

Oral Disease Burden and Barriers to Preventive Dental Care Among Incarcerated Adults: A Systematic Review and Meta-Analysis

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ABSTRACT

Background: Evidence on dental disease among incarcerated adults is fragmented across small national surveys, and no pooled estimate links that burden to the barriers that keep preventive care from people in custody.

Methods: This systematic review followed PRISMA 2020. Google Scholar and web and agency sources were searched on 16 October 2026, with citation searching of two systematic reviews. Studies reporting oral health, service use or barriers among incarcerated or formerly incarcerated adults were eligible. Mean DMFT and caries prevalence were pooled by REML random-effects meta-analysis with Hartung-Knapp intervals; barriers were mapped to the Andersen behavioural model.

Results: Thirty-two reports were included. Across seven studies (1,042 adults) from Brazil, Finland, Poland, Portugal, Saudi Arabia and the United Kingdom, pooled mean DMFT was 15.24 (95% CI 12.46 to 18.01; $I^2 = 94.8\%$). Across seven studies (1,742 adults), pooled caries prevalence was 87.9% (95% CI 71.7% to 95.4%). In Silesia, incarcerated patients had 2.95 more DMFT teeth (95% CI 1.50 to 4.40) than matched controls, driven by untreated decay. Barriers clustered in the enabling domain: reactive service models, extraction-led treatment and loss of coverage after release.

Conclusions: Untreated caries affects most incarcerated adults, and the binding constraints are institutional. Custodial dental services should be commissioned for scheduled prevention and restoration, with decayed and extraction components reported separately.

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INTRODUCTION

Oral diseases are among the most common non-communicable conditions in the world, and the World Health Organization estimates that they affect close to 3.5 billion people, a burden it describes as alarming and in need of urgent action (World Health Organization, 2022). The distribution of that burden follows social disadvantage, and people in custody sit at its sharpest edge. The published world prison population stands at 10.99 million, and the true total is likely to exceed 11.5

million once countries that do not publish figures are counted (Fair & Walmsley, 2024). In the United States, state and federal prisons held 1,254,200 people at yearend 2023 (Mueller & Kluckow, 2025), and local jails held 657,500 people at midyear 2024 (Zeng, 2025). Each of these admissions passes through a health intake, which makes custody one of the few points at which a health system meets a large, high-need and otherwise hard-to-reach population on a predictable schedule.

The available surveys describe a population with extensive caries experience, high levels of untreated decay and early tooth loss. In Karnataka, India, 92.5% of 800 life-sentenced inmates in seven central jails had dental caries (Reddy et al., 2012). A matched case-control study at the University Centre for Dentistry in Bytom, Poland, found more decayed and more missing teeth among 136 incarcerated patients than among 136 matched controls (Fiegler-Rudol et al., 2025a). In the Eastern Province of Saudi Arabia, 98.3% of 230 inmates had untreated decay (Shahin et al., 2025). Systematic reviews have tabulated similar findings among men (Korkosz et al., 2024), among women (Fiegler-Rudol et al., 2025b) and among prisoners in India, where twelve studies gave a pooled caries prevalence of 78.42% (Mehta et al., 2024). None of these reviews pooled clinical indices across countries, and none connected the measured burden to the structural barriers that determine whether preventive care is delivered.

The service context explains why this connection matters. Guidance published by the National Commission on Correctional Health Care states that the cornerstone of preventive dentistry is patient education and that institutions should offer basic on-site care, including extractions, surface restorations, prostheses and prophylaxis (Adu-Tutu & Shields, 2014). The Federal Bureau of Prisons requires a dentist-performed admission examination within 30 days of arrival and a dentist review within three business days for patients in the urgent pathway (Federal Bureau of Prisons, 2016). Yet reviews of custodial dental services describe a predominantly reactive, emergency-led model in which extraction is common and prevention is rarely evaluated (Reis-Marcelino et al., 2026; Amaya et al., 2024). This review therefore asked three questions: how large is the oral disease burden among incarcerated adults; how does it compare with matched and general-population reference data; and which barriers to preventive care are reported, organised by the domain of access they affect.

CONCEPTUAL FRAMEWORK

Equivalence of care and the ethics of oral health disparities

The principle of equivalence holds that people in prison are entitled to a standard of health care equivalent to that available in the community, and the World Health Organization Regional Office for Europe treats prison health, including oral health, as part of public health rather than as a custodial matter (Enggist et al., 2014). Oral health inequities are produced by income, education, place and the social conditions in which people live (Tellez et al., 2014), and because these inequities are avoidable, addressing them has been framed as an ethical imperative for the dental profession and for policymakers (Lee & Divaris, 2014). In the United States, prisoners can bring claims under Section 1983 when dental care is delayed, and a review of federal appellate decisions on such claims has set out practices that prison officials and dentists should follow to avoid liability (Nolasco & Vaughn, 2020). Legal scholarship has also argued

that extraction-only policies create a substantial barrier to long-term dental care, although the case law on such policies is mixed (Douds et al., 2020).

The Andersen behavioural model as an organising frame

The behavioural model of health services use separates predisposing characteristics, enabling resources and need as determinants of whether people obtain care (Andersen, 1995). The model suits custodial settings because enabling factors such as triage rules, escort availability, custody movements and appointment capacity sit almost entirely with the institution, so they can override both patient preference and clinical need. Using the model to sort reported barriers makes it possible to separate those that a correctional health administrator can change from those that reflect the life circumstances people bring into custody. The same model has been used to frame access to dental care among formerly incarcerated people, where economic stability and access to health care were the social determinants most often examined (Amoako et al., 2026).

Indices of burden

The decayed, missing and filled teeth (DMFT) index records lifetime caries experience, but its components carry different meanings: the decayed component records active, untreated disease, the missing component records extraction, and the filled component records restorative care received. The Community Periodontal Index of Treatment Needs (CPITN) was developed by the World Health Organization as a simple screening index for periodontal treatment need (Ainamo et al., 1982), and it is the periodontal index named in the federal admission examination (Federal Bureau of Prisons, 2016). The PUFA index records the clinical consequences of untreated caries, namely pulpal involvement, ulceration caused by dislocated tooth fragments, fistula and abscess (Monse et al., 2010). A service that extracts rather than restores can lower its decayed count while raising its missing count, so aggregate DMFT alone cannot show whether care is preventive or reactive.

METHODS

Design and reporting

This systematic review with meta-analysis was conducted and reported in accordance with the PRISMA 2020 statement (Page et al., 2021). The review question was framed as condition (oral disease burden and barriers to preventive care), context (custodial settings and the period after release) and population (adults who are or have been incarcerated). The protocol was not registered. Every quantitative value used in the synthesis was checked against the source document, and where a value was taken from the table of a published systematic review, the primary report was identified and its bibliographic record confirmed by its digital object identifier. Guidance on the appropriate use of the PRISMA statement was followed in reporting the flow of records (Sarkis-Onofre et al., 2021).

Eligibility criteria

Reports were eligible if they (a) described adults held in prisons, jails, remand or detention facilities, or adults with a history of incarceration; (b) reported a clinical or self-reported oral health measure, a measure of dental service use, or barriers to dental care; and (c) were primary studies, or systematic, scoping or integrative reviews. Reports were excluded if they concerned only people under 18 years, reported no oral health outcome, were methodological or reporting guidance, were commentaries or legal analyses without data, were not peer reviewed, or had a bibliographic record that could not be verified. For the meta-analyses, primary studies had to report a clinically examined mean DMFT with its standard deviation and sample size, or the number or proportion of participants with dental caries, in a custodial sample. These criteria follow the condition, context and population structure recommended for prevalence reviews (Munn et al., 2014).

Information sources and search

Google Scholar was searched with 31 verbatim queries on 16 October 2026, returning 171 records, and three rounds of web and agency-document searching returned 86 unique records. Query terms combined incarceration terms (prison, jail, correctional, incarcerated, inmate, detainee, persons deprived of liberty, justice-involved) with oral health terms (oral health, dental, caries, periodontal, DMFT, CPITN, PUFA, tooth loss), prevention terms (preventive dentistry, fluoride, sealant, prophylaxis, oral hygiene instruction) and access terms (barriers, utilisation, unmet need, waiting time, equivalence of care). The study tables of two systematic reviews were searched for further primary studies (Korkosz et al., 2024; Fiegler-Rudol et al., 2025b), and journal and agency websites were searched for studies of reentry and formerly incarcerated populations. Searching a single bibliographic engine supplemented by citation searching is a pragmatic strategy, and its implications are considered in Section 6.4 (Walsh et al., 2008).

Selection and data extraction

Records were screened on title and abstract and then on full text against the criteria in Section 3.2. From each included report, the country, setting, design, sample size, sex composition, index or outcome measure, principal estimates and reported barriers were extracted. For the meta-analyses, the mean DMFT and its standard deviation, the decayed, missing and filled components, and the number of participants with caries were recorded. Values for Cavalcanti et al. (2014) and Vainionpää et al. (2017) were taken from the study table of Korkosz et al. (2024), and values for Rodrigues et al. (2014), Rouxel et al. (2013) and Soares et al. (2019) from the study table of Fiegler-Rudol et al. (2025b); values for the remaining studies were taken from the primary reports (Reddy et al., 2012; Soares et al., 2023; Fiegler-Rudol et al., 2025a; Shahin et al., 2025).

Statistical analysis

Mean DMFT was pooled on its natural scale with the variance of each mean taken as the squared standard deviation divided by the sample size. Caries prevalence was pooled on the logit

scale with a continuity correction of 0.5 and back-transformed. Between-study variance was estimated by restricted maximum likelihood, and 95% confidence intervals for the pooled means used the Hartung-Knapp adjustment, which performs better than the normal approximation when studies are few and heterogeneous (Hartung & Knapp, 2001). Heterogeneity was summarised by I^2 (Higgins & Thompson, 2002), and 95% prediction intervals were reported because they describe the range in which the burden of a new custodial population is expected to fall (Riley et al., 2011). The random-effects estimator generalises the approach of DerSimonian & Laird (1986). The weighted mean and its variance are given in Equations (1) and (2).

$$\tilde{r}_{RE} = \frac{\sum_{i=1}^k w_i y_i}{\sum_{i=1}^k w_i}, \quad w_i = \frac{1}{v_i + \hat{\sigma}^2} \quad (1)$$

In Equation (1), y_i is the estimate of study i , v_i its within-study variance and $\hat{\sigma}^2$ the REML estimate of between-study variance. The Hartung-Knapp confidence interval multiplies the variance of the pooled estimate by the weighted residual mean square shown in Equation (2) and uses a t distribution with k minus 1 degrees of freedom.

$$\text{Var}_{HK}(\tilde{r}_{RE}) = \frac{\sum_{i=1}^k w_i (y_i - \tilde{r}_{RE})^2}{(k-1) \sum_{i=1}^k w_i} \quad (2)$$

Sensitivity was assessed by leave-one-out analysis and by a subgroup analysis restricted to samples of women. Because fewer than ten studies contributed to each analysis, funnel-plot tests for small-study effects were not performed. Certainty of evidence for each outcome was rated with the GRADE approach, considering risk of bias, inconsistency, indirectness, imprecision and publication bias (Guyatt et al., 2008). Barriers reported in the included studies were coded to the predisposing, enabling and need domains of the behavioural model (Andersen, 1995) and synthesised narratively. Analyses were run in Python 3.13 with SciPy 1.18.

RESULTS

Study selection

The database and web searches identified 257 records, of which one was a duplicate. After screening 256 records, 185 reports were sought, 2 could not be retrieved and 183 were assessed in full; 161 were excluded, most often because the population was not incarcerated ($n = 70$), the report was methodological guidance ($n = 32$) or the report duplicated another ($n = 20$). Citation and targeted searching identified 17 further reports, of which 7 could not be retrieved or verified and 10 were included. In total, 32 reports were included: 20 primary studies and 12 reviews, with 7 studies contributing to the meta-analyses (Figure 1). The volume of excluded methodological material reflects the breadth of the shared search strategy, which

also served other questions, and is consistent with earlier observations about the heterogeneity of prison dental research (Walsh et al., 2008).

Characteristics of included studies

Table 1 lists the primary studies that reported clinical burden. They came from eight countries on four continents, were cross-sectional except for one retrospective case-control study (Fiegler-Rudol et al., 2025a), and ranged from 65 women in a prison in northeastern Brazil (Rodrigues et al., 2014) to 800 life-sentenced inmates in Karnataka (Reddy et al., 2012). Three samples were of women only (Rouxel et al., 2013; Rodrigues et al., 2014; Soares et al., 2019), one was of men only (Soares et al., 2023), and the rest were mixed or predominantly male. Further primary studies described dental fear and attendance in Finland (Vainionpää et al., 2019), mediators of decay in three Scottish prisons (Arora et al., 2020), remand prisoners in London (Heidari et al., 2007), a United States federal prison (Mixon et al., 1990), knowledge and attendance in a district jail in North India (Sandhu et al., 2017) and suspected bruxism among persons deprived of liberty in Peru (Jalk-Tiravanti et al., 2026).

Table 1 also shows the source from which each value was extracted, so that values taken from published review tables can be distinguished from those taken directly from primary reports.

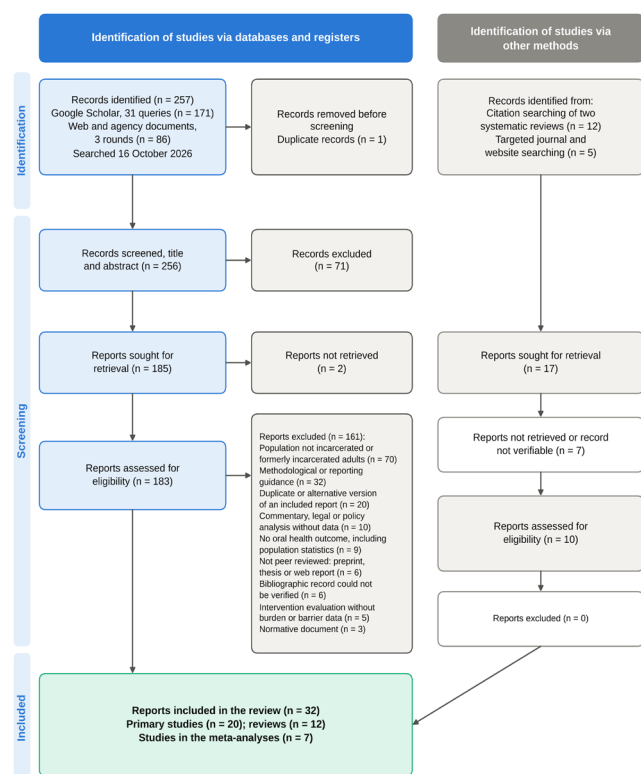


Figure 1: PRISMA 2020 flow diagram of record identification, screening and inclusion. Database and web searches were run on 16 October 2026; other methods comprised citation searching of the study tables of Korkosz et al. (2024) and Fiegler-Rudol et al. (2025b) and targeted journal and website searching.

Pooled caries experience

Seven studies with 1,042 participants reported a mean DMFT with its standard deviation. The pooled mean DMFT was 15.24 (95% CI 12.46 to 18.01), with a 95% prediction interval of 7.24 to 23.24 and substantial heterogeneity ($I^2 = 94.8\%$, $\tau^2 = 8.40$) (Figure 2). Study means ranged from 11.70 among women in Brazil (Soares et al., 2019) to 20.37 among women in a prison in northeastern Brazil, where most of the index was made up of missing teeth (Rodrigues et al., 2014). Removing one study at a time moved the pooled mean only between 14.40 and 15.85. In the three samples of women, the pooled mean was 14.74 (95% CI 2.76 to 26.72), and in the four male or mixed samples it was 15.57 (95% CI 13.20 to 17.93), so the data did not show a difference by sex. Missing teeth formed the largest component in the Portuguese and northeastern Brazilian samples (Soares et al., 2023; Rodrigues et al., 2014), which matches the pattern described across United Kingdom prison studies, where DMFT ranged from 12.3 to 15.6 and missing teeth were the largest component (Venturelli et al., 2025).

Prevalence of dental caries

Seven studies with 1,742 participants reported the number or proportion with dental caries. The pooled prevalence was 87.9% (95% CI 71.7% to 95.4%), with a 95% prediction interval of 26.7% to 99.3% and I^2 of 94.5% (Figure 3). The lowest estimate came from the men in northern Portugal, among whom 62.1% had caries lesions (Soares et al., 2023), and the highest from the Eastern Province of Saudi Arabia, where 98.3% had untreated decay (Shahin et al., 2025). Leave-one-out estimates ranged from 84.4% to 90.3%. Among women, the pooled prevalence was 81.1% (95% CI 65.0% to 90.8%; $I^2 = 57.4\%$), which is in line with the range of 75% to 92.4% reported by the systematic review of incarcerated women (Fiegler-Rudol et al., 2025b). The pooled estimate is close to the 78.42% reported for prisoners in India across twelve studies (Mehta et al., 2024).

Comparison with matched controls and community benchmarks

Only one study compared incarcerated patients with matched controls examined in the same clinic. In Bytom, Poland, mean DMFT was 14.42 ± 5.74 among 136 incarcerated patients and 11.47 ± 6.47 among 136 controls, a difference of 2.95 teeth (95% CI 1.50 to 4.40), and the decayed component differed by 1.55 teeth (95% CI 0.89 to 2.21); 94.9% of incarcerated patients against 84.6% of controls had at least one untreated decayed tooth, and 95.6% against 80.1% had at least one missing tooth (Fiegler-Rudol et al., 2025a). Community benchmarks show the size of the gap. In the United States, untreated caries affected 21.3% of adults in the National Health and Nutrition Examination Survey for 2017 to 2020 (Bashir, 2022) and 25.0% of adults in 2011 to 2014 (Gupta et al., 2018), and about one in five adults aged 65 years and over had untreated decay in 2011 to 2012 (Dye et al., 2015). In the United Kingdom, prison samples had more decayed and fewer filled and sound teeth than the general population (Venturelli et al., 2025). In

Table 1: Primary studies reporting clinically examined caries burden among incarcerated adults

Study	Country and setting	Design	n; sex	Principal burden estimates	Source of extracted values
Reddy et al., 2012	India; 7 central jails, Karnataka	Cross-sectional	800; mixed	Mean DMFT 5.26 (SD not reported); caries 92.5%	Primary report
Rouxel et al., 2013	United Kingdom; HMP Holloway	Cross-sectional	103; women	DMFT 12.30 ± 7.48; caries 75%	Fiegler-Rudol et al. (2025b)
Cavalcanti et al., 2014	Brazil; men’s prison	Cross-sectional	127; men	DMFT 19.72 (D 11.06, M 7.20, F 1.46); SD not reported	Korkosz et al. (2024)
Rodrigues et al., 2014	Brazil; women’s prison, northeast	Cross-sectional	65; women	DMFT 20.37 ± 7.87 (M 11.26); caries 84.6%	Fiegler-Rudol et al. (2025b)
Vainionpää et al., 2017	Finland; Pelso Prison	Cross-sectional	100; mixed	DMFT 16.80 ± 8.90 (D 5.0, M 4.7, F 6.9)	Korkosz et al. (2024)
Soares et al., 2019	Brazil; women’s prison	Cross-sectional	305; women	DMFT 11.70 ± 6.33; caries 84%	Fiegler-Rudol et al. (2025b)
Soares et al., 2023	Portugal; prison, northern region	Cross-sectional	103; men	DMFT 17.17 ± 8.23 (M 13.14); caries lesions 62.1%	Primary report
Fiegler-Rudol et al., 2025a	Poland; University Centre for Dentistry, Bytom	Retrospective case-control, 2019 to 2024	136 cases, 136 controls; mixed	DMFT 14.42 ± 5.74 vs 11.47 ± 6.47; untreated decay 94.9% vs 84.6%	Primary report
Shahin et al., 2025	Saudi Arabia; Eastern Province	Cross-sectional	230; mixed	DMFT 14.41 ± 7.89; untreated decay 98.3%	Primary report

DMFT, decayed, missing and filled teeth; SD, standard deviation; D, M and F, decayed, missing and filled components. Values are means ± SD unless stated. For Reddy et al. (2012), the abstract reports caries in 97.5% and the results section 92.5%; the results-section value is used.

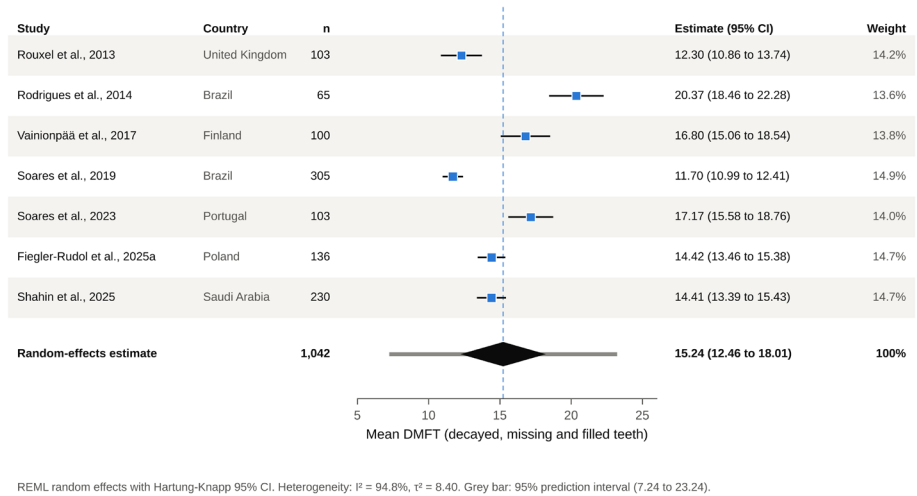


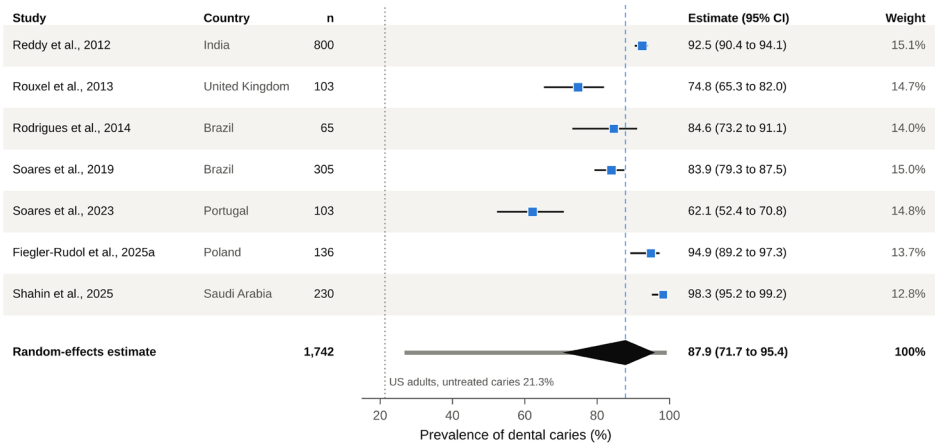
Figure 2: Forest plot of mean DMFT among incarcerated adults (seven studies; 1,042 participants). Squares show study means with 95% confidence intervals, sized by random-effects weight; the diamond shows the REML pooled estimate with its Hartung-Knapp 95% confidence interval, the dashed vertical line marks the pooled estimate, and the grey bar shows the 95% prediction interval.

a United States federal prison, mean DMFT rose from 12.9 at ages 20 to 34 to 22.1 at ages 45 and over (Mixon et al., 1990).

Treatment need and service use

Treatment need in custodial samples is dominated by primary care. Among 800 life-sentenced inmates in Karnataka, 87.6% needed restorations, 62.1% needed extractions and 32.2%

needed prostheses, while 41.1% had severe loss of periodontal attachment (Reddy et al., 2012). Among 78 remand prisoners at HMP Brixton in London, decay was high while missing and filled teeth were relatively few, and the high turnover of the remand population made preventive care difficult to complete (Heidari et al., 2007). In a district jail in North India, 62.24% of inmates had never visited a dental clinic, even before



Logit-transformed proportions, REML random effects with Hartung-Knapp 95% CI. $I^2 = 94.5\%$, $\tau^2 = 1.17$. Grey bar: 95% prediction interval (26.7% to 99.3%).

Figure 3: Forest plot of the prevalence of dental caries among incarcerated adults (seven studies; 1,742 participants). Proportions were pooled on the logit scale by REML with a Hartung-Knapp 95% confidence interval and back-transformed; the grey bar shows the 95% prediction interval, and the dotted line marks the 21.3% prevalence of untreated caries among United States adults in 2017 to 2020 (Bashir, 2022) for reference.

imprisonment, and 39.21% gave the absence of a dental clinic in the jail as the reason for not attending (Sandhu et al., 2017). Among 89 male prisoners at Pelso Prison in Finland, 8.7% reported severe and 30.4% moderate dental fear, and oral health was poor whether or not fear was present (Vainionpää et al., 2019). These findings describe disease that routine examination, restoration and prevention would address, which corresponds to the basic on-site services set out in correctional dental guidance (Adu-Tutu & Shields, 2014).

Barriers to preventive dental care

Table 2 maps the barriers reported in the included studies to the domains of the behavioural model (Andersen, 1995). In the predisposing domain, an integrative review of 26 studies found a general lack of oral health knowledge among people in custody and identified tobacco use and free sugar consumption as the most common risk behaviours (Barak et al., 2026). In three Scottish prisons, the association between depression and decay experience among 298 prisoners was mediated primarily by drug use and secondarily by dental anxiety (Arora et al., 2020). In the enabling domain, a global scoping review of 46 studies found that the availability and accessibility of prison dental services varied widely between countries (Amaya et al., 2024), a scoping review of 28 studies described a predominantly reactive, emergency-led model (Reis-Marcelino et al., 2026), and interviews with 15 professionals identified organisational barriers alongside facilitators such as funding, community partnership and transport (Amaya et al., 2025). In Brazil, incarcerated women in the Consuelo Nasser women’s penitentiary described pain, tooth loss and reactive, limited access to dental care in a facility without its own primary care team (Abreu et al., 2026).

Barriers after release extend those within custody. A scoping review of 12 observational studies in the United States found that prior incarceration was consistently associated with less dental care, more unmet need, lower odds of dental

insurance and poorer self-rated oral health, although several associations weakened after adjustment for socioeconomic position and insurance (Testa et al., 2026b). In the Health and Retirement Study, formerly incarcerated adults aged 55 years and over were more likely than others to have intermittent or no dental coverage over time (Testa et al., 2026a). Qualitative work with 21 women attending sex work support services in Liverpool, several of whom had used prison dental services, described stigma and structural barriers that continued after release (Doughty et al., 2026). An integrative review of incarcerated women identified caries, periodontal disease, tooth pain and the use of dental prostheses as the most common problems and linked them to poorer quality of life (de Moraes Longhi et al., 2022).

Certainty of evidence

Table 3 summarises the certainty of evidence. Certainty that most incarcerated adults have dental caries and high caries experience was rated moderate: all studies were observational, but the direction of effect was consistent in every country and the confidence intervals excluded community benchmarks by a wide margin. Certainty about the magnitude of pooled estimates was rated low because of very high heterogeneity, small samples and convenience sampling in several studies. Certainty about the excess burden relative to matched controls was rated very low because only one study made this comparison (Fiegler-Rudol et al., 2025a). The ratings follow the GRADE domains (Guyatt et al., 2008), and the use of prediction intervals is intended to make the heterogeneity behind them visible (Riley et al., 2011).

DISCUSSION

Principal findings

This review provides, to the author’s knowledge, the first pooled estimate of caries burden among incarcerated adults

Table 2: Barriers to preventive dental care reported for incarcerated and formerly incarcerated adults, mapped to the Andersen behavioural model

Domain	Barrier	Reported consequence	Sources
Predisposing	Limited oral health knowledge; tobacco use and free sugar intake	Fewer self-initiated requests for routine care and higher caries risk	Sandhu et al., 2017; Barak et al., 2026
Predisposing	Depression, drug use and dental anxiety	Drug use and anxiety mediate the link between depression and decay	Arora et al., 2020; Vainionpää et al., 2019
Predisposing	Psychological distress with oral parafunction	Anxiety, depression and stress associated with suspected bruxism	Jalk-Tiravanti et al., 2026
Enabling	Reactive, emergency-led service models	Routine and preventive care deferred in favour of acute presentations	Reis-Marcelino et al., 2026; Amaya et al., 2024
Enabling	Extraction-led treatment	Restorable teeth lost; missing component dominates DMFT	Douds et al., 2020; Soares et al., 2023
Enabling	Absence of an on-site clinic or primary care team	Care depends on transfer to another facility	Sandhu et al., 2017; Abreu et al., 2026
Enabling	Short stays and high turnover	Courses of preventive care not completed	Heidari et al., 2007
Enabling	Loss of dental coverage after release	Intermittent or absent coverage in later life	Testa et al., 2026a; Testa et al., 2024
Need	High burden of untreated, often painless disease	Need not visible to request-based triage	Fiegler-Rudol et al., 2025a; Shahin et al., 2025
Need	Unmet need persisting after release	Less dental care and more unmet need among formerly incarcerated adults	Testa et al., 2026b; Amoako et al., 2026

Table 3: Summary of findings and certainty of evidence (GRADE)

Outcome	Studies (participants)	Estimate (95% CI)	Main concerns	Certainty
Mean DMFT	7 (1,042)	15.24 (12.46 to 18.01); PI 7.24 to 23.24	Inconsistency (I ² 94.8%); convenience samples	Low for magnitude; moderate for a high burden
Caries prevalence	7 (1,742)	87.9% (71.7% to 95.4%); PI 26.7% to 99.3%	Inconsistency (I ² 94.5%); differing case definitions	Low for magnitude; moderate for a majority affected
Excess DMFT versus matched controls	1 (272)	2.95 (1.50 to 4.40)	Single study; single centre	Very low
Barriers to preventive care	14 reports	Narrative synthesis (Table 2)	Mostly qualitative and review evidence	Low

PI, 95% prediction interval.

across countries. Seven studies from six countries gave a pooled mean DMFT of 15.24 and seven gave a pooled caries prevalence of 87.9%, and these estimates exceed the 21.3% to 25.0% prevalence of untreated caries among United States adults by a wide margin (Bashir, 2022; Gupta et al., 2018). The single matched comparison showed that the excess lay in decayed and missing teeth rather than filled teeth (Fiegler-Rudol et al., 2025a), and in two samples the missing component was the largest part of the index (Soares et al., 2023; Rodrigues et al., 2014). Taken together, the data describe a population whose caries has been treated by extraction or not treated at all, which is the pattern expected under the reactive service model described by recent reviews (Reis-Marcelino et al., 2026; Amaya et al., 2024).

Comparison with previous reviews

Previous reviews either restricted their scope to one country or one sex or did not pool across studies. The meta-analysis of twelve Indian studies reported a pooled caries prevalence

of 78.42% (Mehta et al., 2024), the review of male prisoners described nine studies narratively with mean DMFT ranging from 1.37 to 19.72 (Korkosz et al., 2024), and the review of incarcerated women described seven studies without pooling (Fiegler-Rudol et al., 2025b). The present estimate of 87.9% is higher than the Indian estimate, which is consistent with the inclusion here of studies that recorded untreated decay at a fine threshold (Shahin et al., 2025; Fiegler-Rudol et al., 2025a). An earlier systematic review of prison dental research found 21 studies, 11 of them from the United States, and judged the field heterogeneous in design and measurement (Walsh et al., 2008); that judgement still applies, since the heterogeneity in the present analyses is close to its maximum.

Why the barriers are institutional

The barrier map places the decisive constraints in the enabling domain. Knowledge deficits, dental anxiety and drug use are real (Barak et al., 2026; Arora et al., 2020), but in custody a person cannot buy care, choose a dentist or attend without

escort, so the institution determines whether need is met. Where prisons have no on-site clinic, people report the absence of a clinic as their reason for not attending (Sandhu et al., 2017), and where a women's facility depends on another institution for dental care, access becomes reactive and limited (Abreu et al., 2026). The National Health Service specification for prison dentistry in England sets a concrete trigger for review when waits for routine care in a secure setting are consistently beyond eight weeks (NHS England and NHS Improvement, 2020), showing that waiting time can be treated as a commissioned standard. Indicator-based accountability frameworks developed for long-term care offer a comparable model for tying service tiers to measurable indicators (Ekemezie et al., 2023).

Measurement implications

Aggregate DMFT conceals the distinction between treated and untreated disease, so a service that extracts can show stable or falling decayed counts while missing counts rise. Custodial dental services should therefore report the decayed, missing and filled components separately, the PUFA index as a measure of untreated disease progressing to pulpal involvement and abscess (Monse et al., 2010), and the CPITN that is already recorded at federal admission (Federal Bureau of Prisons, 2016; Ainamo et al., 1982). The National Oral Health Surveillance System in the United States was developed to monitor the burden of oral disease and the use of the oral health care delivery system (Malvitz et al., 2009), and its indicators do not currently cover people in custody (Centers for Disease Control and Prevention, 2024). Adding the custodial population to such surveillance would make the disparity reported here visible in the same instruments that guide community resource allocation.

Implications for practice and policy

Four implications follow. First, the admission examination should be used to record the decayed, missing, filled and PUFA components, so that the disease burden of each cohort is known on entry (Federal Bureau of Prisons, 2016; Monse et al., 2010). Second, the preventive measures already listed in correctional guidance, namely oral hygiene instruction, fluoride toothpaste, interdental cleaning and prophylaxis, should be scheduled for every person rather than offered on request (Adu-Tutu & Shields, 2014). Third, restoration should be the default treatment for restorable teeth, because the missing component already dominates the index in several samples (Soares et al., 2023; Rodrigues et al., 2014). Fourth, dental records and coverage should follow the person across release, since continuity of care breaks at that point for other chronic conditions: in Wisconsin, only 51.7% of adults leaving prison on chronic medication filled the same medication class within six months (Dague et al., 2025). Administrative governance has been identified as a missing link in continuity of care in other services (Ogundipe & Ominde, 2024), and coverage expansion has been associated with lower mortality among formerly incarcerated people (Perera et al., 2024).

STRENGTHS AND LIMITATIONS

Strengths

The review pooled clinical indices from six countries rather than from one, reported prediction intervals alongside confidence intervals, used the Hartung-Knapp adjustment suited to small numbers of heterogeneous studies (Hartung & Knapp, 2001), and checked every extracted value and bibliographic record against its source. Values taken from published review tables were labelled as such in Table 1, and barriers were organised by a validated model of service use rather than listed (Andersen, 1995). The certainty of each conclusion was rated explicitly, so that readers can distinguish the well-supported finding that most incarcerated adults have caries from the less certain estimates of its exact magnitude (Guyatt et al., 2008).

Heterogeneity and comparability

Heterogeneity was very high in both meta-analyses, and the pooled means should be read as the centre of a wide distribution rather than as a single population value; the prediction intervals show that a new custodial population could have a mean DMFT between about 7 and 23 (Riley et al., 2011). Case definitions differed: some studies recorded untreated decay, others any caries lesion, and one counted teeth with temporary fillings as decayed (Soares et al., 2023). Sampling was often by convenience, and examiner calibration was not consistently reported, which limits comparability in the way described by earlier reviews (Walsh et al., 2008).

Representativeness

No study from the United States contributed to the pooled DMFT estimate, and only one United States study reported clinical indices at all, from 1990 (Mixson et al., 1990). Samples of women were small, and no study reported results for older incarcerated adults separately, although caries experience rises steeply with age in custodial samples (Mixson et al., 1990). The barrier synthesis drew heavily on reviews and qualitative studies, which describe the presence of barriers more reliably than their relative weight (Amaya et al., 2025; Testa et al., 2026b). Low- and middle-income countries other than India and Brazil were not represented in the pooled analyses.

Search and selection

The search used one bibliographic engine supplemented by web, agency and citation searching rather than several bibliographic databases, and screening was carried out by a single reviewer, so relevant studies, particularly those published in languages other than English, may have been missed. Seven reports identified through citation searching could not be retrieved or verified and were excluded, which may have narrowed the meta-analyses. Because fewer than ten studies contributed to each analysis, small-study effects could not be tested (Page et al., 2021). The protocol was not registered in advance, so the eligibility criteria and analysis plan, although stated here in full, were not fixed publicly before the search was run (Sarkis-Onofre et al., 2021).

CONCLUSION

Most incarcerated adults have dental caries, and their mean caries experience is about fifteen affected teeth, a burden well above that of community populations and dominated in several settings by untreated decay and missing teeth. The barriers that keep preventive care from reaching people in custody are mainly institutional: reactive, emergency-led service models, extraction-led treatment, the absence of on-site clinics, short stays and the loss of coverage after release. Each of these can be changed by commissioning decisions. Custodial dental services should record the decayed, missing, filled and PUFA components at admission, schedule the preventive measures already listed in correctional guidance for every person, make restoration the default for restorable teeth, and carry dental records and coverage across release. Future studies should use calibrated examiners, standard case definitions and comparison groups so that the size of the gap, and the effect of closing it, can be measured.

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COMPETING INTERESTS

The author declares no competing interests.

ETHICS APPROVAL

Not applicable. This review analysed data from published studies and did not involve human participants.

DATA AVAILABILITY

All data analysed in this review are reported in Tables 1 to 3 and Figures 2 and 3, and the analysis code is available from the corresponding author on reasonable request.

AUTHOR CONTRIBUTIONS

Ehizogie Paul Adeghe conceived the study, designed the methods, conducted the searches, screening, data extraction and analyses, interpreted the findings, and wrote and approved the manuscript.

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