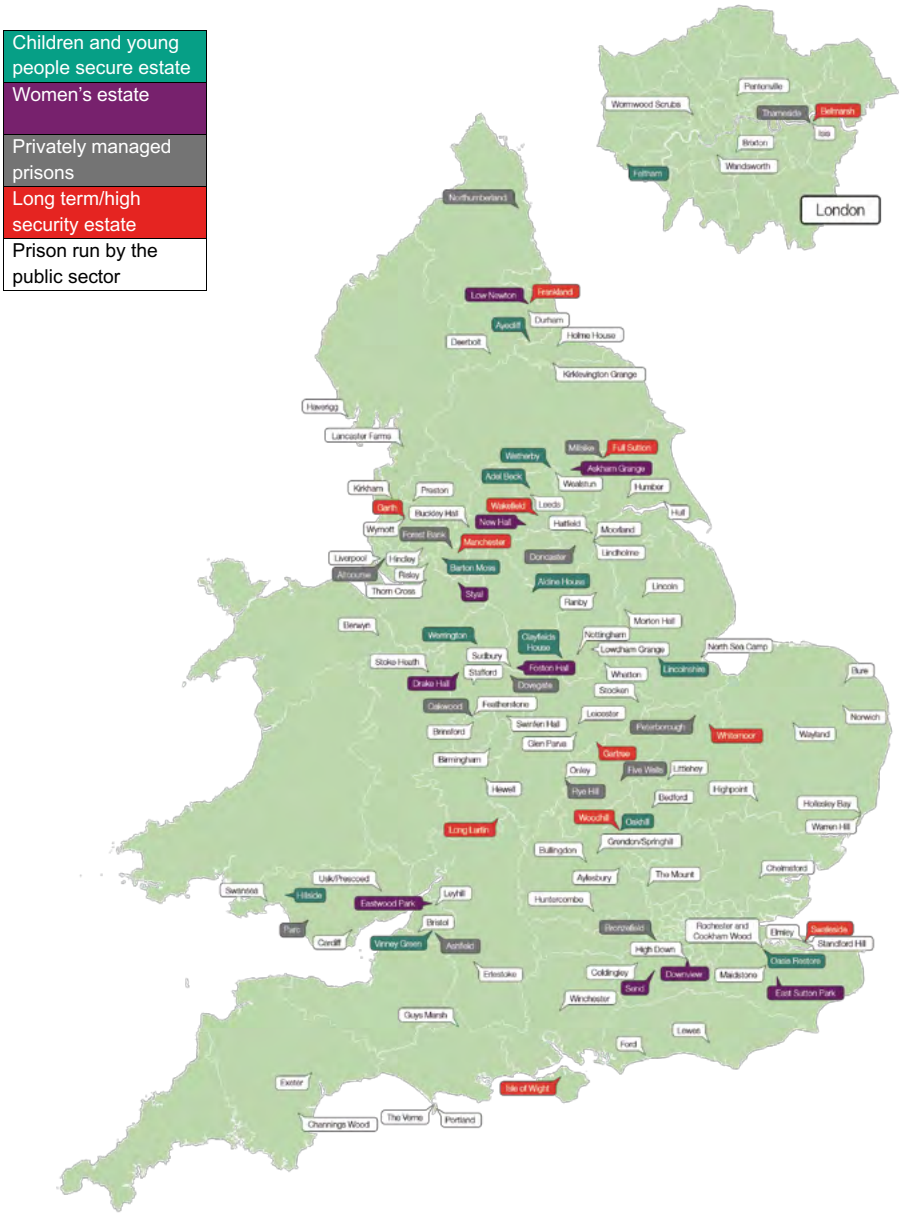
# The health of people in prison, on probation and in the secure NHS estate in England

## Appendix



# Appendix

# Contents

# Children and young people in custody or at risk of custody

## Further detail on the structure and governance of the children and young people secure estate

The Youth Custody Service and Youth Justice Board cover both England and Wales, while NHS England is the statutory commissioner of health services in secure settings in England only[a]. Children in the Secure School, in Secure Children's Homes, Young Offender Institutions or the Secure Training Centre can be placed by the Youth Custody Service if sentenced or[1] remanded to custody for a criminal offence[b]. Two-thirds of children in the secure estate for justice reasons are there for violent offences, with 1 in 10 there for sexual offences. More than half (56%) of the children sentenced to custody in 2023 had 3 or more previous cautions or convictions[2]. This is a significant change in the cohort from a decade ago.

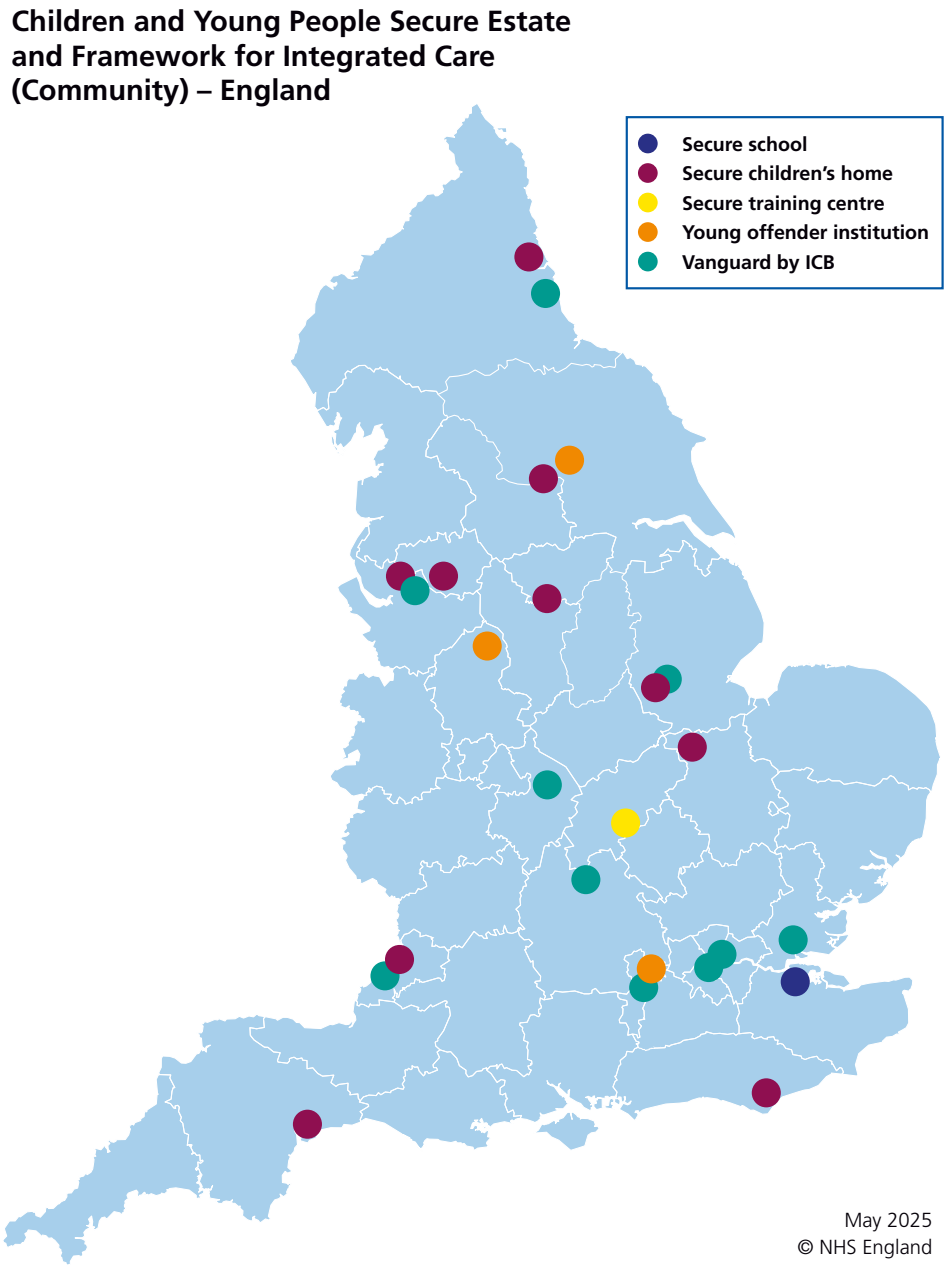
In Secure Children's Homes children and young people can also be held under the Children Act 1989[3] for their own protection or for the safety of others. This includes when the child has a history of absconding and is likely to abscond from any other description of accommodation; and if the child absconds, (s)he is likely to suffer significant harm; or if the child is kept in any other description of accommodation (s)he is likely to injure her/himself or others. In this case they are referred to the Secure Welfare Coordination Unit who are commissioned by the Department for Education to provide a brokerage service between local authorities and secure children's homes[c]. Some Secure Children's Homes hold a mixture of children placed for justice reasons and those placed under the Children Act, and some hold only children placed under the Children Act. Figure 1 shows the geographic location of the secure estates and vanguards.

[a] There is one Young Offender Institution in Wales, and one Secure Children's Home in which Youth Custody Service also commission beds.

[b] The number of young adults aged 18 held in the secure estate for children and young people more than doubled from around 60 in the previous year to 150 in the latest year. This was due to significant pressures on capacity in the adult estate and the policy to hold over 18s in the children and young people estate has now ended.

[c] The Department for Education has policy responsibility for Secure Children's Homes but not operational responsibility.

**Figure 1: geographic location of the secure estate and vanguards in England in 2025**




## Summary of data used for immunisation uptake comparison:

Figure 17 in the chapter is based on data on the proportion of eligible children covered by each vaccine at the end of each month extracted from the electronic healthcare record system SystmOne. For all the vaccines given in adolescence (HPV, Td/IPV and MenACWY), the graph shows the mean annual vaccine coverage for the academic year 2023 to 2024. For flu vaccine, the graph shows the coverage on 31 January 2024 as this represents the best approximation to the comparator data (which is the cumulative uptake among the same age group from 1 September 2023 to 31 January 2024). For MMR, the graph shows the proportion of children in the financial year 2023 to 2024 who had received at least 1 dose by their 17th birthday, with the comparator showing the coverage in that birth cohort by their 5th birthday (which will, therefore, not include any catch-up vaccinations received between age 5 to 17 years). For

Hepatitis B, the data is presented for the financial year 2023 to 2024 and there are no relevant comparator data for children in the relevant age groups.

## Costs associated with entering the children and young people secure estate

The associated costs include:

- £1 million: average annual cost of children entering the youth justice system for the first time in the year ending March 2020[4d]
- £1.5 billion: cost of reoffending by children within a 12-month period[5]
- £271k: average annual cost for a child in secure children's home[6]
- £201k: average annual cost for a child in secure training centre[7]
- £119k: average annual cost for a child in young offender institution[8]
- £48k: average annual cost for an adult prisoner[9]

These costs are higher than intervening early, with an estimated cost of late intervention in England and Wales at around £17 billion per year. This estimate captures the costs of acute, statutory services that are required when children and young people experience difficulties, many of which might have been prevented, such as the costs of children taken into care, the costs to the health system of youth alcohol and drug misuse, and the costs to the criminal justice system of youth offending[10].

## Suggested early impact of community vanguard pilots

The early impacts of the community vanguard pilots are thought to include:

- joint working resulting in effective reduced duplication, strengthened pathways and more time for cross agency case co-ordination, and staff support.
- strong relationships with the voluntary and community sector, increasing levels of trust with children and alignment to needs.
- collaborative working with the Violence Reduction Units (VRU) (in some areas known as Violence Reduction Partnerships (VRP)).

[d] A technical report by the National Audit Office and Ministry of Justice in 2011 concluded that in 2009 each child in England and Wales proven to offend cost £8000 per year to the criminal justice system (including the costs of police, courts, offender management teams, and custody. For the purpose of this report we calculate that) 11,100 child FTEs x £8000 per child average cost of proven offending = £80,800,000 is the annual cost of children entering the YJS in the year ending March 2020. We can estimate that this to be on average £1 million per year with conflation. This does not include costs for Health and Justice children's programme at approximately £35 million (provided by NHS England)

- the recruitment of people with lived experience, allowing for co-design and co-production, including innovations such as diversionary activities for children and young people who are at the risk of entering the youth justice system
- demonstration of clear thinking around changing culture and shifting to a more trauma responsive way of working, including common understanding and language.

## Waiting times for and access to services

GP waiting times were very low for both types of settings. Both types of setting experienced overall longer waits for dentistry and optometry, with significant variation between settings as indicated by the range.

Waiting times are reported based on how many days have elapsed between the last working day of the month and the next available appointment date, with the addition of the number of days waited by the longest waiting patient on the waiting list. However, these represent a snapshot only and it is expected by commissioners that monthly figures will vary. This data also does not indicate differences for urgent compared to routine appointment requests. This should be kept in mind when reviewing the waiting times presented below.

The waiting times as of March 2023 are outlined below:

**Table 1: waiting times (days) for primary care in SCHs in March 2023**

| | Median | Mean | Interquartile range | Range |
|---|---|---|---|---|
| GP | 0 | 1.77 | 4 | 7 |
| Dentist | 0 | 11.62 | 14 | 55 |
| Optometrist | 9 | 23.62 | 40 | 90 |

**Table 2: waiting times (days) for primary care in YOIs in March 2023**

| | Median | Mean | Interquartile range | Range |
|---|---|---|---|---|
| GP | 0.5 | 1 | 1.5 | 3 |
| Dentist | 37 | 70.75 | 67.75 | 204 |
| Optometrist | 56 | 47 | 31 | 76 |

In 2021 and 2022 combined, there were 287 discharges of children on welfare placements from secure settings. Over half (53%) were discharged to residential settings. One in 10 (11%) were discharged home. A further 7% were discharged to semi-independent or independent living. A

small proportion (3%) were discharged to a Secure Children's Homes setting. A further 25% were discharged to another setting including foster care, remand, Secure Training Centres or Young Offender Institutions, and other settings (the numbers for each are too small to present here). Detailed discharge location data was not available for those on youth justice placements for this report.

## Secondary care use

There are limited routine data available with regards to secondary care use for children in the children and young people secure estate and there is of course overlap here with data described in the sections of substance misuse, assault and self-harm data. However, an analysis by the Nuffield Trust[11] provides some insight into secondary care use. This suggested that the proportion of people in Youth Offender Institutions that did not attend an outpatient appointment was slightly higher than people in the general population (39% compared to 27%), with a greater proportion cancelled by the patient or on their behalf (18% compared to 9%). This data does not provide any detail as to the reasons of the cancellation.

This report also provided insight into the speciality of the outpatient appointments attended, which was most commonly trauma and orthopaedics for children and young people in young offender institutions, compared to orthodontic services and trauma and orthopaedics in the general population. NHS England has considered the Nuffield Trust recommendation for 'Children and Young People Secure Estate National Partnership signatory organisations to understand and address the reasons why outpatient appointments for children and young people in young offender institutions are cancelled much more often than is the case for people in prisons.'

## Medium secure adolescent service: Clinical network and pathways into medium secure settings

All medium secure adolescent services will be part of the National Secure Forensic Mental Health Service for Young People (NSFMHSfYP) clinical management network. The network supports:

- a single national co-ordinated referral and admission pathway into individual service settings and across the network
- a co-ordinated national response that evidences equity of provision 3 across services in England.

Adolescent medium secure service settings provide care and treatment within a highly prescribed set of physical, relational and procedural security measures to a variety of young people. The predominant need for care and treatment will be related to the young person's assessed risk of harm to self and/or others in the context of their mental disorder.

There are 4 recognised pathways into adolescent medium secure services:

- stepping up from low secure adolescent services

- direct admission through a criminal court process or from youth justice custodial settings
- admissions from non-criminal justice and welfare settings including welfare secure units and specialist educational settings
- admission from PICU, from the community or a non-secure adolescent inpatient service

## Older people in prison

Examples of assessment tools include:

- the Clinical Frailty Scale (CFS) is a 9-point tool. It is not a questionnaire but is based on clinical judgement. Grading ranges from 'very fit' to 'terminally ill'. Scores from 6 ('moderate frailty') to 9 ('terminal care') indicate the need for specialist multi-disciplinary and social care[12]
- the Comprehensive Geriatric Assessment (CGA) is the standard evidence-based method to prevent and manage frailty syndromes and their complications, commonly used in hospital settings. It includes physical, cognitive, functional, social and psychological components, using interventions tailored to the needs of the individual[13]
- useful and swift screening tools for cognitive impairment included CPOG screening tool Hodkinson Abbreviated Mental Test Score (AMTS) Mini-Mental State Examination (MMSE) and Geriatric Mental State (GMS) covers various cognitive domains, orientation, memory, attention, language, visual perception, and mood
- Geriatric Depression Scale (GDS) is a common rating scale for depression in old age, with its emphasis on hope and hopelessness but may lead to false positive results when used in prison setting

## Palliative and end of life care

Potential prescribing solutions to overcome barriers in access to end of life medications:

- avoiding benzodiazepines and gabapentinoids for neuropathic pain for medications with less addictive potential such as tricyclic antidepressants or duloxetine
- issuing medications such as once daily clonazepam in dosette boxes to minimise quantities that can be diverted
- using slow release opioid preparations that can be issued at See To Take such as twice daily modified release opioids or patches
- use of in cell lockable cabinets with keys held by the prisoner for small quantities of Morphine 10mg/5ml oral solution to allow 24/7 access to pain relief, subject to personal risk assessment
- regular compliance checks from pharmacy for prisoners with in possession medication

- collaboration with specialist palliative care for early referrals for interventional pain techniques to minimise use of problematic medications
- medications being administered by social care, in collaboration with pharmacy to produce individual medicine administration records, for those requiring social care and unable to self administer
- involvement of senior palliative care professionals able to individualise prescribing off guidelines to suit prison environment

# Health protection in prisons and probation

## Additional section specific authors and contributors

### Antimicrobial resistance and antimicrobial use

Authors: Emily Mason, Jacquelyn McCormick, Dr Mariyam Mirfenderesky, Clare Oliver-Williams

Contributors: Professor Diane Ashiru-Oredope, Dr Theresa Lamagni, Rebecca Guy, Denise Farmer

### Bloodborne viruses

Authors: Dr Monica Desai, David Leeman, Dr Veronique Martin, Sean Cox Libby Eastwood

Contributors: Dr Ruth Simmons, Dr Tamara Đuretić, Dr Matthew Hibbert, Dr Sema Mandal, Annabel Powell, Natasha Ratna, Lee Christensen, Julia Sheehan

### Data analytics

Contributors: Noor Saeed

### Environmental threats

Authors: Tracy Gooding, Donna Clarke, James Lewis, Professor Stuart B. Dalziel, Dr Sara Mohammed, Dr Oscar O'Mara, Dr M. Cristina Rodriguez Rivero, Professor Tim Sharpe, Stuart Aldridge, Julia Chieng, Lisa Woodland, Benjamin Fenech, Sarah Dack, Amanda Craswell

### Recognising the prison setting exacerbates health protection risk

Authors: Esther Taborn, Dr Anjana Roy, Dr Kakoli Choudhury, Libby Eastwood

Contributors: Nimah Whittome, Michaela Mckie, Claudia Salvagno, Carol Chatt

### Respiratory infections

Authors: Dr Claire Ferraro, Dr Sharon Cox, Dr Esther Robinson, Pete Dodd, Dr Nyashadzaishe Mafirakureva, Lianne Strauss, Rachel Campbell, Lipi Begum, Ellen Pringle, Tanith Palmer,

Dr Samihah Moazam, Elliot Graves, Steve Parratt, Zoe Richardson, Dona Foster, Professor Lorenzo Pellis, Professor Ian Hall OBE, Joseph Brookes, Dr Tom Fowler

Contributors: Professor Rachael Hunter, Dr Thomas Finnie, Dr Andrew Lee, Abdul-Hakeem Khan, Amy Trindall, Dr Julie Yates

### Sexually transmitted infections

Authors: Dr Hamish Mohammed, Dr Katy Sinka, Norah O'Brien, Joe Harper, Libby Eastwood, Lynda Mooney

Contributors: Jon Dunn, Professor Jackie Cassell

### Summary of infectious disease

Authors: Libby Eastwood

### Vaccinations and vaccine preventable diseases

Authors: Dr Samia Latif, Ian Palmer, Dr Anjana Roy, Joe Harper

Contributors: Dr Julie Yates

## Quality and methodology information

### Data sources and populations

The evidence used within this report relies on multiple surveillance datasets, survey data and qualitative studies, some of which have been produced specifically for this report.

### Prison populations

Data on the total number of people entering and exiting prisons in a year is not recorded by the Ministry of Justice (MoJ). This adds complexity to calculating rates of disease as the total number of people entering and exiting prison in a year (the denominator) has to be estimated. To overcome this, calculated rates are based on person-years in prison. This calculation assumes that as one person exits prison, another will enter and person-years will remain constant. In this report annual prison populations, and therefore person-years in prison, have been estimated from published mid-year population figures for prisons across England and Wales published by the MoJ[14], broken down by sex.

### Routine and surveillance datasets

Five routine surveillance datasets have been interrogated for information relating to people in prison throughout this report. These are Second Generation Surveillance system (SGSS) laboratory data, national Sentinel Surveillance of Blood Borne Virus testing (SSBBV), National Tuberculosis Surveillance (NTBS) and the CTAD Chlamydia Surveillance System (CTAD). Hospital admissions have come from Hospital Episode Statistics (HES) data. For most of these

routine datasets, prison residents were identified through use of prison postcodes. The majority of prison postcodes are unique to the prison establishment and this method of employing postcode as a prison identifier has been validated and used previously in other prison research in England[15 16]. For data from sentinel surveillance systems, data is reported as the proportion of individuals who tested positive (positivity).

## Survey data

Survey data was drawn from biobehavioural surveys undertaken in 8 English prisons (2,328 respondents) between 2022 to 2024. This approach used a pragmatic sample, undertaking whole population testing in prisons conducive to undertaking serological surveys and who volunteered to participate.

While not a fully representative sample of the English prison estate, a broad selection of prisons participated, including male prisons of different security categories, female prisons and foreign national prisons. This is a new study and full results have not yet been published. A table of results and information on methodology is available in this Appendix and the full report will be published in 2025.

For these biobehavioural surveys, in which all residents in the selected prisons were offered the opportunity to be tested, results are reported as a prevalence estimate. Point prevalence is a measure of the proportion of a population who has a particular condition at a specific point in time.

## Qualitative data

Throughout this report lived experience insights have been drawn from several commissioned engagement studies with people working and living in prison and probation. These studies provide important insights not captured in qualitative datasets, but should be interpreted with caution as they may not be representative of the broader population given small sample sizes and potential biases, including who chooses to participate.

## Coherence and comparability

The prison population has been identified in differing ways in some of the different datasets used in this report. (see table 2)

There is currently no standardised method to comprehensively link surveillance data and individual level data on the prison population. Where prison identifiers exist, these have been used. Where this has not been possible address matching using postcodes has been used. Therefore, caution should be applied in comparing across different statements in the report on disease prevalence/incidence. To overcome this limitation, where possible estimates have been triangulated with more than one dataset. For example, Hepatitis C prevalence rates from both biobehavioural surveys and High Intensity Test and Treat data has been reported, along with community comparators.

**Table 2: data sources used within this chapter**

| Analysis | Key data sources | Prison identifiers in system | Address identifiers | Limitations and mitigations employed to validate analysis |
|---|---|---|---|---|
| Bio-behavioural Survey | Serological survey | ✓ | | This was based on a convenience sample. To overcome this limitation comparisons have been included in the report with other data sources and have been found broadly consistent. For example, Syphilis rates from biobehavioural surveys consistent with SGSS data |
| Hospital admissions data for prisoner hospital admissions (COVID-19 and influenza) | HES | | ✓ | |
| Data on Hepatitis diagnoses are provided through sentinel surveillance data | SSBBV | ✓ | | Not a national laboratory dataset and will only represent prisons that provide samples to English laboratories which opt in to sentinel surveillance (approx 40%) |
| TB | National Tuberculosis Surveillance | ✓ | ✓ | |

| Analysis | Key data sources | Prison identifiers in system | Address identifiers | Limitations and mitigations employed to validate analysis |
|---|---|---|---|---|
| Incidents/ Outbreaks | HPZone/ CIMS | ✓ | | Prisons were identified using categories available on the system, for example 'Custodial Institution' with text identifiers used to restrict data to prisons only (excluding any other types, for example Immigration Removal Centres/Secure Children's Homes.) Regional inconsistencies may exist in the recording of incidents as noted in previous UKHSA reports.* |
| AMR | SGSS | | ✓ | Postcode method may be limited due to inconsistency in reporting. |
| HMP X STI analysis | SGSS | | ✓ | SGSS not universally/ consistently used by prisons for STI recording. Through regional networks HMP X was identified as having robust reporting in this area. Baseline checks on the number of cases identified were compared with results provided by the Head of Healthcare at HMP X and found to be broadly consistent |

| Analysis | Key data sources | Prison identifiers in system | Address identifiers | Limitations and mitigations employed to validate analysis |
|---|---|---|---|---|
| Chlamydia surveillance | CTAD | ✓ | | 'Other' test setting includes chlamydia screening offices, antenatal and obstetric services, military, education, occupational health, prison, youth services, outreach, accident and emergency, minor injuries, NHS walk-in centres and hospitals. |
| HIV | NCDR derived from SystmOne | ✓ | | |

*Page 16 Weekly Flu and COVID-19 Report_w27: "The incidents captured on HPZone represent a subset of all ongoing ARI clusters and outbreaks in England rather than an exhaustive listing. A variety of arrangements are in place across UKHSA Centres, with local authorities and other stakeholders supporting HPTs in outbreak investigation in some areas without HPZone reporting. As a result, the number of outbreaks reported for some of the regions are underestimates"

## Information on specific datasets

### Secondary-Generation Surveillance System (SGSS)

The Second-Generation Surveillance System (SGSS) is the national laboratory reporting system, providing laboratory results for infectious disease testing. Results that are attributed to a prison setting in England are identified in this data set, and estimated denominators for prison populations (including resident churn) are calculated. Using this, we calculated rates of disease among prisoners compared to the community.

Midyear population figures for England broken down by sex were used to calculate the denominators. This was taken from MoJ published data[17]. The calculation of the rate is made on the basis of person-years, therefore using snapshots in this way, rather than estimating the total number of people who had been in prison during the period is seen as a defensible approach.

Data from SGSS was used to understand STI diagnoses in HMP X. For this analysis any duplicate test results attributed to the same individual within 28 days were removed from the analysis.

### Biobehavioural Survey (BBS) data

In 2022 to 2024, the UK Health Security Agency (UKHSA) undertook a series of mass serological surveys in eight English prisons (2,328 respondents) to better understand the

prevalence of, exposure to, and immunity against a number of key infectious diseases. The prevalence of certain chronic infections was also investigated. As the prevalence of some of the infections studied usually vary considerably by age, sex and country of birth, the prisons selected for inclusion in the study were chosen to ensure that sufficient numbers of male and female prisoners and foreign-born prisoners were included to enable us to calculate prevalence estimates by these key variables. The prisons were, therefore, not a fully representative sample of the prison estate. One prison was surveyed twice, in different years.

In these surveys, respondents were offered a chest x-ray for active tuberculosis and testing for:

- Hepatitis B & C (HCV core antigen)
- HIV
- syphilis
- latent tuberculosis infection
- antibodies to measles and rubella viruses

Later surveys in 5 prisons expanded the testing to include samples to test for gonorrhoea, chlamydia, and trichomonas vaginalis, testing 1,216 prisoners. It also included a questionnaire on behavioural risk factors such as injecting drug use and history of homelessness. 1,046 questionnaires were completed and analysed. As these questionnaires were self-reported and voluntary, risk factor information may be under-reported due to disclosure concerns.

In total, 2,328 prisoners were surveyed, this included 1,199 men and 1,127 women and 2 people who identified their sex as 'other'. As with the general prison population, the majority of those surveyed were in the younger age groups, with 15% aged 18 to 25, 34% aged 25 to 34, 30% aged 35 to 44, 14% aged 45 to 54 and 7% aged 55 and over. 29.4% of those surveyed were born outside the UK. The response rate to the surveys varied considerably by prison, from 31% in a men's category D open prison to 91% in a women's prison (median 56%).

The full report on the biobehavioural survey results will be published in 2025, in the interim data can be requested from UKHSA.

## HPZone data

HPZone is a web-based case and outbreak management system used by health protection teams (HPTs) in England to record outbreaks they are notified of and investigate.

HPZone is not designed as a surveillance system. Prison settings have been identified in this dataset if categorised as a custodial institution which is validated by postcode. It is likely that some incidents and outbreaks in prisons may be missed using this method so the data reported here may be an under-estimate. The term 'outbreak' can also include issues categorised as clusters and incidents.

## National Sentinel Surveillance of Bloodborne Virus testing (SSBBV)

Sentinel Surveillance of Blood borne Virus (SSBBV) testing collects data on tests undertaken at any of the participating sentinel laboratories across England regardless of test result (both positive and negative results). Tests include Hepatitis A to E, HIV and human T-lymphotropic virus type 1 (HTLV). There are currently 23 laboratories[18] participating in SSBBV testing, accounting for approximately 40% of diagnostic testing. Most HCV reporting is for HCV RNA although a small number of laboratories test for HCV antigen.

Information from sentinel surveillance is used to estimate diagnosed prevalence in those tested and enhance our knowledge and understanding of bloodborne virus testing, including who is being tested, from which service type and how this has changed over time. In this report it has been used to estimate positivity of tests among people in prison or with a prison history.

## National Tuberculosis Surveillance (NTBS)

People who are diagnosed with TB in England, Wales and Northern Ireland must be notified through the National Tuberculosis Surveillance system (NTBS). This report only includes data for individuals with TB who are resident in England or are treated in England (including individuals who are homeless or visiting from abroad).

Only individuals with disease caused by Mycobacterium tuberculosis complex (MTBC) are reported. Individuals were denotified and removed from the data set if the infective agent was identified as non-MTBC or M. bovis Bacillus Calmette-Guerin (BCG) subspecies.

Prisoners (current or in the past) are identified if mentioned in the comment's fields, if HMP or a prison name are recorded as the address or if the residential postcode corresponds with a prison. Up until 2020, data on incident TB individuals reported to the Public Health in Prisons (PHiP) log were used to further identify people who had been imprisoned, but this was not conducted in 2022 or 2023.

More information on NTBS can be found in this methodology and definitions report[19].

## Chlamydia surveillance (CTAD)

Chlamydia surveillance data is routinely collected and reported by all primary diagnostic laboratories in England. A geographical linkage algorithm utilising postcode was used to identify chlamydia tests in prisons.

## Unlinked Anonymous Monitoring Survey of people who inject drugs (UAM)

The UAM Survey of PWID aims to monitor the prevalence of HIV, HBV, and HCV infections, as well as associated risk and protective behaviours among PWID. People who have ever injected psychoactive drugs, such as heroin, crack cocaine and amphetamines, are recruited through specialist drug and alcohol agencies.

## Antimicrobial resistance surveillance

Data on the antibiotic susceptibility of pathogens was obtained from SGSS (Second Generation Surveillance System), a national database maintained by UKHSA that contains laboratory data supplied electronically by approximately 98% of hospital microbiology laboratories in England. SGSS comprises 2 modules, a communicable disease reporting (CDR; formerly CoSurv/LabBase2) module and an antimicrobial resistance (AMR; formerly AmSurv) module. For this report, resistance data between 01 April 2019 and 31 March 2024 are taken from the AMR module. Hospital microbiology laboratories have reported antimicrobial susceptibility test results as 'susceptible', 'susceptible, increased exposure' or 'resistant', defined as per the European Committee on Antimicrobial Susceptibility Testing (EUCAST)[20]. As patients may have more than one positive culture taken, cultures taken from the same patient that yielded growth of the same pathogen during a rolling 14-day period from the initial positive culture were regarded as comprising the same episode of infection and were de-duplicated, retaining the worst-case scenario susceptibility result for each antibiotic tested (resistant > susceptible, increased exposure > susceptible).

Two specimen groups are presented in this section: blood and skin and soft tissue (for example, skin/wound and swab); antibiotic groupings by specimen type are shown in Table 4 and 5a to d.

The burden of antimicrobial resistance was estimated from the total number of bacteraemia episodes due to bacteria of public health importance resistant to 1 or more defined antibiotics in blood isolates, as described in the annexe of the English surveillance programme for antimicrobial utilisation and resistance (ESPAUR) report[21].

**Table 3: antimicrobial grouping for bacteraemia infection episodes**

| Antimicrobial group | Antimicrobials |
|---|---|
| Third-generation cephalosporins | cefotaxime, ceftazidime, cefpodoxime or ceftriaxone, unless otherwise indicated |
| Carbapenems | meropenem or imipenem, except where neither were tested, in which cases results for ertapenem were used if available; the exception to this is for Pseudomonas spp. where ertapenem was not used |
| Aminoglycosides | gentamicin and amikacin |
| Fluoroquinolones | ciprofloxacin, unless otherwise defined |
| Glycopeptides | vancomycin or teicoplanin |
| Macrolides | azithromycin, clarithromycin or erythromycin |

**Table 4: antimicrobial grouping for skin and soft tissue infection episodes**

| Antimicrobial group | Antimicrobials |
|---|---|
| Fluoroquinolones | Levofloxacin, delafloxacin, moxifloxacin or ciprofloxacin; exception to this is for Group A streptococci where ciprofloxacin is not used. |
| Glycopeptides | Vancomycin or teicoplanin |
| Macrolides | Azithromycin, clarithromycin, or erythromycin |

Patient postcode from the AMR module of SSGS and patient alternate postcode from the CDR module of SGSS were used to identify adults (aged 18+ years) in prison. To account for potential delays in updating addresses, this analysis captures those with prison postcodes listed as their postcode at the time of their specimen as well as those that had a non-prison postcode at the time of their specimen but had at least 1 sample reported into SGSS while registered at a prison postcode between 01 April 2019 and 31 March 2024. The method of identifying the prison population by using postcodes has been employed in other studies[22] and was also validated by using IIS (Immunisation Information system) to cross check the current population identifiable by using prison postcode against the published MoJ population as at September 2024. Rates of infection were calculated by dividing the total number of infections over person-years. Mid-year population figures for England broken down by sex were used to calculate the denominators. This was taken from MoJ published data. The calculation of the rate is made on the basis of person-years, therefore using snapshots in this way, rather than estimating the total number of people who had been in prison during the period is seen as a defensible approach.

SGSS is a live reporting database, and therefore data is subject to change and may differ to other published outputs.

The Office for Health Improvements and Disparities developed a method for assigning ethnic group based on hospital admissions data[23]. As different ethnicities may be recorded in different treatment episodes, the method selected a single ethnic group from a patient's HES records. Episodes were linked to ethnic group using patient NHS number and date of birth.

SGSS is a live reporting database, and therefore data is subject to change and may differ to other published outputs.

## AMR supplementary information

**Table 5a Number of tested and resistant skin and soft tissue infection episodes for meticillin-resistant Staphylococcus aureus (n =1,185)**

| Antimicrobial | 2019/2020 No. tested | 2019/2020 % resistance (n) | | 2020/2021 No. tested | 2020/2021 % resistance (n) | | 2021/2022 No. tested | 2021/2022 % resistance (n) | | 2022/2023 No. tested | 2022/2023 % resistance (n) | | 2023/2024 No. tested | 2023/2024 % resistance (n) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Macrolides | 224 | 59.4 | (133) | 147 | 65.3 | (96) | 164 | 64.0 | (105) | 221 | 62.4 | (138) | 314 | 64.3 | (202) |
| Clindamycin | 180 | 46.7 | (84) | 127 | 48.8 | (62) | 133 | 49.6 | (66) | 187 | 52.9 | (99) | 293 | 58.7 | (172) |
| Tetracycline | 220 | 19.5 | (43) | 150 | 23.3 | (35) | 167 | 17.4 | (29) | 218 | 18.8 | (41) | 290 | 17.6 | (51) |
| Co-trimoxazole | 90 | 4.4 | (4) | 62 | 4.8 | (3) | 81 | 1.2 | (1) | 123 | 4.1 | (5) | 206 | 3.9 | (8) |
| Fluoroquinolones | 203 | 42.9 | (87) | 142 | 40.1 | (57) | 148 | 42.6 | (63) | 201 | 39.3 | (79) | 265 | 48.7 | (129) |
| Linezolid | 185 | 0.0 | (0) | 124 | 0.8 | (1) | 139 | 0.7 | (1) | 192 | 0.0 | (0) | 266 | 0.0 | (0) |
| Glycopeptides | 124 | 1.6 | (2) | 69 | 0.0 | (0) | 86 | 1.2 | (1) | 105 | 0.0 | (0) | 160 | 0.0 | (0) |

**Table 5b Number of tested and resistant skin and soft tissue infection episodes for meticillin-susceptible Staphylococcus aureus (n =12,315)**

| Antimicrobial | 2019/2020 No. tested | 2019/2020 % resistance (n) | | 2020/2021 No. tested | 2020/2021 % resistance (n) | | 2021/2022 No. tested | 2021/2022 % resistance (n) | | 2022/2023 No. tested | 2022/2023 % resistance (n) | | 2023/2024 No. tested | 2023/2024 % resistance (n) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Macrolides | 2,911 | 26.2 | (763) | 1,854 | 27.7 | (514) | 2,191 | 28.8 | (632) | 2,268 | 31.0 | (702) | 2,664 | 32.4 | (863) |
| Clindamycin | 2,422 | 22.4 | (543) | 1,574 | 24.4 | (384) | 1,864 | 25.5 | (475) | 1,914 | 28.2 | (539) | 2,248 | 28.9 | (650) |
| Tetracycline | 2,774 | 5.5 | (153) | 1,787 | 5.3 | (94) | 2,106 | 5.8 | (123) | 2,137 | 6.6 | (140) | 2,431 | 7.3 | (177) |
| Co-trimoxazole | 827 | 1.3 | (11) | 645 | 1.4 | (9) | 900 | 0.8 | (7) | 994 | 1.2 | (12) | 1,215 | 0.9 | (11) |
| Fluoroquinolones | 1,972 | 3.3 | (65) | 1,267 | 4.3 | (54) | 1,500 | 3.7 | (55) | 1,567 | 7.7 | (121) | 1,870 | 11.1 | (207) |
| Linezolid | 1,602 | 0.1 | (1) | 1,021 | 0.1 | (1) | 1,153 | 0.1 | (1) | 1,364 | 0.0 | (0) | 1,539 | 0.0 | (0) |
| Glycopeptides | 1,194 | 0.1 | (1) | 703 | 0.1 | (1) | 870 | 0.1 | (1) | 939 | 0.2 | (2) | 1,053 | 0.0 | (0) |

**Table 5c Number of tested and resistant skin and soft tissue infection episodes for Group A Streptococci** (n =2,823)**

| Antimicrobial | 2019/2020 No. tested | 2019/2020 % resistance (n) | | 2020/2021 No. tested | 2020/2021 % resistance (n) | | 2021/2022 No. tested | 2021/2022 % resistance (n) | | 2022/2023 No. tested | 2022/2023 % resistance (n) | | 2023/2024 No. tested | 2023/2024 % resistance (n) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Macrolides | 790 | 5.7 | (45) | 339 | 7.7 | (26) | 334 | 6.6 | (22) | 503 | 7.8 | (39) | 765 | 15.4 | (118) |
| Clindamycin | 626 | 4.8 | (30) | 272 | 9.2 | (25) | 266 | 7.1 | (19) | 378 | 5.0 | (19) | 602 | 7.8 | (47) |
| Tetracycline | 774 | 64.9 | (502) | 328 | 63.1 | (207) | 332 | 59.6 | (198) | 495 | 64.2 | (318) | 709 | 71.8 | (509) |
| Co-trimoxazole | 189 | 6.9 | (13) | 118 | 3.4 | (4) | 124 | 4.0 | (5) | 203 | 3.9 | (8) | 376 | 1.9 | (7) |
| Fluoroquinolones | 199 | 1.0 | (2) | 84 | 2.4 | (2) | 120 | 3.3 | (4) | 183 | 0.5 | (1) | 294 | 0.3 | (1) |
| Linezolid | 128 | 0.0 | (128) | 130 | 0.0 | (130) | 166 | 0.0 | (166) | 196 | 0.0 | (196) | 212 | 0.0 | (212) |
| Glycopeptides | 354 | 0.3 | (1) | 185 | 0.0 | (0) | 217 | 0.5 | (1) | 282 | 0.0 | (0) | 376 | 0.0 | (0) |

**Table 5d Number of tested and resistant skin and soft tissue infection episodes for Group C/G Streptococci** (n =2,189)**

| Antimicrobial | 2019/2020 No. tested | 2019/2020 % resistance (n) | | 2020/2021 No. tested | 2020/2021 % resistance (n) | | 2021/2022 No. tested | 2021/2022 % resistance (n) | | 2022/2023 No. tested | 2022/2023 % resistance (n) | | 2023/2024 No. tested | 2023/2024 % resistance (n) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Macrolides | 483 | 39.1 | (189) | 370 | 43.2 | (160) | 352 | 45.5 | (160) | 420 | 45.2 | (190) | 476 | 47.1 | (224) |
| Clindamycin | 339 | 32.4 | (110) | 285 | 39.6 | (113) | 260 | 40.4 | (105) | 300 | 38.3 | (115) | 340 | 42.4 | (144) |
| Tetracycline | 473 | 32.3 | (153) | 367 | 35.4 | (130) | 351 | 33.9 | (119) | 386 | 43.0 | (166) | 427 | 42.4 | (181) |
| Co-trimoxazole | 139 | 0.7 | (1) | 109 | 0.9 | (1) | 134 | 0.7 | (1) | 165 | 1.8 | (3) | 253 | 0.0 | (0) |
| Fluoroquinolones | 146 | 2.7 | (4) | 119 | 0.0 | (0) | 155 | 0.0 | (0) | 142 | 4.2 | (6) | 175 | 1.7 | (3) |
| Linezolid | 89 | 0.0 | (0) | 123 | 0.0 | (0) | 140 | 0.0 | (0) | 143 | 0.0 | (0) | 112 | 1.8 | (2) |
| Glycopeptides | 230 | 0.0 | (0) | 222 | 0.5 | (1) | 201 | 1.0 | (2) | 230 | 0.0 | (0) | 233 | 0.4 | (1) |

*Flucloxacillin, first-line treatment for meticillin-susceptible Staphylococcus aureus, is not presented in this table as resistance would re-categorise the sample as meticillin-resistant Staphylococcus aureus

**Resistance to penicillin is not presented in this table as it has not been detected in GAS

**Table 6: total number and percentage of bacteraemia and resistant bacteraemia by organism, 2019/20 – 2023/24**

| Bacteria | All bacteraemia (%) | Resistant bacteraemia (%) |
|---|---|---|
| Staphylococcus aureus | 208 (45.3%) | 20 (29.0%) |
| Escherichia coli | 112 (24.4%) | 30 (43.5%) |
| Enterococcus spp | 44 (9.6%) | 6 (8.7%) |
| Klebsiella pneumoniae | 41 (8.9%) | 10 (14.5%) |
| Streptococcus pneumoniae | 23 (5.0%) | 0 (0.0%) |
| Pseudomonas spp | 18 (3.9%) | 2 (2.9%) |
| Klebsiella oxytoca | 10 (2.2%) | 1 (1.4%) |
| Acinetobacter spp | 3 (0.7%) | 0 (0.0%) |
| **Total** | **459** | **69** |

**Table 7a: number of tested and resistant bacteraemia episodes for Acinetobacter spp, 2019/20 – 2023/24**

| Antimicrobial class/ antibiotic | Number tested for resistance | % resistance (n) |
|---|---|---|
| Aminoglycosides | 3 | 0% (0) |
| Fluroquinolones | 2 | 0% (0) |
| Carbapenems | 3 | 0% (0) |

**Table 7b: number of tested and resistant bacteraemia episodes for Enterococcus spp, 2019/20 – 2023/24**

| Antimicrobial class/ antibiotic | Number tested for resistance | % resistance (n) |
|---|---|---|
| Glycopeptides | 43 | 14.1% (6) |

**Table 7c: number of tested and resistant bacteraemia episodes for E.coli, 2019/20 – 2023/24**

| Antimicrobial class/ antibiotic | Number tested for resistance | % resistance (n) |
|---|---|---|
| Third generation cephalosporins | 109 | 11.0% (12) |
| Aminoglycosides | 112 | 14.3% (16) |
| Fluroquinolones | 100 | 16.0% (16) |
| Carbapenems | 108 | 0% (0) |

**Table 7d: number of tested and resistant bacteraemia for K. oxytoca, 2019/20 – 2023/24**

| Antimicrobial class/ antibiotic | Number tested for resistance | % resistance (n) |
|---|---|---|
| Third generation cephalosporins | 10 | 0% (0) |
| Aminoglycosides | 10 | 10.0% (1) |
| Fluroquinolones | 8 | 0% (0) |
| Carbapenems | 10 | 0% (0) |

**Table 7e: number of tested and resistant bacteraemia episodes for K. pneumoniae, 2019/20 – 2023/24**

| Antimicrobial class/ antibiotic | Number tested for resistance | % resistance (n) |
|---|---|---|
| Third generation cephalosporins | 40 | 20.0% (8) |
| Aminoglycosides | 40 | 15.0% (6) |
| Fluroquinolones | 39 | 12.8% (5) |
| Carbapenems | 40 | 2.5% (1) |

**Table 7f: number of tested and resistant bacteraemia episodes for Pseudomonas spp., 2019/20 – 2023/24**

| Antimicrobial class/ antibiotic | Number tested for resistance | % resistance (n) |
|---|---|---|
| Three or more antimicrobial groups (excluding carbapenems) | 16 | 0.0% (0) |
| Carbapenems | 17 | 11.8% (2) |

**Table 7g: number of tested and resistant bacteraemia episodes for S. aureus, 2019/20 – 2023/24**

| Antimicrobial class/ antibiotic | Number tested for resistance | % resistance (n) |
|---|---|---|
| Meticillin | 202 | 9.9% (20) |

**Table 7h: number of tested and resistant bactereaemia episodes for S. pneumoniae, 2019/20 – 2023/24**

| Antimicrobial class/ antibiotic | Number tested for resistance | % resistance (n) |
|---|---|---|
| Penicillin | 22 | 0% (0) |
| Penicillin and macrolides | 21 | 0% (0) |

## COVID-19 and influenza hospital admissions

Hospital Admission records from the Hospital Episode Statistics (HES) data source were filtered to admissions with either Influenza or COVID-19 ICD-10 diagnosis codes or other respiratory ICD-10 diagnosis codes associated with a positive COVID-19 or influenza test.

For COVID-19, admissions between May 2020 – April 2024 were used. For Influenza, the 12.5 year period between January 2012 – June 2024 was used.

Admissions were attributed to prisoners through 1 of t3 detection methods:

- the origin or destination code in HES indicated a penal institution
- the postcode in the admission data matched a postcode for a prison or young offenders' institution, where no other properties shared the same postcode

- a positive COVID or Flu test that occurred at the time of admission could be linked by address matching to a prison using key words, for example "HMP", "Prison"

Detection methods were inclusive, and the final list of people in prison (PIP)-attributed admissions was deduplicated to prevent double counting. Hospital admissions for the General Population of England were all HES records that were not identified as being from PIP but did have a patient address postcode that was linkable to an IMD score.

Admissions for those living in the 20% most deprived areas of England were a subset of the General Population where the stated patient address was linked to a postcode with the lowest most Index of Multiple Deprivation quintile as per the 2019 IMD data available from ONS.

To estimate the sampling error for PIP detection, we used a capture recapture model with Bayesian model averaging. This assessed and compared the sampling coverage of the 3 approaches listed above to produce an estimate of the true number of PIP hospital admissions in the data. We use this to estimate a percentage of PIP admission that we did not detect which is stated as an error term in point 6. We did not then inflate our further analysis by this number.

To calculate admission rates per 100,000 of the General Population and those living in the 20% most deprived areas of England we used the ONS Census 2021 whole population of England broken down by age, sex, and Lower layer Super Output Areas (LSOA) as denominators. The denominator population for those living in the 20% most deprived areas of England was the total population for all LSOAs identified as the most deprived deprivation quintile using the IMD.

To calculate admission rates per 100,000 for PIP we took the mean prison population snapshot from the UK Government Offender Management Statistics. For each disease we took the mean June snapshot population to estimate the total prison population in England and Wales. For COVID we took the mean between 2020 – 2024, which was 4336. For Influenza we took the mean between 2016 – 2024 which was 498. We did not include earlier years for flu because these populations are not available broken down by age category. The denominators produced form these official statistics include both English and Welsh prisons, whereas the admission data from HES APC does not contain PIP admitted to Welsh hospitals. As such, rates produced from this will be underestimates of the true England-only PIP admission rates. This is unavoidable, because there is currently no available age-stratified data for England-only prison populations.

Relative differences in admission rates between groups are calculated as rate ratios between PIP and each of the 2 comparator groups. A rate ratio of 1 indicates identical rates, >1 indicates a higher rate in PIP, and <1 indicates a lower rate in PIP. We consider rate ratios that are higher than 1.25 or lower than 0.8 to be notable as per guidance from the Cabinet Office's Race Disparity Unit, and asses the statistical significance of this based on whether the 95% confidence interval overlaps with these boundaries.

Compared to people living in the 20% most deprived areas of England, people in prison had significantly higher rates of COVID-19 admission than those aged 60 to 69 years, where admission rates for people in prison were 67% (95% CI: -18%, +20%) higher per 100,000. Those

living in the 20% most deprived areas of England had a similar critical care admission rate at 220 per 100 000. The slightly lower rate in prisons may be due to good prevention and control measures.

Identifying hospital admissions among prisoners is hindered by data limitations, which can obscure a significant public health concern. Methods for identifying hospital admissions for people in prisons are limited and are highly likely to be underestimating total admissions.

The total admissions in people in prisons represent a much lower number than the total admissions in the general population and the most deprived 20%. Low counts, particularly in influenza admissions reduce the confidence in the data and small counts can distort rates.

While the age profile of people in prisons may show a lower proportion of the older age groups most at risk of hospitalisation for COVID-19 and influenza, there may also be other differences in the demography of people in prisons compared to the other population groups. The total proportion of females is distinctly lower for PIP compared to the other groups in both admissions and the overall population. The total number of PIP admissions in females was 180 for COVID-19 and 31 for influenza. The European Standard population can be used to calculate sex-standardised and age-and-sex-standardised rates but the discrepancy between the sex distribution in people in prisons mean that weighting could dramatically inflate the rate in females, which is where we have few admissions. Sex standardisation could therefore present artificial rates where the magnitude could be heavily impacted by small differences in admissions for females.

## Summary of prison results compared to the community

**Table 8: comparison of prison data to available community data**

| Disease | Community rate | Prison rate | Comparator |
|---|---|---|---|
| **Syphilis** | Syphilis is not routinely tested for in any community dataset, and it is possible to live with the disease for long periods without being diagnosed.<br>Population prevalence of syphilis from antenatal screening is 1.64 per 1,000 people.<br>2023 syphilis diagnostic rate: 16.7 per 100,000 | UKHSA biobehavioural survey: 3.6% positivity rate<br>UKHSA biobehavioural surveys (2022 to 2024): Males: 1.8%; Females: 5.6%. | Unclear.<br>It is difficult to understand how much higher prison rates are compared to the community, as there is no directly comparable dataset. However, it is clear that among the prison population there are large sex inequalities, with women experiencing a considerably higher rate of syphilis.<br>Similarly, the antenatal screening programme, though a useful source of intelligence, will not represent the overall population. If comparing the female prison rate with the antenatal screening programme, the female prison population has a rate **3.4 times** the antenatal screening rate. |

| Disease | Community rate | Prison rate | Comparator |
|---|---|---|---|
| **Hepatitis C** | Hepatitis C is not routinely tested for in any community dataset, and it is possible to live with the disease for long periods without being diagnosed.<br>Modelled estimate of general community prevalence in England: 0.1%<br>Opt-out emergency department testing in England (2023) HCV RNA positive: 0.2% | UKHSA biobehavioural surveys core antigen (2022 to 2024): 0.8%<br>National sentinel surveillance of bloodborne virus testing (2022): 2.7%<br>High Intensity Test and Treat RNA positive (2019 to 2024): 1.1%<br>UKHSA biobehavioural surveys (2022 to 2024): Males: 0.3%; Females: 3.1%. | If comparing opt out emergency department testing with the biobehavioural survey, the prison population has a **4 times** higher rate of HCV than the general population. However, it is unclear how representative of the overall population those presenting at emergency departments are- some will be overrepresented. |

| Disease | Community rate | Prison rate | Comparator |
|---|---|---|---|
| **Hepatitis B** | Hepatitis B is only routinely tested for in the HBV antenatal dataset, and it is possible to live with the disease for long periods without being diagnosed.<br>Modelled estimate of general community HBV prevalence in England: 0.6%<br>Opt-out emergency department testing in England (2023) HBsAg (current infection): 1.1%<br>HBV antenatal screening programme in England HBsAg (current infection): 0.4% | UKHSA biobehavioural surveys (2022 to 2024) Anti-HBC (current or previous infection): 5.0%<br>UKHSA biobehavioural surveys (2022 to 2024) Anti-HBC (current or previous infection) Males: 5.4%; Females: 4.7%<br>UKHSA biobehavioural surveys (2022 to 2024) HBsAg current infection (acute or chronic): 0.7%<br>UKHSA biobehavioural surveys (2022 to 2024) HBsAg current infection (acute or chronic): Males: 0.8%; Females: 0.6%<br>National sentinel surveillance of bloodborne virus testing (2015 – 2022) 1.0 – 1.7% | If comparing opt out emergency department testing with the biobehavioural survey HBsAg results, the prison population has a **lower** positivity of HBV than the general population There was slightly **higher** positivity in prisons SSBBV data, which may be more representative. It is unclear how representative of the overall population those presenting at emergency departments are- some people with risk factors for HBV will be overrepresented.<br>Similarly, the antenatal screening programme, though a useful source of intelligence, will not represent the overall population. If comparing the female prison rate with the antenatal screening programme, the female prison population has a rate **1.5 times** the antenatal screening rate. |

| Disease | Community rate | Prison rate | Comparator |
|---|---|---|---|
| **HIV** | HIV is not routinely tested for in any community dataset, and it is possible to live with the disease for long periods without being diagnosed.<br>Opt-out emergency department testing in England (2023): 0.9%<br>Estimated prevalence in England in 2023 using Multi-Parameter Evidence Synthesis (MPES) statistical model: 0.2% | NHS England Health and Justice Data (2023): 0.7%<br>UKHSA biobehavioural surveys (2022 to 2024): 1.1%<br>UKHSA biobehavioural surveys (2022 to 2024): Males: 0.8%; Females: 1.5%. | If comparing opt out emergency department testing with the biobehavioural survey, the prison population has a **1.2 times** higher rate of HIV than the general population. However, it is unclear how representative of the overall population those presenting at emergency departments are- some people with risk factors for HIV will be overrepresented. |
| **Tuberculosis** | TB is not routinely tested for in any community dataset, and it is possible to live with the disease for long periods without being diagnosed.<br>Total notification rate for TB in 2023: 8.2 per 100,000 | Prison history within last 5 years at time of notification of TB in 2023: 32.6 per 100,000<br>UKHSA biobehavioural surveys (2022 to 2024): 7.5% (IGRA Test)<br>UKHSA biobehavioural surveys (2022 to 2024): Males: 9.4%; Females: 5.5% | The prison population has a **4 times** higher rate of TB than the general population. |

| Disease | Community rate | Prison rate | Comparator |
|---|---|---|---|
| **COVID-19** | | | In the first wave of the pandemic, people in prisons were 2.5 times more likely to be infected with COVID-19 and 3.3 times more likely to die from COVID -19 than someone of the same age and sex in the community |
| **Influenza** | No statistics exist to describe the proportion of people in the community and in prison settings who experience influenza each season. | Between 2011 to 2024 UKHSA managed 83 outbreaks of influenza in English prisons. | |

# Supporting information

## The prison setting exacerbates health protection risk

### Sanitation and waste water

The nature of prison plumbing systems can influence the ability to deploy wastewater surveillance. Wastewater-based surveillance was widely applied during the COVID-19 pandemic as an unbiased, aggregate and anonymous method of monitoring for population-level infection trends and the spread of variants and was deployed in several English prisons[24]. However, the utility in prisons remained limited due to issues with determining the scope of the contributing population, dilution from other water sources and identification of suitable sampling locations.

### Infection prevention and control

Improving IPC measures in prisons will reduce the risk of disease transmission and subsequent outbreaks. Recent outbreaks of Group A streptococcal infection (GAS) have been attributed to poor IPC practice within prisons as highlighted in the following case study.

## Case study: GAS outbreaks in a prison

In 2024 there were 2 concurrent outbreaks of Group A Streptococcal (GAS) infection reported in a remand prison in England. GAS occurs when the bacterium enters the body and causes an infection, most often in the skin and throat through an existing wound. A total of fifteen prisoners were swabbed and found positive for GAS between September and November 2024. Strain typing indicated at least 2 clusters involved with 2 distinct groups of genetically (emm type) linked cases. The cases of 1 emm type were on separate wings and no obvious link was identified. The first case in each of the genetically identical clusters had been in the prison for more than 21 days indicating that transmission occurred inside the prison. Prisoners with infected wounds were treated on different days to reduce cross-infections. Cleaning in the wings had previously been described as "hit and miss". A new deep cleaning schedule was introduced in response to the outbreak. This included use of chlorine tablets, noting that due to budgetary restrictions chlorine tablets were no longer routinely used. As in other prisons, prisoners were employed as wing cleaners. The prison conducts an in-person cleaning course with a workshop instructor who signs off participants at the end of the course and a cleaning officer monitors their work. Further work needs to be done to upskill prisoners employed in cleaning roles on effective cleaning and IPC, which is challenging due to the high turnover in the prison population.

# Influenza

Between 2011 to 2024 UKHSA managed 83 outbreaks of influenza in English prisons, in 2024 there were 9 outbreaks, with a peak in 2018 where there were 20 prison outbreaks, with 2018 known to be marked by high levels of influenza in the community[25].

## COVID-19

Prisons were disproportionately affected by the COVID-19 pandemic. There were concerns from the outset that prisons would become potential high-risk settings for outbreaks and amplifiers of infection in the community[26]. In March 2020, prison systems across the UK were quick to introduce a full lockdown, with control measures remaining largely in place for the first year. Outbreaks often led to further restrictions on imprisoned people's regimes, limiting contact not only with their peers but also with visitors, families and staff, and restricting access to education, training and employment activities, gym, religious associations, and general association in exercise yards[27] and could result in prisoners who were cases or contacts remaining in their cells for 23 hours a day[28].

During the pandemic people in prisons in England and Wales were isolated for up to 23 hours a day, similar to solitary confinement. This lack of social contact and activities led to depression, self-harm, and suicidal thoughts. The government's "Hands. Face. Space." guidance was ineffective due to limited access to sanitiser, masks, and social distancing. Healthcare access was also restricted, worsening existing conditions and delaying new diagnoses. People felt abandoned, especially as society reopened while prisons remained in lockdown. Healthcare staff believed prison healthcare was neglected, lacking resources for COVID-19 testing, vaccinations, and PPE[29].

### Case study: managing COVID-19 in open prisons in the North West

The North West developed a model to support each of their 15 prison sites, which vary by estate and population. A Health Protection Consultant was assigned to each site to develop understanding and build relationships with associated HMPPS and healthcare teams. This provided continuity for both routine check-ins and outbreak management. This understanding of the site-specific regime and population was particularly relevant to open prisons and the additional challenges of managing community ingress while maintaining work and rehabilitation regimes and resulted in no prolonged COVID-19 outbreaks in their open prisons. Key outcomes of this model included: identifying the importance of relationships, work and rehabilitation as part of health protection risk assessments; development of effective partnership working, open communication and comprehensive understanding of evolving situations.

The COVID-19 pandemic had longer term repercussions on prison capacity and function, as court backlogs have meant prisoner numbers have risen substantially over the last few years squeezing capacity in the estate[30]. This increased overcrowding and churn has had continued effects for health protection, increasing the risk of disease transmission and limiting the ability to implement public health interventions to halt spread, such as isolation and restricting prison movements.

During the pandemic, prison COVID-19 guidelines changed frequently based on new evidence and the availability of rapid testing. Various strategies were used, such as isolating new arrivals, routine testing for staff and visitors, mass outbreak testing, and wastewater testing. Some of

these methods were unique to prisons, with limited evidence of their effectiveness[31]. Mass testing of everyone in a prison was recommended during outbreaks, but it was difficult to implement due to staffing shortages and testing fatigue. Modelling[32] suggested mass testing can stop outbreaks with up to 70% success providing the outbreak is declared very quickly, the first test is undertaken immediately at the point the outbreak is declared, uptake of testing and adherence to isolation is high and 3 rounds of testing are completed. However, isolating symptomatic individuals was generally more effective, as long as there were enough isolation facilities and adherence was high.

## Tuberculosis

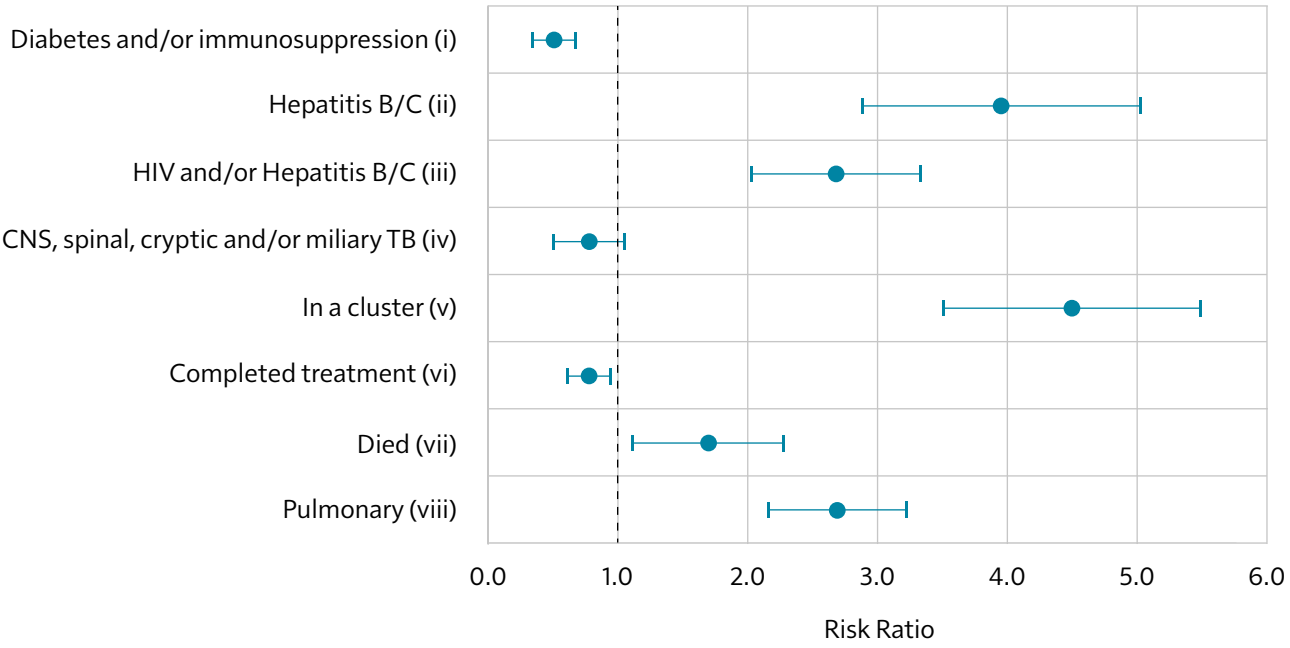
### Rates of TB disease and case characteristics

Rates of TB disease can be seen in table 9. Clinical comorbidities and TB disease characteristics and demographic risk factors associated with prison TB cases can be seen in figure 2 and figure 3.

**Table 9: rates of TB notifications in England and Wales in 2023**

| | Rates per 100,000 | 95% Confidence Interval |
|---|---|---|
| Total notifications | 8.2 | 8.0 to 8.4 |
| Prison history at the time of notification | 17.8 | 10.5 to 28.1 |
| Prison history within last 5 years at time of notification | 32.6 | 26.8 to 39.2 |

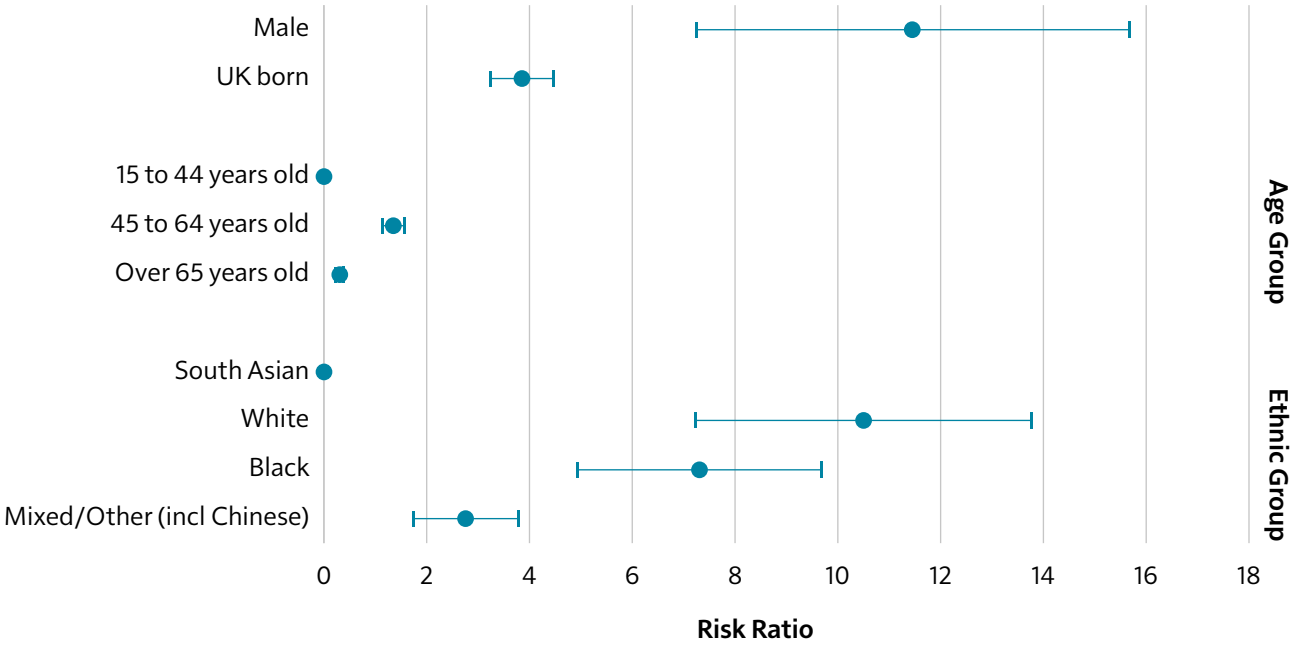
**Figure 2: clinical comorbidities and TB disease characteristics associated with prison history in people notified with active TB disease, 2021 to 2023, England**




Notes: reference groups for the above analysis include, (i) no diabetes or immunosuppression in those with recorded values, (ii) people without Hepatitis B or C in those with recorded values; (iii) people without HIV or Hepatitis B or C including all notifications; (iv) people with non-CNS (central nervous system) (non-severe) disease; (v) people not in a genomic cluster limited to those with a positive culture (a genomic cluster is defined as TB notifications which have a culture positive result within 12 SNPs of each person); (vi) people who did not complete TB treatment at their last recorded treatment outcome; (vii) people who had not died at their last recorded TB treatment outcome; (viii) people diagnosed with TB not including any pulmonary sites of disease and therefore non-infectious disease

Among those notified with active TB, individuals with a recorded prison history are more likely to be male (risk ratio 11.4), UK born (risk ratio 3.9) and of white ethnicity (risk ratio 10.5)[33]; factors which are representative of the majority of the English prison population.

**Figure 3: demographic risk factors associated with prison history in people notified with active TB disease, 2021 to 2023, England**




Notes: age 15 to 44 years and people of reported South Asian ethnicity were the reference groups for analysis of age and ethnic group.

Although the percentage of TB notifications with multidrug resistant (MDR) or rifampicin-resistant (RR) TB has increased between 2021 and 2023[34] this increase has not been observed in the prison population.

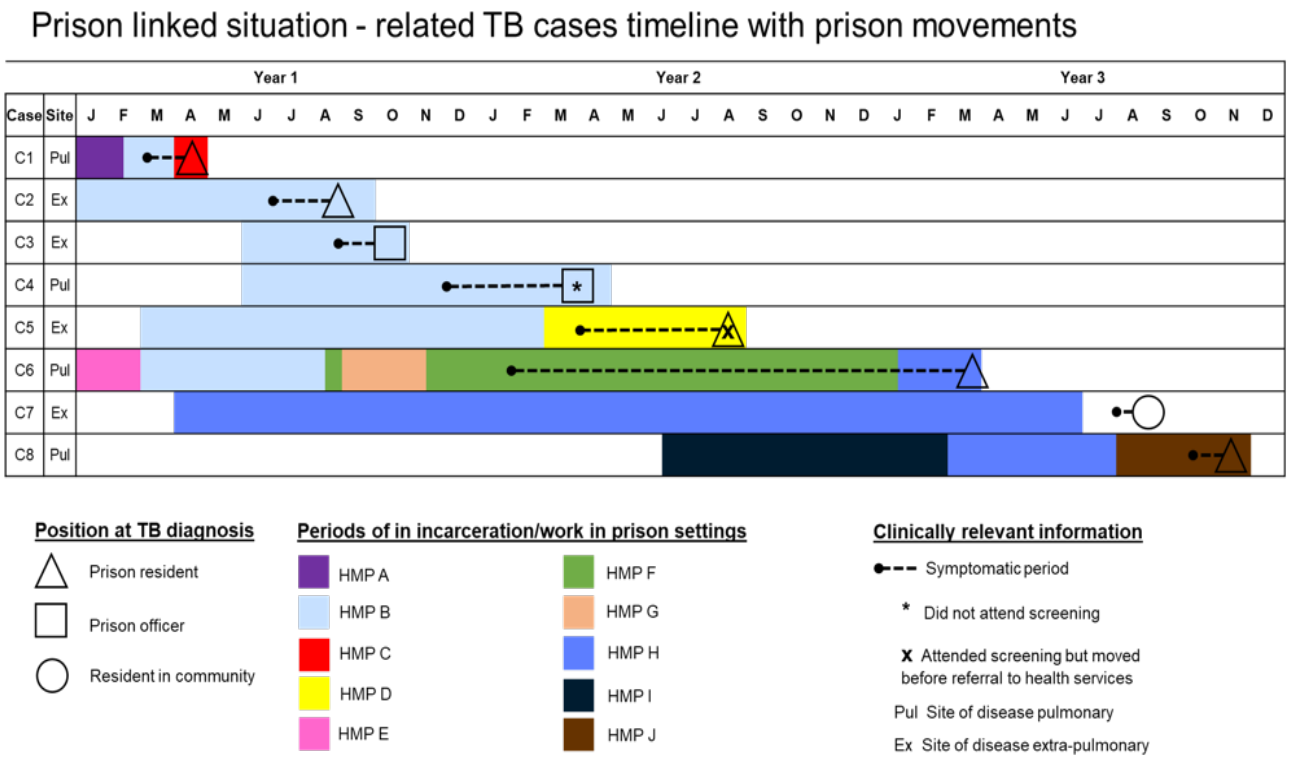
## Costs of TB management

Diagnosis and treatment of each person notified with TB in prison is estimated to cost the NHS over £50,000[35] with 80% of these costs attributed to the prison officer escort and bedwatch required at secondary care sites, reimbursed to the prison service from NHS budgets. There are also costs associated with contact tracing and subsequent screening following each individual identified with active TB. On average, there are 4 mass-screening events in English prisons every year following TB cases or outbreaks. Data from University College London Hospital Find and Treat service estimates that an average mass-screening event, encompassing 900 residents and 350 staff, will cost around £174,000. Clear communication to prisoners and staff is essential to identify close contacts and encourage testing and treatment if required. Churn in the prison system (due to frequent transfer or release after short sentences) results in high rates of loss-to-follow-up.

## Prison Cluster outbreak demonstrating resident to staff transmission

Figure 4 shows a timeline of TB cases linked to an outbreak in a male category C prison several years ago (details removed to avoid deductive disclosure). Eight cases were linked by whole genome sequencing (WGS) and shown to be closely related; some were diagnosed in settings different to their likely source of exposure. This highlights the risk of outbreaks lasting several years, with cases in prisoners and prison officers across multiple prisons and seeding transmission in and out of prison into the community.

**Figure 4: timeline of TB cases linked to an outbreak**




Note: Each row of the diagram relates to an individual TB case and shows the movement of that individual through different prison establishments. For more information on this outbreak see appendix 6.4.4

WGS of culture-positive samples can support tracing of transmission networks and related outbreaks. WGS identifies single nucleotide polymorphisms (SNPs) and their position on the genome to show how TB isolates are related[36]. The first row demonstrates the first case, a prison resident, who moved between 3 different prisons (HMP A, B and C) in a short space of time and was symptomatic in the latter 2 prisons but diagnosed quickly in the third. The second row, another resident, stayed in HMP B and was diagnosed there. The third and fourth rows are prison officers at HMP B, the second did not attend a mass screening event run at the prison following the 3 previously linked case even though invited. They subsequently presented with symptoms at a later date. The fifth row represents another resident who moved between HMP B and HMP D, who was screened but moved between prisons before being referred to health services, delaying diagnosis and treatment. Row 6 represents a resident who moved between 5 different prisons, and was symptomatic for a long period of time in 2 of them before being diagnosed in HMP H. Row seven is a member of the community, who was diagnosed after a long

residence in HMP H. Finally, row H represents another resident of HMP H, along with 2 other prisons, who was diagnosed after a period of symptoms in another prison, HMP J.

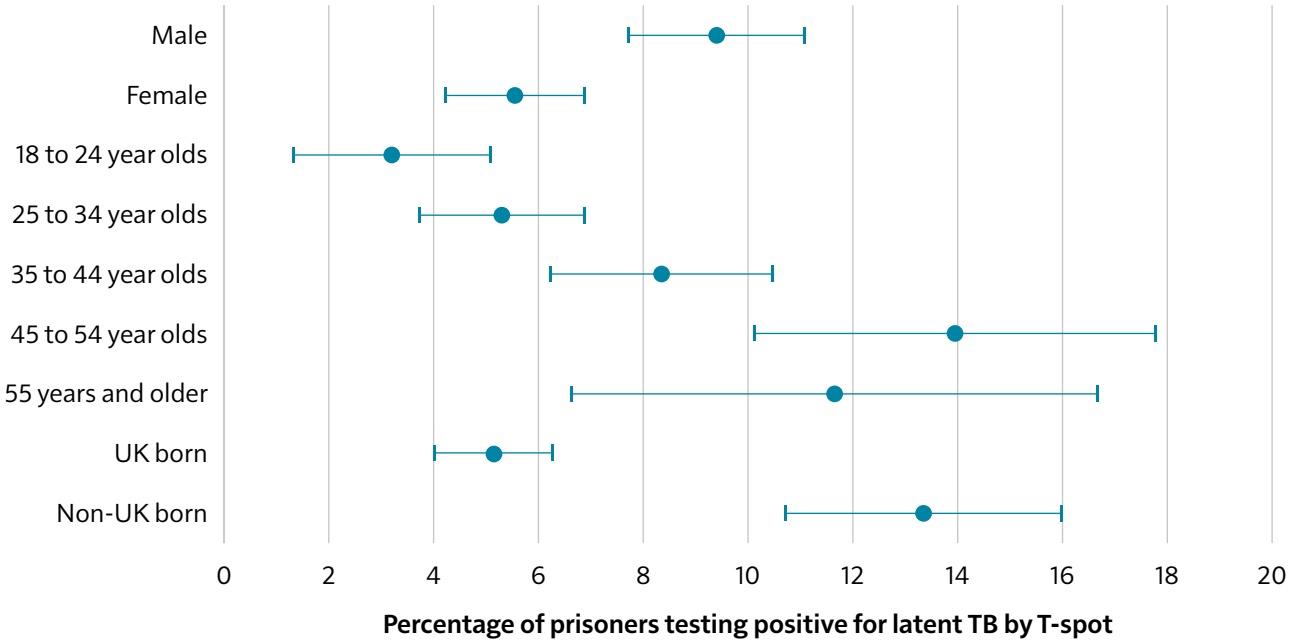
The example prison cluster shows that 4 out of 8 cases were diagnosed in settings different to their likely source of exposures including 1 diagnosed in the community following release. Two mass TB screening events were carried out at separate prisons with over 2,000 residents screened, while a further 4 prisons were risk assessed and contact screening offered where appropriate. 37.5% (3/8) of the cases in this cluster were lost to follow-up and did not complete treatment. Completion rates could be improved with better quality health record referrals, comprehensive prison records (such as history or cell sharers or intra-prison movements) and discharge planning.

## Biobehavioural survey IGRA latent TB (LTBI) results

Prisoners who participated in the biobehavioural surveys were testing using IGRA. Once active TB is excluded, a positive IGRA test usually means that someone has latent TB infection, although some people will test positive if they have previously been successfully treated for TB. Of the 2,209 people tested 166 (7.5%) were positive. Prevalence varied between the prisons included in the survey, with the highest rates seen in an English prison housing foreign national men with 13.9% positivity (95% confidence interval [CI]: 9.6% to 18.2%) and the lowest rates seen in an adult men's category C (closed) prison with only 2% of positive tests (95% confidence interval [CI]: 0.1% to 4%)[37]. Being born outside of the UK was associated with significantly higher rates of positivity with 13.4% of tests positive from those born outside the UK compared with 5.2% born in the UK. Prevalence was also significantly higher in individuals born in a country with medium or high TB incidence[38].

Figure 5 shows the biobehavioural survey results by demographic risk factors. There was a significant difference in the prevalence in male prisoners compared to female prisoners. Positivity also generally increased with age, with the lowest rates seen in 18 to 44 year olds and the highest in 45 to 54 year olds.

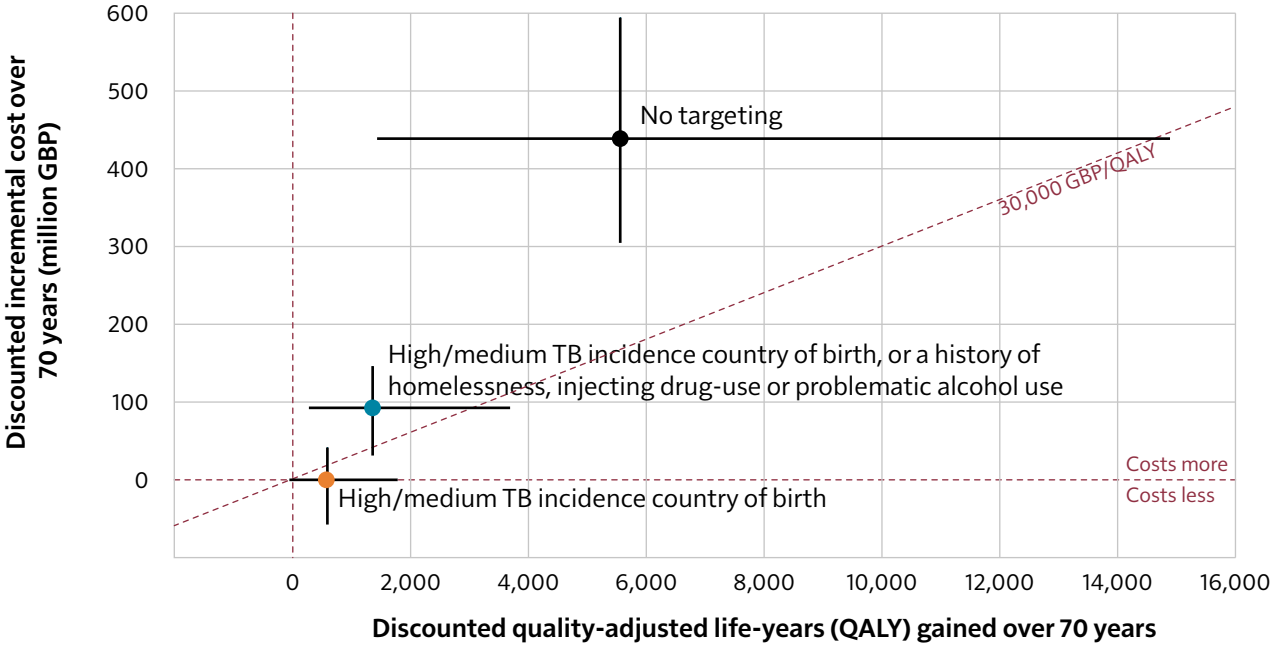
**Figure 5: percentage of prisoners testing positive for latent TB by IGRA in England, biobehavioural survey 2023**




## Cost effectiveness modelling of latent TB screening in prisons

Economic modelling was applied to understand whether based on biobehavioural survey IGRA test results, implementation of routine LTBI screening in prison could be cost effective. The modelling predicted that screening prisoners born in high or medium TB incidence countries for latent TB infection would be cost saving, averting 1 TB death a year and 6 TB cases a year with half of these in the community. This strategy would save around £35,000 GBP per year relative to the current standard of care, further research is required to ratify this finding and any potential savings.

**Figure 6: cost-effectiveness plane for LTBI screening at first reception into English prisons – average saving per year over 70 years. Colours denote strategies of universal screening (no targeting), and targeted screening of risk groups. The error bars denote the 95% uncertainty quantile**




Note: The orange "high/medium TB incidence country of birth" marker is below the horizontal red line indicating cost savings and represents a £35,000 saving. The blue and black markers are both above this line.

Source: Cost-effectiveness of tuberculosis infection screening at first reception into English prisons: a model-based analysis (manuscript submitted) MEDRXIV/2024/319317 Mafiralureva et al[39]

Biobehavioural survey LTBI rates were assumed to apply to the cohort of first receptions into prisons, and aggregate public data from HMPPS was used to inform a model of flow through the prison system. Treatment for TB can be lengthy; currently treatment for LTBI involves 3 months of daily-observed medication, while active TB treatment lasts at least 6 months[40]. This means people may fail to complete treatment or be lost to follow up. The model assumed 31% of those eligible for active TB treatment and 24% of those eligible for LTBI treatment would make it through to treatment completion.

### Improving TB management in prisons

There is a current multi-agency working group including members from UKHSA, NHS England, HMPPS, Home Office and academia that have reviewed the evidence to improve TB detection and management in prisons, including a literature review, academic modelling of LTBI screening, review of outbreak reports and lessons learnt, review of reception screening data and engagement with staff and people living in prison. This group has made recommendations to a national TB tripartite group and NHS England for improvement. The ability to implement recommendations is under discussion with NHS England and requires consideration of resources required. Recommendations include:

- improving the detection of active TB on entry, through better verbal screening and potential use of point of care diagnostics such as sputum testing
- consider the introduction of routine targeted LTBI screening to groups which have higher levels of LTBI, in line with cost effectiveness evidence
- improve in-reach care to prison settings to reduce delays and the need for escorts off site for both outbreaks and routine screening; including in-reach diagnostics (such as mobile x-ray) and telemedicine treatment
- recognising that staff are often exposed to TB cases, ensure considerations for prison staff are included in the response to TB cases, have adequate PPE and are included in contact tracing and screening

## Viral Hepatitis

The UK is committed to achieving elimination of viral Hepatitis as a public health threat by 2030[41]. Prisons are an integral part of the elimination agenda, given the disproportionate burden of infection among residents in these settings.

Recent engagement[42] with residents and staff in prisons reported consistent offers of BBV screening and reasonable uptake at the second stage health assessment on entry in to prison. Participants reported that uptake improved if linked to medical clearance to use the gym or work, and also through proactive follow up with those who initially refuse testing. Prisoner's recollections of the BBV screen were often hazy with some mistaking it for a mandatory process.

### Hepatitis C

There are several sources of data which can be used to estimate HCV prevalence and positivity among people in prison, alongside available community comparator data. Data on Hepatitis diagnoses in prisons are provided through the Sentinel Surveillance Data for Bloodborne Viruses (SSBBV) dataset. This is not a national laboratory dataset and will only represent prisons that provide samples to English laboratories which opt into sentinel surveillance (approximately 80 prisons).

## Hepatitis C – Microelimination and reductions in HCV positivity

Microelimination includes an offer of an HCV test to 100% of prisoners, with 90% test uptake and ensuring 90% of those diagnosed with HCV commenced or completed treatment[43]. SSBBV data demonstrates that overall HCV RNA (a marker of having a current infection) positivity among people tested in prison has decreased from 5.2% in 2018 to 2.7% in 2022. This decrease in HCV RNA positivity observed in prisons is likely due to the intensive testing and treatment initiatives in place in prison settings[44]. Although testing uptake has increased over recent years this increase in test uptake has not yet been sufficient in all prisons to achieve the 95 to 100% uptake of reception testing that would be needed to achieve prison micro-elimination, though some prisons have reached 100% reception testing.

## High intensity test and treat for HCV

The Hepatitis C Trust is commissioned by NHS England to deliver the High Intensity Test & Treat (HITT) programme in English prisons. HITTs are completed in addition to reception testing and aim to test at least 95% of a prison population over 3-5 days for HCV. If someone is found to be positive, they are fast-tracked onto treatment. In most cases, treatment can begin within 2 to 5 days. HITTs test individuals for HCV RNA.

Since 2019, NHS England has commissioned HITT peer led initiatives in selected prisons which aim to test everyone for HCV and fast track them onto treatment. Since 2019 82 HITTs have been completed achieving a testing uptake of 92%, testing 54,080 prisoners. 522 people were subsequently referred to treatment, with 478 people commencing treatment as a result. Uncertainty remains over how and whether HITTs will be funded and commissioned when national HCV funding comes to an end in 2026.

## HCV treatment and sustained virological response

Table 11 shows the proportion of individuals with sufficient identifiers who had an HCV RNA positive test in prison between 2015 and 2023 (n = 5313) who started treatment and achieved a sustained virological response (SVR)[e] compared to the general community.

[e] SVR indicates someone has been cured of HCV reducing their risk of liver damage and associated consequences such as cirrhosis and liver cancer. It should be noted that evidence of follow up testing may be limited in persons tested in prisons, and an SVR may therefore be incompletely recorded

**Table 11: treatment pathway for individuals with a positive HCV RNA in prison between 2015 and 2023**

| Group | England | Prisons |
|---|---|---|
| Percentage who started treatment out of all HCV RNA positive tests with identifiers [Note 1] | 78% | 76% |
| Percentage achieving SVR [Note 2] after starting treatment | 83% | 79% |
| Percentage achieving SVR out of all HCV RNA positive tests with identifiers | 65% | 60% |

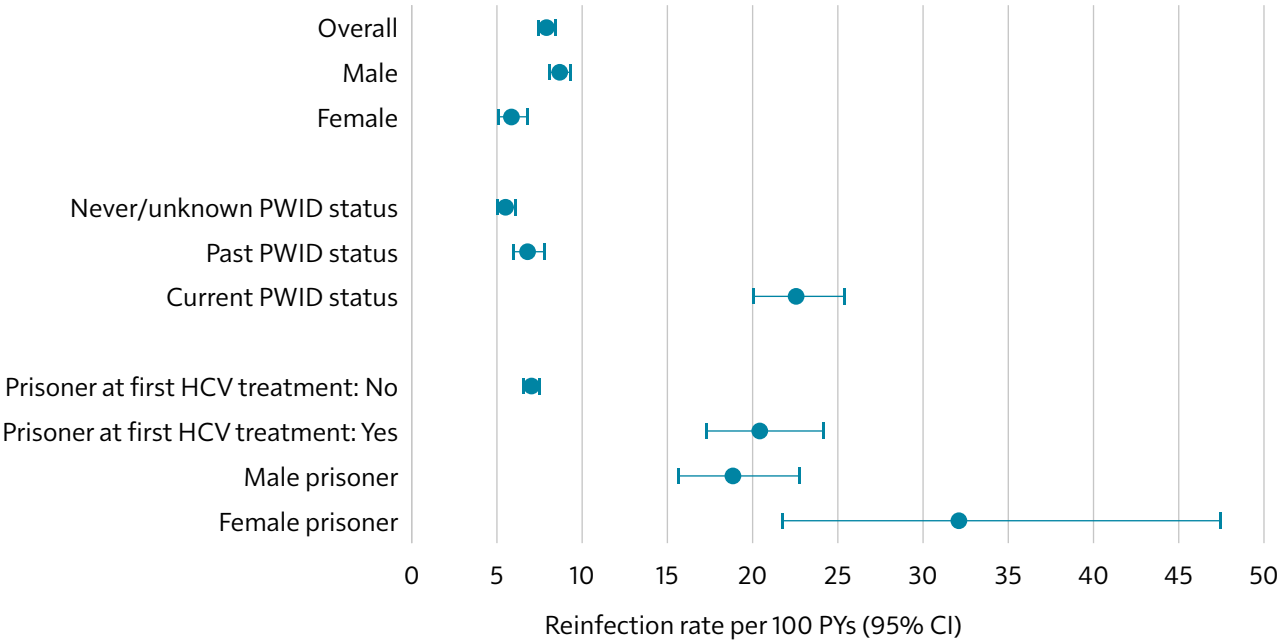
Note 1: Excludes individuals with an RNA negative test and no linkage to treatment (possible spontaneous clearance) and who died with no RNA negative test. In individuals testing Hepatitis C virus RNA positive with no linkage to the Hepatitis C Patient Registry and Treatment Outcome System or NHSE's Blueteq System, there are no time restrictions on a subsequent RNA negative test after the initial RNA positive test. Therefore, these individuals may include those that have spontaneous clearance of their infection or individuals who have cleared infection as a result of treatment but were not linked to the NHS England Hepatitis C Patient Registry and Treatment Outcome System or Blueteq.

Note 2: Sustained virological response (SVR) is number achieving SVR as a reported treatment outcome, or in the in the absence of a reported SVR, an RNA negative test recorded at 96 days or more after the treatment start date in SSBBV.

## Hepatitis C reinfections

There is a high rate of HCV reinfection in people who were tested for and initiated HCV treatment in prison[45]. Figure 7 shows there are 20.4 reinfections per 100 person years among people tested in prison. This was particularly notable among women prisoners with 32.1 reinfections per 100 person years[46].

**Figure 7: rates of HCV reinfection in England by gender, drug use status and prisoner status, 2015 to 2019**




PWID: People who inject drugs, PYs: Person-years

Data source: Hibbert M, Simmons R, Harris H, Desai M, Sabin CA, Mandal S. Investigating rates and risk factors for Hepatitis C virus reinfection in people receiving antiviral treatment in England. J Viral Hepat. 2023 Aug;30(8):646-655. doi: 10.1111/jvh.13835. Epub 2023 Apr 13. PMID: 36929670.

## Hepatitis B

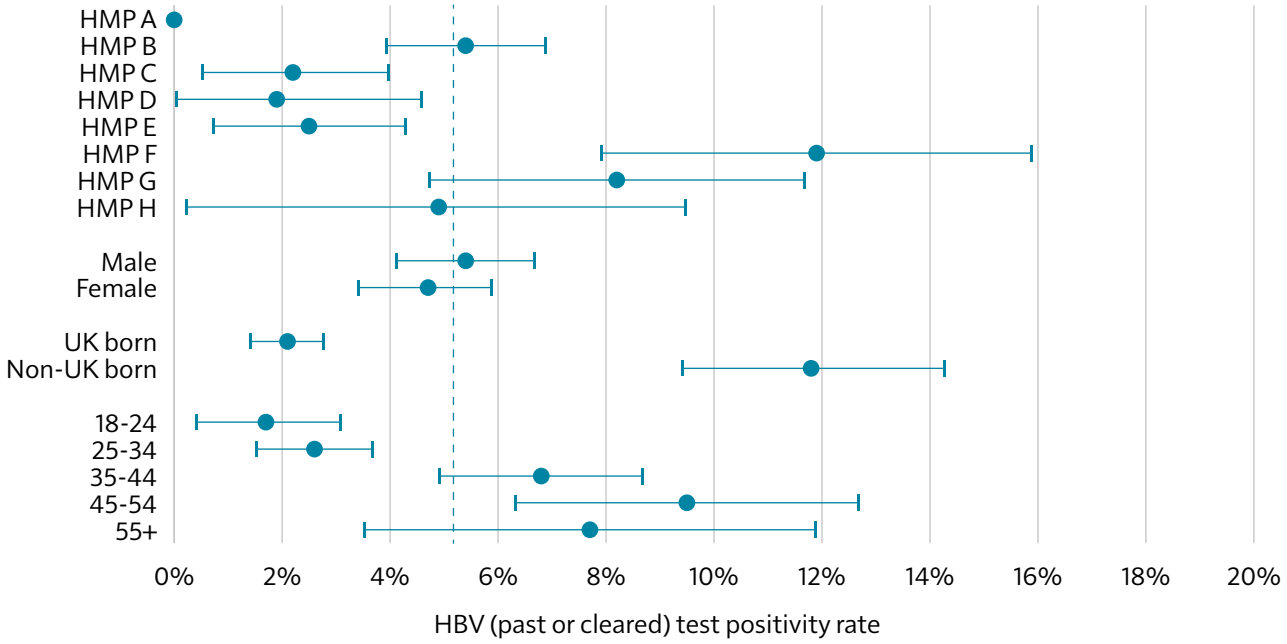
Modelling based on the English antenatal screening programme[47] suggests approximately 268,000 people are living with chronic Hepatitis B in England. This equates to around 0.6% of the population[48 49]. New estimates suggest that only 31.0% to 46.8% of people living with HBV are diagnosed as having the disease[50]. Most of these people will have acquired their infection in infancy in higher prevalence countries. Most adults with acute infections will clear the infection naturally, but around 10% will develop a lifelong, chronic HBV infection. HBV is transmitted through contact with infected body fluids, mainly blood, which can occur through multiple routes including mother to child transmission, sexual contact, sharing of injecting equipment, sharing of personal hygiene products including razors and toothbrushes, medical procedures, and tattooing.

## Hepatitis B biobehavioural survey results

In UKHSA biobehavioural surveys, of the 2,253 people tested for Hepatitis B serology, 113 (5%) were positive for Hepatitis B core antibody, indicating either a current or past infection[51]. Prevalence varied considerably between the eight prisons included in the survey, with the highest prevalence seen in a foreign national men's prison at 11.9% (95% confidence interval [CI]: 7.9% to 15.9%) and 0% in an adult men's category C prison. Prevalence increased with age, with the lowest prevalence seen in 18 to 24 year olds at 1.7% (95% confidence interval [CI]: 0.4% to 3.1%) and the highest prevalence found in 45 to 54 year olds at 9.5% (95% confidence interval [CI]: 6.3% to12.7%). Being born outside of the UK was again associated with

significantly higher prevalence at 11.8% (95% confidence interval [CI]: 9.4% to 14.3%) compared with 2.1% among those who were born in the UK (95% confidence interval [CI]: 1.4% to 2.8%). There were no significant differences in prevalence between those who did or did not report a history of homelessness, though there was a trend towards higher numbers in those reporting a history of IV drug use. Sixteen people in the survey tested positive for HBsAg (0.7%). Prevalence was again significantly higher in those born outside the UK, but numbers were too small to derive any further insights. See Figure 8.

**Figure 8 HBV (past or cleared infection) test positivity for people in prison, biobehavioural survey data**




## HIV

The UK is aiming to achieve zero HIV transmissions by 2030[52]. Key to this is a multipronged approach including equitable access to Pre-Exposure Prophylaxis (PrEP), reducing the number of people who are undiagnosed through HIV testing, ensuring prompt linkage to HIV care for those recently diagnosed and access to ongoing care.

There are several sources of data which can be used to estimate HIV prevalence and positivity among people in prison as shown in Table 13, alongside available community comparator data.

**Table 13a HIV positivity data for people in prisons in England and community comparator data**

| Prison Data source | HIV positivity |
|---|---|
| NHS England Health and Justice Data (2023)[53] | 0.7% |
| UKHSA biobehavioural surveys (2022 to 2024) | 1.1% |

**Table 13b HIV positivity data for people in the English community (comparator data)**

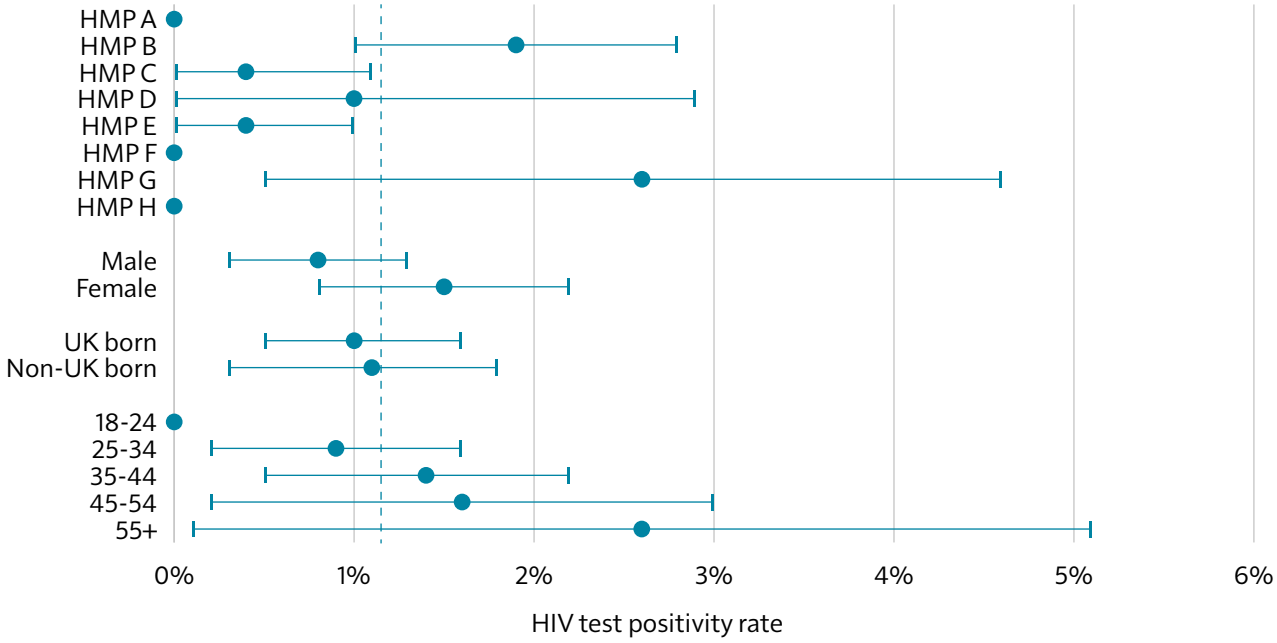
| Community Data source | HIV positivity |
|---|---|
| Estimated prevalence in England in 2023 using Multi-Parameter Evidence Synthesis (MPES) statistical model[54 55] | 0.2% |
| Prevalence of HIV among participants in the Unlinked Anonymous Monitoring (UAM) Survey of people who inject drugs using dried blood spot testing (2023)[56] | 1.0% |
| Opt-out emergency department testing in England (2023)[57] | 0.9% (including people with known HIV diagnosis) |

Note: UKHSA biobehavioural surveys offer testing to all prisoners in a setting NHS England Health and Justice data reports positivity for the opt-out BBV testing programme offered to all people on entry in to prison

## HIV biobehavioural survey results

In the biobehavioural surveys, HIV prevalence varied considerably between prisons. Prevalence was higher among women compared to men, but this difference was not statistically significant. There was no association with being born outside of the UK or a reported history of homelessness or injecting drug use. Those who were in the older age category (55 years and older) had the highest prevalence compared to the other age groups. See Figure 9.

**Figure 9 HIV test positivity rate for people in prison from biobehavioural survey data**




People with HIV should be seen for HIV care at least once a year. However, in 2023, an estimated 5,000 to 12,000 people seen for care in England had a 15-month HIV attendance gap[58]. People from ethnic minorities, women, young people and people living in areas of deprivation are more likely to disengage from care[59]. No data is currently available on HIV treatment attendance for people in prison.

### HIV Pre Exposure Prophylaxis (PrEP) audits

No national data is available on PrEP access for people in prisons. However, 2 English regions have recently piloted a self-assessment tool for prisons to evaluate whether they are meeting sexual health standards as described in the most recent British Association for Sexual Health and HIV (BASHH)[60] guidelines for prisons. This audit showed variation in provision and access to PrEP. One region reported that HIV PrEP is offered at all 6 sites who responded to the audit (67% of prisons), either on a shared care basis or via out-reach services outside of the prison, but that only 3 sites were actively promoting the use of PrEP. The audit report concluded that there were gaps in terms of education and training in healthcare teams and the provision of some sexual health services, in particular HIV PrEP and promotional activity for PrEP and post exposure prophylaxis (PEP). Similarly, the second audit in a different region found that there were gaps in the provision of HIV PrEP and PEP and the promotional activities that are needed to ensure uptake. Again, workforce was highlighted as an issue with 50% of respondent sites indicating that they did not have a sexual health trained member of staff available each day at the time of audit/survey.

## Chlamydia

There were 41 cases of chlamydia diagnosed in HMP X in 2024, and 32 in 2023, and test positivity rates of 4.3% in 2024 and 3.1% in 2023. In 2024, similarly higher positivity rates were seen in the 18 to 24 and 35 to 44 years age groups (6.3% and 6.0% respectively) compared to

the 25 to 34 years age group (4.1%), though this pattern was inverted in 2023 (18 to 24 positivity rate 3.3%, 25 to 34 positivity rate 4.7%, 35 to 44 positivity rate 2.9%).

## Vaccinations and vaccine-preventable diseases

### Building the evidence base for whole prison influenza vaccination

#### Case study: South West whole prison influenza vaccination feasibility study

The influenza prison feasibility study is a collaborative whole system approach across settings in the South West of England, and with national partners aiming to understand the feasibility of delivering and evaluating an influenza vaccination programme for everyone in prison to inform influenza prison vaccination policies. The initial phase of the study, carried out during the winter season of 2023 to 2024 aimed to provide baseline data for evaluation, and involved: exploring the potential for enhanced influenza surveillance and uptake data piloted through a review of current data capture systems; enhanced testing of acute-respiratory infection cases in prisons and the use of contact pattern questionnaires; focus groups with staff and residents looking at barriers and facilitators to delivery; and acceptability of a whole prison vaccination model and a detailed review of vaccination uptake data for prisoners and staff.

Year 1 of the study involved additional tests for influenza and COVID-19 undertaken alongside collection of information such as vaccination status, age, gender, and cell/wing location, to understand feasibility of linking cases to vaccination status. A questionnaire to help understand contact patterns was piloted. Results of this questionnaire will both inform modelling of influenza transmission and prison modelling research more broadly through a better understanding of in-prison levels of contact. Focus groups were conducted with staff and residents. These showed that staff supported an expanded offer of influenza vaccination in prisons and felt it would be feasible to deliver with residents also supporting the idea based on the principle of protection in a closed setting, and equity. "Normalising" influenza vaccination through a whole prison programme was seen by prison residents as a potential way to improve uptake among vulnerable residents. Wider issues relating to vaccination generally for staff and residents, such as hesitancy concerns, and communication, also need to be considered.

> "If the boys are seeing everyone getting it done, you're more inclined to get it done." Prison resident

> "Everybody should be eligible for it for the simple reason that if somebody gets it in any environment everyone's going to get it." Prison resident

> "I just think we look after a really vulnerable population, and I just think we should be vaccinating and offering it to everybody. That's my firm belief. I don't see a negative to working in that way or that model or that approach." Prison healthcare worker

Primary research data gathered from the influenza feasibility study is being used to inform the development of a cost effectiveness model for whole prison influenza vaccination. This will estimate cases averted by vaccination and evaluate gain in quality of life after vaccine campaign, the reduced cost of health care and compare with the cost of the campaign. A key uncertainty remaining is knowledge of the contact patterns in prison settings, between prisoners, between staff, and critically between staff and prisoners. As such a contact survey is underway which in future could be used to inform other existing models of interventions to reduce disease transmission to prison settings.

## Antimicrobial resistance

The UK government has both a 20 Year Vision and publishes 5-year national action plans to tackle AMR. The 2024 to 2029 AMR National Action Plan includes a dedicated outcome and commitments to reducing health disparities /inequalities, including among prison populations.

All individuals in prison recieve a health care assessment on entry to prison[61] where samples may be taken if there is clinical suspicion of illness; samples may also be taken in hospital if a prisoner is admitted due to illness. These samples are sent to laboratories where testing for infections and antimicrobial resistance will be undertaken for all submitted samples (for those in the community/hospital and those in prison) and reported through SGSS.

### Systematic review on AMR among prisons

Data on AMR in prisons is sparse but a recent systematic review conducted by UKHSA on bacterial AMR and antimicrobial usage (AMU) among people in contact with the criminal justice system in high- and middle-income countries provides some understanding of the risk of AMR/AMU in this population[62]. Fourteen papers reported findings for bacterial antimicrobial resistance; the majority focused on Mycobacterium tuberculosis (Tuberculosis, or TB) and Staphylococcus aureus. Four papers assessed the prevalence of drug resistant TB among the prison population with TB ranging from 5.2% to 37%[63 64 65 66]. Six papers assessed Staphylococcus aureus[67 68 69 70 71 72] with estimates of MRSA colonization approximating 8% (4 papers), considerably higher than estimates in the general population[73]. The review concluded that individuals in contact with the criminal justice system are a marginalised population at risk of a range of resistant bacterial infections. As only 3 studies looked at antibiotic use, limited conclusions could be drawn[74 75 76].

### Skin and soft tissue infections

Staphylococcus aureus (S. aureus) and Group A Streptococci (GAS) are the primary pathogens responsible for most skin and soft tissue infections (SSTIs), which can range from mild to severe/life threatening. In addition, Group C and Group G Streptococci (GCS and GGS) are increasingly recognised as contributors to SSTIs.

Skin and soft tissue infections (SSTIs) are often associated with factors such as injecting drug use, tattooing, or other causes of skin injury, including violence or self-harm. In prisons, where overcrowding and unhygienic conditions are present, there may be an increased risk of SSTI due

to the transmission of infectious pathogens. This includes infections caused by resistant organisms, which can pose significant challenges to effective antimicrobial treatment.

Between April 2019 and March 2024, 19,101 SSTI episodes, defined by a specimen type recorded as 'skin' or 'wound', were reported in adults aged 18 years or over in an English prison or among those who had been in an English prison over this period. S. aureus comprised 73.8% of episodes and the remaining 26.2% were due to beta-haemolytic Streptococci (GAS: 14.8% and GCS and GGS: 11.5%).

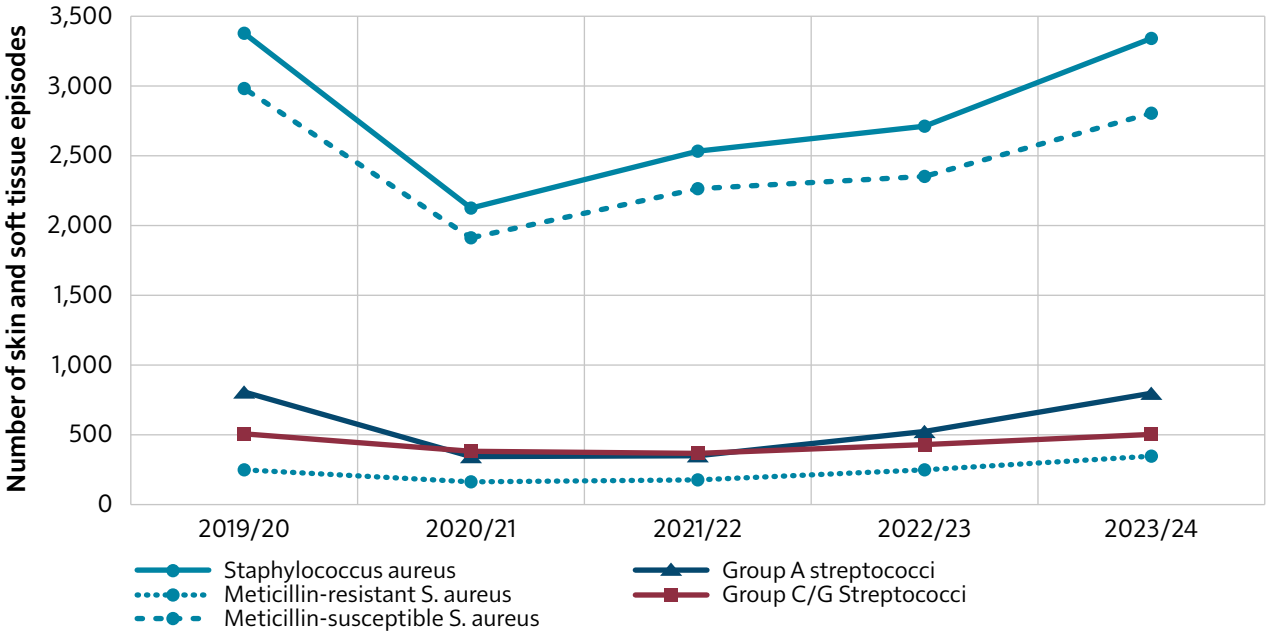
In people in prison the majority of SSTIs occurred in those aged 18-44 years (68.4%), followed by those aged 45-64 years (27.1%). While only 11.7% of SSTI reports occurred in females, the rate of SSTIs in females were nearly treble that of males (13,466 compared with 4,627 per 100,000 person years), highlighting the need for gender specific approaches to reduce SSTI burden.

Similar to the community[43 44], the number of SSTIs in prisons decreased by 39.2% during 2020/21 but has since increased, nearly returning to pre pandemic levels possibly linked to the return to normal testing levels. The implementation of non- pharmaceutical interventions for COVID-19 such as social distancing and increased hand hygiene, along with a decrease in the overall prison population likely reduced the transmission potential of these organisms.

## Resistance to some antibiotics has increased in SSTI isolates from prison

Between 2019/20 and 2023/24 the proportion of methicillin-resistant S. aureus (MRSA) isolates from prisons increased from 7.4% to 10.4% ($p<0.05$). During this period, resistance to most antibiotics also rose in MRSA isolates, particularly to clindamycin. In methicillin-susceptible S. aureus (MSSA) resistance to several antibiotics increased, particularly to clindamycin and macrolides, limiting their use for treatment. However, resistance to oral agents co-trimoxazole and linezolid, remained low in both MRSA and MSSA isolates, making co-trimoxazole an option for treatment in certain cases. GAS remained universally susceptible to penicillin. However, the percentage of infections resistant to most second-line antibiotics increased, especially to macrolides, tetracycline and clindamycin (appendix 6.2.9). Resistance trends in Group C/G Streptococci also increased, with resistance to macrolides and clindamycin more than doubling compared to GAS (Appendix Table 5). Resistance to tetracycline significantly increased from 32.3% to 42.4% ($p<0.05$). Resistance to oral agents, co-trimoxazole and linezolid, remained low for all Streptococci groups. Therefore, co-trimoxazole could, in appropriate cases, serve as an effective and practical empirical treatment for SSTIs, providing coverage of both beta-haemolytic Streptococci and S. aureus (MSSA and MRSA).

**Figure 10 Annual trends in the number of skin and soft tissue infection episodes identified in English prisons between April 2019 – March 2024, by organism**




## Bacteraemia

The presence of bacterial pathogens in the blood is referred to as a bloodstream infection or bacteraemia. Bacteraemia is a serious condition that can lead to sepsis, a life-threatening condition. Immediate treatment with antibiotics is usually required, typically within a hospital setting where intravenous antibiotics and additional supportive therapy can be administered.

Between April 2019 and March 2024, a total of 459 episodes of bacteraemia caused by selected organisms of public health importance due to AMR were reported in individuals who were in prison during this period[77]. In the prison population Staphylococcus aureus drove the burden of bacteraemia comprising 45.3% of reported episodes, followed by Escherichia coli at 24.4% (Table 8). This contrasts with the overall English population in 2023 where E. coli comprised 50.1% of the bacteraemia burden with only 16.7% of bacteraemia being attributable to S. aureus. This may be in part attributable to the differences in age distribution in those in prison compared to those in the community, as well as the disproportionate overrepresentation of people in the prison system who have a history of injecting drug use[78], self-harm[79] or tattooing[80]. People who inject drugs are known to be more frequently colonised with S. aureus and have an increased risk for skin and soft tissue infections and community acquired bacteraemia[81 82].

Of all bacteraemia isolates, 69 (15%) were reported to exhibit resistance to selected antibiotics[83] compared to 21% in the general population. The lower proportion in prisons is likely due to age differences between the populations in prison (who are typically younger) and in the community, as rates of resistance are highest in older age groups. E. coli was singularly responsible for over 43.5% of antibiotic-resistant bacteraemia over the 5 years (30 reported episodes, Table 8). MRSA was the second most common cause of resistant bacteraemia, comprising 29.0% over the 5 years (20 reported episodes). This varies from the wider English population in 2023 where E. coli was responsible for over 65% of resistant bacteraemia and

MRSA only 4.7%. In S. aureus bacteraemia, 9.9% of the tested prison population samples were MRSA, compared to 6.7% in the wider England population in 2023[84]. These findings highlight the need to consider empirical MRSA regimes, particularly for those presenting with skin and soft tissue infections within the prison population. The higher levels of MRSA are possibly due to risk factors associated with injecting drug use.

These 459 episodes of bacteraemia were reported in 365 individuals. Among them, 297 had a single episode, while 68 individuals (18.6%) had multiple episodes: 55 had 2 episodes, 7 had 3, and 6 had between 4 and 7 episodes. Nearly 1 in 5 prisoners who had a bacteraemia episode in prison had either previously experienced or subsequently developed another episode. Additionally, 15.5% of individuals with staphylococcal bacteraemia experienced multiple staphylococcal episodes over the 5-year period.

Among people in prison, the age group with the highest number of bacteraemia and resistant bacteraemia reports was 18-44 years (49.5% and 44.9%, respectively), followed by those aged 45-64 years (32.9% and 36.2%, respectively). Although females accounted for only 8.9% of bacteraemia and 8.7% of resistant bacteraemia cases, the rate of bacteraemia in females was more than double that of males (247.8 compared with 114.9 per 100,000 person-years).

Antibiotic use is a key driver of AMR and appropriate stewardship is critical to preserving the effectiveness of antibiotics. While routine prescribing data for prisons is not yet available, NHS England is collaborating with UKHSA and data analytics teams to develop a bespoke dashboard for antibiotic prescribing in prisons. Key focus areas include reducing the use of broad-spectrum antibiotics in alignment with AMR guidance, prescribing appropriate course lengths, and addressing antibiotic prescribing for acne.

## Environmental threats

### Prison land surface temperatures

High-resolution environmental data is often limited, reducing the ability to fully understand how temperature extremes may result in poor health outcomes for vulnerable populations locally. A pilot study incorporating the application of earth observation (EO) data to draw insights into the prison environment using remotely sensed land surface temperatures (LST) focused on eight prison compounds across London between 2014-2023.

LST differs from air temperature in that it measures how hot a surface is to touch, for example, roofs of buildings, tree canopies, soil, or urban structures, rather than ambient air temperature. Although LST does not report the internal indoor air temperatures of buildings, it can give an indication of building and compound heat externally, allowing comparison between localities. The study included a series of thermal data for 47 days, with less than 10% cloud cover.

Results showed that LST in prisons followed a general pattern where most prisons were above the average LST of London, apart from 2 prisons, which were consistently below the London mean LST across all seasons. This provisional analysis demonstrated that the mean LST of all prisons ranged from 20.7 to 25.3°C, compared to 23.0°C in London. Analysis also suggested

that prisons experience a wider temperature range than London as whole, ranging from –2.4 to 48.2°C in prison compounds compared to 1.5 to 44.1°C in London.

**Table 14 Summary statistics for land surface temperature (LST) derived from remote sensing across London and London prison compounds [Note 1] [Note 2]**

| Prison | Mean land surface temperature | Minimum land surface temperature | Maximum land surface temperature |
|---|---|---|---|
| HMP A | 24.89 | 1.24 | 47.07 |
| HMP B | 24.74 | 1.54 | 47.06 |
| HMP C | 24.83 | 1.60 | 46.19 |
| HMP D | 21.39 | -1.08 | 42.90 |
| HMP E | 25.33 | 2.96 | 48.20 |
| HMP F | 20.67 | -2.38 | 42.14 |
| HMP G | 24.44 | 2.01 | 46.51 |
| HMP H | 24.58 | -0.96 | 46.89 |

[Note 1]: There was insufficient data to conduct a full, statistical analysis, so we were only able to investigate trends in prison compounds.

[Note 2]: Although the data was filtered to include less than 10% cloud cover, cloud and cloud shadow still exist in the data and may affect results.

Over the summer seasons, most prison compound LSTs were higher than the London mean, apart from 2. During the summer 2022 heatwave, all but 2 prison compounds were hotter by several degrees (mean LST 40.8 to 42.4°C) compared to the London average (38.9°C), with 1 prison compound reaching a high of 48.2°C. Although it was not possible to compare the difference in LSTs between prison compounds and the London average due to insufficient cloud-free data for a statistical-based analysis, higher temperatures of a few degrees may be significant for prisoners and prison staff during hotter/extreme weather events.

Over winter, all prison compound LSTs, apart from 1, were lower than the London average of 8.4°C. The coldest prison recorded a 3.3°C mean LST. Although LST does not relate directly to indoor air temperatures inside prison buildings, it does demonstrate that prison compounds not only experience a wider range of LST than that seen across the rest of London but that prison compounds also reach quite high LSTs in summer and low LSTs in winter. Living in consistently cold or hot conditions can have severe health impacts on vulnerable populations.

## Cell temperatures

The work carried out by NCS PROTECT researchers and HM Prison and Probationary Service (HMPPS) Science Office examined temperatures in cells of 1 of the newly built HMP facilities in the Midlands region during the heatwave of August 2022[85], temperatures in 1 of the 4 cells tested were high 24 hours a day and indicated overheating according to the recommendations with prisoners exposed to indoor temperatures exceeding 23°C over prolonged periods of time, exceeding 30°C in some instances[86]. Relative humidity regularly exceeded the recommended maximum value of 70%.

## Radon

Radon is a radioactive gas that comes from natural sources. On average, it is the largest source of ionising radiation the UK public are exposed to[87] and contributes to more than 1,100 lung cancer deaths annually[88] (2005 data). The indoor average radon concentration is 20 Bq m-3 (Becquerel per cubic metre of air)[89], however, indoor radon levels vary over 5 orders of magnitude in the UK – from a few Bq m-3 to more than 10,000 Bq m-3. The dose, and therefore risk, increases linearly over a wide range. There is also a multiplicative synergy with tobacco smoking[90], such that exposure to both high levels of radon and tobacco smoke increases lung cancer risk further. Levels of ever smoking among the prison population are known to be higher than for the general community[91].

Indoor radon levels are strongly linked with the underlying geology, but each room within each building has a radon level that is influenced by the occupancy, heating, ventilation, indoor compared with outdoor temperature, wind speed and multiple other factors. Radon levels in buildings can be reduced by undertaking specialised building and/or ventilation works (mitigation or remediation), which can reduce radon levels by a factor of more than 10, although around 6 is more typical[92]. If a working environment is in a radon Affected Area, a suitable and sufficient risk assessment[93] will include radon measurements and action based upon the results. If any part of the working environment exceeds 300 Bq m-3, the employer is required to notify the Health Safety Executive, consult a radiation protection adviser to obtain advice and reduce exposures as low as reasonably practicable.

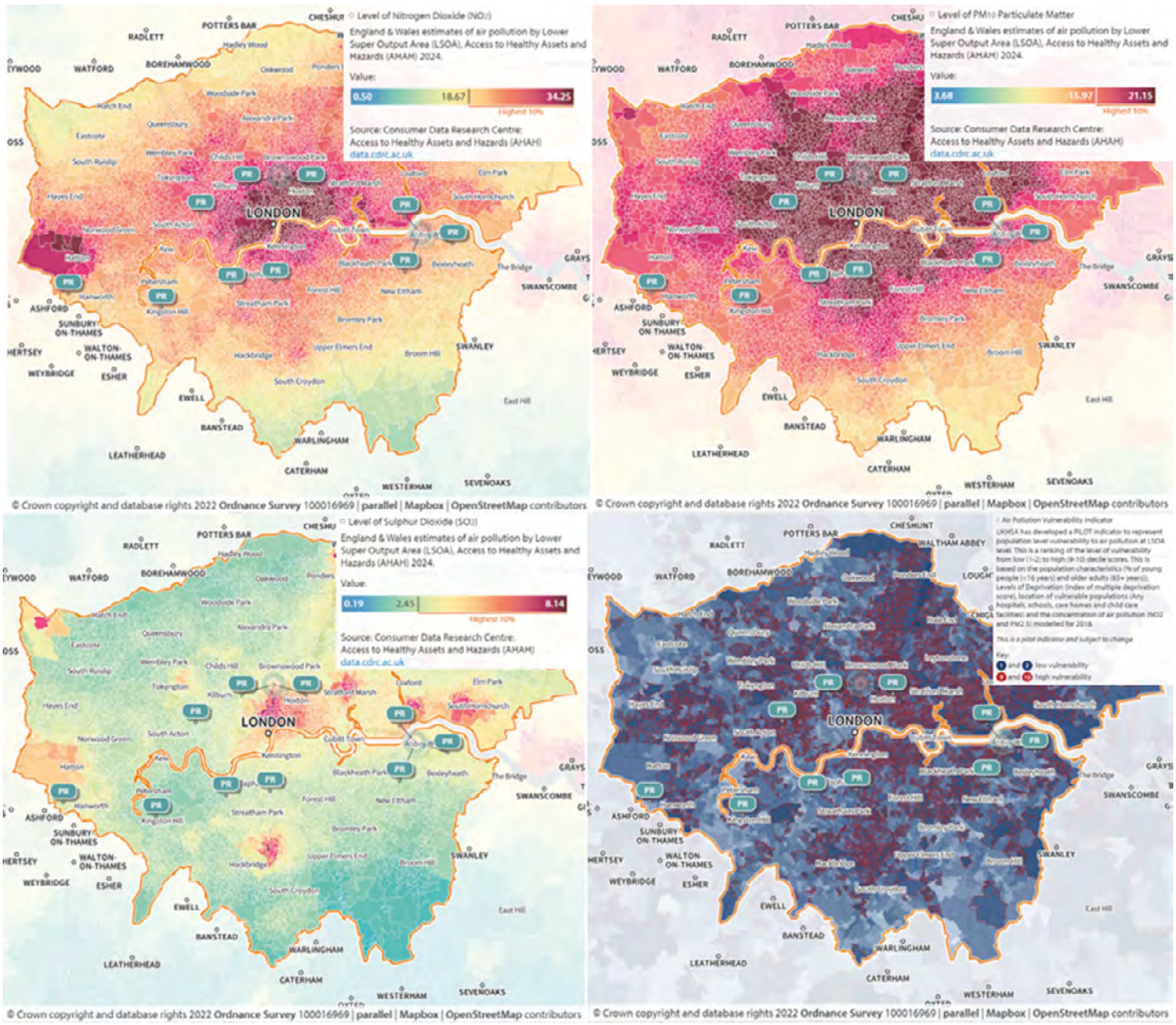
The annual dose limit for employees is 20 mSv (millisievert), with a significant increase in regulatory requirements at 6 mSv. The annual dose limit is 1 mSv for 'other persons', for example, prisoners, care home residents, students and members of the public[94]. For very high occupancy situations, for example prisons, this will be exceeded if the average radon concentration is more than ~40 Bq m-3. Mitigating a building significantly above the threshold is unlikely to achieve this radon level in all areas.

Of the 115 prisons and 400 probation offices in England, currently 23 prisons and 18 probation offices exceed 300 Bq m-3. MoJ is working with radon mitigation contractors who need to design and install systems that are compliant with prison security. In summer 2024 HMP Dartmoor was closed in response to the detection of high levels of radon[95 96]. As at the time of publishing this report HMP Dartmoor remains closed due to the health risks posed and is awaiting remediation work.

## Air pollution

A growing body of evidence draws attention to prisons and environmental justice, pointing out the propensity for prisons to be located on contaminated sites and to be in close proximity to polluting industries[97]. Many prisons remain situated in busy urban areas, notably London prisons which are centrally concentrated in the city and exposed to high levels of air pollutants (Figure 11).

**Figure 11 Air pollutants across Great London and associated prison sites**




Note: Clockwise from upper left: 1) Levels of Nitrogen Dioxide (NO2) across Greater London and locations of prison sites. 2) Levels of PM10 Particulate Matter across Greater London and locations of prison sites. 3) Air pollution vulnerability indicator across Greater London and prison sites. 4) Levels of Sulphur Dioxide (SO2) across Greater London and prison sites.

Note: Prison sites in London denoted as 'PR'

Source: Department of Health and Social Care SHAPE tool. Includes data from the Consumer Data Research Centre: Access to Healthy Assets and Hazards (AHAH) and Ordnance Survey map data

## Noise

Prisons can be noisy environments due to constant activities and routine operations. Noise can occur unpredictably at any time of day or night. The level of noise depends on factors such as density of occupancy and the architectural design of the building. For example, noise can be intensified by the reverberant environment due to the acoustically hard materials and high ceilings typically found in prisons.

It is well-established that noise exposure in residential settings is linked to adverse psychological and physiological health effects[98 99 100 101] but there is limited evidence with regard to the extent this also applies to prison residents[102 103 104].

A survey in 1 prison found that noise was a common problem, with noise levels being the most frequently reported attribute of the building design that resulted in a negative impact on inmates' well-being[105]. Noise was 1 of the environmental factors that led to sleep disturbances in a women's prison in the United States[106] and increased insomnia in 2 prisons for adult men and 1 prison for young and adult women in the UK[107]. The health effects of noise vary depending on individual sensitivity and coping capacity[108 109], and people with pre-existing physical and mental health conditions are likely to be more vulnerable[110 111]. A prison environment offers limited control over noise and few opportunities for respite or access to quiet space, which may increase one's susceptibility to the adverse impact of noise. Integration of good acoustic design principles in the building design has the potential to reduce the negative impacts of noise[112 113 114 115].

## Lead in drinking water supplies

Lead pipes supplying drinking water may be found in buildings constructed before 1970, as they were commonly used both within buildings and to connect to the mains water network. Lead is a non-threshold substance, so any concentration of lead in water poses a health risk[116] leading to forgetfulness, irritability, headache, and cognitive deficits such as learning and memory as well as psychiatric symptoms[117]. The use of lead pipes has since been banned[118], however many older buildings that have not been modernised are likely to have lead pipework underground and/or inside the building.

# Mental health of people in prison and in contact with the criminal justice system in the community

Segregation is always used as a last resort and all prisoners held under a segregation rule are managed by Segregation Review Boards (SRB). The review boards must take place at least every 14 days, are multi-disciplinary with the board members tailored to the needs of the individual. If a prisoner is suffering with mental health problems, then this would be highlighted and support requested/provided and logged at the SRB. The segregation policy is currently under the final stages of review and will be published and implemented within the calendar year. The updated policy will include specific reintegration plans which are prisoner centered and are a tool that assists getting the prisoner back to normal location at the earliest opportunity.

Section 117 of the Mental Health Act is an obligation for the provision of after-care to patients that are no longer detained in hospital under the act. The section's application is based on whether an individual has met the criteria for detention under the Act, rather than the severity of their mental health need or in this case, the sentence they are serving. Therefore, extending section 117 to all offenders serving the IPP sentence is not appropriate given its specific purpose.

# Data and information sharing

## Historical changes to data and information sharing in prisons

Prior to 2009 prison healthcare services relied on paper Inmate Medical Records (IMR). These paper records were repeatedly lost, duplicated and/or failed to be conveyed on transfer between prisons and would not have been capable of being analysed for research purposes. They were ultimately only for retention inside the prison and/or archived upon a person's release. The deployment of TPP's SystmOne in 2009 to 2010 (Offender Health IT, OHIT) in the prison estate in England (and Wales) was a significant advancement in supporting the care provision within the prison estate as it was considered to be a fully functioning primary care electronic health record, enabling continuous medical record to be kept and transferred to another establishment, along with many other important functionalities. However, primarily for security reasons, the prison version of SystmOne was required to be a 'closed' system thus preventing the sharing and transfer of information to other wider NHS IT systems by default. In 2013, the re-procurement of OHIT resulted in the commencement of Health and Justice Information Service (HJIS). The primary objectives of which were to connect the prison EHR with the wider NHS Spine. In brief, this included the deployment of NHS Smart Cards, which allowed use of the NHS Personal Demographic Services (PDS[119]). Following positive identification on PDS, and where records existed, access to Summary Care Record (SCR[120]) was enabled. Initially, SCR only held the patients' current medication, allergies and details of any previous reactions to medicines and the name, address, date of birth and NHS number of the patient. In 2020, and in the response to the COVID-19 pandemic, through the Control of Patient Information (COPI) legislation, access to SCR was upgraded to Summary Care Record with Additional Information (SCRa). This was particularly helpful for the care provision within the prison setting as it allowed the clinicians to see a greater wealth of information from the

community GP records. SCRa included information such as significant medical history (past and present), reason for medication, information about the management of long-term conditions, end of life care information and immunisations. The visibility of this additional information, including coded diagnoses, has been extremely helpful in ensuring timely access to community health-related information such as recently prescribed medications, conditions not reported by the person on arrival in prisons and other benefits. The change implemented during the response to the pandemic enabling access to SCRa have since been continued beyond the COPI[121].

## IT system capability, digitisation and AI support

The functionality of the health information system in prisons is basic compared to the community primary care. There is:

- no mechanism for data extraction to benchmark prescribing outcomes or to identify prescribing patterns.
- no capability for internal electronic prescribing which leads to a fragmented process for remote prescriptions.
- Access to Arden' templates is not universal and there is no access to clinical decision making tools such as OptimiseRx to support evidence-based cost-effective prescribing and medicines optimisation
- no access to clinical prioritisation tools such as Ecplise Live which extracts individual patient prescribing and results data to identify potential patient safety issues related to medicines monitoring or drug interactions.
- no voice recognition software to support record keeping
- no capability for digitised patient messaging to support communication, education or digitised lifestyle interventions such as digitised weight loss support

## Opportunities for data platforms and digitised AI driven tools identified by clinicians to support long-term condition care

- triaging tools which require patient access to electronic application system
- digital patient support platforms and software tools such as Eclipse Live, ePACT2 to support
  - evidence based formulary-linked prescribing
  - medication-based risk stratification to optimise medicines and patient safety
  - prescription data benchmarking
- clinical templates such as Arden's templates which provide accurate coding of clinical data and support clinical decision making based on localised best practice through linkage with national and local clinical guidelines.

- digital voice recognition software such as Heidi AI or Tortus AI summarises the consultation to support record keeping and referral letter writing
- document scanning tools such as Documan support filing of clinical correspondence

## Staff experience: Data and IT system

Health care staff voiced their frustrations about digital inequity in prisons compared to community primary care and offered suggestions for data and IT system solutions that could improve staff experience and patient outcomes.

> "Flows of information make practise easier and patient care prioritised…we know that Eclipse live, they've demonstrated a reduction in hospital admissions so…there's a huge potential for escort bed watches and various other things to reduce admissions due to lack of awareness of some of the risks that patients are sitting with…"

> "we can't measure our outcomes and our prescribing patterns in a way our primary care colleagues can and increasingly, there are mechanisms to pull together on a population health perspective, hospital and primary care medicines information that our patients can't contribute to"

> "…in the southwest…because all the information is now in some primary care hub… they can't actually see to choose where the 2 week cancel wait times are because they're not allowed to access the system in order to be able to decide where the best course of action for the patient."

> "We can't deliver care unless we have the equivalent digital capabilities, data flows and digital technology…and it's frustrating that we're not recognised as GP practises and GP practise populations in our own right that we seem to still be a separate thing when actually that integration and recognition of digital transformation, if it's happening in a GP practise, it should automatically be planned to be enabled within our setting as well, so that we're not behind. That is something that is that needs to happen if we're going to continue for equivalence because in the end, we're going to start moving backwards, not forwards, because the progress in primary care using AI and other decision tools…even some of the digital therapies for weight management, for example, going forward, we're increasingly going to be using digital solutions and digital therapy that unless we are at the table of development at the get go as a primary care small residential setting, we're going to have a problem both in terms of litigation and equity of care. So the gap's going to widen unless people recognise that they have to engage with (prison healthcare)…if they engage early, there's nothing technically impossible about integration of some of these digital systems. It's just about recognising…we have to be there and they have to approach us to be inclusive about it. So that's where with the best will in the world, our fantastic workforce that we have on the ground they are, they've got their hands tied behind their back."

# A health and care workforce for the future criminal justice population

The following are principles developed by the chapter author to meet the needs for a workforce fit for the future criminal justice population.

Integrated workforce planning should be embedded into ICB neighbourhood health workforce planning and informed by:

- joint strategic needs assessments that include prison population health needs and identify probation population health needs through inclusion health markers
- workforce profiling information mapped across all levels of the healthcare system serving a neighbourhood health system, including prison health workforce, general practice and wider primary care, acute hospitals, community mental health, VCFSE, HMPPS, inclusion health care navigators (lived experts)

Recruitment and retention strategies for health and justice workforce should be included within wider ICB inclusion health workforce frameworks and recruitment strategies, to:

- attract new staff to share across all levels of the local health system for neighbourhood and ICS inclusion health provision
- improve staff experience and offer flexible ways of working offer career
- development for health and justice as part of wider inclusion health careers
- develop training pathways with local health education institutions to include health and justice nurse training within inclusion health training career pathways
- offer inclusion health apprenticeships for people with lived experience of health and justice and other inclusion health
- offer prison placements as part of inclusion health education within undergraduate medical, dental and pharmacy courses, and offer GP and psychiatry training rotations into prisons to develop specialist inclusion health accreditation

Workforce planning needs to:

- manage the level of churn in reception prisons
- meet changing, increasingly complex population health needs
- meet the complex inclusion health needs of expanding probation populations
- expand roles for example dual training for nurses in mental health and substance misuse, or substance misuse and sexual health
- improve skill mixes, including joint HMPPS/health roles, lived expert roles in care navigation, health prevention, VCFSE, increase GP portfolio working across inclusion health populations
- utilise technology for digital triage, telemedicine, virtual care platforms

This requires effective IT integration into ICB analytics platforms with system-wide intelligence function to understand changing population needs.

# Health research with people in prison and on probation in England

## Definitions

We used the following definitions throughout the chapter and appendix to ensure consistency:

- health: the physical, mental and social care needs of individuals
- health research: the systematic collection of data from a population to determine the causes of ill health, their health and social care needs, the effectiveness of new treatments, or how existing treatments are best implemented. The aim of such research is to improve the health of the population engaged. Data collection may involve direct contact with the population (which could include taking physical measurements or conducting interviews) or joining up existing data about them (originally collected for another purpose) to answer research questions
- independent health researcher: someone who is not an employee of a central government department or agency. Such researchers could include university academics, NHS researchers and those working for private companies, charities and social enterprises

## Recent health research

### Method

The 6 databases we reviewed are shown in Table 1.

**Table 1: research application databases used in a review of research projects conducted with people in prison and on probation in England between 2015 and 2024**

| Name of database | Host Organisation | Area covered | Period covered |
|---|---|---|---|
| National Institute for Health and Care Research (NIHR) | Department of Health and Social Care (DHSC) | Health and social care research across the UK | Entire review period |
| UK Research and Innovation (UKRI) – limited to funding from the Economic and Social Research Council (ESRC), Medical Research Council (MRC) and specialist COVID funding | Department for Science, Innovation and Technology (DSIT) | Research across the UK | Entire review period |
| Data First | Ministry of Justice (MoJ), funded by Administrative Data Research UK (ADR UK) | Data from the courts, prison and probation services in England and Wales | June 2020 to present |
| Data Access Panel (DAP) | HM Courts and Tribunals Service (HMCTS) | Research involving defendants and staff within HMCTS | 2018 to present |
| National Research Committee (NRC) | MoJ/HM Prison and Probation Service (HMPPS) | Research involving people in prison or on probation, or staff in HMPPS | 2013 to May 2024 |
| Research and Evaluation Database (RED) | MoJ/HMPPS | Research involving people in prison or on probation, or staff in HMPPS, as well as internal research conducted within MoJ | May 2024 to present |

The following search terms were applied to the NIHR and UKRI databases: prison; offender; secure estate; low secure service; low-secure service; medium secure service; medium-secure service; high secure service; high-secure service; liaison and diversion service; probation; secure school; locked facilit*; detention cent*; criminal; custod; remand cent; incarceration; secure children's home; secure training cent; secure cent; secure unit; court. * denotes open ended search term

The results of the NIHR and UKRI database searches, along with the entire Data First, DAP, NRC and RED databases were screened. Duplicates between databases were identified and marked to avoid double counting and then each database was screened according to the criteria in Table 2.

**Table 2: inclusion and exclusion criteria to identify research projects conducted with people in prison and on probation in England between 2015 and 2024**

| | Inclusion | Exclusion |
|---|---|---|
| Population | People in prison or on probation in England (to align with scope of whole report) | People in prison or on probation outside of England<br>Staff<br>Victims/survivors<br>Any other population |
| Intervention | An assessment of any aspect of health, including clinical, public health, psychological or social care research | Research focused on anything other than clinical, public health, psychological or social care assessments or interventions |
| Comparator | Any | N/A |
| Outcomes | Any | N/A |

| | Inclusion | Exclusion |
|---|---|---|
| Study | Any type of primary research (collecting and/or using the data of people in prison or on probation)<br>conducted independently of a government department or one of its agencies (besides from the NHS); that is, research conducted by university academics, NHS researchers and those working for private companies, charities and social enterprises);<br>conducted between January 2015 and December 2024 | Secondary research (that is, any type of literature review) conducted by a government department or one of its agencies; (that is, conducted by a member of MoJ, an MoJ agency or any other central government department such as the Department for Health and Social Care, UK Health Security Agency, and so on);<br>project started prior to January 2015 or after December 2024 |
| Setting | Prison or probation service in England (NB projects spanning England and Wales or Scotland were also included) | Only prison or probation services outside of England;<br>any other part of the justice system in England (including<br>criminal court, family court);<br>any other setting |

# Results

## Screening process

A record of the screening process is shown in Table 3. A total of 5,589 application records were screened across the 6 databases. A total of 5,369 were removed as they did not meet the inclusion criteria. This left 220 approved projects which met the inclusion criteria, of which 17 were duplicates. Therefore, 203 approved projects were included in the review.

**Table 3: records identified and screened in a review of research projects conducted with people in prison and on probation in England between 2015 and 2024**

| | NIHR | UKRI | Data First | NRC | RED | DAP |
|---|---|---|---|---|---|---|
| Total at outset | 168 | 1,629 | 61 | 3,082 | 589 | 60 |
| Intra-database duplicate | 4 | 33 | | 9 | | 1 |
| MoJ/government applications | | | | 996 | 215 | |
| Declined | | | | 376 | 23 | |
| Draft/awaiting review/ info | | | | 133 | 224 | |
| Withdrawn/cancelled | | | | 77 | 9 | |
| No decision recorded | | | | 286 | | |
| Other | | | | 20 | | |
| <Jan 2015 or >Dec 2024 | 15 | | 2 | | | |
| Outside of England | 6 | 210 | 2 | 86 | 4 | 2 |
| Outside of CJS | 99 | 1,089 | | | | |
| Victims/survivors | | 5 | | 2 | | |
| Staff work/training | | 3 | | 41 | 26 | |
| Staff health/wellbeing | | 1 | | 23 | 8 | |
| Not health | 2 | 266 | 52 | 800 | 64 | 49 |
| Health adjacent* | 4 | 11 | 5 | 72 | 3 | 7 |
| Not enough info to decide | | | | 4 | | |
| Total removed | 130 | 1,618 | 61 | 2,925 | 576 | 59 |
| Total remaining | 38 | 11 | 0 | 157 | 13 | 1 |

* Health adjacent projects were those that included consideration of an individuals' health, but where the focus of the study was not their health or healthcare provided to them (for example, projects where the focus was the offending pattern of individuals with particular conditions, or the most effective way to rehabilitate people with certain conditions).

This gave a total of 220 after screening, 17 of which were duplicates so 203 individual approved projects were included.

## Characteristics of included research projects

Below are the data extracted from the databases for the characteristics of included research projects. Note that to present the data as accurately as possible, percentages have been rounded to the nearest 0.5, which may mean that the total percentage does not equal 100. Please see main chapter for the description of results and the accompanying figures.

**Table 4: year of commencement of research projects conducted with people in prison and on probation in England between 2015 and 2024**

| Year research project started | Number of research projects (n=203) | Percentage of total (%) |
|---|---|---|
| 2015 | 16 | 8.0 |
| 2016 | 23 | 11.5 |
| 2017 | 21 | 10.5 |
| 2018 | 26 | 13.0 |
| 2019 | 24 | 12.0 |
| 2020 | 12 | 6.0 |
| 2021 | 23 | 11.5 |
| 2022 | 13 | 6.5 |
| 2023 | 18 | 9.0 |
| 2024 | 27 | 13.5 |

**Table 5: organisation of lead applicant for research projects conducted with people in prison and on probation in England between 2015 and 2024**

| Organisation of lead applicant | Number of research projects (n=203) | Percentage of total (%) |
|---|---|---|
| University | 127 | 62.5 |
| NHS | 41 | 20.0 |
| Private company | 18 | 9.0 |
| Charity | 17 | 8.5 |

**Table 6: criminal justice setting of research projects conducted with people in prison and on probation in England between 2015 and 2024**

| Justice setting | Number of research projects (n=203) | Percentage of total (%) |
|---|---|---|
| Prison | 158 | 78.0 |
| Probation | 27 | 13.5 |
| Both prison and probation | 7 | 3.5 |
| Youth estate | 9 | 4.5 |
| Community youth justice | 1 | 0.5 |
| Unknown | 1 | 0.5 |

**Table 7: sex of participants in research projects conducted with people in prison and on probation in England between 2015 and 2024**

| Participant sex | Number of research projects (n=203) | Percentage of total (%) |
|---|---|---|
| Male | 64 | 31.5 |
| Female | 20 | 10.0 |
| Both | 42 | 20.5 |
| Unknown | 77 | 38.0 |

**Table 8: health category of study in research projects conducted with people in prison and on probation in England between 2015 and 2024**

| Health Category | Number of research projects (n=203) | Percentage of total (%) |
|---|---|---|
| Mental health | 106 | 52.0 |
| Generic health relevance | 66 | 32.5 |
| Social care | 8 | 4.0 |
| Infection | 7 | 3.5 |
| Neurological | 4 | 2.0 |
| Metabolic & endocrine | 3 | 1.5 |
| Cancer & neoplasms | 3 | 1.5 |
| Reproductive & childbirth | 2 | 1.0 |
| Skin | 1 | 0.5 |
| Respiratory | 1 | 0.5 |
| Renal & urogenital | 1 | 0.5 |
| Cardiovascular | 1 | 0.5 |
| Blood | 0 | 0.0 |
| Congenital disorders | 0 | 0.0 |
| Ear | 0 | 0.0 |
| Eye | 0 | 0.0 |
| Inflammatory & immune system | 0 | 0.0 |
| Injuries & accidents | 0 | 0.0 |
| Musculoskeletal | 0 | 0.0 |
| Oral and gastrointestinal | 0 | 0.0 |
| Stroke | 0 | 0.0 |

**Table 9: funders of research projects conducted with people in prison and on probation in England between 2015 and 2024**

| Funder | Number of research projects (n=203) | Percentage of total (%) |
|---|---|---|
| Unknown | 93 | 46.0 |
| NIHR | 42 | 20.5 |
| UKRI (COVID) | 4 | 2.0 |
| UKRI (ESRC) | 9 | 4.5 |
| UKRI (MRC) | 2 | 1.0 |
| UKRI (AHRC) | 1 | 0.5 |
| University | 8 | 4.0 |
| Charity | 9 | 4.5 |
| Private company | 2 | 1.0 |
| HMPPS | 11 | 5.5 |
| MoJ | 2 | 1.0 |
| OGD | 9 | 4.5 |
| NHS | 11 | 5.5 |

**Table 10: funding amount for research projects conducted with people in prison and on probation in England between 2015 and 2024**

| Funding amount (£) | Number of research projects (n=203) | Percentage of total (%) |
|---|---|---|
| Unknown | 108 | 53.0 |
| Up to 100K | 30 | 15.0 |
| 100K up to 200K | 16 | 8.0 |
| 200K up to 300K | 15 | 7.5 |
| 300K up to 400K | 6 | 3.0 |
| 400K up to 500K | 3 | 1.5 |
| 500K up to 600K | 4 | 2.0 |
| 600K up to 700K | 4 | 2.0 |
| 700K up to 800K | 4 | 2.0 |
| 800K up to 900K | 1 | 0.5 |
| 900K up 1M | 2 | 1.0 |
| 1M to 2M | 8 | 4.0 |
| 2M to 3M | 2 | 1.0 |

**Table 11: expenditure on health research with people in prison and on probation in England by NIHR per financial year, as compared to NIHR research total expenditure**

| Financial year | Spend on included research applications (£) * | Spend on all health research (excluding large infrastructure projects (£) ** | Percentage of spend (%) |
|---|---|---|---|
| 2015 to 2016 | 82,320 | 298,576,801 | 0.03 |
| 2016 to 2017 | 670,951 | 293,865,689 | 0.23 |
| 2017 to 2018 | 1,119,397 | 374,260,414 | 0.30 |
| 2018 to 2019 | 1,697,663 | 386,158,517 | 0.44 |
| 2019 to 2020 | 1,769,075 | 413,280,434 | 0.43 |
| 2020 to 2021 | 1,866,083 | 412,097,090 | 0.45 |
| 2021 to 2022 | 2,113,677 | 500,110,539 | 0.42 |
| 2022 to 2023 | 1,561,046 | 536,204,851 | 0.29 |
| 2023 to 2024 | 2,251,661 | 500,164,991 | 0.45 |
| Total | 13,131,873 | 3,714,719,328 | 0.35 |

* Applicable awards have been extracted using keyword searches, this may not be an exhaustive list.

** NIHR research expenditure is derived using health categories of the UK Clinical Research Collaboration's Health Research Classification System. The award expenditure coded to these categories will be apportioned between the relevant categories.

## Calculations of NIHR spending per person in 2023 to 2024 financial year

NIHR spending per person in prison or on probation in England:

- in the 2023 to 2024 financial year, the NIHR spend on health research with people in prison and on probation was £2,251,661
- in March 2024 the number of people in prison in England was 81,995[122]
- in March 2024 the number of people on probation in England was 224,910[123]
- in March 2024 the number of people in prison and on probation in England was 81,995 + 224,910 = 306,905

In the financial year 2023 to 2024, the NIHR spend per person in prison and on probation in England was approximately £2,251,661/306,905 = £7.34.

Please note that this figure has been calculated according to the research projects which the NIHR has directly funded and were identified for inclusion in this review. As such it is an approximation only.

NIHR spending per person in UK general population:

- in the 2023 to 2024 financial year, the NIHR spend on all health research programmes across the UK was £500,164,991
- in the 2023 to 2024 financial year, the NIHR spend on all health research programmes across the UK minus spend on health research with people in prison and on probation was £500,164,991 – £2,251,661 = £497,913,330
- in 2023 (latest figure available), the population of the UK was 68,265,209[124]
- in 2024, the population of the UK minus the number of people in prison in England was 68,265,209 – 81,995 = 68,183,214 (NB number of people on probation not subtracted since they could have volunteered for general health research projects in the community)
- in the financial year 2023 to 2024, NIHR spend per member of the UK general population on health research in the UK was £497,913,330/68,183,214 = £7.30

Please note, these figures are based on the NIHR's overall spend on health research programs in general per financial year (excluding investment into expertise, facilities, research delivery support and training). The NIHR do not routinely report funding for the 4 nations of the UK and therefore the funding for England only was not available to be used as a comparator. This figure does not account for spending which may have occurred on health research with people in prison and on probation in Wales, Scotland and Northern Ireland and is an approximation only.

## Limitations

The review was undertaken by a single researcher, meaning that screening and data extraction have not been quality assured by a second researcher. As funding and research approval databases were searched it cannot be identified if all included projects were completed (UKRI and NIHR record this information, but this is not currently mandated by the MoJ for all its databases). Because the research approval bodies of the MoJ and its agencies do not mandate that research applicants state their sources or amount of funding on applications, funding data was not available for all of the projects included in this review.

## Survey

### Method

The online survey was open to individuals who were currently or had previously considered, attempted, or conducted health-related research with people in prison or on probation in England. Eligible participants also had to be based outside the MoJ or other government departments, such as in academia, the NHS, the private sector, or a charity.

Convenience and snowball sampling techniques were used. The survey was sent to over 50 individual researchers along with several academic and clinical organisations. The survey email requested recipients to forward it to any other eligible researchers. The survey remained open for 12 days.

The questions (presented below) were delivered via the SmartSurvey platform. All necessary information required for informed consent was provided in the survey introduction. The first 4 questions determined participants eligibility and requested their consent before they could continue with the survey; negative answers resulted in the survey being brought to a close.

Ninety-four respondents met the eligibility criteria and fully completed the survey. Content analysis was performed by academic collaborators at the University of Southampton. Survey data was analysed using qualitative content analysis, applying Vears and Gilliam's (2022) analytical framework for Inductive Content Analysis. Three researchers iteratively developed the final coding schema. Intercoder-reliability was conducted on 10 of the 94 responses to ensure consistency of analysis.

## Survey questions

Q1. Are you currently active in, or have you ever considered undertaking, attempted or completed, research with people in prison or on probation in England?

Yes

No (including if the research was solely with staff, the judiciary or victims/survivors)

Q2. Was the primary aim of the research to collect and/or use the data of the population to investigate their health, or the healthcare provision to them, including any clinical, public health, psychological and social care assessments or interventions?

Yes

No (including if only a literature review was undertaken)

Q3. Was your professional role at the time external to the Ministry of Justice, one of its agencies or another government department (for example, you were based at a university, the NHS, a voluntary/community organisation or a social enterprise)?

Yes

No (including if you were employed by, or on placement with, HMPPS at the time)

Q4. I have read the introductory information on the previous page, and I consent to take part in the survey (please email [email address] if you require more information before deciding whether to participate).

Yes

No

[NB negative responses to any of the above questions brought the survey to a close].

Q5. Are you currently active in and/or have you ever completed a health research project with people in prison or on probation in England?

Yes

No

[NB a positive response to the above question led on to questions 6 to 9; a negative response moved the participant to question 10].

Q6. How satisfied are you with the following stages of conducting research with people in prison or on probation in England?

| | **Very dissatisfied** | **Dissatisfied** | **Neutral** | **Satisfied** | **Very satisfied** | **Not applicable** |
|---|---|---|---|---|---|---|
| Applying for and gaining funding | | | | | | |
| Applying for research approvals (including ethical approval) from the Ministry of Justice, HMPPS or other justice organisation | | | | | | |
| Criminal legal system and services | | | | | | |
| Gaining access to the justice estate | | | | | | |
| Support from prison, probation or other justice staff | | | | | | |
| Engaging the prison population or other justice involved population | | | | | | |

Q7. What helped you to conduct your research and what worked well? [open question, no text limit]

Q8. What were the challenges? Were there any factors that limited what you could do? [open question, no text limit]

Q9. Are there any changes to the process of applying for and/or conducting research with people in prison or on probation in England which could increase the quantity, quality and impact of research in this area? [open question, no text limit]

Q10. Have you ever considered undertaking, or attempted to conduct, a health research project with people in prison or on probation in England, but either not proceeded with, or not been able to complete, the project?

Yes

No

[NB a positive response to the above question led on to questions 11 to 13; a negative response moved the participant to question 14].

Q11. What parts/aspects of the process of applying for and/or conducting health research with people in prison or on probation in England put you off applying or prevented your project from going ahead/being completed? Tick all that apply. [multiple choice question]

☐ Applying for and gaining funding

☐ Applying for research approvals (including ethical approval) from the Ministry of Justice, HMPPS or other justice organisation

☐ Criminal legal system and services

☐ Gaining access to the justice estate

☐ Support from justice staff

☐ Engaging the prison population or other justice involved population

☐ Other (please specify):

Q12. Please explain in more detail what put you off applying or prevented your research project from going ahead/being completed. [open question, no text limit]

Q13. How could the process of applying for and/or conducting research with people in prison or on probation in England be changed so that such a project could go ahead in the future? Both big and small ideas are welcome. [open question, no text limit]

Q14. Is there anything else you want to tell us regarding the process of applying for and/or conducting health research with people in prison or on probation in England that we have not captured as part of this survey? [open question, no text limit]

Q15. If you would like to consent to be contacted for follow up research on this topic (such as interviews or case reports) please give your email address below. This is completely optional and any email addresses given will be removed from the spreadsheet of results prior to analysis to ensure anonymity. [open question, no text limit]

## Results

In total, 116 people started the survey. Twenty-two did not match the eligibility criteria and could not progress to the rest of the survey. Ninety four respondents fully completed the survey. Key themes from the content analysis are presented in the chapter and the results of the 2 survey tools used are included below.

## Insights from independent researchers

Independent researchers also fed in what aspects of the research process they are satisfied with and what they consider to be the barriers to conducting health and care research with people in prison and on probation

Table 12 and Figure 12 gives an overview of responses received from researchers who confirmed that they were currently undertaking or had completed a relevant health research project (n=89). The majority of this group of respondents were satisfied with the process of engaging with justice involved populations (70%) and support from justice staff (57%). However, half (50%) reported dissatisfaction with applying for research approvals. Respondents also reported dissatisfaction with gaining access to the justice estate and securing funding.

**Table 12: responses to a Likert scale to assess satisfaction with 6 aspects of conducting research with people in prison or on probation in England (89 responses)**

| Answer Choices | Very dissatisfied | Dissatisfied | Neutral | Satisfied | Very satisfied | Not applicable | Response Total |
|---|---|---|---|---|---|---|---|
| Applying for and gaining funding | 9 (10%) | 14 (16%) | 20 (23%) | 27 (30%) | 9 (10%) | 10 (11%) | 89 |
| Applying for research approvals (including ethical approval) from Ministry of Justice, HMPPS or other justice organisation | 18 (20%) | 27 (30%) | 16 (18%) | 13 (15%) | 8 (9%) | 7 (8%) | 89 |
| Criminal legal system and services | 7 (8%) | 11 (13%) | 35 (40%) | 7 (8%) | 4 (5%) | 24 (27%) | 88 |
| Gaining access to the justice estate | 9 (10%) | 22 (25%) | 19 (21%) | 23 (26%) | 11 (12%) | 5 (6%) | 89 |
| Support from prison, probation or other justice staff | 7 (8%) | 13 (15%) | 16 (18%) | 32 (36%) | 19 (21%) | 2 (2%) | 89 |
| Engaging the prison population or other justice involved population | 3 (3%) | 7 (8%) | 11 (12%) | 32 (36%) | 30 (34%) | 6 (7%) | 89 |

**Figure 12: responses to a Likert scale to assess satisfaction with 6 aspects of conducting research with people in prison or on probation in England**

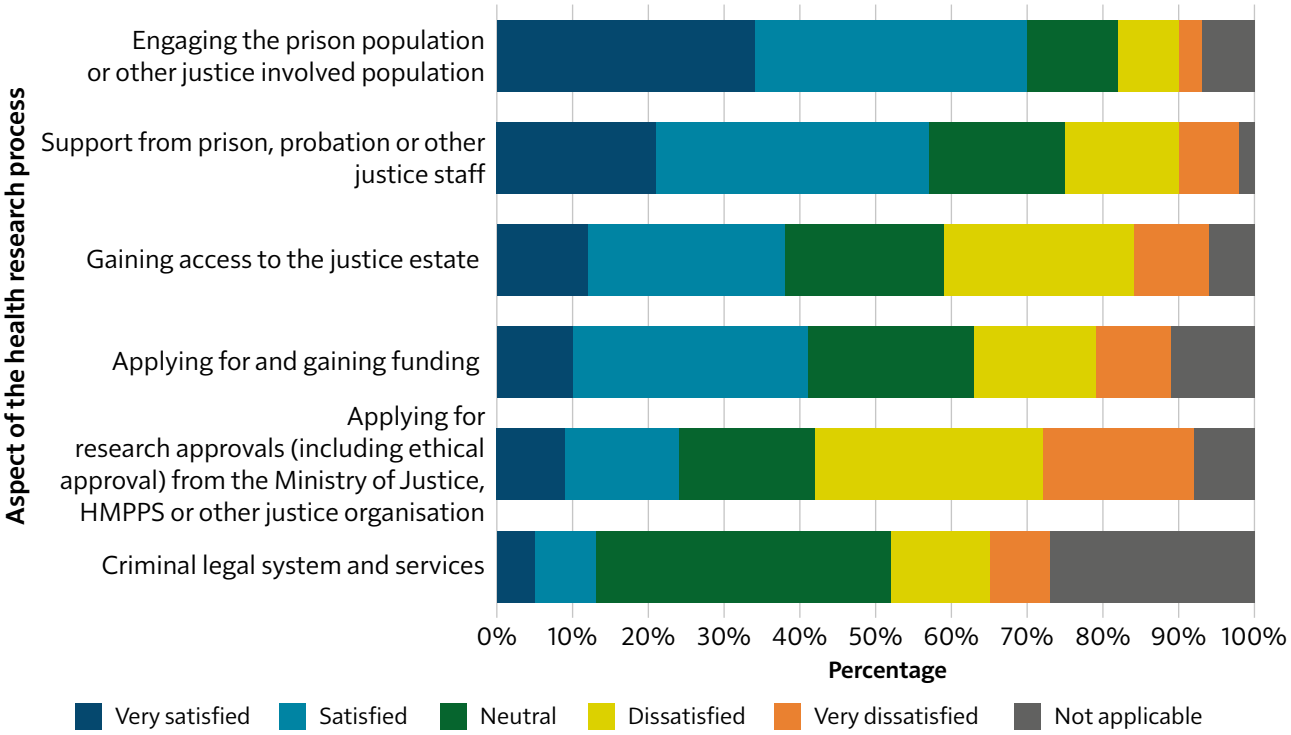
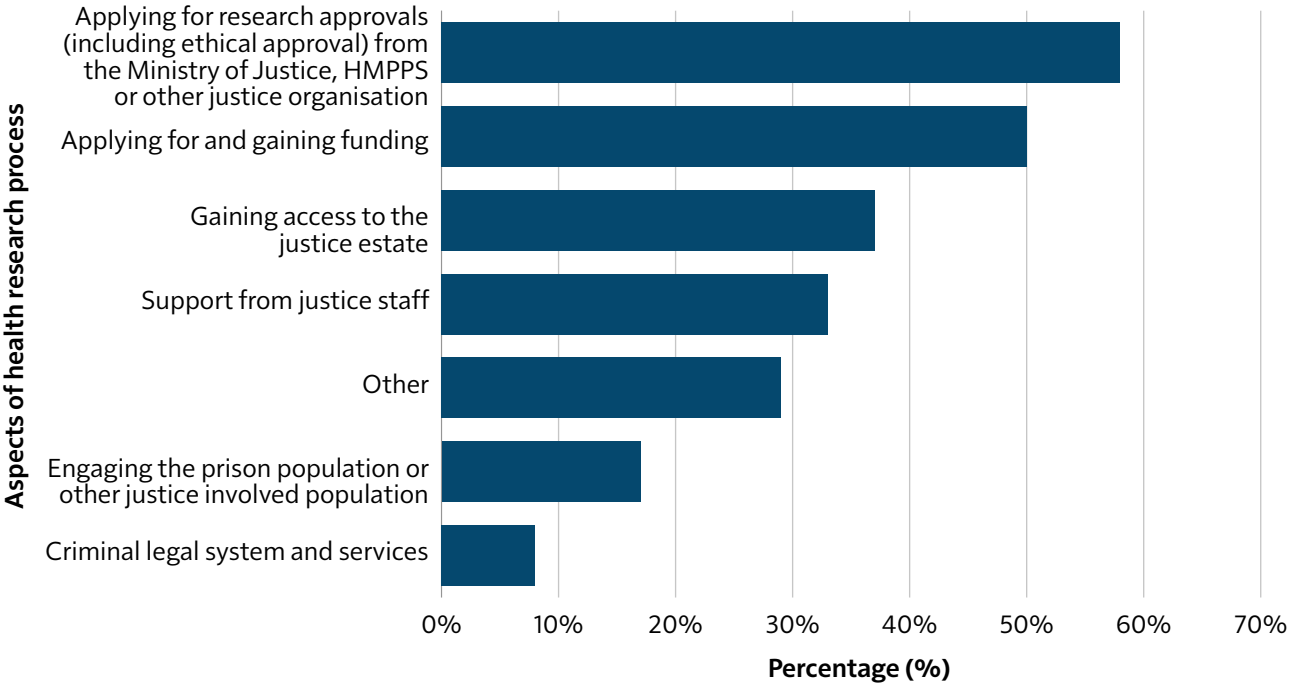



Figure 13 gives an overview of responses received from researchers who confirmed that they had been unable to deliver a research project (n=52). The biggest perceived barriers from this group of respondents were applying for research approvals (58%) and securing funding (50%). Gaining access to the justice estate (37%) and lack of support from justice staff (33%) were also highlighted as perceived obstacles by some of these respondents. Additionally, 31% cited 'other' factors as barriers. Of these, the main one listed was gaining access to data, along with changing MoJ priorities and finding the NIHR application process complicated.

**Figure 13: responses to a 'tick all that apply' multiple choice question to assess what aspects of conducting health research with people in prison or on probation in England had prevented projects from going ahead, or being completed**




## Limitations

A convenience (non-probability) sampling method was used: the survey was distributed through existing networks and participants self-selected to take part. While every effort was made to distribute the survey to the largest possible number of potential participants as possible, it may be that there is some bias in the responses. For example, researchers who have had negative past experiences could be more likely to respond to the survey. The responses are more likely to lean towards highlighting issues with MoJ and HMPPS processes as the survey questions were focused on these and the survey came from a MoJ staff member.

# Workshop

The workshop included delegates from the following organisations:

- Ministry of Justice (MoJ)
- HM Prisons and Probation Service (HMPPS)
- HM Courts and Tribunals Service (HMCTS)
- Department of Health and Social Care (DHSC)
- National Health Service (NHS) England
- UK Health Security Agency (UKHSA)
- Office for Life Sciences

- National Institute of Health and Care Research (NIHR)
- UK Research and Innovation (UKRI; Medical Research Council and Economic and Social Research Council)

Please note that representatives from the Health Research Authority were not present at the workshop but fed into the drafting of this chapter.

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