctional:ti,ab OR detainee*:ti,ab OR inmate*:ti,ab OR imprison*:ti,ab OR confinement:ti,ab OR incarcerat*:ti,ab OR cellmate*:ti,ab

#2 Active case finding

'mass screening'/exp OR 'screening test'/exp OR 'screening'/de OR 'mandatory testing'/exp OR screen*:ti,ab OR 'case finding'/exp OR "case finding":ti,ab OR "case-finding":ti,ab OR casefinding:ti,ab OR "cases finding":ti,ab OR "case identification":ti,ab OR "cases identification":ti,ab OR testing:ti,ab OR "rapid test":ti,ab OR "rapid tests":ti,ab OR 'early diagnosis'/exp OR early diagnos*:ti,ab OR early detect*:ti,ab OR early test*:ti,ab OR 'clinical evaluation'/exp OR "clinical evaluation":ti,ab OR "clinical evaluations":ti,ab

#3 Vaccination

`vaccine'/exp OR vaccin*:ti,ab OR jab:ti,ab OR 'immunization'/exp OR immuniz*:ti,ab OR immunis*:ti,ab OR immune:ti,ab OR immunity:ti,ab OR inoculat*:ti,ab OR innoculat*:ti,ab OR "active immunotherapy":ti,ab OR "active immunotherapies":ti,ab

#4 TB prevention and care

'tuberculosis'/exp OR 'Mycobacterium tuberculosis'/exp OR 'Mycobacterium avium'/exp OR 'Mycobacterium bovis'/exp OR tuberc*:ti,ab OR "Kochs Disease":ti,ab OR "Koch Disease":ti,ab OR TB:ti,ab OR LTB:ti,ab OR LTBI:ti,ab OR DRTB:ti,ab OR "DR-TB":ti,ab OR XDRTB:ti,ab OR "XDR-TB":ti,ab OR MDRTB:ti,ab OR "MDR-TB":ti,ab OR "Mycobacterium tuberculosis":ti,ab OR "M. bovis":ti,ab OR "Mycobacterium avium":ti,ab OR "M. avium":ti,ab

COCHRANE LIBRARY

#1 Prisons and other custodial settings

MeSH descriptor: [prisons] explode all trees OR MeSH descriptor: [prisoners] explode all trees OR prison*:ti,ab,kw OR penal:ti,ab,kw OR jail*:ti,ab,kw OR reformator*:ti,ab,kw OR custodial:ti,ab,kw OR custody:ti,ab,kw OR gaol*:ti,ab,kw OR remand*:ti,ab,kw OR penitentiar*:ti,ab,kw OR detention*:ti,ab,kw OR correctional:ti,ab,kw OR detainee*:ti,ab,kw OR inmate*:ti,ab,kw OR imprison*:ti,ab,kw OR confinement:ti,ab,kw OR incarcerat*:ti,ab,kw OR cellmate*:ti,ab,kw

Search limits

The only search limit that was applied for this systematic review is a time limit: literature was searched in PubMed and Embase.com from 1990 onwards for macro area I (active case finding) and III (TB prevention and care), and from 1980 for macro area II (vaccination). In Cochrane Library, systematic reviews and economic evaluations were searched from 1980 onwards for all three macro areas.

Language limits were not applied. Additionally, age and geographical limits were not applied in the search phase. Rather, during title and abstract screening phase, articles focusing only on those <18 years were not included. Moreover, only articles that were performed in EU/EEA (candidate) countries or in the United States of America (USA), Canada, Australia or New Zealand were included (see section 2.4.6). Articles from these non-EU/EEA high-income countries were included to broaden the evidence base.

Running the literature search

The final searches in PubMed, Embase.com and Cochrane Library were run on the 4th of February 2016. Due to overlap between the three macro areas, the search strings were combined in a single search. The relevant full text publications were subdivided into the three separate macro areas during the screening of full article phase.

PubMed, Embase.com, and Cochrane Library output, including all indexed fields per hit (e.g. title, authors, abstract), were exported to Endnote version X7.4 and saved in separate folders per database. Duplicate articles were removed through automatic and manual duplicate removal.

Hand search

Reference lists of good quality systematic review articles were checked for further potentially relevant articles.

Peer reviewed literature selection

From the articles retrieved from PubMed, Embase.com, and Cochrane Library the relevant references were selected by a three-phase selection procedure, based on:

- Screening of title and abstract (first selection phase): in this phase, titles of publications were screened based on the inclusion and exclusion criteria (see section 2.4.7). If the title was inconclusive, the abstract was read. Articles with titles and abstracts that suggest that they did not contain information relevant to the review objectives were not selected for full text assessment (no reason for exclusion documented per article). In case of doubt, the article was checked full-text in the second selection step. Articles that were excluded during screening of title and abstract were stored in an indexed folder in Endnote.
- Screening of full article (second selection phase): the articles selected during the first phase were assessed in full text. PDF-files of the original articles were downloaded and stored. Articles were included if the reported information was relevant (based on the inclusion and exclusion criteria, see section 2.4.7) and of sufficient quality (see section 2.4.8). The reasons for exclusion of full text papers were documented per article and summarised in an exclusion table.
- Screening during data-extraction phase: further scrutiny of the article during the data-extraction phase could have led to exclusion. For example, when articles make use of the same dataset and present identical outcome measures, the most recent or the most extensive article was included.

The process of selection and inclusion and exclusion of articles was registered in an Excel file and an Endnote library.

Inclusion and exclusion criteria

The inclusion and exclusion criteria are listed in Table 1 below.

Table 1. Inclusion and exclusion criteria peer-reviewed literature

	Inclusion	Exclusion
Study design/ type	• Meta-analysis or systematic review[1] • Randomised controlled trials (RCTs) • Non-randomised, prospective comparative studies • Prospective observational studies (e.g. cohort studies) • Retrospective observational studies (e.g. case-control studies) • Cross-sectional studies	• Narrative review • Case reports • Non-pertinent publication types (e.g. expert opinions, letters to the editor, editorials, comments, conference abstract/poster, news, consensus document, chapter) • Animal studies • Genetic studies, biochemistry or molecular studies • Modelling studies (i.e. this did not apply to economic evaluation studies) • Outbreak studies (except when data on contact tracing for TB or vaccination were reported)
Study quality	• Study duration (no minimum) • Number of subjects (no minimum)	• Insufficient methodological quality (both inherent methodology as well as insufficient description of inherent methodology provided; based on quality checklists)
Study population	Adults in prisons, jails and other custodial settings that function as a prison • Detained persons, including persons in remand • Persons "going through the gate" (e.g. prison guards, healthcare workers, etc.)	• Children (<18 years) • Persons in police custody • Persons in migrant detention centres
Geographical area	• EU/EEA + candidate countries, EFTA and other high-income countries (i.e. USA, Canada, Australia, New Zealand)	
Study comparison	• Comparison appropriate for a specific outcome • Clinical studies on efficacy or effectiveness of vaccination with no vaccination as control	• Clinical studies on efficacy or effectiveness of vaccination with other comparisons than no vaccination as control (e.g. vaccines for other diseases)
Specific outcomes of interest	• Quantitative outcomes • Qualitative outcomes	• No exclusion based on outcomes

[1]*High-quality meta-analyses or systematic reviews were included in case they matched the review objectives. If not, the relevant individual articles from these meta-analyses/systematic reviews were checked. If an individual article reported new and relevant data and the study was of sufficient quality, it was included.*

Grey literature search

A grey literature search with a focus on EU/EEA countries was performed to complement the evidence from the peer-reviewed literature. Reports and documents focusing on prisons and people in prisons were searched for.

The following types of documents were searched for:

- Articles, abstracts, research reports
- Guidelines and protocols
- Case studies, service models

This grey literature search comprised the following sources:

- A pre-defined list of websites
- Call for papers/experts input

Search on pre-defined websites

Websites of conference abstracts

In order to capture studies not published yet in peer-reviewed literature, conference abstracts published in the last five years (i.e. from 2010 onwards) were searched for on all the following websites of relevant congresses:

- International Union for Tuberculosis and Lung Disease (http://www.theunion.org/)
- European Respiratory Society (http://www.ersnet.org/)
- American Respiratory Society (https://www.thoracic.org/)
- International Corrections and Prisons Association (ICPA, http://icpa.ca/)
- American Correctional Association (http://www.aca.org/aca_prod_imis/aca_member)
- Experiencing Prison 7th Global Conference (http://www.inter-disciplinary.net/probing-the-boundaries/persons/experiencing-prison/)
- National Conference on Correctional Health Care (http://www.ncchc.org/national-conference)

Other websites

The following sources were searched for other grey literature documents published in the last ten years (i.e. from 2005 onwards):

- Guidelines:
  - Guidelines International Network (http://www.g-i-n.net/)
  - NICE guidelines (https://www.evidence.nhs.uk/)
- Organisations and institutes:
  - WHO – Health in prisons programme (HIPP) (http://www.euro.who.int/prisons)
  - WHO – EU (http://www.euro.who.int/en/home)
  - WHO – IRIS (http://apps.who.int/iris/)
  - Council of Europe/POMPIDOU Group (http://www.coe.int/T/DG3/Pompidou/AboutUs/default_en.asp), and other Council of Europe documents
  - UNODC (http://www.unodc.org/)
  - ECDC (http://ecdc.europa.eu/en/Pages/home.aspx)
  - Public Health England (PHE) – (http://www.gov.uk)
  - European Monitoring Centre for Drugs and Drug Addition (EMCDDA) (http://www.emcdda.europa.eu/)
  - International Corrections and Prisons Association (ICPA, http://icpa.ca/)
- Bibliographies
  - Campbell Collaboration (http://www.campbellcollaboration.org/)
  - Bibliography on HIV/AIDS and Hepatitis C in prisons (http://www.aidslaw.ca/)
  - IDEAS (https://ideas.repec.org/)
  - Evidence in Health and Social Care (NHS Evidence, https://www.evidence.nhs.uk/)
  - Open grey (http://www.opengrey.eu)

Conduct of the main search on pre-defined websites and corresponding search terms

The main search for grey literature on the pre-defined websites was performed by two senior researchers. The main search was performed in English. On each website, a more general search was conducted at first using only terms for prisons (i.e. prison, jail, correctional, incarcerated). If this resulted in many hits, a more specific search was performed by combining the prison terms with 'infectious diseases', 'screening'/'case finding', 'vaccination' and 'tuberculosis'. In case a website was only focused on prison populations, only this latter search was performed.

Expert input

In addition to the search on pre-defined websites, expert input was used in the form of:

- A search for documents conducted by field researchers of the HWBs Federation Network
- A "call for paper" issued to experts contacted via the HWBs Federation Network and members of the ECDC expert panel

Search field researchers

Main documents describing information relevant to the objectives (based on the inclusion and exclusion criteria, section 2.5.4); written in English or in other EU/EEA languages were searched. Five national field researchers and infectious diseases specialists were identified within the HwBs network, one for each of the EU/EEA countries represented in the Federation, namely France, Germany, Italy, the Netherlands and Spain. The field researchers conducted a search for national guidelines, protocols (clinical/intervention), and unpublished research reports. This was done by searching the national websites of HWBs member organisations:

- SIMSPe-Onlus: Italian Society for Prison Health and Medicine (http://www.sanitapenitenziaria.org/);
- APSEP: Association des Professionnels de Santé Exerçant en Prison (http://www.sante-prison.com/fr/);
- NAPDUK: National Association of Prison Dentistry UK (http://www.napduk.org/);
- SESP: Sociedad Espanola de Sanidad Penitenciaria (http://www.sesp.es/);
- DJI: Netherlands National Agency for Correctional Institutions (https://www.dji.nl/).

Call for paper

A "call for paper" was issued to stakeholders in the field by the selected national field researchers, via e-mail. The grey literature search officially started on 18 April 2016, with an official letter and call to the researchers sent by HWBs' Secretariat. After two weeks from the start, an e-mail reminder was sent out. If clarifications or additional details were needed, the respective national contact point was contacted. The call was also shared with the ECDC expert panel members.

The initial deadline was set on 2 May 2016. However, due to the low number of contributions received in particular on MA 2, the replacement of some field researchers and the possibility to collect further documents by the panel members, the definitive deadline for the collection of documents was extended to 30 June 2016.

The call targeted stakeholders, service providers or technical experts working in the field to submit additional documents including abstracts, national guidelines, protocols, unpublished research reports and/or intervention case studies/service models regarding the three macro areas. For the latter, a short pre-defined format was provided to collect clearly described accounts of their intervention/service model related to the relevant macro areas.

Grey literature selection

All retrieved documents were reviewed by two researchers. Documents were included if the reported information was relevant and of sufficient quality (see inclusion and exclusion criteria below). A record was kept of the reasons for exclusion of documents screened in full text.

Inclusion and exclusion criteria

Table 2. Inclusion and exclusion criteria grey literature

	Inclusion	Exclusion
Period of publication	Conference abstracts: from 2005 onwards Other documents: from 2010 onwards	
Type of document	• Guidelines • Intervention or clinical protocols • Unpublished research results • Case studies/service models, including measures of effectiveness	• Published article
Document quality	Only grey literature documents with a methods section or an overview of sources.	Document without a clear source/reference for the relevant information
Document population	Adults in prisons, jails and other custodial settings that function as a prison • Detained persons, including persons in remand • Persons "going through the gate" (e.g. prison guards, healthcare workers, etc.)	• Children (<18 years) • Persons in police custody • Persons in migrant centres
Subject of the document	• Active case finding for communicable diseases at entrance and during prison stay • Vaccination against relevant communicable diseases at entrance and during prison stay (including outbreak situations) • Prevention, diagnosis, treatment and care of TB	
Geographical area	• EU/EEA	
Specific outcomes of interest	• Quantitative outcomes • Qualitative outcomes	• No exclusion based on outcomes

Guidelines selection

Guidelines were selected in a three-step approach. First, only prison-focused guidelines were searched for relevant information. However, when there was not sufficient information on certain review objectives coming from these prison-focused guidelines, guidelines that have a relevant section on people in prison were searched for relevant information. To include such guidelines, multiple transparent sources should have been stated for the prisoner group and a recommendation for this specific group should have been made. In case there was still a lack of information on a certain topic, general population guidelines were reviewed for relevant information.

Appendix 2. Quality appraisal checklists other than NICE

Cross-sectional study	Code as - - / - / + - / + / ++ or NA if not applicable
Author	
Countries	
Internal validity	
The study addresses an appropriate and clearly focused question	
The study population is clearly described	
The population is a representative sample of the source population	
The outcome measures are described	
The assessment of outcome is made blind to exposure status	
Where blinding was not possible, there is some recognition that knowledge of exposure status could have influenced the outcome assessment	
Exposure status is measured in a standard, valid and reliable way	
The measurement of outcome is clearly described (e.g., written questionnaire, face-to-face interview, internet survey)	
The main potential confounders are identified and taken into account in the design and analysis	
Comparison is made between participants and non-participants to establish their similarities/ differences	
Confidence intervals are provided	
If study is carried out at more than one site, results are comparable for all site	
Overall assessment of the study	
How well was study done to minimize confounding/ bias, and to establish a causal relationship?	
If coded + or -, what is the likely direction in which bias might affect the study results?	
Was the likelihood of bias due to measuring exposure and outcome at the same moment, taken into account by the authors?	
Are you certain that the overall effect is due to the exposure being investigated?	
Are the results of the study applicable to the patient group targeted in the search question?	
Comments	
Include or exclude	
If exclusion, give reason	

Surveillance study	Code as - - / - / + - / + / ++ or NA if not applicable
Author	
Countries	
Internal validity	
The study addresses an appropriate and clearly focused question	
The population being studied is selected from a data source that is representative for the overall population of interest	
The outcomes are clearly defined	
The main potential confounders are identified and taken into account in the design and analysis	
Additional questions	
Are epidemiological outcomes described that can be used in this review, e.g. incidences or rates per 100,000 or proportion of cases?	
Is the study population large enough to be a representative sample of the source population?	
Is the disease of interest the main subject of the paper?	
Are the outcomes of the study based on observed cases (and not on assumptions or models?)	
The surveillance period is long enough to detect new cases and to accurately calculate prevalence/ incidence rates	
Overall assessment of the study	
Are the results valid?	
Are the results applicable to the population targeted in the search question?	
Comments	
Include or exclude	
If exclusion, give reason	

Other research (applied to outbreak studies)	Code as - - / - / + - / + / ++ or NA if not applicable
Author	
Countries	
Internal validity	
The study addresses an appropriate and clearly focused question	
The study population is clearly described	
The population is representative of the source population	
Exposure status is measured in a standard, valid and reliable way	
The outcomes are clearly defined	
Variation (e.g. range, SD) in outcome of interest is provided	
The diagnosis of interest the main subject of the paper	
Overall assessment of the study	
Are the results valid?	
Are the results applicable to the population targeted in the search question?	
Comments	
Include or exclude	
If exclusion, give reason	

Appendix 3. Expert panel members and ECDC/EMCDDA staff

Expert panel members

Name	Organisation	Country
Barbara Janíková	Government of Czech Republic	Czech Republic
Kristel Kivimets	Ministry of Justice	Estonia
Fadi Meroueh	Association des Professionnels de Santé Exerçant en Prison	France
Heino Stöver	HA-REACT	Germany
Peter Wiessner	Action Against AIDS and EATG	Germany
Ruth Zimmerman	Robert Koch Institute	Germany
Roberto Ranieri	Società Italiana di Medicina e Sanità Penitenziaria	Italy
Lucia Mihailescu	Formerly with Romanian National Administration of Penitentiaries	Romania
Jose-Manuel Royo	General Secretariat of Penitentiary Institutions	Spain
Stefan Enggist	Federal Office of Public Health	Switzerland
Eamonn O'Moore	Public Health England	UK
Alison Hannah	Penal Reform International	International
Jan Malinowski	Council of Europe	International
Lars Møller	WHO	International
Ehab Salah	United Nations on Drugs and Crime	International

ECDC and EMCDDA staff who attended expert panel meetings

Name	Organisation
Dagmar Hedrich	EMCDDA
Andrew Amato	ECDC
Netta Beer	ECDC
Helena Carvalho Gomes	ECDC
Ida Czumbel	ECDC
Erika Duffell	ECDC
Teymur Noori	ECDC
Kate Olsson	ECDC
Anastasia Pharris	ECDC
Pasi Penttinen	ECDC
Jan Semenza	ECDC
Ettore Severi	ECDC
Gianfranco Spiteri	ECDC
Judit Takas	ECDC
Lara Tavoschi	ECDC
Marieke van der Werf	ECDC

Appendix 4. Exclusion table peer-reviewed literature and corresponding reference list

Exclusion table second selection step

Exclusion reason (number of articles)	References
No data on objectives (n=137)	[1-137]
Non-pertinent publication types (n=81)	[138-218]
Narrative reviews (n=74)	[219-292]
Prevalence/incidence studies (n=35)	[293-327]
Insufficient (description of) methodology (n=35)	[328-362]
Duplicate articles (n=18)	[363-380]
Already included in review Rumble et al. (n=15) (to avoid duplicate data)	[381-395]
Incorrect setting (n=15) (e.g. police detention centre, or juvenile detention centre)	[396-410]
Not country of interest (n=7)	[411-417]
Modelling studies (n=2)	[418, 419]
Children (n=1)	[420]
More recent data available (n=1)	[421]

Reference list of excluded articles during second selection step

1. Multidrug-resistant tuberculosis outbreak on an HIV ward--Madrid, Spain, 1991-1995. MMWR Morbidity and mortality weekly report. 1996;45(16):330-3.
2. Syphilis screening among women arrestees at the Cook County Jail--Chicago, 1996. MMWR Morbidity and mortality weekly report. 1998;47(21):432-3.
3. Assessment of sexually transmitted diseases services in city and county jails--United States, 1997. MMWR Morbidity and mortality weekly report. 1998;47(21):429-31.
4. Anonymous or confidential HIV counseling and voluntary testing in federally funded testing sites--United States, 1995-1997. MMWR Morbidity and mortality weekly report. 1999;48(24):509-13.
5. Abou-Saleh MT, Rice P, Foley S. Hepatitis C testing in drug users using the dried blood spot test and the uptake of an innovative self-administered DBS test. Addictive Disorders and their Treatment. 2013;12(1):40-9.
6. Anda RF, Perlman SB, D'Alessio DJ, Davis JP, Dodson VN. Hepatitis B in Wisconsin male prisoners: considerations for serologic screening and vaccination. American journal of public health. 1985;75(10):1182-5.
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Appendix 6. Report on field researchers for grey literature

Field researchers

A field researcher was appointed through Health Without Barriers in each of the following countries where the federation is active, namely UK, Germany, Spain, France and Italy. Several attempts have been made to find a field researcher for The Netherlands, through an e-mail exchange with Dr. Michel Westra (member of HWBs) and Dr. Kim van Rooy.

It was up to the field researcher whether to work in team with any other expert they wished to involve, or to perform the research on their own. The European field researchers appointed as responsible for each Country were:

- Ruth Gray – UK
- Sofia Victoria Casado Hoces – Spain
- Leon Weichert – Germany
- Deborah Iwanikow – France
- Giordano Madeddu - Italy

Materials

The grey literature research officially started on 18th April 2016, with an official letter and call to the researchers sent by HWBs' Secretariat. The definitive deadline for the collection of materials regarding the first three macro areas (active case finding, vaccination and TB) was settled on 30th June 2016.

The following are the results concerning the first three selected Macro areas:

1. UK

The batch of documents has been received on 10th May 2016. A total of 37 documents have been sent to HWBs.

2. Spain

The batch of documents has been received on 28th April 2016. A total of 93 documents have been sent to HWBs.

3. Germany

The batch of documents has been received on 24th May 2016. A total of 18 documents have been sent to HWBs. The fact that the prison healthcare system in Germany is not managed by central headquarters, instead is handled by the single Länder, has affected negatively the research.

4. France

The first batch of documents has been received on 6th June 2016. A total of five documents have been sent to HWBs.

5. Italy

The first batch of documents has been received on 6th June 2016. A total of five documents have been sent to HWBs.

Appendix 7. Exclusion table grey literature and corresponding reference list

Exclusion table second selection step

Exclusion reason (number of articles)	References
Outside date range (n=35)	[1-35]
No data on objectives (n=24)	[36-59]
Prevalence/incidence studies (n=14)	[60-73]
More recent data available (n=2)	[74, 75]
No country of interest (n=4)	[76-79]
Insufficient description methodology (n=1)	[80]

Reference list of excluded articles during second selection step

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Appendix 8. Summary tables and guideline summaries – hepatitis

Hepatitis A

Peer-reviewed literature

The uptake, positivity rate, effectiveness, treatment initiation and cost-effectiveness of hepatitis A active case finding is summarised below. For further details on the outcomes and study-specific background information (e.g. setting, study population), see the evidence tables in a separate document ("Annex 2. Evidence tables systematic review active case finding in prison settings").

Uptake, positivity rate, effectiveness and treatment initiation

Mandatory

EU/EEA countries

No data

Other countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
At release										
Sieck, 2011 [32] USA Cross-sectional study	A male prison housing minimum, medium, close, and maximum security inmates n=916	Blood test, not further specified Mandatory	All inmates scheduled for release At release (4-6 weeks before the scheduled release day) Letter describing STD testing process	NA	0.0%	NR	NR	NR	NR	Very low

NA=not applicable, NR=not reported, STD=sexually transmitted disease, USA=United States of America

Opt-in

No studies were found that reported on opt-in HAV testing in correctional facilities.

Opt-out

No studies were found that reported on opt-out HAV testing in correctional facilities.

COST-EFFECTIVENESS

No studies were found that reported on the cost-effectiveness of HAV active case finding in correctional facilities.

Grey literature

No documents on hepatitis A active case finding have been found.

Hepatitis B

Peer-reviewed literature

The uptake, positivity rate, effectiveness, treatment initiation and cost-effectiveness of hepatitis B active case finding is summarised below. For further details on the outcomes and study-specific background information (e.g. setting, study population), see the evidence tables in a separate document ("Annex 2. Evidence tables systematic review active case finding in prison settings").

Uptake, positivity rate, effectiveness and treatment initiation

Mandatory

EU/EEA countries

No data

Other countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
At release										
Sieck, 2011 [32] USA Cross-sectional study	A male prison housing minimum, medium, close, and maximum security inmates n=916	Blood test, not further specified Mandatory	All inmates scheduled for release At release (4-6 weeks before the scheduled release day) Letter describing STD testing process	NA	0.5%	NR	NR	NR	NR	Very low

NA=not applicable, NR=not reported, STD=sexually transmitted disease, USA=United States of America

Opt-in

EU/EEA countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
At entry										
Jacomet, 2016 [33] France Cross-sectional study	Two prisons n=702	ELISA Opt-in	Adult inmates At entry (timing NR) Posters, personalised information letters	91.3%	0.6% 0.3% newly diagnosed	NR	NR	NR	NR	Very low
During imprisonment										
Sagnelli, 2012 [34] Italy Cross-sectional study	Six penitentiaries n=3 468	Analogous commercial immune enzymatic assay Opt-in	All inmates During imprisonment Presentation on advantages of screening by peer-educators, pamphlets on importance of screening	65.3%	4.4%	Higher uptake than in the nine correctional facilities evaluated in this study before peer-education (10.0%)	NR	NR	NR	Very low

ELISA=enzyme-linked immunosorbent assay, NR=not reported

Other countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
At entry										
Watkins, 2009 (included in review Rumble, 2015 [2]) Australia Descriptive study	Western Australian prisons (not further specified) n=946	Standard routine BBV testing with venous blood sampling: HIV, HBV, HCV Opt-in	Male and female inmates At entry (within 28 days) NR	NR	4.5% (95% CI 1.2-2.1%)[1]	NR	NR	NR	NR	Very low[2]

BBV=blood-borne virus, HBV=hepatitis B virus, HCV=hepatitis C virus, HIV=human immunodeficiency virus, NR=not reported, USA=United States of America
[1] As reported in Rumble et al., 2015 (and in the original article). Positivity rate is not included in the 95% CI. [2] This article was included in the review of Rumble et al., 2015, which has a very low level of evidence

Opt-out

No studies were found that reported on opt-out HBV testing in correctional facilities.

COST-EFFECTIVENESS

No studies were found that reported on the cost-effectiveness of HBV active case finding in correctional facilities.

Grey literature

The uptake, positivity rate, effectiveness, treatment initiation and cost-effectiveness of hepatitis B active case finding is summarised below. For further details on the outcomes and study-specific background information (e.g. setting, study population), see the evidence tables in a separate document ("Annex 2. Evidence tables systematic review active case finding in prison settings").

Uptake, positivity rate, effectiveness and treatment initiation

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Type of document
During imprisonment										
Bedoya A 2014 [37] Spain Retrospective study	Single prison in Barcelona (Spain) N=7,767	HBV serology Opt-in	All people in prison from 1987 to 2013 During imprisonment NR	NR	13.2%	NR	NR	NR	NR	Conference abstract
Babudieri S 2015 [36] Italy Cross-sectional study	4 prisons in Italy N=2,233	HBV serology Opt-in	All people in prison During imprisonment NR	83.8%	104/2233 (4.7%)	NR	NR	NR	NR	Conference abstract
Babudieri S 2012 [35] Italy Series of cross-sectional studies	20 Italian prisons N=4,072	HBV serology Opt-in	All people in prison During imprisonment Peer educators, leaflets, posters and staff training	56.3%	5.3%	From 10.0% to 42.9%	NR	NR	NR	Conference abstract
At entry										

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Type of document
Gabbuti A 2015 [38] Italy Series of cross-sectional studies	Regional prison, Florence (Italy) People in prison: -2009 N=2,303 -2010 N=2,376 -2011 N=2,198 -2012 N=2,015 -2013 N=1,843 -2014 N=1,408	HBV serology Opt-in	All people in prison At entry NR	>95%	-16.5 % in 2009 -15.7% in 2010 -11.7% in 2011 -8.0% in 2012 -6.9% in 2013 -8.1% in 2014	NR	NR	NR	NR	Unpublished research
Foschi A 2015 [39] Italy Cross-sectional study	Single prison in Italy (Opera prison, Milan) N=711	HBV serology Opt-in	All people in prison At entry NR	91.5%	31/468 (6.6%)	NR	NR	NR	NR	Conference abstract

CI=confidence interval, HBV= hepatitis B virus, NR=not reported, RR=relative risk

COST-EFFECTIVENESS

No studies on cost-effectiveness have been found from the grey literature search.

Hepatitis C

Peer-reviewed literature

The uptake, positivity rate, effectiveness, treatment initiation and cost-effectiveness of hepatitis C active case finding is summarised below. For further details on the outcomes and study-specific background information (e.g. setting, study population), see the evidence tables in a separate document ("Annex 2. Evidence tables systematic review active case finding in prison settings").

Uptake, positivity rate, effectiveness and treatment initiation

Mandatory

EU/EEA countries

No data

Other countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
At release										
Sieck, 2011 [32] USA Cross-sectional study	A male prison housing minimum, medium, close, and maximum security inmates n=916	Blood test, not further specified Mandatory	All inmates scheduled for release At release (4-6 weeks before the scheduled release day) Letter describing STD testing process	NA	1.7%	NR	NR	NR	NR	Very low

NA=not applicable, NR=not reported, STD=sexually transmitted disease, USA=United States of America

Opt-in

EU/EEA countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
At entry										
Jacomet, 2016 [33] France Cross-sectional study	Two prisons n=702	ELISA Opt-in	Adult inmates At entry (timing NR) Posters, personalised information letters	89.9%	4.7% 2.0% newly diagnosed	NR	NR	NR	NR	Very low
Horne, 2004 (included in review Rumble, 2015 [2]) UK Descriptive study	Dartmoor Prison, UK n=3,034	Standard routine BBV testing with venous blood sampling: HCV (HCV antibody testing and confirmatory PCR) Opt-in	Male inmates At entry (timing NR) NR	12%	12.0%	NR	NR	NR	NR	Very low[1]
Skipper, 2003 (included in review Rumble, 2015 [2]) UK Descriptive study	Isle of Wight (not further specified) n=1,618	Standard routine BBV testing with venous blood sampling: HIV, HBV, HCV (HCV antibody testing and confirmatory PCR) Opt-in	Inmates At entry (timing NR) NR	9%	29.9%	NR	NR	NR	NR	Very low[1]
During imprisonment										
Sagnelli, 2012 [34] Italy Cross-sectional study	Six penitentiaries n=3,468	Analogous commercial immune enzymatic assay Opt-in	All inmates During imprisonment Presentation on advantages of screening by peer-educators, pamphlets on importance of screening	64.6%	22.8%	Higher acceptance than in the nine correctional facilities evaluated in this study before peer-education (20.5%)	NR	NR	NR	Very low

BBV=blood-borne virus, ELISA=enzyme-linked immunosorbent assay, HBV=hepatitis B virus, HCV=hepatitis C virus, HIV=human immunodeficiency virus, NR=not reported

[1] *This article was included in the review of Rumble et al., 2015, which has a very low level of evidence*

Other countries

Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Effectiveness: Uptake	Effectiveness: Positivity rate	Effectiveness: Change in number or % tested	Effectiveness: Change prevalence /incidence	Effectiveness: Other	Effectiveness: Treatment initiation	Level of evidence
Opt-in at entry versus client-initiated										
Kim, 2013 [44] USA Before-after study	Two facilities of the correctional institute (one for male and one for female inmates) n=12,297	NR Opt-in	Risk-based: High-risk inmates (risk assessment based on dynamic model of virological parameters) At entry (risk assessment within 7 days of admission, timing test NR) Staff educational seminar on benefits identifying acute HCV	80.7% of high risk inmates had laboratory testing*	25.4% of high risk inmates with laboratory testing had positive test result	NR	Historical control period: 0.7 cases/month; risk-based active case finding: 1.94 cases/month	Acute cases identified through active case finding twice as likely to be asymptomatic (48.6%) compared with historical control period (33.3%, RR 2.0; p=0.09)	NR	Very low
		NR Client-initiated	Historical control: All inmates When having hepatitis symptoms or significant ALT elevations Staff educational seminars on acute HCV	NR	NR	NR				
Opt-in at entry and during imprisonment										
Cocoros, 2014 [46] USA Cross-sectional study	A county facility, for those awaiting trial and those sentenced <2.5 years n=2,716	Immunoassay testing Opt-in	All inmates At entry (within few days) & during imprisonment when not tested at entry (during regular "sick call") Mandatory education session on hepatitis before choice to be tested, referral upon release if HCV positive	21.9%	20.5%	NR	NR	NR	NR	Very low
Opt-in at entry										
Watkins, 2009 (included in review Rumble, 2015 [2]) Australia	Western Australian prisons (not further specified) n=946	Standard routine BBV testing with venous blood sampling: HIV, HBV, HCV Opt-in	Male and female inmates On entry (within 28 days) NR	NR	24.8% (95% CI 20.2-29.5%)	NR	NR	NR	NR	Very low[1]

Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Effectiveness: Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
Descriptive study										
Opt-in during imprisonment										
Beckwith, 2015 [45] USA Cross-sectional study	Minimum security facility, women's facility and the intake service centre n=957	OraQuick HCV Rapid Antibody Test (blood specimen); confirmation with HCV RNA plasma viral load testing Opt-in	Inmates selected by the research staff During imprisonment 8-minute informational video, post-test counselling, appointment reminder card	26% reactive rapid HCV test 92% of HCV+ testers underwent confirmatory testing	10% reactive HCV test 6% confirmed hepatitis C	NR	NR	NR	26.7% of confirmed HCV inmates were linked to care after release	Very low

ALT=alanine aminotransferase, BBV=blood-borne virus, ELISA=enzyme-linked immunosorbent assay, HBV=hepatitis B virus, HCV=hepatitis C virus, HIV=human immunodeficiency virus, NR=not reported, RNA=ribonucleic acid, RR=relative risk, USA=United States of America

[1] *This article was included in the review of Rumble et al., 2015, which has a very low level of evidence*

**28.2% of admitted inmates were screened for risk factors, 4.9% were high risk inmates*

Opt-out

No studies were found that reported on opt-out HCV testing in correctional facilities.

Not specified

EU/EEA countries

Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Effectiveness: Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
At entry versus client-initiated										
Craine, 2015 [42] UK Stepped-wedge cluster-RCT	Five prisons; 1 female closed local prison, 2 male local adult remand prisons; 1 male convicted prison (adults & youth); 1 male open prison n=~3,600	Intervention: DBST, detection of HCV antibodies NR	All eligible inmates At entry (timing NR) Pre- and post-test counselling	NR	NR	*At 18 months:* Higher HCV test rates during intervention months (data only stratified presented) Insufficient evidence of effect of the intervention: - ITT: OR=0.84; 95% CI: 0.68-1.03; p=0.088 - Actual intervention time: OR= 0.86; 95% CI: 0.71 - 1.06; p=0.153	NR	NR	NR	Low
		Control: Venepuncture Only female prison offered routine HCV testing, other prisons NR	All eligible inmates NR NR							
Not specified versus client-initiated										
Hickman, 2008 [43] UK	6 prisons throughout England and Wales	Intervention: DBST NR	Inmates, not further specified NR	NR	NR	Mean % HCV tested after 6 months follow-up:	NR	NR	NR	Moderate

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
Cluster RCT	NR	 Control: NR (regular practice) Client-initiated	Staff training on counselling, pre- and post-test counselling Inmates, not further specified On request or at selected times each week NR			50% increase in one prison pair, 10% increase in other two prison pairs				
Not specified										
Khaw, 2007 [40] UK Cross-sectional and qualitative study	3 prisons in England n=30	NR NR	Inmates, not further specified NR Information sheets about study, no reimbursements/ inducements	63.3%	36.8% HCV+	NR	NR	NR	NR	Very low

CI=confidence interval, DBST=dried blood spot testing, HCV=hepatitis C virus, ITT=intention to treat, NR=not reported, OR=odds ratio, RCT=randomised controlled trial

Other countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
At entry										
Kuncio, 2015 [47] USA Cross-sectional study	6 jails and special detention sites (awaiting trial or serving sentences ≤2 years) n=51 562	NR NR	High-risk inmates (HIV-infected or self-reported IDU, identified during medical examination) At entry (timing NR) NR	NR	57% of high-risk inmates* (serosurvey among all entrants during an 8-day period: 11.9%)	NR	NR	Risk-based active case finding failed to capture 4 877, or 76% of the predicted HCV positive inmates incarcerated in 2011-2012	NR	Very low

HIV=human immunodeficiency virus, IDU=injecting drug user, NR=not reported, USA=United States of America
**5.3% of admitted inmates were high risk inmates*

COST-EFFECTIVENESS

EU/EEA countries

Four cost-effectiveness studies examined the cost-effectiveness of HCV active case finding in correctional facilities in the UK from a healthcare provider perspective (Castelnuevo 2006 [48], Sutton 2008 [49], and Martin 2013 [50], all moderate level of evidence; Sutton 2006 [51], low level of evidence).

One study compared three different opt-in HCV case finding scenarios using ELISA and PCR among former injecting drug users in prison: 1) at entry after a general lecture, 2) at entry after a lecture with special focus on injecting drug use, and 3) symptom-based HCV case finding [48]. The exact timing of testing at entry was not further specified. The authors concluded that case-finding at entry compared to symptom-based case finding is likely cost-effective, with the scenario using an injecting drug use-focused lecture being the most cost-effective. However, another study, which evaluated similar opt-in scenarios, found that HCV case finding at entry after a lecture for current/former injecting drug users (timing not further specified) is likely not cost-effective compared to symptom-based HCV case finding [49]. Martin et al. compared opt-in HCV case finding among inmates who inject drugs using DBST with venepuncture, concluding that DBST is likely not cost-effective under commonly used willingness-to-pay thresholds [50]. The time of testing was not reported in this article.

An additional study compared no active case finding with four opt-in active case finding scenarios at entry (timing not further specified) after a health awareness lecture: 1) verbally screening for past positive HCV test and ever having injected illicit drugs, 2) verbally screening for past positive HCV test only, 3) verbally screening for ever having injected illicit drugs only, and 4) no verbal screening (lecture only) [51]. The incremental cost-effectiveness analysis revealed that verbally screening for past positive HCV test and ever having injected illicit drugs prior to opt-in HCV testing at entry is the most cost-effective option.

Other countries

One USA study (He 2016 [52], moderate level of evidence) compared five HCV case finding scenarios: 1) no active case finding, 2) one-time risk-based active case finding of active/former currently incarcerated injecting drug users and active/former injecting drug users at entry for up to 1 year (testing policy NR), 3) one-time universal active case finding of all currently incarcerated persons and all entrants for up to 1 year (opt-out), 4) one-time universal active case finding of all currently incarcerated persons and all entrants for up to 5 years (opt-out), and 5) one-time universal active case finding of all currently incarcerated persons and all entrants for up to 10 years (opt-out). The timing of testing at entry was not specified. The authors concluded that universal opt-out active case finding of inmates for HCV is highly cost-effective for at least 10 years.

Grey literature

The uptake, positivity rate, effectiveness, treatment initiation and cost-effectiveness of hepatitis C active case finding is summarised below. For further details on the outcomes and study-specific background information (e.g. setting, study population), see the evidence tables in a separate document ("Annex 2. Evidence tables systematic review active case finding in prison settings").

Uptake, positivity rate, effectiveness and treatment initiation

Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Effectiveness: Uptake	Effectiveness: Positivity rate	Effectiveness: Change in number or % tested	Effectiveness: Change prevalence /incidence	Effectiveness: Other	Effectiveness: Treatment initiation	Type of document
During imprisonment										
Babudieri S 2015 [36] Italy Cross-sectional study	4 prisons in Italy N=2,233	HCV serology Opt-in	All people in prison During imprisonment NR	83.8%	17.6%	NR	NR	NR	NR	Conference abstract
Babudieri S 2012 [35] Italy Series of cross-sectional studies	20 Italian prisons N=4,072	HCV serology Opt-in	All people in prison During imprisonment Testing promotion based on peer educators, leaflets, posters and staff training	56.3%	32.8%	From 20.5% to 42.0%	NR	NR	NR	Conference abstract
At entry										
Gabbuti A 2015 [41] Italy Series of cross-sectional studies	Regional prison, Florence (Italy) - N=2,376 in 2010 - N=2,198 in 2011 - N=2,015 in 2012 - N=1,843 in 2013	HCV serology + HCV-RNA in those HCV ab positive Opt-in	All people in prison At entry NR	- 395/1667 (23.7%) in 2010 - 419/1617 (25.9%) in 2011 - 905/1472 (61.4% in 2012 - 960/1166 (82.3%) in 2013	- 281/395 (71.1%) in 2010 with 228 (81.1%) HCV-RNA + - 308/419 (73.5%) in 2011 with 257 (83.4%) HCV-RNA+ - 393/905 (43.4%) in 2012 with 329 (83.7%) HCV-RNA+ - 274/970 (28.2%) in 2013 with 219	NR	NR	NR	NR	Unpublished research

Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Effectiveness: Uptake	Effectiveness: Positivity rate	Effectiveness: Change in number or % tested	Effectiveness: Change prevalence /incidence	Effectiveness: Other	Effectiveness: Treatment initiation	Type of document
					(79.9%) HCV-RNA+					
Foschi A 2015 [39] Italy Cross-sectional study	Single prison in Italy (Opera prison, Milan) N=711	HCV serology + HCV-RNA in those HCV ab positive Opt-in	All people in prison At entry NR	91.5%	46/468 (9.8%) HCV RNA positive: 38/46 (83%)	NR	NR	NR	NR	Conference abstract

HCV=hepatitis C virus, NR=not reported, RNA=ribonucleic acid

COST-EFFECTIVENESS

No studies on cost-effectiveness have been found from the grey literature search.

Guidelines[2] hepatitis A, B and C

No guidelines were found reporting on hepatitis A.

Both supranational and national guidelines on how to actively find cases of viral hepatitis B and C exist. World Health Organization (WHO) guidelines do not specify which strategy is more useful but just link the screening of HIV infection with testing for HBV, HCV, and tuberculosis (TB). The United Nations Office on Drugs and Crime (UNODC) propose a passive case finding in a client-initiated strategy.

Guidelines specific to prison setting - supranational guidelines

WHO. Prison and Health. 2014.

"Testing for HIV or hepatitis is both an information (prevention) measure and a diagnostic measure. Thus whatever the context in which a test is conducted, it should be accompanied by pre- and post-counselling for both positive and negative test results. Testing for HIV and hepatitis, as with any other medical intervention, cannot be mandatory."

"The assessment [of newly diagnosed HIV cases] should include testing for **hepatitis B and C** and screening for TB."

"Hepatitis B surface antigen (HBsAg) testing is the primary tool for screening and diagnosis. A second test a few weeks later is needed to confirm a first positive test."

"The diagnosis of HCV infection is based on detection of anti-HCV antibodies by enzyme immunoassay. A positive test must be confirmed with an HCV RNA qualitative assay or, ideally, with a real-time polymerase chain reaction assay."

Source: WHO. Prison and Health. 2014 (Type of guideline: practice-based; level of evidence: ++,-,0) [7]

[2] Relevant guidelines were critically appraised with a selection of criteria derived from the AGREE instrument (1. The overall objective/objectives of the guideline is/are specifically described; 2. Systematic/clear methods were used to search for evidence for compiling the data and/or clear data sources/references; 3. The recommendations are specific and unambiguous). The criteria were qualitatively scored using - -, -, 0, +, ++; no total quality score of summed + and – was calculated

Guidelines specific to the prison setting - national guidelines

United Kingdom. Opt-out BBV test algorithm. 2014

Opt-out testing for blood-borne viruses (BBVs) was identified as a joint developmental priority in the National Partnership Agreement between Public Health England (PHE), NHS England and National Offender Management Service (NOMS) in October 2013. Several documents have been developed to guide and monitor the implementation of the opt-out strategy in UK prisons.

"Opt-out blood-borne virus test algorithm guidance notes

During induction provide basic information about:

- BBV risks, transmission and treatment
- HBV vaccination
- **HBV/HCV**/HIV testing and treatment services
- policy on access to condoms and disinfectant tablets

Recommend all eligible patients a test for HIV, hepatitis B and hepatitis C (HCV antibody, HBsAg and HIV Ab and Ag P24 test) within 72 hours of arrival using dry blood spot testing (DBST) or venous sampling. People in prison who refuse a test should be re-offered throughout their stay at regular intervals. Testing should be a 'continuous offer' and be re-offered at all available opportunities, for example at hepatitis B vaccination appointments and treatment reviews with the substance misuse service to look at both clinical and psychosocial support requirements."

Source: Public Health England. Opt-out BBV test algorithm, May 2014 (Type of guideline: practice-based; level of evidence: --,--,+) [56]

United Kingdom. Tackling BBVs in prisons. 2011

In 2011 the UK Department of Health and the National AIDS Trust have developed a document for best practice on **BBV** in the prison setting. "The prisoner pathway" includes different approaches to BBV testing, prevention and treatment according to custody period. For those with custody period <one week only information about BBV transmission and healthcare services should be provided whereas for those staying more than one week BBV testing should be offered.

Source: Department of Health, National AIDS Trust. Tackling BBVs in prisons. May 2011 (Type of guideline: practice-based; level of evidence: ++,-,+) [55]

United Kingdom. Physical health of people in prison. 2016

According to the NICE, people in prison should receive the same standard of healthcare as those in the community. The draft guidelines on "*Physical health of people in prison"* to be officially released in November 2016, refer to hepatitis testing based on NICE. PH43 **Hepatitis B and C** testing: people at risk of infection. 2012 document:

Prison healthcare services (coordinated with, and supported by, the NHS lead for hepatitis) should ensure that:

- All people in prison are offered access to confidential testing for hepatitis B and C when entering prison and during their detention.
- People in prison who test for hepatitis B or C receive the results of the test, regardless of their location when the test results become available.
- Results from hepatitis B and C testing are provided to the prisoner's community-based GP, if consent is given.

Source: NICE. Physical health of people in prison, draft document 2016. (Type of guideline: evidence-based; level of evidence: ++,++,++) [57], available at: https://www.nice.org.uk/guidance/indevelopment/gid-cgwave0729/documents

Appendix 9. Summary tables and guideline summaries – HIV

Peer-reviewed literature

The uptake, positivity rate, effectiveness, treatment initiation and cost-effectiveness of HIV active case finding is summarised below. For further details on the outcomes and study-specific background information (e.g. setting, study population), see the evidence tables in a separate document ("Annex 2. Evidence tables systematic review active case finding in prison settings").

Uptake, positivity rate, effectiveness and treatment initiation

These articles are summarised in tables below, organised by testing policy (mandatory, opt-in, opt-in and client-/clinician-initiated, opt-out, or not specified).

Mandatory

EU/EEA countries

No data

Other countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
At release										
Sieck, 2011 [32] USA Cross-sectional study	A male prison housing minimum, medium, close, and maximum security inmates n=916	Blood test, not further specified Mandatory	All inmates scheduled for release At release (4-6 weeks before scheduled release day) Letter describing STD testing process	NA	0.1%	NR	NR	NR	NR	Very low

NA=not applicable, NR=not reported, STD=sexually transmitted disease, USA=United States of America

Opt-in

EU/EEA countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
At entry and on release										
Jacomet, 2016 [33] France Cross-sectional study	Two prisons n=702	- At entry: ELISA - On release: rapid POC test Opt-in	Adult inmates At entry and on release (timing NR) Posters, personalised information letters	At entry: 91.3% On release: 4.2%	At entry: 0.3% (0% newly diagnosed) On release: 0%	NR	NR	NR	NR	Very low
At entry and during imprisonment										
Kivimets, 2014 [58] Estonia Cross-sectional study	All four prisons in Estonia n=3 289	Fourth generation HIV tests, Western blot confirmatory test	All inmates At entry (timing NR) & during imprisonment when negative at	At entry: 97.3% During imprisonment: 96% of inmates >1 year in prison	11.8% At entry only: 1.8% new HIV cases Of those >1 year in prison	NR	NR	NR	NR	Very low

Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Effectiveness: Uptake	Effectiveness: Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
		Opt-in	entry (once a year or more often when necessary) Counselling, not further specified	during 3-month period	during 3-month period, 12.5% HIV cases identified at entry and 0.06% during imprisonment					
During imprisonment										
Sagnelli, 2012 [34] Italy Cross-sectional study	Six penitentiaries n=3 468	Analogous commercial immune enzymatic assay, Western blot confirmatory test Opt-in	All inmates During imprisonment Presentation on advantages of screening by peer-educators, pamphlets on importance of screening	67.4%	3.8%	Higher acceptance than in the nine correctional facilities evaluated in this study before peer-education (14.1%)	NR	NR	NR	Very low

ELISA=enzyme-linked immunosorbent assay, HIV=human immunodeficiency virus, NR=not reported, POC=point of care

Other countries

Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Effectiveness: Uptake	Effectiveness: Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
At entry and during imprisonment										
Bauserman, 2001 [76] USA Comparative study	Ten local detention and juvenile justice facilities in one state n=1314	Demonstration project: Blood or oral HIV testing Opt-in Control: Blood HIV testing only Opt-in	Inmates in facilities for adults or youths At entry (timing NR) for adults, during imprisonment for youth Pre-test HIV counselling	NR	NR	Demonstration project compared to same time period year earlier: +63%	NR	NR	NR	Very low
Cocoros, 2014 [46] USA Cross-sectional study	A county facility, for those awaiting trial and those sentenced <2.5 years n=2 716	Third-generation assay Opt-in	All inmates At entry (within few days) & during imprisonment when not tested at entry (during regular "sick call") Mandatory HIV education session before choice to test	24.6%	0.8%	NR	NR	NR	NR	Very low
Arriola, 2001 [71] USA	Three adult county jails n=NR	Confirmatory testing using a HIV antibody or a CD4 cell count test Opt-in	Inmates In all jails at intake (one jail 3 days after	NR	17% (7% newly diagnosed)	At all three facilities, the number of inmates HIV tested rose compared to	NR	NR	49%	Very low

Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Effectiveness: Uptake	Effectiveness: Positivity rate	Effectiveness: Change in number or % tested	Effectiveness: Change prevalence /incidence	Effectiveness: Other	Effectiveness: Treatment initiation	Level of evidence
Cross-sectional study			admission, other jails NR), in two jails also during imprisonment Disease education, post-test counselling			previous testing				
At entry										
Spaulding, 2015 [65] USA Cross-sectional study	One county jail n=30 799	Rapid HIV test (oral), Western blot confirmatory test (venous blood) Opt-in	Adult newly incarcerated inmates, except HIV positive and mentally incompetent inmates At entry (immediately after booking, timing NR) Pre- and post-test counselling	38.4%	1.1% preliminary positive 0.3% confirmed new HIV cases	NR	NR	NR	NR	Very low
Tartaro, 2013 [70] USA Cross-sectional study	One county jail n=NR (n=689 inmates tested)	Free rapid fingerprick HIV test, confirmatory blood test not specified Opt-in	Newly incarcerated inmates At entry (give consent within 24-72 hours, test mostly 1-3 days after consent) Group-based HIV education while waiting for test results, post-test counselling	50% consent 56% tested of those giving consent*	0.3% HIV positive 0.1% newly HIV diagnosed	NR	NR	NR	NR	Very low
Begier, 2010 [73] USA Cross-sectional study	Eleven New York City jails n=9 405 new admissions with available medical intake data	Bio-Rad HIV-1/HIV-2 EIA plus "O", Western Blot confirmatory test Opt-in	Newly incarcerated inmates At entry (timing NR) NR	NR	NR	NR	NR	Based on a blinded serosurvey, n~743 (95% CI 552-934) of the n~ 820 (95% CI 619-1021) annual entrants with undiagnosed HIV remain undiagnosed	NR	Very low
MacGowan, 2009 [66] USA Cross-sectional study	Jails in four states n=550 000	Rapid HIV tests, confirmatory testing using EIA followed by Western blot or immunofluorescent assay (blood/ oral) Opt-in	Newly incarcerated inmates At entry (after 24 hours, in one jail after 72 hours, maximum timing NR)	6% rapid test 96% confirmatory test of positive rapid testers	1.3% positive rapid test 1.2% confirmed HIV positive 0.8% new HIV cases	NR	NR	99.9% received test result	NR	Very low

Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Effectiveness: Uptake	Effectiveness: Positivity rate	Effectiveness: Change in number or % tested	Effectiveness: Change prevalence /incidence	Effectiveness: Other	Treatment initiation	Level of evidence
			Advertising of rapid HIV tests, pretest counselling, active follow-up and referral for positive testers							
Shrestha, 2009 [67] USA Cross-sectional study	Jail facilities in four USA states n=NR (n=17 433 inmates tested)	OraQuick rapid HIV test Opt-in	Jail inmates At entry (timing NR) Counselling, not further specified, and active referral of positive testers	NR	Range four jails: 0.3-2.4% preliminary HIV positive 0.2-1.3% newly confirmed HIV cases	NR	NR	NR	NR	Very low
Strick, 2011 (included in review Rumble, 2015 [2]) USA Descriptive study	Washington State Department of Corrections - Opt-in: n=16 908 - Opt-out: n=5 168	Standard routine BBV testing with venous blood sampling: HIV Period of voluntary[1], opt-in and opt-out	Male inmates At entry (within 14 days) NR	Opt-in: 72%	Opt-in: 0.1% (new)	Increase from 5% (testing on request) to 72% (opt-in) to 90% acceptance (opt-out)	NR	100% of HIV-positive inmates received test result, NR for HIV-negative inmates	NR	Very low[3]
Watkins, 2009 (included in review Rumble, 2015 [2]) Australia Descriptive study	Australian prisons (not further specified) n=946	Standard routine BBV testing with venous blood sampling: HIV, HBV, HCV Opt-in	Male and female inmates At entry (within 28 days) NR	NR	0.6% (95% CI 0.2-1.5%)	NR	NR	NR	NR	Very low[3]
Beckwith, 2007 (included in review Rumble, 2015 [2]) USA Cross-sectional study	Rhode Island Department of Corrections n=100	Rapid routine BBV testing with dried blood spot test: HIV Opt-in	Male inmates At entry (timing NR) NR	95%[2]	0.0%	NR	NR	100% received test result	NR	Very low[3]
Liddicoat, 2006 (included in review Rumble, 2015 [2]) USA Before-after study	County jail Boston, MA n=2 886	Standard routine BBV testing with venous blood sampling: HIV Opt-in	Male and female inmates At entry (timing NR) NR	73%	0.3%	Increase from 18% to 73% compared to historical period when testing was on request	NR	NR	NR	Very low[3]
Cotten-Oldenberg, 1999 (included in review Rumble, 2015 [2]) USA	North Carolina Correctional Institution for Women n=680	Standard routine BBV testing with venous blood sampling: HIV Opt-in	Female inmates At entry (timing NR) NR	71%	2.5%	NR	NR	NR	NR	Very low[3]

Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Effectiveness: Uptake	Effectiveness: Positivity rate	Effectiveness: Change in number or % tested	Effectiveness: Change prevalence /incidence	Effectiveness: Other	Effectiveness: Treatment initiation	Level of evidence
Cross-sectional study										
Behrendt, 1994 (included in review Rumble, 2015 [2]) USA Cross-sectional study	Maryland prison n=2 791 (serosurvey: n=2 842)	Standard routine BBV testing with venous blood sampling: HIV Opt-in	Male and female inmates At entry (timing NR) NR	47%	5.4% (serosurvey: 7.2%)	NR	NR	Compared to the serosurvey, opt-in testing failed to detect 56% of HIV cases	NR	Very low[3]
Hoxie, 1990 (included in review Rumble, 2015 [2]) USA Cross-sectional study	Wisconsin (not further specified) 1987: n=1 783 1988: n=1 675	Standard routine BBV testing with venous blood sampling: HIV Opt-in	Male inmates At entry (timing NR) NR	1987: 40% 1988: 71%	1987: 0.8% (95% CI 0.17-1.53%) 1988: 0.6% (95% CI 0.15-1.03%)	NR	NR	Compared to the sero-survey, opt-in testing failed to detect 28% of HIV cases	NR	Very low[3]
Andrus, 1989 (included in review Rumble, 2015 [2]) USA Cross-sectional study	Oregon corrections system n=977	Standard BBV testing with venous blood sampling: HIV, HBV (HBcAb was used only as surrogate marker for a history of risk behaviour for HIV infection) Opt-in	Male and female inmates At entry (timing NR) NR	65%	0.9%	NR	NR	Compared to the serosurvey, opt-in testing failed to detect 50% of HIV cases	NR	Very low[3]
At release										
Simonsen, 2015 [72] USA Cross-sectional study	One jail facility n=507	OraQuick rapid HIV test, confirmatory test not specified Opt-in	Jail inmates At release (during discharge proceedings) Educational materials, pre- and post-test counselling, active referral of positive testers to community-based care	60%	0.3%	NR	NR	100% received test result	100% (n=1)	Very low

BBV=blood-borne virus, CI=confidence interval, EIA=enzyme immunoassay, ELISA=enzyme-linked immunosorbent assay, HBV=hepatitis B virus, HCV=hepatitis C virus, HIV=human immunodeficiency virus, NR=not reported, USA=United States of America

**Please note that the denominators for these acceptance rates are different from the other studies*

[1] Period of HIV testing provided only on request, if clinically indicated, or by court order (data not included in this table; positivity rate of 0.5%)

[2] The rate was calculated with the number of consenting participants as the baseline and therefore will overestimate the true acceptance rate

[3] This article was included in the review of Rumble et al., 2015, which has a very low level of evidence

Opt-in and client-/clinician-initiated

EU/EEA countries

No data

Other countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
At entry and during imprisonment										
Rosen, 2009 [68] USA Cross-sectional study	Eight intake prisons n=54 664	Conventional ELISA, Western blot confirmatory test Opt-in & client-/clinician-initiated	Newly incarcerated adult inmates At entry (opt-in, within 21 days) and during imprisonment Presentation on BBDs	At entry: 34% During imprisonment: 6% of those not tested at entry	NR	NR	NR	NR	NR	Very low
Kassira, 2001 [69] USA Surveillance study	27 correctional facilities in one state n=22 338	NR Opt-in & client-/clinician-initiated	All inmates At entry (opt-in, timing NR) and when symptoms warrant testing at clinics Counselling, not further specified	At entry: 39%	At entry: 3.3% Client-initiated: 12%	NR	NR	NR	NR	Very low

BBD=blood borne disease, ELISA=enzyme immunosorbent assay, NR=not reported, USA=United States of America

Opt-out

EU/EEA countries

No data

Other countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
At entry										
Spaulding, 2013 (included in review Rumble, 2015 [2]) USA Descriptive study	Fulton County Jail, Georgia n=39 073	Rapid routine BBV testing with oral testing: HIV Opt-out	Male and female inmates At entry (timing NR) NR	64%	0.4% (new)	Increase from 43% acceptance during opt-in testing to 64% under opt-out	NR	NR	NR	Very low[3]
Beckwith, 2012 (included in review Rumble, 2015 [2]) USA Descriptive study	Baltimore (Ba), Philadelphia (Ph), District of Colombia (DC) n=129 084: - Ba: n=72 000 - Ph: n=39 181 - DC: n=17 903	Rapid routine BBV testing with venous blood sampling (Ba) and oral testing (Ph, DC): HIV Opt-out	Inmates At entry (details varied between sites) NR	Ba: 22% Ph: 69% DC: 79%	Ba: 2.0 % Ph: 0.6% DC: 0.8%	NR	NR	NR	NR	Very low[3]

				Effectiveness						
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
Beckwith, 2011 (included in review Rumble, 2015 [2]) USA Descriptive study	Rhode Island Department of Corrections n=NR (n=1 364 test offers)	Rapid routine BBV testing with oral testing: HIV Opt-out	Male inmates At entry (within 24 hours) NR	98%[4]	0.1% (new)	NR	NR	100% of HIV-positive inmates received test result, 0% of HIV-negative inmates	NR	Very low[3]
Strick, 2011 (included in review Rumble, 2015 [2]) USA Descriptive study	Washington State Department of Corrections - Opt-in: n=16 908 - Opt-out: n=5 168	Standard routine BBV testing with venous blood sampling: HIV Period of voluntary[1], opt-in and opt-out	Male inmates At entry (within 14 days) NR	Opt-out: 90%	Opt-out: 0.1% (new)	Increase from 5% (testing on request) to 72% (opt-in) to 90% acceptance (opt-out)	NR	100% of HIV-positive inmates received test result, NR for HIV-negative inmates	NR	Very low[3]
Beckwith, 2010 (included in review Rumble, 2015 [2]) USA Descriptive study	Rhode Island Department of Corrections n=140 739	Standard routine BBV testing with venous blood sampling: HIV Opt-out	Male and female inmates At entry (within 24 hours) NR	NR	0.2% (new)	NR	NR	NR	NR	Very low[3]
Kavasery, 2009a (included in review Rumble, 2015 [2]) USA Prospective controlled trial	York Correctional Institution, Connecticut n=323: - Immediate: n=108 - Early: n=108 - Delayed: n=107	Rapid routine BBV testing with oral testing: HIV Opt-out	Female inmates At entry (3 arms: immediate, early, delayed)[2] NR	Immediate: 63% Early: 91% Delayed: 81%	0.0%	NR	NR	100% of HIV-positive inmates received test result, 99% of HIV-negative inmates	NR	Very low[3]
Kavasery, 2009b (included in review Rumble, 2015 [2]) USA Prospective controlled trial	New Haven Correctional Centre, Connecticut n=298: - Immediate: n=103 - Early: n=98 - Delayed: n=97	Rapid routine BBV testing with oral testing: HIV Opt-out	Male inmates At entry (3 arms: immediate, early, delayed)[2] NR	Immediate: 47% Early: 70% Delayed: 65%	0.8% (new)	NR	NR	100% of HIV-positive inmates received test result, NR for HIV-negative inmates	NR	Very low[3]

Ba=Baltimore, BBV=blood-borne virus, DC=District of Colombia, HBcAb=hepatitis B core antibody, HBV=hepatitis B virus, HCV=hepatitis C virus, HIV=human immunodeficiency virus, NR=not reported, Ph=Philadelphia, USA=United States of America
[1] Period of HIV testing provided only on request, if clinically indicated, or by court order (data not included in this table; positivity rate of 0.5%) [2] Immediate (during initial medical screen on night of admission); early (during a physical examination the following evening); delayed (7 days after arrival)[3] This article was included in the review of Rumble et al. 2015, which has a very low level of evidence
[4] Denominator is not the total number of inmates as in other studies, but inmates that were offered testing

Not specified

EU/EEA countries

No data

Other countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
Not specified										
Pearson, 2014 [74] USA Cluster-randomised trial	Two pairs of correctional facilities (no maximum security) n=3 300	NR NR	Admitted inmates NR Intervention Modified NIATx process improvement model* (staff receive HIV service training and are coached in the model)	Facility pair 1: 48% Facility pair 2: 53%	NR	Combined log OR acceptance rate: 0.16 (95% CI -0.24-0.57)	NR	NR	NR	Moderate
			Admitted inmates NR Control Staff only receive HIV service training	Facility pair 1: 49% Facility pair 2: 44%						
Ross, 2006 [75] USA Longitudinal study	Five randomly selected Project Wall Talk participating units vs. 5 matched non-participating units in one state n=590 peer educators and 2,506 student inmates (n=NR for non-participating units)	NR NR	Project Wall Talk: Peer educator inmates and student inmates NR Peer-education programme (intensive training for peer educators, ongoing HIV education sessions given by peer educators to inmates)	NR	NR	At 12-month follow-up: p=0.000; OR: 2.76, 95% CI 2.21-3.44** At 18-month follow-up: p=0.000; OR: 1.78, 95% CI 1.40-2.25**	NR	NR	NR	Low
			Control: Prison unit inmates NR NR							

CI=confidence interval, HIV=human immunodeficiency virus, NIATx=Network for the Improvement of Addiction Treatment, NR=not reported, OR=odds ratio, USA=United States of America
**NIATx approach: begins with walking through the service delivery to see it from the service recipient's point of view and to detect difficulties. Next, the teams use rapid plan-do-study-act cycles: identify specific problems and generate solutions (plan), try out new processes (do), measure and assess the outcomes (study), and implement the solution or make additional changes (act). Local change teams repeat the cycle for any other problems discovered.*
*** Number of HIV tests/daily census at 12 months: project = 2.08%, control = 0.77%, at 18 months: project = 1.36%, control = 0.69%. As the denominator is the daily census, rates are not comparable to other studies, and therefore not added to the acceptance column of the table above.*

COST-EFFECTIVENESS

EU/EEA countries

No data

Other countries

Four studies examined the cost-effectiveness of HIV active case finding in correctional facilities in the USA (Resch 2005 [79], moderate level of evidence; Varghese 2001 [80], low level of evidence; Spaulding 2015 [65] and Shrestha 2009 [67], very low level of evidence).

The first modelling study compared five HIV testing scenarios using ELISA and Western blot in one state's correctional facility for women from a state government perspective: 1) mandatory newborn active case finding directly after birth, 2) opt-in prenatal active case finding among pregnant inmates, 3) scenario 1 and 2 combined, 4) opt-out prenatal active case finding among pregnant inmates, and 5) scenario 1 and 4 combined. The results showed that mandatory newborn active case finding is cost-saving, and that this scenario combined with opt-out prenatal active case finding among pregnant inmates is cost-effective compared to the other three remaining scenarios.

In the second modelling study HIV counselling and opt-in testing at or near time of release was compared to a scenario where this was not offered. From a societal perspective, offering counselling and testing resulted in 4 fewer HIV cases and saved $563,834 compared to not offering counselling and HIV testing at or near time of prison release.

The last two studies were cross-sectional studies that estimated the cost per new HIV diagnosis of opt-in HIV testing offered at entry (timing not further specified). In the first of the two studies, HIV testing including pre- and post-test counselling resulted in an average cost per newly diagnosed HIV infection of $6 688, while this was estimated to be $2 451–$5 288 for the four project areas in the latter study (counselling included, but not further specified). The test method used was a rapid HIV test followed by Western blot confirmatory testing in the first study, and a rapid HIV test only in the latter study.

Grey literature

The uptake, positivity rate, effectiveness, treatment initiation and cost-effectiveness of HIV active case finding is summarised below. For further details on the outcomes and study-specific background information (e.g. setting, study population), see the evidence tables in a separate document ("Annex 2. Evidence tables systematic review active case finding in prison settings").

Uptake, positivity rate, effectiveness and treatment initiation

				Effectiveness						
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Type of document
At entry and during stay										
Prestileo T 2006 [64] Italy Retrospective, longitudinal study	3 western Sicily prisons Sample: 144 IDU inmates -141 males -3 females	NR Opt-in	IDU inmates At entry and during stay NR	NR	51/144 (35.4%) -30 (20.8%) HIV infected -19 (13.2%) HIV/HCV coinfection -2 (1.4%) HIV/HBV coinfection	NR	NR	NR	18/51 (35.2%)	Conference abstract
Marco A 2014 [62] Spain Prospective, observational study	2 prisons in Barcelona N=6,691	NR Opt-in	All inmates At entry and during stay NR	NR	68/6.691 (0.97%) -mean age 34 -55.4% foreigners -60% IDU -48.3% Late diagnosis (<350 CD4 mm3) -38.3% advanced infection (<200 CD4 mm3)	NR	NR	NR	NR	Conference abstract

Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Effectiveness: Uptake	Effectiveness: Positivity rate	Effectiveness: Change in number or % tested	Effectiveness: Change prevalence /incidence	Effectiveness: Other	Effectiveness: Treatment initiation	Type of document
Lugo RG 2012 [61] Spain Cross-sectional study	3 penitentiary institutions in Catalonia N=1 410	NR NR	All inmates At entry and during stay NR	NR	10.9 % overall -10.3% among males (majority between 25 and 39 years old) 17% among females (majority between 35 and 39 years old)	NR	NR	NR	NR	Conference abstract
Babudieri S 2015 [36] Italy Cross-sectional study	4 Italian prisons N=2 233	NR Opt-in	All inmates At entry and during stay NR	83.8%	87/2233 (3.9%)	NR	NR	NR	NR	Conference abstract
Babudieri S 2012 [35] Italy Cross-sectional study	20 Italian prisons N=4 072	NR Opt-in	All inmates At entry and during stay Peed educators and ID specialists	56.3%	5.6%	From 14.1% to 56.3%	NR	NR	NR	Conference abstract
Babudieri S 2008 [59] Germany, Italy Scotland, Spain, Ukraine Cross-sectional study	28 European prisons N=19 772	NR NR	All inmates At entry and during stay NR	12,560/19,772 (63.5%)	1,351/12,560 (10.8%) overall - 22.7% in IDU - 4.0% in foreigners -10.7% in men -11.1%% in women	NR	NR	NR	845/1,430 (59.1%)	Conference abstract
At entry										
Foschi A 2015 [39] Italy Cross-sectional study	Single prison in Italy N=711	Serology Opt-in	All detainees At entry NR	91.5%	15/468 (3.2%)	NR	NR	NR	NR	Conference abstract
Timing not specified										
Gallego C 2010 [60] Spain Cross-sectional study	Prisons in Catalonia N=10 857	NR NR	All inmates NR NR	82.5%	769 (9.9%)	NR	NR	NR	600/769 (78%)	Conference abstract
Monarca R 2002 [63] Italy Cross-sectional study	Single prison in Italy N=320	NR Opt-in	All inmates NR NR	NR	85/320 (26.56%)	NR	NR	NR	NR	Conference abstract

HBV= hepatitis B virus, HCV=hepatitis C virus, HIV=human immunodeficiency virus, ID=infectious diseases; IDU=injecting drug user, NR=not reported

COST-EFFECTIVENESS

No studies on cost-effectiveness have been found from the grey literature search.

Guidelines[2] HIV

Guidelines specific to the prison setting – supranational guidelines

WHO. Prison and health. 2014

"Healthcare providers should offer confidential HIV testing and counselling to all detainees during medical examinations, especially when people in prison ask for it and if the previous test was more than 12 months earlier. The test should be recommended to all people in prison with symptom markers of HIV infection, those with TB, and female people in prison who are pregnant."

Source: WHO. Prison and Health. 2014 (Type of guideline: practice-based; level of evidence: ++,-,0) [7]

UNODC, UNAIDS, WHO. HIV testing and counselling in prisons and other closed settings. 2009

"Efforts to scale up access to HIV testing and counselling in prisons should not be undertaken in isolation, but as part of a comprehensive HIV programme aimed at improving healthcare and at achieving universal access to HIV prevention"

"Prison systems should review and, if necessary, change prison policies and practices that discriminate against HIV-positive people in prison, recognizing that increasing access to HIV testing and counselling must go hand in hand with greater protection from HIV-related discrimination and abuse."

"WHO and UNODC do not support mandatory or compulsory HIV testing of people in prison on public health grounds. Therefore, countries should review and, if necessary, change their laws, regulations, policies and practices to prohibit mandatory or compulsory HIV testing of people in prison."

"Prison systems should ensure that all people in prison have easy access to client-initiated testing and counselling programmes on request and at any time during their imprisonment. People in prison should be informed about the availability of the service, both at the time of their admission and regularly thereafter".

"In order to ensure that people in prison can give informed consent, prison systems should adopt policies according to which people in prison will be offered or recommended HIV testing and counselling, but will not be tested unless they specifically state that they want the test."

"Prison systems should ensure that personnel performing HIV testing and counselling receive training, particularly on obtaining informed consent, confidentiality, counselling and how to offer or recommend the test."

"Prison systems, working with the national country-level monitoring and evaluation system, should carefully monitor and evaluate provision of testing and counselling in prison."

Source: United Nations Office on Drugs and Crime (UNODC), UNAIDS, WHO. HIV testing and counselling in prisons and other closed settings. 2009. (Type of guideline: evidence-based; level of evidence: ++,+,0) [83]

Guidelines specific to the prison setting - national guidelines

United Kingdom. Physical health of people in prison. 2016

According to the NICE, people in prison should receive the same standard of healthcare as those in the community. The draft guidelines on "Physical health of people in prison" to be officially released in November 2016, refer to HIV testing:

"Primary care providers should ensure annual HIV testing is part of the integrated healthcare offered to men who are known to have sex with men; Provide information on HIV testing and discuss why it is recommended (including to those who indicate that they may wish to decline the test); Conduct post-test discussions, including giving positive test results and delivering post-test and general health promotion interventions; Recognise illnesses that may signify primary HIV infection and clinical indicator diseases that often coexist with HIV."

[2] Relevant guidelines were critically appraised with a selection of criteria derived from the AGREE instrument (1. The overall objective/objectives of the guideline is/are specifically described; 2. Systematic/clear methods were used to search for evidence for compiling the data and/or clear data sources/references; 3. The recommendations are specific and unambiguous). The criteria were qualitatively scored using - - or -, 0, + or ++; no total quality score of summed + and – was calculated

Source: NICE. Physical health of people in prison, draft document 2016. Available at: https://www.nice.org.uk/guidance/indevelopment/gid-cgwave0729/documents (Type of guideline: evidence-based; level of evidence: ++,++,++) [57]

United Kingdom. Opt-out BBV test algorithm. 2014

Opt-out testing for blood-borne viruses (BBVs) was identified as a joint developmental priority in the National Partnership Agreement between Public Health England (PHE), NHS England and National Offender Management Service (NOMS) in October 2013. Several documents have been developed to guide and monitor the implementation of the opt-out strategy in UK prisons.

"Opt-out blood-borne virus test algorithm guidance notes

During induction provide basic information about:

- BBV risks, transmission and treatment
- HBV vaccination
- HBV/HCV/HIV testing and treatment services
- policy on access to condoms and disinfectant tablets

Recommend all eligible patients a test for HIV, hepatitis B and hepatitis C (HCV antibody, HBsAg and HIV Ab and Ag P24 test) within 72 hours of arrival using dry blood spot testing (DBST) or venous sampling. People in prison who refuse a test should be re-offered throughout their stay at regular intervals. Testing should be a 'continuous offer' and be re-offered at all available opportunities, for example at hepatitis B vaccination appointments and treatment reviews with the substance misuse service to look at both clinical and psychosocial support requirements.

Source: Public Health England. Opt-out BBV test algorithm, May 2014 (Type of guideline: practice-based; level of evidence: --,--,+) [56]

United Kingdom. Tackling BBVs in prisons. 2011

In 2011 the UK Department of Health and the National AIDS Trust have developed a document for best practice on BBV prevention and care in the prison setting. "The prisoner pathway" includes different approaches to BBV testing, prevention and treatment according to custody period. For those with custody period <one week only information about BBV transmission and healthcare services should be provided whereas for those staying more than one week BBV testing should be offered.

Source: UK Department of Health, National AIDS Trust. Tackling BBVs in prisons. 2011 (Type of guideline practice-based; level of evidence +,-,+) [55]

Other guidelines – supranational guidelines

WHO. Consolidated guidelines on HIV testing services.2015

"In prisons and other closed settings, offering voluntary HIV testing as part of a package of care is a critical approach. HIV testing using RDTs [rapid diagnostic tests] could improve uptake of HTS and increase the speed with which clients receive test results and learn their HIV status. Particular attention should go to providing accurate information, obtaining informed consent and maintaining confidentiality. Also, there are often major challenges to continuity of care within closed settings and between prisons and the community; these need to be addressed. Retesting at least annually is recommended for all people from key populations. More frequent voluntary retesting may be beneficial, depending on risk behaviours."

Source: WHO (2015). Consolidated guidelines on HIV testing services 2015. Available at: http://who.int/hiv/pub/guidelines/hiv-testing-services/en/ (Type of guidelines: evidence-based; level of evidence: ++,+,++) [85]

WHO. Consolidated guidelines on HIV prevention, diagnosis, treatment and care for key populations.2014

"HIV testing services should be routinely offered to all key populations in the community, in closed settings such as prisons and in facility-based settings."

Source: WHO (2014). Consolidated guidelines on HIV prevention, diagnosis, treatment and care for key populations. Available at: http://www.who.int/hiv/pub/guidelines/keypopulations/en/ (Type of guideline: evidence-based; level of evidence: ++,+,++) [84]

Appendix 10. Summary tables and guideline summaries – STI

Chlamydia and gonorrhoea

Peer-reviewed literature

The uptake, positivity rate, effectiveness, treatment initiation and cost-effectiveness of chlamydia and gonorrhoea active case finding is summarised below. For further details on the outcomes and study-specific background information (e.g. setting, study population), see the evidence tables in a separate document ("Annex 2. Evidence tables systematic review active case finding in prison settings").

Uptake, positivity rate, effectiveness and treatment initiation

These articles are summarised in tables below, organised by testing policy (opt-in versus opt-out, opt-in, opt-out, or not specified).

Opt-in versus opt-out

EU/EEA countries

No data

Other countries

					Effectiveness					
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
Opt-in during imprisonment, opt-out at entry										
Shaikh, 2015 [94] USA Cross-sectional study	One jail facility n=2 261 new inmates within 1 week and all inmates residing in housing units (n=NR)	DNA amplification probe protocol (urine) Opt-in	All inmates Weekly/bi-weekly education, followed by testing opportunity Education on STIs	NR	Chlamydia: 5.6% Gonorrhoea: 0.9%	Opt-in vs. opt-out: - Chlamydia: p=0.006 - Gonorrhoea: p=ns	NR	NR	NR	Low
		DNA amplification probe protocol (urine) Opt-out	All inmates At entry (timing NR) NR	NR	Chlamydia: 9.7% Gonorrhoea: 1.3%					

DNA=deoxyribo nucleic acid, NR=not reported, ns=not significant, STI=sexually transmitted infection, USA=United States of America

Opt-in

EU/EEA countries

No data

Other countries

<table>
<tr><th colspan="10">Effectiveness</th></tr>
<tr><th>Reference, country, study design</th><th>Prison setting, sample</th><th>Testing method, offer</th><th>Who, when, promotion</th><th>Uptake</th><th>Positivity rate</th><th>Change in number or % tested</th><th>Change prevalence /incidence</th><th>Other</th><th>Treatment initiation</th><th>Level of evidence</th></tr>
<tr><td colspan="11">Opt-in at entry versus client-initiated</td></tr>
<tr><td rowspan="2">Franklin, 2012 [88]

USA

Cross-sectional study</td><td rowspan="2">Jail system with 11 facilities (pre-trial and <1 year sentence)

n=2,417</td><td>At entry: NAAT combination assay (urine)

Opt-in</td><td>All newly incarcerated males who completed medical intake

At entry (within 24 hours)

STI clinic brochures, instruction to follow-up at clinic, letter of aftercare mailed to residential address</td><td>100%</td><td>6.4% chlamydia
0.9% gonorrhoea</td><td rowspan="2">NR</td><td rowspan="2">NR</td><td rowspan="2">Sensitivity, specificity, and positive predictive value for positivity:
- Urethral symptoms: 2.5% (95% CI 0.8-6.7), 98.4% (95% CI 97.7-98.8), and 10.3% (95% CI 3.3-25.1), respectively
- LET: 10.5% (95% CI 6.4-16.5), 97.5% (95% CI 96.7-98.1), and 23.0% (95% CI 14.3-34.5), respectively</td><td rowspan="2">63% prior to jail release</td><td rowspan="2">Very low</td></tr>
<tr><td>Client-initiated: Laboratory urinalysis STI-specific testing (urethral swab)

Client-initiated</td><td>All male inmates

Based on self-reported symptoms or signs, or urine dipstick testing (including LET)

NR</td><td>NR</td><td>NR</td></tr>
<tr><td rowspan="2">Broad, 2009 [92]

USA

Before-after study</td><td rowspan="2">One county jail (pre-detention)

n=NR</td><td>NAAT (urethral/cervical swab)

Opt-in</td><td>Universal program: All inmates

All: at intake (timing NR)

NR</td><td rowspan="2">NR</td><td rowspan="2">NR</td><td rowspan="2">NR</td><td rowspan="2">Change reported cases after discontinuation of the universal program:
Chlamydia:<table><tr><td></td><td>Jail</td><td>Chicago</td></tr><tr><td>All</td><td>-82.3</td><td>-9.3</td></tr><tr><td>M</td><td>-91.7</td><td>-33.3</td></tr><tr><td>F</td><td>-20.3</td><td>2.5</td></tr></table>Gonorrhoea:<table><tr><td></td><td>Jail</td><td>Chicago</td></tr><tr><td>All</td><td>-70.9</td><td>-12.9</td></tr><tr><td>M</td><td>-90.5</td><td>-19.5</td></tr><tr><td>F</td><td>5.5</td><td>-5.6</td></tr></table></td><td rowspan="2">NR</td><td rowspan="2">NR</td><td rowspan="2">Very low</td></tr>
<tr><td>NAAT (urethral/cervical swab)

Client-initiated</td><td>Discontinuation program: All inmates

Males: symptom-based; females: universal at intake (timing NR)

NR</td></tr>
<tr><td colspan="11">Opt-in at entry</td></tr>
<tr><td>Mertz, 2002 [89]

USA

Cross-sectional study</td><td>2 county jails, 1 city jail, 1 detention centre

n=NR (recruited inmates: County jail 1 n= 2 205 and county jail 2 & city jail n= 1 819; inmates gave</td><td>LCx assay (urine)

Opt-in</td><td>Women entering one of four jails

At intake (county jail 1 within 8 hours, county jail 2 and city jail at median 2 days after intake, detention centre at median 11 days after booking)</td><td>County jail 1: 90.7%
County jail 2 and city jail: 85.1%
Detention centre: 100%</td><td>Only stratified by age and ethnicity, see evidence tables</td><td>NR</td><td>NR</td><td>NR</td><td>County jail 1: 61%
County jail 2 & city jail: 85%
Detention centre: 76.8%</td><td>Very low</td></tr>
</table>

	consent: detention centre n=1 931)		Active referral for treatment when released before knowing results							
Arriola, 2001 [71] USA Cross-sectional study	Two adult county jails n=NR	NR Opt-in	All inmates At intake (timing NR) Disease education, post-test counselling	NR	Chlamydia: 6.5% Gonorrhoea: 3.1%	NR	NR	NR	Chlamydia: 79% Gonorrhoea: 66%	Very low
Opt-in during imprisonment										
Brown, 2014 [90] USA Case-control study	One metropolitan jail (sentenced, awaiting trial, immigration violators) n=NR (n=394 tested)	PCR and DNA probe protocol (urine) Opt-in	All inmates During imprisonment Education on STIs before choice to test, post-test counselling	NR	Chlamydia: 5.3% Gonorrhoea: 0.8%	NR	NR	NR	NR	Low
Newman, 2003 [98] USA Survey study	One main federal prison n=800	Urine vs. vaginal swab specimens Opt-in	All incarcerated women At a "call out" (routinely used system to gather inmates in groups of 30) NR	- 82.1%, of which: - 97% both specimens - 1.5% swab only - 1.9% urine only	NR	NR	NR	NR	NR	Very low
Opt-in at release										
Sieck, 2011 [32] USA Cross-sectional study	A male prison housing minimum, medium, close, and maximum security inmates n=916	Genital swab test, not further specified* Opt-in	All inmates scheduled for release At release (4-6 weeks before the scheduled release day) Letter describing STD testing process	37.6%*	Chlamydia: 0.6% Gonorrhoea: 0.0%*	NR	NR	NR	NR	Very low

DNA= deoxyribo nucleic acid, LCx=ligase chain reaction, LET=leukocyte esterase test, NAAT=nucleic acid amplification technology, NR=not reported, PCR=polymerase chain reaction, STD=sexually transmitted disease, STI=sexually transmitted infection, USA=United States of America
**An opt-in physical examination for herpes simplex virus and human papillomavirus was also offered; 44.7% of inmates accepted the physical exam, 2.2% were found to be infected with human papillomavirus, none with herpes simplex virus*

Opt-out

EU/EEA countries

No data

Other countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
Opt-out at entry versus client-initiated										
Cole, 2014 [91] USA Before-after study	One county jail n=17 065	NAAT (urine) Opt-out	All female inmates At entry (timing NR) NR	78.1% 28.3% opted out in 1st year, 16.8% in 2nd year	Gonorrhoea: 2.5% Chlamydia: 7.6%	Mean tests per month: 155 client-initiated vs. 455 opt-out (similar jail census during both periods, p not given)	Mean diagnoses per month: 9.3 client-initiated vs. 40.8 opt-out (similar jail census during both periods, p not given)	Acceptance 68% during first and 45% during last 3 months of year 2 (p<0.001)	69.5% (treatment rates remained constant during opt-in period)	Low
		NAAT (urine) Client-initiated	All female inmates When inmates request it, or when reported symptoms/risk factors NR	NR	NR			NR	NR	

NAAT=nucleic acid amplification technology, NR=not reported, USA=United States of America

Not specified

EU/EEA countries

No data

Other countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
At entry versus client-initiated										
Pathela, 2009 [93] USA Before-after study	Six adult jails n=NR	Active case finding program: Dual NAAT (urine) NR	All incarcerated men aged ≤35 years At entry (within 72 hours) NR	NR	NR	NR	In jails: - Chlamydia: +1636% - Gonorrhoea: +885% City-wide: - Chlamydia: +59% - Gonorrhoea: +4%	NR	NR	Very low
		Before program: Diagnostic testing, not further specified Client-initiated	All incarcerated men When reporting complaints NR							

NAAT=nucleic acid amplification technology, NR=not reported, USA=United States of America

COST-EFFECTIVENESS

EU/EEA countries

No data

Other countries

Three cost-effectiveness studies examined the cost-effectiveness of active case finding for chlamydia and gonorrhoea in correctional facilities in the USA (Gift 2006 [95], Gopalappa 2013 [96], Kraut-Becher 2004 [97], all low level of evidence).

The first (Gift 2006) compared four different active case finding scenarios (testing policy NR) among male inmates in a medium-security correctional facility: 1) screening all inmates at intake (day of incarceration), 2) screening all inmates <25 years at intake (day of incarceration), client-initiated testing for those ≥25 years, 3) screening all inmates <30 years at intake (day of incarceration), client-initiated testing for those ≥30 years, and 4) client-initiated only. An LCR assay was used for chlamydia testing, and a DNA probe test (urethral swab) for gonorrhoea testing. The results indicated that an age-based active case finding program for men restricted to those <30 years of age is nearly as effective as universal active case finding and is substantially less costly than universal active case finding, from both the healthcare and the prison perspective.

In the second modelling study (Gopalappa 2013) five active case finding scenarios (testing policy NR) are investigated among 100,000 males entering a county jail each year: 1) client-initiated, 2) screening all inmates 8-14 days after entry, 3) screening inmates ≤35 years between 8-14 days after entry, 4) screening all inmates 2-3 days after entry, 5) screening inmates ≤35 years between 2-3 days after entry, all scenarios using a urine-based combination assay. The authors concluded that active case finding among male inmates ≤35 years on days 2-3 of entry to jail has the least cost per infection averted compared with symptom-based testing, from the perspective of correctional health services and the county department of public health.

The last cost-effectiveness study (Kraut-Becher 2004) compared among 10,000 jail inmates universal active case finding at intake (timing NR) for chlamydia and gonorrhoea, universal active case finding at intake for chlamydia only, and no active case finding. NAAT was used a testing method for both STIs, the cost-effectiveness was investigated from the healthcare perspective. The authors concluded that universal active case finding for chlamydia only is cost-saving for female detainees, while for males this is less clear.

Grey literature

The uptake, positivity rate, effectiveness, treatment initiation and cost-effectiveness of chlamydia and gonorrhoea active case finding is summarised below. For further details on the outcomes and study-specific background information (e.g. setting, study population), see the evidence tables in a separate document ("Annex 2. Evidence tables systematic review active case finding in prison settings").

Uptake, positivity rate, effectiveness and treatment initiation

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Type of document
During imprisonment										
Lopez-Corbeto E 2012 [87] Spain Cross-sectional study	3 prisons in Barcelona N=430 young inmates	Urine sample for Chlamydia trachomatis (CT) NR	All inmates During imprisonment NR	NR	- 39/430 (11%) -7 Spaniards -32 foreigners	NR	NR	-No use of condom in 70% of cases - Prison entry <1 year associated with OR 4.15 (CI 95%, 1.54-11.2) of CT diagnosis	NR	Conference abstract
Torrez E 2010 [86] Spain Cross-sectional study	1 youth prison in Barcelona N=430	Urine sample for Chlamydia tracomatis (CT) And Neisseria gonorrhoea (NG) By PCR NR	Young (<25 years old) inmates During imprisonment NR	418/425 (98.4%)	CT = 20(6%) NG= 1 (0.2%)	NR	NR	All CT cases were asymptomatic	NR	Conference abstract

CI=confidence interval, CT= Chlamydia trachomatis, NG= Neisseria gonorrhoea, NR=not reported, OR=odds ratio
**The following grey literature sources can be identified (by order of quality – highest first): 1) conference abstracts and unpublished research, 2) guidelines, 3) case studies/service models*

COST-EFFECTIVENESS

No studies on cost-effectiveness have been found from the grey literature search.

Syphilis

Peer-reviewed literature

The uptake, positivity rate, effectiveness, treatment initiation and cost-effectiveness of syphilis active case finding is summarised below. For further details on the outcomes and study-specific background information (e.g. setting, study population), see the evidence tables in a separate document ("Annex 2. Evidence tables systematic review active case finding in prison settings").

Uptake, positivity rate, effectiveness and treatment initiation

These articles are summarised in tables below, organised by testing policy (mandatory, opt-in, opt-out, or not specified).

Mandatory

EU/EEA countries

No data

Other countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
At release										
Sieck, 2011 [32] USA Cross-sectional study	A male prison housing minimum, medium, close, and maximum security inmates n=916	Blood test, not further specified Mandatory	All inmates scheduled for release At release (4-6 weeks before the scheduled release day) Letter describing STD testing process	NA	0.1%	NR	NR	NR	NR	Very low

NA=not applicable, NR=not reported, STD=sexually transmitted disease, USA=United States of America

Opt-in

EU/EEA countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
During imprisonment										
Sagnelli, 2012 [34] Italy Cross-sectional study	Six penitentiaries n=3 468	TPHA, confirmed with FTA-ABS or VDRL tests Opt-in	All inmates During imprisonment Presentation on advantages of screening by peer-educators, pamphlets on importance of screening	55.7%	2.1%	Higher acceptance than in the nine correctional facilities evaluated in this study before peer-education (10.0%)	NR	NR	NR	Very low

FTA-ABS= fluorescent treponemal antibody absorbed, NR=not reported, TPHA=Treponema pallidum hemagglutination assay, VDRL=Venereal Disease Research Laboratory

Other countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
At entry										
Kahn, 2002 [99] USA Cross-sectional study	One jail (awaiting trial or sentence <1 year) n=50 941	RPR (blood), MHA-TP confirmatory test Opt-in	All inmates entering jail At entry (within 24 hours) NR	76%	6% confirmed syphilis 1.3% diagnosed untreated syphilis	NR	*From start to 4 years later:* Untreated syphilis in jail: -64% Early syphilis in jail: -68% Early syphilis in community: -79%	NR	NR	Very low
Arriola, 2001 [71] USA Cross-sectional study	One adult county jail n=NR	NR Opt-in	Inmates At intake (3 days after admission) Disease education, post-test counselling	NR	2.0%	NR	NR	NR	100%	Very low

MHA-TP=microhemagglutination for Treponema pallidum, NR=not reported, RPR=rapid plasma reagin, USA=United States of America

Opt-out

No studies were found that reported on opt-out syphilis testing in correctional facilities.

Not specified

EU/EEA countries

No data

Other countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
At entry										
Silberstein, 2000 [100] USA Cross-sectional study	One jail (awaiting trial or sentence <1 year) n=26,829	RPR (blood), MHA-TP confirmatory test NR	All inmates entering jail At entry (within 24 hours) NR	69%	1.4% confirmed syphilis	NR	Prevalence syphilis from year 1 to 2: -35%	Estimated 6.42 total case-equivalents of congenital and 43.74 total case-equivalents of late/ neurosyphilis were prevented	56.7%	Very low
Heimberger, 1993 [101] USA Cross-sectional study	One jail (awaiting trial or sentence <1 year) n=12,685	ART (blood), FTA-ABS confirmatory test NR	All inmates entering jail At entry (within 24 hours) NR	77%	2.6% confirmed syphilis 1.6% newly diagnosed syphilis	NR	NR	NR	83.5%	Very low

ART=automated reagin test, FTA-ABS=fluorescent treponemal antibody absorbed, MHA-TP=microhemagglutination for Treponema pallidum, NR=not reported, RPR=rapid plasma reagin, USA=United States of America

COST-EFFECTIVENESS

EU/EEA countries

No data

Other countries

One cross-sectional study (Silberstein 2000 [100], very low level of evidence) from the USA reported the cost-effectiveness of syphilis active case finding at entry within 24 hours (test offer NR), using rapid plasma reagin (blood) and the FTA-ABS confirmatory test. The authors concluded that the active case finding is cost-effective, with a net benefit of $1,473,084 and a cost-benefit ratio of 9.14:1.

Grey literature

The uptake, positivity rate, effectiveness, treatment initiation and cost-effectiveness of syphilis active case finding is summarised below. For further details on the outcomes and study-specific background information (e.g. setting, study population), see the evidence tables in a separate document ("Annex 2. Evidence tables systematic review active case finding in prison settings").

Uptake, positivity rate, effectiveness and treatment initiation

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Type of document
During imprisonment										
Babudieri S 2012 [35] Italy Cross-sectional study	20 Italian prisons N=4 072	Test for syphilis (ELISA) -TPHA and VDRL offered to positive patients at screening NR	All people in prison During imprisonment NR	56.3%	- 2.3% ELISA Of ELISA screening positive cases: TPHA+, FTA-abs positive (85.7%)	NR	NR	NR	NR	Conference abstract
Foschi A 2015 [39] Italy Cross-sectional study	Single prison in Italy (Opera prison, Milan) N=711	Syphilis Serology Opt-in	All newly incarcerated people in prison At entry Pre-emptive counselling	511/711 (71.8%) reached for screening 468/511 (91.5%) accepted to be screened	17/468 (3.6%)	NR	NR	NR	NR	Conference abstract

CI=confidence interval, ELISA=enzyme-linked immuosorbent assay, NR=not reported, OR=odds ratio, TPHA=Treponema pallidum hemagglutination assay, VDRL=Venereal Disease Research Laboratory

COST-EFFECTIVENESS

No studies on cost-effectiveness have been found from the grey literature search.

Trichomoniasis

Peer-reviewed literature

The uptake, positivity rate, effectiveness, treatment initiation and cost-effectiveness of trichomoniasis active case finding is summarised below. For further details on the outcomes and study-specific background information (e.g. setting, study population), see the evidence tables in a separate document ("Annex 2. Evidence tables systematic review active case finding in prison settings").

Uptake, positivity rate, effectiveness and treatment initiation

Opt-in

EU/EEA countries

No data

Other countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
Opt-in at entry versus client-initiated										
Roth, 2011 [102] USA Before-after study	One privately operating minimum security facility Universal: n=471 Client-initiated: n=362	Universal: PCR Opt-in	All incarcerated women At entry (timing NR) NR	NR	44%	NR	NR	NR	NR	Very low
		Client-initiated: PCR Client-initiated	Incarcerated women with symptoms At entry (timing NR) NR	NR	14%					
Opt-in at release										
Sieck, 2011 [32] USA Cross-sectional study	A male prison housing minimum, medium, close, and maximum security inmates n=916	Genital swab test, not further specified Opt-in	All inmates scheduled for release At release (4-6 weeks before the scheduled release day) Letter describing STD testing process	37.6%	5.5%	NR	NR	NR	NR	Very low

NR=not reported, PCR=polymerase chain reaction, STD=sexually transmitted disease, USA=United States of America

Opt-out

No studies were found that reported on opt-out trichomoniasis testing in correctional facilities.

COST-EFFECTIVENESS

No studies were found that reported on the cost-effectiveness of trichomoniasis active case finding in correctional facilities.

Grey literature

No grey literature documents on trichomoniasis have been collected.

Guidelines[2] all STIs

No guidelines were found specifically on trichomoniasis.

Guidelines specific to prison setting - supranational guidelines

WHO. Prison and Health. 2014.

"Apart from screening for HIV, HBV and HCV, voluntary screening for other STIs (chlamydia, gonorrhoea, syphilis) should be offered to all people in prison with risky behaviour."

Source: WHO. Prison and Health. 2014 (Type of guideline: practice-based; level of evidence: ++,-,0) [7]

Other guidelines - supranational guidelines

Where retrieved prison specific guidelines were scarce or none, and in agreement with the Expert panel, guidelines addressing the general population were considered. Among those, supranational guidelines were preferred.

[2] Relevant guidelines were critically appraised with a selection of criteria derived from the AGREE instrument (1. The overall objective/objectives of the guideline is/are specifically described; 2. Systematic/clear methods were used to search for evidence for compiling the data and/or clear data sources/references; 3. The recommendations are specific and unambiguous). The criteria were qualitatively scored using - - or -, 0, + or ++; no total quality score of summed + and – was calculated

European guideline on the management of Chlamydia trachomatis infections. 2015

"Indications for laboratory testing (Level of evidence IV; Grade C recommendation)

- Risk factor(s) for C. trachomatis infection and/or other STI (age<25 years, new sexual contact in the last year, more than one partner in the last year);
- Symptoms or signs of urethritis in men;
- Cervical or vaginal discharge with risk factor for STI;
- Acute epididymo-orchitis in a male aged <40 years or with risk factors for STI;
- Acute pelvic pain and/or symptoms or signs of PID;
- Proctitis/proctocolitis according to risk;
- Purulent conjunctivitis in a neonate or adult;
- Atypical neonatal pneumonia;
- Persons diagnosed with other STI;
- Sexual contact of persons with an STI or PID;
- Termination of pregnancy;
- Any intrauterine interventions or manipulations."

Source: Lanjouw E, Ouburg S, de Vries HJ, Stary A, Radcliffe K, Unemo M. 2015 European guideline on the management of Chlamydia trachomatis infections. Int J STD AIDS. 2016r;27(5):333-48 (Type of guideline: evidence based; level of evidence: 0,+,+) [103]

European Guideline on the Diagnosis and Treatment of Gonorrhoea in Adults. 2012

"Indications for testing (Level of evidence IV; Grade C recommendation)]

- Symptoms or signs of urethral discharge in men;
- Vaginal discharge with risk factor for STI (age <30 years, new sexual partner);
- Mucopurulent cervicitis;
- Persons diagnosed with any other STI;
- Sexual partner of persons with an STI or PID;
- Acute epididymo-orchitis in a male aged <40 years;
- Acute pelvic inflammatory disease;
- When screening young adults (<25 years of age) for sexually transmitted infection;
- When screening individuals with new or multiple recent sexual partners;
- Purulent conjunctivitis in a neonate or adult;
- Mother of a newborn with ophthalmia neonatorum.

Source: Bignell C, Unemo M. European Guideline on the Diagnosis and Treatment of Gonorrhoea in Adults. 2012 (Type of guideline: evidence-based; level of evidence: 0,+,+) [26]

European guideline on the management of syphilis. 2014

European guidelines for the general population, regarding case finding of syphilis, recommend:

"Routine tests for syphilis should be taken in all pregnant women, people donating blood, blood products or solid organs and the following groups at higher risk of syphilis: all patients who are newly diagnosed with STI; persons with HIV; patients with hepatitis B; patients with hepatitis C; patients suspected of early neurosyphilis (i.e. unexplained sudden visual loss, unexplained sudden deafness or meningitis); patients who engage in sexual behaviour that puts them at higher risk (e.g. men who have sex with men (MSM), sex workers and all those individuals at higher risk of acquiring STIs). Screening tests should also be offered to all attendees at dermatovenereology/genitourinary medicine (GUM)/STI clinics."

Source: Unemo M, Janier M. The 2014 European guideline on the management of syphilis has now been published. Euro Surveill. 2014 Nov 13;19(45):20957 (Type of guideline: evidence-based; level of evidence: 0,+,++) [104]

United States. STD Treatment Guidelines. 2015

"Women ≤35 and men <30 years in correctional facilities should be screened for chlamydia and gonorrhea. Chlamydia and gonorrhea screening should be conducted at intake".

"Universal screening for syphilis should be conducted on the basis of the local area and institutional prevalence of early (primary, secondary, and early latent) infectious syphilis. Correctional facilities should stay apprised of syphilis prevalence as it changes over time".

Source: CDC. STD Treatment Guidelines. 2015 (Type of guideline: evidence-based; level of evidence: +,+,+) [105]Appendix 11: Summary tables and guideline summaries – TB

Active TB

Peer-reviewed literature

The uptake, positivity rate, effectiveness, treatment initiation and cost-effectiveness of active TB active case finding are summarised below. Some articles reporting data for both active TB and LTBI are captured under both sections. For further details on the outcomes and study-specific background information (e.g. setting, study population), see the evidence tables in a separate document ("Annex 2. Evidence tables systematic review active case finding in prison settings").

Uptake, positivity rate, effectiveness and treatment initiation

EU/EEA countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
At entry and during imprisonment										
Martin, 2001 [106] Spain Longitudinal study	One prison n=3 081	TST, followed by CXR and sputum examination NR	Inmates entering prison At entry (timing NR), and annually when not ill, or twice-yearly radiograph if necessary NR	At entry: 82.5% TST	At entry: 0.24% During imprisonment : 2.2% (6.39/ 1000/year)	NR	NR	Inmates who did not submit to LTBI therapy showed greater probability of developing TB (adjusted RR 8.32, 95% CI 1.1-63.5, p= 0.04) compared to those submitting to LTBI therapy	NR	Very low

CI=confidence interval, CXR=chest x-ray, LTBI=latent tuberculosis infection, NR=not reported, RR=relative risk, TB=tuberculosis, TST=tuberculin skin test

Other countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
At entry										
Ritter, 2012 [110] Switzerland Cross-sectional study	Largest remand prison n=4 890	TST, followed by CXR and culture test Opt-in	Inmates entering prison At entry (within 7 days of admission) NR	77.3% TST 67.1% CXR of TST-positives	46.9% TST-positive 2.3% confirmed TB	NR	NR	NR	NR	Very low
Saunders, 2001 [113] USA Surveillance study	One federal detention centre n=NR	January-May 1998 TST, and routine screening of symptoms, followed by radiography and culture test NR	Inmates entering detention centre At entry (TST within 48 hours of admission) NR	NR	NR	NR	Eightfold increase in isolations for suspected pulmonary TB in June-December 1998 compared to January-May 1998 (from 8 to 64)	Time to isolation of suspected TB cases decreased in June-December 1998 compared to January May 1998 (from 96 to ≤24	NR	Very low

Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Effectiveness: Uptake	Effectiveness: Positivity rate	Effectiveness: Change in number or % tested	Effectiveness: Change prevalence /incidence	Effectiveness: Other	Effectiveness: Treatment initiation	Level of evidence
		June-December 1998 CXR in addition to screening above NR	Inmates entering detention centre At intake (CXR directly at intake) NR	NR (91% of inmates screened with CXR also had TST reading)	40% TST-positive			hours from time of admission)		
Puisis, 1996 [114] USA Before-after study	One county jail -1991-1992: n=62,281 -1992-1994: n=NR (n=126 608 screened)	March 1991-February 1992 TST, followed by CXR and culture test NR	Inmates entering jail At intake (timing NR) NR	75% TST	11.6% TST-positive 0.06% confirmed TB	NR	NR	NR	NR	Very low
		March 1992-February 1994 Miniature CXR only, followed by culture test NR		NR	0.3% suspicious radiographs 0.05% confirmed TB (0.03% newly diagnosed TB)					
During imprisonment										
Kiter, 2003 [111] Turkey Longitudinal study	One district prison n=NR	Miniature CXR, followed by standard CXR and culture test Opt-in	Prison inmates Yearly during imprisonment Informed about TB and its control, reluctant people in prison are encouraged by other inmates/staff	99.8%	3.2% abnormal miniature CXR and/or symptoms 0.4% confirmed TB (of which 72.7% newly diagnosed)	NR	NR	NR	100%	Very low
Timing not specified										
Miller, 2006 [112] USA Cross-sectional study	County jail facilities n=22 920	TST, followed by additional evaluation (not further specified) Mandatory	Jail inmates NR NR	NA	1.3% TST-positive 0.03% confirmed TB	NR	NR	NR	100%	Very low

ACF=acid-fast bacilli, CXR=chest x-ray, NA=not applicable, NR=not reported, TB=tuberculosis, TST=tuberculin skin test

COST-EFFECTIVENESS

EU/EEA countries

One study was found that reported on the cost-effectiveness of TB active case finding in correctional facilities. This study (Winetsky 2012 [115], moderate level of evidence) was conducted in Latvia. From the perspective of the healthcare system, eight scenarios were compared: 1) no active case finding, 2) mass miniature radiography (MMR) screening, 3) symptom screening, 4) sputum PCR screening, 5) combined MMR and symptom screening, 6) combined MMR screening and sputum PCR screening (the latter for rapid MDR-TB detection), 7) combined symptom screening and sputum PCR screening (the latter for rapid MDR-TB detection), 8) combined MMR screening, symptom screening, and PCR screening (the latter for rapid MDR-TB detection). The authors concluded that annual screening of the general inmate population with sputum PCR was the most cost-effective. Adding sputum PCR to the currently used strategy of annual MMR screening was cost-saving compared to MMR screening

alone, but resulted only in minor reductions in (MDR-)TB prevalence. Symptom-based strategies were less effective and more expensive than MMR-based strategies.

Other countries

Two studies from the USA reported on the cost-effectiveness of TB active case finding in correctional facilities. The first study (Jones 2001 [116], low level of evidence) was a cost-effectiveness study comparing three active case finding scenarios on admission to jail: 1) routine miniature chest radiography, 2) TST, and 3) symptom-based. Screening for active TB with miniature chest radiography seemed to be more sensitive and more cost-effective than screening with either TST or based on symptoms. The second study (Miller 2006 [112], very low level of evidence) was a cross-sectional study reporting on a state-law mandated TB screening program in jail that also economically evaluated this program. The cost per TB case prevented was $34,761, and per TB and LTBI case diagnosed it was $35,035 and $1,163, respectively.

Grey literature

The uptake, positivity rate, effectiveness, treatment initiation and cost-effectiveness of active TB active case finding are summarised below. For further details on the outcomes and study-specific background information (e.g. setting, study population), see the evidence tables in a separate document ("Annex 2. Evidence tables systematic review active case finding in prison settings").

Uptake, positivity rate, effectiveness and treatment initiation

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Type of document
At entry and during imprisonment										
Andreev V, 2011 [107] Bulgaria Prospective study	One prison n=600	Symptom questionnaire, bacteriology and chest radiography NR	Inmates, not further specified At entry and during imprisonment NR	NR	2/600 (0.3%)	NR	NR	NR	100%	Conference abstract
At entry										
Bös L, 2011 [108] Germany Retrospective study	Prison Hospital in Berlin All people in prison (n=NR)	Chest X-ray Opt-in	Inmates, not further specified At entry NR	100%	62 cases of active TB	NR	NR	The affected people in prison were mainly male (93.6%) and were of a foreign nationality in the majority of cases (61.3%) 22.6% of the affected people in prison were asymptomatic at entry into the prison, 25% reported only dry or productive cough	87.1%	Unpublished research

NR=not reported

COST-EFFECTIVENESS

No studies on cost-effectiveness have been found from the grey literature search.

LTBI

Peer-reviewed literature

The uptake, positivity rate, effectiveness, treatment initiation and cost-effectiveness of LTBI active case finding are summarised below. Some articles reporting data for both active TB and LTBI are captured under both sections. For further details on the outcomes and study-specific background information (e.g. setting, study population), see the evidence tables in a separate document ("Annex 2. Evidence tables systematic review active case finding in prison settings").

Uptake, positivity rate, effectiveness and treatment initiation

EU/EEA countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
At entry										
Martin, 2001 [106] Spain Longitudinal study	One prison n=3 081	TST, followed by CXR and sputum examination NR	Inmates entering prison At entry (timing NR), and annually when not ill, or twice-yearly radiograph if necessary NR	82.5% TST	41.3%[1]	NR	NR	NR	23.0%	Very low
During imprisonment										
Sagnelli, 2012 [34] Italy Cross-sectional study	Six penitentiaries n=3 468	PPD test Opt-in	All inmates During imprisonment Presentation on advantages of screening by peer-educators, pamphlets on importance of screening	42.8%	17.2%	Higher acceptance than in the nine correctional facilities evaluated in this study before peer-education (11.3%)	NR	NR	NR	Very low

CI=confidence interval, CXR=chest x-ray, NR=not reported, PPD=purified protein derivative, RR=relative risk, TST=tuberculin skin test

[1]It might be that the 41.3% inmates infected with M. tuberculosis are 6 with active TB and 1,044 with LTBI, however this is not completely clear from the article as it seems that 397 of the 1044 do not seem to be TST positive. Therefore it is unclear whether there are 1,044 or 647 (1,044-397) inmates with LTBI at entry

Other countries

Effectiveness										
Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Level of evidence
At entry										
Bock, 2001 [127] USA Longitudinal study	One county jail n=NR	TST, followed by CXR NR	All inmates admitted to jail At entry (timing NR) NR	75% TST	7.2% TST-positive	NR	NR	NR	NR	Very low
Timing not specified										

Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Effectiveness: Uptake	Effectiveness: Positivity rate	Effectiveness: Change in number or % tested	Effectiveness: Change prevalence /incidence	Effectiveness: Other	Effectiveness: Treatment initiation	Level of evidence
Miller, 2006 [112] USA Cross-sectional study	County jail facilities n=22 920	TST, followed by additional evaluation (not further specified) Mandatory	Jail inmates NR NR	NA	0.9% treatment for LTBI prescribed	NR	NR	NR	57%	Very low
Bock, 1999 [128] USA Cross-sectional study	One pre-trial detention centre n=NR (1 863 screened)	TST, followed by CXR NR	Inmates NR NR	NR (74% of inmates undergoing TST returned for TST reading)	18% TST-positive	NR	NR	NR	58%	Very low

CXR=chest x-ray, LTBI=latent tuberculosis infection, NR=not reported, TST=tuberculin skin test

COST-EFFECTIVENESS

No studies were found that reported on the cost-effectiveness of LTBI active case finding in correctional facilities.

Grey literature

The uptake, positivity rate, effectiveness, treatment initiation and cost-effectiveness of LTBI active case finding are summarised below. For further details on the outcomes and study-specific background information (e.g. setting, study population), see the evidence tables in a separate document ("Annex 2. Evidence tables systematic review active case finding in prison settings").

Uptake, positivity rate, effectiveness and treatment initiation

Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Effectiveness: Uptake	Effectiveness: Positivity rate	Effectiveness: Change in number or % tested	Effectiveness: Change prevalence /incidence	Effectiveness: Other	Effectiveness: Treatment initiation	Type of document
At entry										
Foschi A 2015 [39] Italy Cross-sectional study	Single prison in Italy (Opera prison, Milan) N=711	TST, IGRA in TST positive Opt-in	All people in prison At entry Motivational counselling	81.4%	TST positivity rate=9.8% TST+IGRA positivity rate= 48.3%	NR	NR	NR	NR	Conference abstract
Ruiz Rodriguez 2010 [119] Spain Cross-sectional study	Spanish penitentiary system N=24,101	TST NR	All people in prison At entry NR	11.6% tested with TST	NR	NR	NR	NR	338 (0.53%)	Conference abstract
Solè M 2010 [117] Spain Prospective study	Single prison in Catalonia N=134	TST NR	Foreign people in prison with unknown TB status At entry NR	100%	63 (49.3%)	NR	NR	In multivariate analysis, only age (<40 years) associated with TST positivity (OR 2.34, CI95% 1.39-3.94).	NR	Conference abstract
Garcìa Guerrero J 2010 [118] Spain	18 prisons in Spain N= 378	TST NR	Randomly selected patients At entry	90.2%	50.4%	NR	NR	The logistic regression model showed the independent association	NR	Scientific paper (Rev Esp Sanid Penit 2010; 12: 79-85)

Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Effectiveness: Uptake	Positivity rate	Change in number or % tested	Change prevalence /incidence	Other	Treatment initiation	Type of document
At entry										
Cross-sectional study			NR					of TST positivity with: age >40 years (OR: 1.76; CI: 1.08-2.87; p=0.024) and length of prison stay >5 years (OR: 2.50; CI: 1.41-4.43; p=0.002		
Martìn, 2001 [120] Spain Cross-sectional study	One prison 478 people in prison with first negative TST result	- TST: Mantoux - TST repeated after 7-10 days to people in prison with negative result at first TST Voluntary	People in prison without previous active TB from September 1995 to June 1999 At prison entry NR	NR	Positivity rate at second TST: 11.7% (56/478) In the multivariate analysis, inmates older than 34 (OR = 3.63, CI 1.9-6.8) and showing signs of induration in the first test (OR = 8.9, CI 48-17.9) demonstrated higher positivity rates in the second TST	NR	NR	NR	NR	Scientific paper (Rev Esp Sanid Penit 2001; 3: 72-76)
At entry and during imprisonment										
Vera-Remartinez 2014 [121] Spain Longitudinal study, observational cohort study	Single prison (Centro Penitenciario Castellon I) NR	TST NR	Inmates, not further specified At entry and during imprisonment (every 6 months) NR	100%	44.9%	NR	In new entries positivity rate was: 7.3% at 6 months 11.9% at 12 months 12.5% at 18 months In previous residents: 10.6% at 6 months 15.1% at 12 months 18% at 18 months	Overall risk of TST positivity associated with: -Male sex, OR 1.91 (95% CI 1.05-3.95) -Foreigner, OR 2.25 (95% CI 1.374- 3.61) -Previous IDU, OR 3.05 (95% CI 1.85-5.05)	NR	Conference abstract
Ruiz-Rodríguez 2014 [122] Spain Cross-sectional study	Single prison (Centro Penitenciario de Albolote) N=158 female people in prison	TST NR	Inmates, not further specified At entry and during imprisonment NR	99.4%	69 (43.9%) 14 (20.3%) converters)	NR	NR	Risk increased in patients with >49 years (RR =3.61) No difference between Spaniards and foreigners	NR	Conference abstract
During imprisonment										
Ruiz-Rodríguez 2010 [123]	Single prison (Centro Penitenciario de Albolote)	TST NR	People in prison with first negative TST and TST	100%	38 (19.3%) tested positive at TST during	NR	NR	No prisoner exposed to active TB cases	NR	Conference abstract

Reference, country, study design	Prison setting, sample	Testing method, offer	Who, when, promotion	Effectiveness: Uptake	Effectiveness: Positivity rate	Effectiveness: Change in number or % tested	Effectiveness: Change prevalence /incidence	Effectiveness: Other	Effectiveness: Treatment initiation	Type of document
At entry										
Spain Retrospective, longitudinal cohort study	N= 197		repeated in the period considered During imprisonment NR		the period considered.			became TST positive. HIV infection increased the risk of TST positivity (OR 3.82, CI 1.003-24.87)		
Vera 2010 [125] Spain Retrospective, longitudinal cohort study	18 prisons in Spain N= 378 people in prison	TST NR	21 people in prison for each prison During imprisonment NR	90.2%	50.4%	NR	NR	Risk factors: -Age > 40 years -Prison stay > 5 years	NR	Conference abstract
Fernàndez-Prieto P 2010 [124] Spain Retrospective study	Single prison in Spain N= 2 871 people in prison	TST NR	All people in prison During imprisonment NR	92.6%	21.8%	NR	NR	NR	NR	Conference abstract
Gabbuti A 2010 [126] Italy Retrospective longitudinal study	Single prison in Italy (Sollicciano, Tuscany) N=7 500	TST Opt-in	All people in prison During imprisonment NR	15.4%	TST >5 mm: 482/1160 (41.6%) Percentage of TST conversion (2004-2009): 128/ 1160 (11.x%)	NR	NR	NR	77 (60.x%) patients completed prophylaxis*	Conference abstract
Babudieri S 2012 [35] Italy Cross-sectional study	20 Italian prisons N=4 072 detainees	TST Opt-in	All people in prison During imprisonment Peer educators and ID specialist intervention to increase TB screening uptake	NR	21.8%	Percentage of tested inmates increased from 11.3% (pre intervention) to 26.3% (post intervention)	NR	NR	NR	Conference abstract

CI=confidence interval, ID= infectious diseases; NR=not reported, OR=odds ratio, TST=tuberculin skin test
**51 (40%) did not complete due to: release in 25 (49%), drop out because of concomitant -methadone therapy in 10 (19.6%), cultural refuse in 12 (23.5%), religious refuse in 3 (5.9%)*

COST-EFFECTIVENESS

No studies on cost-effectiveness have been found from the grey literature search.

Guidelines[2] active TB and LTBI

Guidelines specific to prison setting - supranational guidelines

WHO. Prison and Health.

"How screening activities should be implemented depends on many factors, including the type of facility, the prevalence of TB infection and disease in the facility, the prevalence of TB in the inmates' communities, the prevalence of other risk factors for TB (such as HIV) in the inmate population and the average length of stay of inmates in the facility. The type of screening recommended for a particular facility is determined by an assessment of the risk of TB transmission within that facility"

"Medical screening on entry into the prison system is essential, as many people in prison come from communities with a high prevalence of TB. People in prison should not enter the body of the prison population until it has been verified that they do not have infectious TB. When possible, newly arrived people in prison should not be housed with other inmates until they have been properly screened for TB. … Entry screening should be documented on the screening register and must be followed up with standard procedures for diagnosis and treatment."

"In the prison system, two massive screening rounds a year are ideal. This strategy is very useful to find previously undetected cases missed by passive case-finding. Mass screening is not, however, recommended as the sole method of case-finding in prisons."

Advantages and disadvantages of passive and active case finding are reported in Table 4 on page 59 of the guideline.

Source: WHO. Prison and Health. 2014, from Dara M et al. Guidelines for control of tuberculosis in prisons. Cambridge, MA, TB CAP, US Agency for International Development, 2009 (http://pdf.usaid.gov/pdf_docs/PNADP462.pdf, accessed 17 November 2013) (Type of guideline: practice-based; level of evidence: ++,-,0) [7]

Tuberculosis Coalition for Technical Assistance, International Committee of the Red Cross, USAID. Guidelines for control of tuberculosis in prisons.

"In prisons, passive and active case finding should be implemented simultaneously and systematically. A combination of these two approaches will increase case detection substantially."

Source: Guidelines for control of tuberculosis in prisons. Tuberculosis Coalition for Technical Assistance, International Committee of the Red Cross, USAID. 2009 (Type of guideline: practice-based; level of evidence: ++,-,0) [13]

Guidelines specific to prison setting - national guidelines

United Kingdom. Tuberculosis in prisons or immigration removal centres.

"Healthcare professionals in prisons and immigration removal centres should ensure people in prison and detainees are screened for TB within 48 hours of arrival."

"Prisons with Department of Health-funded static digital X-ray facilities for TB screening should X-ray all new people in prison and detainees (including those being transferred from other establishments) if they have not had a chest X-ray in the past 6 months. This should take place within 48 hours of arrival."

"In high-incidence areas and at prisons that receive people in prison from high-incidence areas, prison health services should offer an interferon-gamma release assay (IGRA) test for TB to inmates younger than 65 years who are in regular contact with substance misuse services or other support services.

Prison health services should incorporate interferon-gamma release assay testing with screening for hepatitis B and C, and HIV testing."

Source: Tuberculosis in prisons or immigration removal centres. National Institute for Health and Care Excellence (NICE). 2016 (Type of guideline: evidence-based; level of evidence: ++,++,++) [130]

[2] Relevant guidelines were critically appraised with a selection of criteria derived from the AGREE instrument (1. The overall objective/objectives of the guideline is/are specifically described; 2. Systematic/clear methods were used to search for evidence for compiling the data and/or clear data sources/references; 3. The recommendations are specific and unambiguous). The criteria were qualitatively scored using - - or -, 0, + or ++; no total quality score of summed + and – was calculated

United Kingdom. Management of tuberculosis in prisons: Guidance for prison healthcare teams.

"All new people in prison should be assessed for their TB risk by symptom screening (and, if facilities are available in the prison for this, digital chest x-ray) and appropriate action then taken:

A prison primary care nurse should assess any prisoner who presents with:

- A history of a cough lasting three weeks or longer
- Unexplained weight loss
- Any cough with other TB symptoms - weight loss, fever, night sweats, haemoptysis, anorexia

People in prison with these symptoms should be referred to the prison doctor for further assessment."

"The symptom screening process should be agreed locally and will depend on local prevalence. If available, the digital chest X ray pathway should be followed as agreed locally." Appendix 1 on page 14 of the guideline provides an example of a risk assessment tool.

Source: Management of Tuberculosis in Prison: guidance for prison healthcare teams. Public Health England. 2013 (Type of guideline: practice-based; level of evidence: +,-,+) [135]

Italy. Protocollo operativo per la gestione della tubercolosi nel sistema penitenziario italiano

"Tuberculosis screening should be performed in all new people in prison with a symptom questionnaire and, if positive, with chest X-ray at entry and in residents with risk factors or predisposing conditions during annual check-up visit.

Every prisoner with positive TB active case finding questionnaire or with a chest X-ray suggestive/compatible with TB should be considered a suspicious TB case".

"Prevention of development of active disease in cases with LTBI could be obtained with screening and treatment of LTBI in close contacts of active TB cases. Furthermore, if sufficient resources are available, screening of high risk subjects for TB reactivation and their treatment is recommended".

Source: Protocollo operativo per il controllo della tubercolosi nel sistema penitenziario italiano. Ministero della Giustizia, Dipartimento della amministrazione penitenziaria, Provveditorato regionale per la Puglia, Ufficio per il trattamento intramurale (Italy). 2008 (Type of guideline: practice-based; level of evidence: +,-,+) [133]

The Netherlands. Tuberculosis in detention

People in prison that are born in the Netherlands do no longer meet the criteria for being a risk group, because the TB prevalence is too low (below 50 per 100,000). Therefore, active case finding for TB among people in prisons born in the Netherlands does no longer meet the legal demand of scientific virtue. However, half of active TB cases within this group belong to one of the following risk groups for which active case finding still applies: drug addicts, alcohol addicts, or homeless persons.

Based on the above, the following policy change is recommended:

- Discontinuation of active case finding for TB among people in prison born in the Netherlands
- Continuation of active case finding for TB among people in prison born in the Netherlands that belong to one of the risk groups for TB
- Continuation of active case finding for TB among people in prison born outside the Netherlands

The following procedures are advised:

- Triage on risk factors for TB at entry among those born in the Netherlands to check whether mobile chest X-ray screening is indicated
- Registration of the number of people in prison with risk factors
- Easy accessible chest X-ray screening of people in prison with symptoms during imprisonment
- Contact tracing when infectious TB cases are found
- Monitoring and evaluation of this new policy, especially with regards to screening of risk groups among those born in the Netherlands
- Additional follow-up for people in prison for which the chest X-ray implies further investigation is necessary, but who do not show up for further investigation

The most appropriate method for active case finding is the chest X-ray. The intake assessment at entry is a time period to check whether mobile chest X-ray screening is indicated among those born in the Netherlands.

Source: Dienst Justitiële Inrichtingen, Ministerie van Veiligheid en Justitie (2010). Tuberculose in Detentie. Richtlijn opsporing, behandeling en preventie van tuberculose voor justitiële inrichtingen (Type of guideline: practice-based; level of evidence: ++,-,0) [132]

Other guidelines - supranational guidelines

WHO. Systematic screening for active tuberculosis: an operational guide.

"Recommendation 2: People living with the human immunodeficiency virus (HIV) should be systematically screened for active TB at each visit to a health facility (*Strong recommendation*)

Recommendation 4: Systematic screening for active TB should be considered in prisons and other penitentiary institutions (*Conditional recommendation*)."

Source: WHO. Systematic screening for active tuberculosis: an operational guide. 2015 (Type of guideline: practice-based; level of evidence: ++,-,++) [136]

WHO. Guidelines on the management of latent tuberculosis infection.

The following are the key recommendations of the WHO Guidelines on the management of latent tuberculosis infection:

- Systematic testing and treatment of LTBI should be performed in people living with HIV, adult and child contacts of pulmonary TB cases, patients initiating anti-tumour necrosis factor (TNF) treatment, patients receiving dialysis, patients preparing for organ or haematologic transplantation, and patients with silicosis. Either interferon-gamma release assays (IGRA) or Mantoux tuberculin skin test (TST) should be used to test for LTBI. (Strong recommendation, low to very low quality of evidence)
- Systematic testing and treatment of LTBI should be considered for people in prison, health-care workers, immigrants from high TB burden countries, homeless persons and illicit drug users. Either IGRA or TST should be used to test for LTBI. (Conditional recommendation, low to very low quality of evidence)
- Individuals should be asked about symptoms of TB before being tested for LTBI. Chest radiography can be done if efforts are intended also for active TB case finding. Individuals with TB symptoms or any radiological abnormality should be investigated further for active TB and other conditions. (Strong recommendation, low quality of evidence)
- Either TST or IGRA can be used to test for LTBI in high-income and upper middle-income countries with estimated TB incidence less than 100 per 100 000 (Strong recommendation, low quality of evidence).
- IGRA should not replace TST in low-income and other middle-income countries. (Strong recommendation, very low quality of evidence)

Source: WHO. Guidelines on the management of latent tuberculosis infection. 2015 (Type of guideline: evidence-based; level of evidence: ++,++,++) [131]

European Union Standards for Tuberculosis Care - Standard for TB diagnosis

Standard 1: All persons presenting with signs, symptoms, history or risk factors compatible with TB should be evaluated for pulmonary and/or extrapulmonary TB

Source: Migliori GB, Zellweger JP, Abubakar I, Ibraim E, Caminero JA, De Vries G, et al. European Union standards for tuberculosis care. Eur Respir J. 2012 Apr;39(4):807-19 (Type of guideline: practice-based; level of evidence: ++,+,+)