National Institute for Health and Care Excellence

Draft for consultation

Osteoporosis: risk assessment

[B] Searching and analysis of electronic health records

NICE guideline

Evidence review underpinning recommendations for research in the NICE guideline

January 2026

Draft for Consultation

This evidence review was developed by NICE

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Local commissioners and/or providers have a responsibility to enable the guideline to be applied when individual health professionals and their patients or service users wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with compliance with those duties.

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1. Searching and analysis of electronic health records

1.1. Review question: What is the clinical and cost-effectiveness of searching and analysis of electronic health records and social care records (including GP practice lists) to facilitate identification of adults who should be assessed for fragility fracture risk?

1.1.1. Introduction

Electronic health records (EHRs) and social care record databases contain information collected from people under the care of a medical professional, service, or organisation. Searching this data could facilitate identification of those patients at increased risk of fragility fracture that should be assessed.

1.1.2. Summary of the protocol

For full details see the review protocol in Appendix A.

Table 1: PICO characteristics of review question

Population	Adults who are 50 years and older
Intervention	Searching and analysis of • Electronic patient records • Social care record databases
Comparison	No searching and analysis

Outcomes	All outcomes are considered equally important for decision making and therefore have all been rated as critical:
	• Number of people identified for further assessment
	• Number of people identified as needing treatment on the basis of further assessment
	• Fragility fracture
	• Generic health-related quality of life (continuous outcomes will be prioritised [validated measures]).
	  ○ EQ-5D
	  ○ SF-6D
	  ○ SF-36
	  ○ SF-12
	  ○ Other utility measures (AQOL, HUI, 15D, QWB)
	• QUALEFFO-41 will be included for studies with vertebral fractures
	
	Latest timepoint reported during study follow up

Study design	• Randomised controlled trials (RCTs) • Systematic review if robust methodological standard • Published NMAs and IPDs

1.1.3. Methods and process

This evidence review was developed using the methods and process described in Developing NICE guidelines: the manual. Methods specific to this review question are described in the review protocol in Appendix A.

Declarations of interest were recorded according to NICE's conflicts of interest policy.

1.1.4. Effectiveness evidence

1.1.4.1. Included studies

No relevant clinical studies comparing searching electronic patient or social care record databases with no searching were identified.

See also the study selection flow chart in **Error! Reference source not found.**.

1.1.4.2. Excluded studies

See the excluded studies list in Appendix J.

1.1.5. Summary of studies included in the effectiveness evidence

No included studies.

1.1.6. Summary of the effectiveness evidence

No evidence identified.

1.1.7. Economic evidence

For methods see the health economic review protocol in Appendix A.

1.1.7.1. Included studies

No health economic studies were included.

See also the health economic study selection flow chart in Appendix G.

1.1.7.2. Excluded studies

No relevant health economic studies were excluded due to assessment of limited applicability or methodological limitations, as detailed in Appendix J.

1.1.8. Summary of included economic evidence

No health economic studies were included.

1.1.9. Economic model

This area was not prioritised for new cost-effectiveness analysis.

1.2. The committee's discussion and interpretation of the evidence

1.2.1. The outcomes that matter most

The committee considered that the number of people identified for further assessment, number of people identified as needing treatment on the basis of further assessment, fragility fracture, and generic health related quality of life would be the most important outcomes for this review. QUALEFFO-41 will be included for studies with vertebral fractures. All outcomes were considered equally important for decision making and therefore were all rated as critical.

No evidence was identified for any of the outcomes.

1.2.2. The quality of the evidence

No evidence was identified.

1.2.3. Benefits and harms

The committee agreed that without any evidence a recommendation could not be made on searching electronic health records to identify people at risk of fragility fracture.

The committee discussed the importance of this question to help identify people in primary care at risk of osteoporotic fractures that would otherwise have been missed. With limited resources the use of searching electronic health records introduces an opportunity to improve identification of people at risk and reduce fractures through treatment.

The committee discussed how primary care health record lists are already searched for secondary prevention, but searching for primary prevention is not routinely done. Another factor is that approximately only 50% of people who sustain a hip fracture have a history of prior fragility fracture, so it is important opportunity to identify those that don't. The committee identified a gap in the evidence and acknowledged the potential that research in this area could inform future guidance.

1.2.4. Cost effectiveness and resource use

There were no published economic evaluations identified.

The committee noted that past and present methods for searching and analysing electronic health records to identify people at risk of fragility fracture have tended to include manual searches of electronic records. Costs will relate to the time taken to plan and execute the searches. The committee highlighted that in the future technological advances could potentially reduce the time required. However, there may be other associated costs such as software licences or training for upskilling.

If a greater number of people are identified for treatment, costs related to searching and analysing electronic health records may potentially be offset by downstream reductions in fractures in terms of reduced fracture-related costs and increased population health. However, no evidence was identified in the clinical review in relation to this. The committee agreed that a research recommendation for this topic should be made.

1.2.5. Other factors the committee took into account

The committee acknowledged that there may be patient characteristics not yet accounted for on the electronic health records. For example, it currently is not able to automatically identify someone who has a biological risk that differs from the gender of which they identify.

The committee noted that people that are not registered with a GP and do not have an electronic health record would not be picked up.

It was discussed that family history especially of hip fractures is poorly recorded which could mean that these people are not identified by the searches.

1.2.6. Recommendations supported by this evidence review

This evidence review supports the recommendation for research on the clinical and cost-effectiveness of searching and analysing electronic health records and social care records (including GP practice lists) to help identify adults who should have a fragility fracture risk assessment. No recommendations were made from this evidence review.

1.3. References

None.

Appendices

Appendix A Review protocols

A.1 Review protocol for electronic health records for identifying adults for fragility fracture risk

Field	Content
Review title	Searching and analysis of electronic health records and social care records (including GP practice lists) to facilitate identification of adults who should be assessed for fragility fracture risk
Review question	What is the clinical and cost-effectiveness of searching and analysis of electronic health records and social care records (including GP practice lists) to facilitate identification of adults who should be assessed for fragility fracture risk?
Objective	This review looks at whether searching and analysis of electronic health records and social care records (including GP practice lists) are useful for identifying adults who should be assessed for fragility fracture risk.
Searches	The following databases (from inception) will be searched: • Embase • MEDLINE Searches will be restricted by: • English language studies • Human studies Other searches: • Reference searching • Citation searching • Inclusion lists of systematic reviews

	The searches may be re-run 6 weeks before the final committee meeting and further studies retrieved for inclusion if relevant. The full search strategies will be published in the final review.
Condition or domain being studied	Osteoporosis or people at risk of fragility fracture.
Population	**Inclusion:** Adults who are 50 years and older. **Exclusion:** - children and young people less than 18 years. - Adults under 50 years old
Intervention	Searching and analysis of electronic patient record and social care record databases used to identify people who should be assessed for fragility fracture risk.
Comparison	No searching and analysis
Types of study to be included	• Randomised controlled trials. For a systematic review to be included it must be conducted to the same methodological standard as NICE guideline reviews. If sufficient details are not provided to include a relevant systematic review, the review will only be used for citation searching. Published NMAs and IPDs will be considered for inclusion. Exclusion: • Nonrandomised controlled trials • Case-control studies • Cross-sectional studies
Other exclusion criteria	Non-English language studies.

Context	All healthcare settings where electronic patient records and social care records are used.

Primary outcomes (critical outcomes)	All outcomes are considered equally important for decision making and therefore have all been rated as critical:
	• Number of people identified for further assessment
	• Number of people identified as needing treatment on the basis of further assessment
	• Fragility fracture
	• Generic health-related quality of life (continuous outcomes will be prioritised [validated measures]). The hierarchy for extracting will be as follows, if measures higher on hierarchy are reported others will not be:
	  ○ EQ-5D
	  ○ SF-6D
	  ○ SF-36
	  ○ SF-12
	  ○ Other utility measures (AQOL, HUI, 15D, QWB)
	• QUALEFFO-41 will be included for studies with vertebral fractures
	
	Latest timepoint reported during study follow up

Data extraction (selection and coding)	All references identified by the searches and from other sources will be uploaded into EPPI R5 and de-duplicated. Titles and abstracts of the retrieved citations will be screened to identify studies that potentially meet the inclusion criteria outlined in the review protocol. Dual sifting will be performed on at least 10% of records; 90% agreement is required. Disagreements will be resolved via discussion between the two reviewers, and consultation with senior staff if necessary.

	Full versions of the selected studies will be obtained for assessment. Studies that fail to meet the inclusion criteria once the full version has been checked will be excluded at this stage. Each study excluded after checking the full version will be listed, along with the reason for its exclusion. A standardised form will be used to extract data from studies. The following data will be extracted: study details (reference, country where study was carried out, type and dates), participant characteristics, inclusion and exclusion criteria, details of the interventions if relevant, setting and follow-up, relevant outcome data, and source of funding. One reviewer will extract relevant data into a standardised form, and this will be quality assessed by a senior reviewer.

Risk of bias (quality) assessment	Risk of bias will be assessed using the appropriate checklist as described in Developing NICE guidelines: the manual.
	• For intervention reviews:
	  ○ Systematic reviews: Risk of Bias in Systematic Reviews (ROBIS)
	  ○ Randomised Controlled Trial: Cochrane RoB (2.0)
	• 10% of all evidence reviews are quality assured by a senior research fellow. This includes checking:
	• papers were included /excluded appropriately
	• a sample of the data extractions
	• correct methods are used to synthesise data
	• a sample of the risk of bias assessments
	Disagreements between the review authors over the risk of bias in particular studies will be resolved by discussion, with involvement of a third review author where necessary.

Strategy for data synthesis	Pairwise meta-analyses will be performed using Cochrane Review Manager (RevMan5). Fixed-effects (Mantel-Haenszel) techniques will be used to calculate risk ratios for the binary outcomes where possible. Continuous outcomes will be analysed using an inverse variance method for pooling weighted mean differences. Heterogeneity between the studies in effect measures will be assessed using the I^2 statistic and visually inspected. An I^2 value greater than 50% will be considered indicative of substantial heterogeneity. Sensitivity analyses will be conducted based on pre-specified subgroups using stratified meta-analysis to explore the

	heterogeneity in effect estimates. If this does not explain the heterogeneity, the results will be presented pooled using random effects. GRADEpro will be used to assess the quality of evidence for each outcome, taking into account individual study quality and the meta-analysis results. The 4 main quality elements (risk of bias, indirectness, inconsistency, and imprecision) will be appraised for each outcome. Publication bias is tested for when there are more than 5 studies for an outcome. The risk of bias across all available evidence will be evaluated for each outcome using an adaptation of the 'Grading of Recommendations Assessment, Development and Evaluation (GRADE) toolbox' developed by the international GRADE working group http://www.gradeworkinggroup.org/ Where meta-analysis is not possible, data will be presented and quality assessed individually per outcome.	
Analysis of sub-groups	Subgroups that will be investigated if heterogeneity is present: - 65 years and over compared to under 65 years	
Type and method of review	☒	Intervention
	☐	Diagnostic
	☐	Prognostic
	☐	Qualitative
	☐	Epidemiologic
	☐	Service Delivery
	☐	Other (please specify)
Language	English	
Country	England	
Anticipated or actual start date	July 2024	
Anticipated completion date	November 2025	

Stage of review at time of this submission	Review stage	Started	Completed
	Preliminary searches	x	x
	Piloting of the study selection process	x	x
	Formal screening of search results against eligibility criteria	x	x
	Data extraction	x	x
	Risk of bias (quality) assessment	x	x
	Data analysis	x	X
Named contact	Named contact Centre for Guidelines, NICE 5b Named contact e-mail osteoporosis@nice.org.uk Organisational affiliation of the review National Institute for Health and Care Excellence (NICE)		
Review team members	From NICE: Carlos Sharpin [Guideline lead] Clare Jones [Senior technical analyst] Annette Chalker [Technical analyst] Qudsia Malik [Technical analyst] Kate Lovibond [Health economic advisor]		

	Muksitur Rahman [Health economist] Sarah Glover [Information specialist]
Funding sources/sponsor	Development of this systematic review is being funded by NICE.
Conflicts of interest	All guideline committee members and anyone who has direct input into NICE guidelines (including the evidence review team and expert witnesses) must declare any potential conflicts of interest in line with NICE's code of practice for declaring and dealing with conflicts of interest. Any relevant interests, or changes to interests, will also be declared publicly at the start of each guideline committee meeting. Before each meeting, any potential conflicts of interest will be considered by the guideline committee Chair and a senior member of the development team. Any decisions to exclude a person from all or part of a meeting will be documented. Any changes to a member's declaration of interests will be recorded in the minutes of the meeting. Declarations of interests will be published with the final guideline.
Collaborators	Development of this systematic review will be overseen by an advisory committee who will use the review to inform the development of evidence-based recommendations in line with section 3 of Developing NICE guidelines: the manual. Members of the guideline committee are available on the NICE website. https://www.nice.org.uk/guidance/indevelopment/GID-NG10216
Other registration details	N/A
Reference/URL for published protocol	N/A
Dissemination plans	NICE may use a range of different methods to raise awareness of the guideline. These include standard approaches such as: • notifying registered stakeholders of publication • publicising the guideline through NICE's newsletter and alerts • issuing a press release or briefing as appropriate, posting news articles on the NICE website, using social media channels, and publicising the guideline within NICE.
Keywords	Electronic patient records, social care records, identifying, fragility fracture, risk
Details of existing review of same topic by same authors	N/A

Current review status	☐	Ongoing
	☒	Completed but not published
	☐	Completed and published
	☐	Completed, published, and being updated
	☐	Discontinued
Additional information	N/A	
Details of final publication	www.nice.org.uk	

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A.2 Health economic review protocol

Review question	All questions – health economic evidence
Objectives	To identify health economic studies relevant to any of the review questions in the guideline update.
Search criteria	• Populations, interventions, and comparators must be as specified in the clinical review protocol above. • Studies must be of a relevant health economic study design (cost–utility analysis, cost-effectiveness analysis, cost–benefit analysis, cost–consequences analysis, comparative cost analysis). • Studies must not be a letter, editorial or commentary, or a review of health economic evaluations. (Recent reviews will be ordered although not reviewed. The bibliographies will be checked for relevant studies, which will then be ordered.) • Unpublished reports will not be considered unless submitted as part of a call for evidence. • Studies must be in English.
Search strategy	A global health economic study search will be undertaken for the guideline update using population-specific terms and a health economic study filter – see Appendix B below. Note that this guideline is being consulted on in two parts, but the health economic search covered the full guideline health economic review.
Review strategy	Studies not meeting any of the search criteria above will be excluded. Studies published before 2009 (including those included in the previous guideline), abstract-only studies and studies from non-OECD countries or the USA will also be excluded. Studies published 2009 onwards that were included in the previous guideline will be reassessed for inclusion and may be included or selectively excluded based on their relevance to the questions covered in this update and whether more applicable evidence is also identified. Each remaining study will be assessed for applicability and methodological limitations using the NICE economic evaluation checklist which can be found in appendix H of Developing NICE guidelines: the manual. **Inclusion and exclusion criteria** • If a study is rated as both 'Directly applicable' and with 'Minor limitations' then it will be included in the guideline. A health economic evidence table will be completed, and it will be included in the health economic evidence profile. • If a study is rated as either 'Not applicable' or with 'Very serious limitations' then it will usually be excluded from the guideline. If it is excluded, then a health economic evidence table will not be completed, and it will not be included in the health economic evidence profile. • If a study is rated as 'Partially applicable,' with 'Potentially serious limitations' or both then there is discretion over whether it should be included. **Where there is discretion** The health economist will make a decision based on the relative applicability and quality of the available evidence for that question, in discussion with the guideline committee if required. The ultimate aim is to include health economic studies that are helpful for decision-making in the context of the guideline and the current NHS setting. If several studies are considered of sufficiently high applicability and methodological quality that they could all be included, then the health economist, in discussion with the committee if required, may decide to include only the most applicable studies and to selectively exclude the remaining studies. All studies

	excluded on the basis of applicability or methodological limitations will be listed with explanation in the excluded health economic studies appendix below. The health economist will be guided by the following hierarchies. *Setting:* • UK NHS (most applicable). • OECD countries with public health insurance systems (for example, France, Germany, Sweden). • OECD countries with predominantly private health insurance systems (for example, Switzerland). • Studies set in non-OECD countries or in the USA will be excluded before being assessed for applicability and methodological limitations. *Health economic study type:* • Cost–utility analysis (most applicable). • Other type of full economic evaluation (cost–benefit analysis, cost-effectiveness analysis, cost–consequences analysis). • Comparative cost analysis. • Non-comparative cost analyses including cost-of-illness studies will be excluded before being assessed for applicability and methodological limitations. *Year of analysis:* • The more recent the study, the more applicable it will be. • Studies published in 2009 or later (including any such studies included in the previous guideline) but that depend on unit costs and resource data entirely or predominantly from before 2009 will be rated as 'Not applicable'. • Studies published before 2009 (including any such studies included in the previous guideline) will be excluded before being assessed for applicability and methodological limitations. *Quality and relevance of effectiveness data used in the health economic analysis:* • The more closely the clinical effectiveness data used in the health economic analysis match with the outcomes of the studies included in the clinical review the more useful the analysis will be for decision-making in the guideline.

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Appendix B Literature search strategies

The literature searches for this review are detailed below and complied with the methodology outlined in Developing NICE guidelines: the manual.(NICE2014) For more information, please see the Methodology review published as part of the accompanying documents for this guideline.

B.1.1 Clinical search literature search strategy

Searches were constructed using a PICO framework where population (P) terms were combined with Intervention (I) and in some cases Comparison (C) terms. Outcomes (O) are rarely used in search strategies as these concepts may not be indexed or described in the title or abstract and are therefore difficult to retrieve. Search filters were applied to the search where appropriate.

What is the clinical and cost-effectiveness of searching and analysis of electronic health records and social care records (including GP practice lists) to facilitate identification of adults who should be assessed for fragility fracture risk?

Table 2: Database parameters, filters and limits applied

Database	Dates searched	Search filter used
Medline (OVID)	1946 – 19 July 2024	Randomised controlled trials Systematic review studies Exclusions (animal studies, letters, comments, editorials, case studies/reports) English language
Embase (OVID)	1974 – 19 July 2024	Randomised controlled trials Systematic review studies Exclusions (animal studies, letters, comments, editorials, case studies/reports) English language
The Cochrane Library (Wiley)	Cochrane Reviews to 2024 Issue 7 of 12 CENTRAL to 2024 Issue 7 of 12	Exclusions (clinical trials, conference abstracts)
Epistemonikos (The Epistemonikos Foundation)	Inception to 19 July 2024	Systematic review studies Exclusions (Cochrane reviews) English language

Medline (Ovid) search terms

1	exp Osteoporosis/
2	(osteopor* or osteo-por* or osteop?eni* or osteo-p?eni*).tw,kf.
3	((age-relat* or agerelat* or perimenopaus* or peri-menopaus* or postmenopaus* or post-menopaus* or menopaus* or pathologic*) adj4 bone* adj4 (los* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or demineral* or strength* or quality or quantit*)).tw.
4	((abnormal* or secondary or early or prematur*) adj4 bone* adj4 (los* or reduc* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*)).tw.
5	((low* or reduc* or decreas* or los*) adj4 bone* adj4 (mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*)).tw.
6	((age-relat* or agerelat* or perimenopaus* or peri-menopaus* or postmenopaus* or post-menopaus* or menopaus* or pathologic*) adj4 BMD).tw.
7	((low* or los* or reduc* or decreas* or abnormal* or secondary) adj4 BMD).tw.
8	(bone* adj4 (deteriorat* or weak* or fragil* or decalc* or brittle* or atroph*)).tw.
9	((trabecula* or cancellous) adj4 (loss* or thin* or reduc* or decreas* or deteriorat* or low* or abnormal*)).tw.
10	((age-relat* or agerelat* or perimenopaus* or peri-menopaus* or postmenopaus* or post-menopaus* or menopaus* or pathologic*) adj4 skeletal adj4 (los* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or demineral* or strength* or quality or quantit* or decalc* or atroph*)).tw.
11	((abnormal* or secondary or early or prematur*) adj4 skeletal* adj4 (los* or reduc* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit* or atroph*)).tw.
12	((low* or reduc* or decreas* or los*) adj4 skeletal adj4 (mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*)).tw.
13	Bone Diseases, Metabolic/
14	Osteoporotic Fractures/
15	(fragil* adj4 (fracture or fractures)).tw.
16	((low-impact* or low-energy or low-trauma* or insufficien*) adj4 fracture*).tw.
17	((risk* or frequen* or inciden* or suscept* or suspect* or predict* or prevent* or stop*) adj4 fracture*).tw.
18	((recurrent or recurring or repeat* or history or chronic or previous or prior or habitual) adj4 fracture*).tw.
19	refracture*.tw.

20	or/1-19
21	medical records systems, computerized/
22	Medical order entry systems/
23	electronic health records/
24	((electronic* or automat* or computer*) adj4 (health adj4 record*)).tw.
25	(EHR or EHRs or EMR or EMRs).tw.
26	((electronic* or automat* or computer*) adj4 (medical* adj4 record*)).tw.
27	((electronic* or automat* or computer*) adj4 (patient* adj4 record*)).tw.
28	((electronic* or automat* or computer*) adj4 (outpatient* adj4 record*)).tw.
29	((electronic* or automat* or computer*) adj4 (patient* adj4 data)).tw.
30	((electronic* or automat* or computer*) adj4 (outpatient* adj4 data)).tw.
31	((electronic* or automat* or computer*) adj4 (patient* adj4 database*)).tw.
32	((electronic* or automat* or computer*) adj4 (outpatient* adj4 database*)).tw.
33	physicians, primary care/
34	Physicians, Family/
35	((GP* or general practi* or primary care* or family physician* or family dr* or family doctor* or family practi*) adj4 (record* or data or algorithm* or search* or database* or list*)).tw.
36	Social Support/
37	Social work/
38	Social welfare/
39	Community Networks/
40	Home care services/
41	((electronic* or automat* or computer*) adj4 (care adj4 record*)).tw.
42	(social adj4 care adj4 (record* or data or algorithm* or search* or database* or list*)).tw.
43	(social adj4 work* adj4 (record* or data or algorithm* or search* or database* or list*)).tw.
44	(social adj4 welfar* adj4 (record* or data or algorithm* or search* or database* or list*)).tw.
45	((community care or community network* or day centre* or day center* or adult day care or drop-in centre* or drop-in center* or homecare or home care or longterm or

	long-term or residential care or personal care or supported living) adj4 (record* or data or algorithm* or search* or database* or list*)).tw.
46	Mass screening/
47	(screening* or rescreening* or re-screening* or casefind* or case-find*).tw.
48	or/21-47
49	20 and 48
50	randomized controlled trial.pt.
51	controlled clinical trial.pt.
52	randomi#ed.ti,ab.
53	placebo.ab.
54	randomly.ti,ab.
55	Clinical Trials as topic.sh.
56	trial.ti.
57	or/52-58
58	Meta-Analysis/
59	exp Meta-Analysis as Topic/
60	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
61	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
62	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
63	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
64	(search* adj4 literature).ab.
65	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
66	cochrane.jw.
67	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
68	or/50-67
69	20 and 68
70	57 or 69
71	animals/ not humans/
72	7 not 71

73	limit 72 to (letter or historical article or comment or editorial or news or case reports)
74	72 not 73
75	limit 74 to english language

Embase (Ovid) search terms

1	exp Osteoporosis/
2	exp Osteopenia/
3	(osteopor* or osteo-por* or osteop?eni* or osteo-p?eni*).tw,kf.
4	((age-relat* or agerelat* or perimenopaus* or peri-menopaus* or postmenopaus* or post-menopaus* or menopaus* or pathologic*) adj4 bone* adj4 (los* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or demineral* or strength* or quality or quantit*)).tw.
5	((abnormal* or secondary or early or prematur*) adj4 bone* adj4 (los* or reduc* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*)).tw.
6	((low* or reduc* or decreas* or los*) adj4 bone* adj4 (mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*)).tw.
7	((age-relat* or agerelat* or perimenopaus* or peri-menopaus* or postmenopaus* or post-menopaus* or menopaus* or pathologic*) adj4 BMD).tw.
8	((low* or los* or reduc* or decreas* or abnormal* or secondary) adj4 BMD).tw.
9	(bone* adj4 (deteriorat* or weak* or fragil* or decalc* or brittle* or atroph*)).tw.
10	((trabecula* or cancellous) adj4 (loss* or thin* or reduc* or decreas* or deteriorat* or low* or abnormal*)).tw.
11	((age-relat* or agerelat* or perimenopaus* or peri-menopaus* or postmenopaus* or post-menopaus* or menopaus* or pathologic*) adj4 skeletal adj4 (los* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or demineral* or strength* or quality or quantit* or decalc* or atroph*)).tw.
12	((abnormal* or secondary or early or prematur*) adj4 skeletal* adj4 (los* or reduc* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit* or atroph*)).tw.
13	((low* or reduc* or decreas* or los*) adj4 skeletal adj4 (mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*)).tw.
14	metabolic bone disease/ or exp bone demineralization/
15	fragility fracture/
16	(fragil* adj4 (fracture or fractures)).tw.

17	((low-impact* or low-energy or low-trauma* or insufficien*) adj4 fracture*).tw.
18	((risk* or frequen* or inciden* or suscept* or suspect* or predict* or prevent* or stop*) adj4 fracture*).tw.
19	((recurrent or recurring or repeat* or history or chronic or previous or prior or habitual) adj4 fracture*).tw.
20	refracture*.tw.
21	or/1-20
22	electronic medical record system/
23	exp Medical record/
24	((electronic* or automat* or computer*) adj4 (health adj4 record*)).tw.
25	(EHR or EHRs or EMR or EMRs).tw.
26	((electronic* or automat* or computer*) adj4 (medical* adj4 record*)).tw.
27	((electronic* or automat* or computer*) adj4 (patient* adj4 record*)).tw.
28	((electronic* or automat* or computer*) adj4 (outpatient* adj4 record*)).tw.
29	((electronic* or automat* or computer*) adj4 (patient* adj4 data)).tw.
30	((electronic* or automat* or computer*) adj4 (outpatient* adj4 data)).tw.
31	((electronic* or automat* or computer*) adj4 (patient* adj4 database*)).tw.
32	((electronic* or automat* or computer*) adj4 (outpatient* adj4 database*)).tw.
33	general practitioner/
34	((GP* or general practi* or primary care* or family physician* or family dr* or family doctor* or family practi*) adj4 (record* or data or algorithm* or search* or database* or list*)).tw.
35	Social care/
36	Social support/
37	Social work/
38	Social work practice/
39	(social adj4 care adj4 (record* or data or algorithm* or search* or database* or list*)).tw.
40	(social adj4 work* adj4 (record* or data or algorithm* or search* or database* or list*)).tw.
41	(social adj4 welfar* adj4 (record* or data or algorithm* or search* or database* or list*)).tw.
42	Community care/

43	((community care or community network* or day centre* or day center* or adult day care or drop-in centre* or drop-in center* or homecare or home care or longterm or long-term or residential care or personal care or supported living) adj4 (record* or data or algorithm* or search* or database* or list*)).tw.
44	Mass screening/ or Screening/ or Rescreening/ or Case finding/
45	(screening* or rescreening* or re-screening* or casefind* or case-find*).tw.
46	or/22-45
47	21 and 46
48	random*.ti,ab.
49	factorial*.ti,ab.
50	(crossover* or cross over*).ti,ab.
51	((doubl* or singl*) adj blind*).ti,ab.
52	(assign* or allocat* or volunteer* or placebo*).ti,ab.
53	crossover procedure/
54	single blind procedure/
55	randomized controlled trial/
56	double blind procedure/
57	or/50-58
58	Systematic review/
59	Meta-Analysis/
60	(meta analy* or metanaly* or metaanaly* or meta regression).ti,ab.
61	((systematic* or evidence*) adj3 (review* or overview*)).ti,ab.
62	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
63	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
64	(search* adj4 literature).ab.
65	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
66	cochrane.jw.
67	((multiple treatment* or indirect or mixed) adj2 comparison*).ti,ab.
68	or/48-67
69	21 and 68

70	47 or 69
71	nonhuman/ not human/
72	70 not 71
73	(letter or editorial).pt.
74	72 not 73
75	(conference abstract* or conference review or conference paper or conference proceeding).db,pt,su.
76	74 not 75
77	limit 76 to english language

Cochrane Library (Wiley) search terms

#1	MeSH descriptor: [Osteoporosis] explode all trees
#2	((osteopor* or osteo-por* or osteopeni* or osteo-peni* or osteopaeni* or osteo-paeni*)):ti,ab,kw
#3	(((age NEXT relat* or agerelat* or perimenopaus* or peri NEXT menopaus* or postmenopaus* or post NEXT menopaus* or menopaus* or pathologic*) near/4 bone* near/4 (los* or mass or architectur* or microarchitectur* or micro NEXT architectur* or dens* or mineral* or content or demineral* or strength* or quality or quantit*))):ti,ab,kw
#4	(((abnormal* or secondary or early or prematur*) near/4 bone* near/4 (los* or reduc* or mass or architectur* or microarchitectur* or micro NEXT architectur* or dens* or mineral* or content or strength* or quality or quantit*))):ti,ab,kw
#5	(((low* or reduc* or decreas* or los*) near/4 bone* near/4 (mass or architectur* or microarchitectur* or micro NEXT architectur* or dens* or mineral* or content or strength* or quality or quantit*))):ti,ab,kw
#6	(((age NEXT relat* or agerelat* or perimenopaus* or peri NEXT menopaus* or postmenopaus* or post NEXT menopaus* or menopaus* or pathologic*) near/4 BMD)):ti,ab,kw
#7	(((low* or los* or reduc* or decreas* or abnormal* or secondary) near/4 BMD)):ti,ab,kw
#8	((bone* near/4 (deteriorat* or weak* or fragil* or decalc* or brittle* or atroph*))):ti,ab,kw
#9	(((trabecula* or cancellous) near/4 (loss* or thin* or reduc* or decreas* or deteriorat* or low* or abnormal*))):ti,ab,kw
#10	(((age NEXT relat* or agerelat* or perimenopaus* or peri NEXT menopaus* or postmenopaus* or post NEXT menopaus* or menopaus* or pathologic*) near/4 skeletal near/4 (los* or mass or architectur* or microarchitectur* or micro NEXT architectur* or

	dens* or mineral* or content or demineral* or strength* or quality or quantit* or decalc* or atroph*))):ti,ab,kw
#11	(((abnormal* or secondary or early or prematur*) near/4 skeletal* near/4 (los* or reduc* or mass or architectur* or microarchitectur* or micro NEXT architectur* or dens* or mineral* or content or strength* or quality or quantit* or atroph*))):ti,ab,kw
#12	(((low* or reduc* or decreas* or los*) near/4 skeletal near/4 (mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*))):ti,ab,kw
#13	MeSH descriptor: [Bone Diseases, Metabolic] this term only
#14	MeSH descriptor: [Osteoporotic Fractures] this term only
#15	((fragil* near/4 (fracture or fractures))):ti,ab,kw
#16	(((low-impact* or low-energy or low-trauma* or insufficien*) near/4 fracture*)):ti,ab,kw
#17	(((risk* or frequen* or inciden* or suscept* or suspect* or predict* or prevent* or stop*) near/4 fracture*)):ti,ab,kw
#18	(((recurrent or recurring or repeat* or history or chronic or previous or prior or habitual) near/4 fracture*)):ti,ab,kw
#19	(refracture*):ti,ab,kw
#20	{or #1-#19}
#21	MeSH descriptor: [Medical Records Systems, Computerized] this term only
#22	MeSH descriptor: [Medical Order Entry Systems] this term only
#23	MeSH descriptor: [Electronic Health Records] this term only
#24	(((electronic* or automat* or computer*) NEAR/4 (health NEAR/4 record*))):ti,ab,kw
#25	((EHR or EHRs or EMR or EMRs)):ti,ab,kw
#26	(((electronic* or automat* or computer*) NEAR/4 (medical* NEAR/4 record*))):ti,ab,kw
#27	(((electronic* or automat* or computer*) NEAR/4 (patient* NEAR/4 record*))):ti,ab,kw
#28	(((electronic* or automat* or computer*) NEAR/4 (outpatient* NEAR/4 record*))):ti,ab,kw
#29	(((electronic* or automat* or computer*) NEAR/4 (patient* NEAR/4 data))):ti,ab,kw
#30	(((electronic* or automat* or computer*) NEAR/4 (outpatient* NEAR/4 data))):ti,ab,kw
#31	(((electronic* or automat* or computer*) NEAR/4 (patient* NEAR/4 database*))):ti,ab,kw
#32	(((electronic* or automat* or computer*) NEAR/4 (outpatient* NEAR/4 database*))):ti,ab,kw
#33	MeSH descriptor: [Physicians, Primary Care] this term only

#34	MeSH descriptor: [Physicians, Family] this term only
#35	(((GP* or general NEXT practi* or primary NEXT care* or family NEXT physician* or family NEXT dr* or family NEXT doctor* or family NEXT practi*) NEAR/4 (record* or data or algorithm* or search* or database* or list*))):ti,ab,kw
#36	MeSH descriptor: [Social Support] this term only
#37	MeSH descriptor: [Social Work] this term only
#38	MeSH descriptor: [Social Welfare] this term only
#39	MeSH descriptor: [Community Networks] this term only
#40	MeSH descriptor: [Home Care Services] this term only
#41	(((electronic* or automat* or computer*) NEAR/4 (care NEAR/4 record*))):ti,ab,kw
#42	((social NEAR/4 care NEAR/4 (record* or data or algorithm* or search* or database* or list*))):ti,ab,kw
#43	((social NEAR/4 work* NEAR/4 (record* or data or algorithm* or search* or database* or list*))):ti,ab,kw
#44	((social NEAR/4 welfar* NEAR/4 (record* or data or algorithm* or search* or database* or list*))):ti,ab,kw
#45	(((community NEXT care or community NEXT network* or day NEXT centre* or day NEXT center* or adult NEXT day NEXT care or drop-in NEXT centre* or drop-in NEXT center* or homecare or home NEXT care or longterm or long-term or residential NEXT care or personal NEXT care or supported NEXT living) NEAR/4 (record* or data or algorithm* or search* or database* or list*))):ti,ab,kw
#46	MeSH descriptor: [Mass Screening] this term only
#47	((screening* or rescreening* or re NEXT screening* or casefind* or case NEXT find*)):ti,ab,kw
#48	{or #21-#47}
#49	#20 AND #48
#50	((clinicaltrials or trialsearch* or trial-registry or trials-registry or clinicalstudies or trialsregister* or trialregister* or trial-number* or studyregister* or study-register* or controlled-trials-com or current-controlled-trial or AMCTR or ANZCTR or ChiCTR* or CRiS or CTIS or CTRI* or DRKS* or EU-CTR* or EUCTR* or EUDRACT* or ICTRP or IRCT* or JAPIC* or JMCTR* or JRCT or ISRCTN* or LBCTR* or NTR* or ReBec* or REPEC* or RPCEC* or SLCTR or TCTR* or UMIN*):so or (ctgov or ictrp)):an
#51	#49 not #50
#52	conference:pt
#53	#51 not #52

1

Epistemonikos search terms

Search 1

1	(title:((osteopor* OR osteo-por* OR osteopaeni* OR osteo-paeni* OR osteopeni* OR osteo-peni*)) OR abstract:((osteopor* OR osteo-por* OR osteopaeni* OR osteo-paeni* OR osteopeni* OR osteo-peni*))) OR (title:(Fragil*) OR abstract:(Fragil*)) AND (title:(fracture OR fractures) OR abstract:(fracture OR fractures)) OR (title:(low AND impact* OR low AND energy OR low AND trauma* OR insufficien*) OR abstract:(low AND impact* OR low AND energy OR low AND trauma* OR insufficien*)) AND (title:(Fracture*) OR abstract:(Fracture*))
2	(title:((electronic* OR automat* OR computer*)) OR abstract:((electronic* OR automat* OR computer*)) AND (title:(record*) OR abstract:(record*))
3	1 AND 2

Search 2

1	(title:((osteopor* OR osteo-por* OR osteopaeni* OR osteo-paeni* OR osteopeni* OR osteo-peni*)) OR abstract:((osteopor* OR osteo-por* OR osteopaeni* OR osteo-paeni* OR osteopeni* OR osteo-peni*))) OR (title:(Fragil*) OR abstract:(Fragil*)) AND (title:(fracture OR fractures) OR abstract:(fracture OR fractures)) OR (title:(low AND impact* OR low AND energy OR low AND trauma* OR insufficien*) OR abstract:(low AND impact* OR low AND energy OR low AND trauma* OR insufficien*)) AND (title:(Fracture*) OR abstract:(Fracture*))
2	(title:(EHR OR EHRs OR EMR OR EMRs) OR abstract:(EHR OR EHRs OR EMR OR EMRs))
3	1 AND 2

Search 3

1	(title:((osteopor* OR osteo-por* OR osteopaeni* OR osteo-paeni* OR osteopeni* OR osteo-peni*)) OR abstract:((osteopor* OR osteo-por* OR osteopaeni* OR osteo-paeni* OR osteopeni* OR osteo-peni*))) OR (title:(Fragil*) OR abstract:(Fragil*)) AND (title:(fracture OR fractures) OR abstract:(fracture OR fractures)) OR (title:(low AND impact* OR low AND energy OR low AND trauma* OR insufficien*) OR abstract:(low AND impact* OR low AND energy OR low AND trauma* OR insufficien*)) AND (title:(Fracture*) OR abstract:(Fracture*))
2	(title:(GP* OR general AND practi* OR primary AND care* OR family AND physician* OR family AND dr* OR family AND doctor* OR family AND practi*) OR abstract:(GP* OR general AND practi* OR primary AND care* OR family AND physician* OR family AND dr* OR family AND doctor* OR family AND practi*)) AND (title:(record* OR data OR algorithm* OR search* OR database* OR list*) OR abstract:(record* OR data OR algorithm* OR search* OR database* OR list*))
3	1 AND 3

Search 4

1	(title:((osteopor* OR osteo-por* OR osteopaeni* OR osteo-paeni* OR osteopeni* OR osteo-peni*)) OR abstract:((osteopor* OR osteo-por* OR osteopaeni* OR osteo-paeni* OR osteopeni* OR osteo-peni*))) OR (title:(Fragil*) OR abstract:(Fragil*)) AND (title:(fracture OR fractures) OR abstract:(fracture OR fractures)) OR (title:(low AND impact* OR low AND energy OR low AND trauma* OR insufficien*) OR abstract:(low AND impact* OR low AND energy OR low AND trauma* OR insufficien*)) AND (title:(Fracture*) OR abstract:(Fracture*))
2	(title:(social AND (Care OR work* OR welfare)) OR abstract:(social AND (Care OR work* OR welfare))) AND (title:(record* OR data OR algorithm* OR search* OR database* OR list*) OR abstract:(record* OR data OR algorithm* OR search* OR database* OR list*))
3	1 AND 2

1 **Search 5**

1	(title:((osteopor* OR osteo-por* OR osteopaeni* OR osteo-paeni* OR osteopeni* OR osteo-peni*)) OR abstract:((osteopor* OR osteo-por* OR osteopaeni* OR osteo-paeni* OR osteopeni* OR osteo-peni*))) OR (title:(Fragil*) OR abstract:(Fragil*)) AND (title:(fracture OR fractures) OR abstract:(fracture OR fractures)) OR (title:(low AND impact* OR low AND energy OR low AND trauma* OR insufficien*) OR abstract:(low AND impact* OR low AND energy OR low AND trauma* OR insufficien*)) AND (title:(Fracture*) OR abstract:(Fracture*))
2	(title:(community AND care OR community AND network* OR day AND centre* OR day AND center* OR adult AND day AND care OR drop AND in AND centre* OR drop AND in AND center* OR homecare OR home AND care OR longterm OR long AND term OR residential AND care OR personal AND care OR supported AND living) OR abstract:(community AND care OR community AND network* OR day AND centre* OR day AND center* OR adult AND day AND care OR drop AND in AND centre* OR drop AND in AND center* OR homecare OR home AND care OR longterm OR long AND term OR residential AND care OR personal AND care OR supported AND living))
3	1 AND 2

2 **Search 6**

1	(title:(osteopor* OR osteo-por* OR osteopaeni* OR osteo-paeni* OR osteopeni* OR osteo-peni*) OR abstract:(osteopor* OR osteo-por* OR osteopaeni* OR osteo-paeni* OR osteopeni* OR osteo-peni*)) OR (title:(Fragil* AND (fracture OR fractures)) OR abstract:(Fragil* AND (fracture OR fractures))) OR (title:((low AND impact* OR low AND energy OR low AND trauma* OR insufficien*) AND fractur*) OR abstract:((low AND impact* OR low AND energy OR low AND trauma* OR insufficien*) AND fractur*))
2	(title:(screening* OR rescreening* OR re AND screening* OR casefind* OR case AND find*) OR abstract:(screening* OR rescreening* OR re AND screening* OR casefind* OR case AND find*))
3	1 AND 2

3

B.1.2 Health Economics literature search strategy

Health economic evidence was identified by conducting searches using terms for a population at risk of fragility fracture. The following databases were searched: NHS Economic Evaluation Database (NHS EED - this ceased to be updated after 31st March 2015), Health Technology Assessment database (HTA - this ceased to be updated from 31st March 2018) and The International Network of Agencies for Health Technology Assessment (INAHTA). Searches for recent evidence were run on Medline and Embase from 2014 onwards for health economics.

Table 3: Database parameters, filters and limits applied for population at risk of fragility fracture

Database	Dates searched	Search filters and limits applied
Medline (OVID)	Health Economics 1 January 2014 – 22 August 2025	Health economics studies Exclusions (animal studies, letters, comments, editorials, case studies/reports) English language
Embase (OVID)	Health Economics 1 January 2014 – 22 August 2025	Health economics studies Exclusions (animal studies, letters, comments, editorials, case studies/reports, conference abstracts) English language
NHS Economic Evaluation Database (NHS EED) (Centre for Research and Dissemination - CRD)	Inception –31st March 2015	
Health Technology Assessment Database (HTA) (Centre for Research and Dissemination – CRD)	Inception – 31st March 2018	
The International Network of Agencies for Health Technology Assessment (INAHTA)	Inception - 22 August 2025	English language

Medline (Ovid) search terms

1	exp Osteoporosis/
2	(osteopor* or osteo-por* or osteop?eni* or osteo-p?eni*).tw,kf.
3	((age-relat* or agerelat* or perimenopaus* or peri-menopaus* or postmenopaus* or post-menopaus* or menopaus* or pathologic*) adj4 bone* adj4 (los* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or demineral* or strength* or quality or quantit*)).tw.
4	((abnormal* or secondary or early or prematur*) adj4 bone* adj4 (los* or reduc* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*)).tw.
5	((low* or reduc* or decreas* or los*) adj4 bone* adj4 (mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*)).tw.
6	((age-relat* or agerelat* or perimenopaus* or peri-menopaus* or postmenopaus* or post-menopaus* or menopaus* or pathologic*) adj4 BMD).tw.
7	((low* or los* or reduc* or decreas* or abnormal* or secondary) adj4 BMD).tw.
8	(bone* adj4 (deteriorat* or weak* or fragil* or decalc* or brittle* or atroph*)).tw.
9	((trabecula* or cancellous) adj4 (loss* or thin* or reduc* or decreas* or deteriorat* or low* or abnormal*)).tw.
10	((age-relat* or agerelat* or perimenopaus* or peri-menopaus* or postmenopaus* or post-menopaus* or menopaus* or pathologic*) adj4 skeletal adj4 (los* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or demineral* or strength* or quality or quantit* or decalc* or atroph*)).tw.
11	((abnormal* or secondary or early or prematur*) adj4 skeletal* adj4 (los* or reduc* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit* or atroph*)).tw.
12	((low* or reduc* or decreas* or los*) adj4 skeletal adj4 (mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*)).tw.
13	Bone Diseases, Metabolic/
14	Osteoporotic Fractures/
15	(fragil* adj4 (fracture or fractures)).tw.
16	((low-impact* or low-energy or low-trauma* or insufficien*) adj4 fracture*).tw.
17	((risk* or frequen* or inciden* or suscept* or suspect* or predict* or prevent* or stop*) adj4 fracture*).tw.
18	((recurrent or recurring or repeat* or history or chronic or previous or prior or habitual) adj4 fracture*).tw.
19	refracture*.tw.

21	or/1-19
22	Economics/
23	Value of Life/
24	exp "Costs and Cost Analysis"/
25	exp Economics, Hospital/
26	exp Economics, Medical/
27	Economics, Nursing/
28	Economics, Pharmaceutical/
29	exp "Fees and Charges"/
30	exp Budgets/
31	budget*.ti,ab.
32	cost*.ti.
33	(economic* or pharmaco?economic*).ti.
34	(price* or pricing*).ti,ab.
35	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
36	(financ* or fee or fees).ti,ab.
37	(value adj2 (money or monetary)).ti,ab.
38	or/22-37
39	21 and 38
40	limit 39 to ed=20140101-20250822

Embase (Ovid) search terms

1	exp osteoporosis/
2	exp Osteopenia/
3	(osteopor* or osteo-por* or osteop?eni* or osteo-p?eni*).tw,kf.
4	((age-relat* or agerelat* or perimenopaus* or peri-menopaus* or postmenopaus* or post-menopaus* or menopaus* or pathologic*) adj4 bone* adj4 (los* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or demineral* or strength* or quality or quantit*)).tw.
5	((abnormal* or secondary or early or prematur*) adj4 bone* adj4 (los* or reduc* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*)).tw.

6	((low* or reduc* or decreas* or los*) adj4 bone* adj4 (mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*)).tw.
7	((age-relat* or agerelat* or perimenopaus* or peri-menopaus* or postmenopaus* or post-menopaus* or menopaus* or pathologic*) adj4 BMD).tw.
8	((low* or los* or reduc* or decreas* or abnormal* or secondary) adj4 BMD).tw.
9	(bone* adj4 (deteriorat* or weak* or fragil* or decalc* or brittle* or atroph*)).tw.
10	((trabecula* or cancellous) adj4 (loss* or thin* or reduc* or decreas* or deteriorat* or low* or abnormal*)).tw.
11	((age-relat* or agerelat* or perimenopaus* or peri-menopaus* or postmenopaus* or post-menopaus* or menopaus* or pathologic*) adj4 skeletal* adj4 (los* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or demineral* or strength* or quality or quantit* or decalc* or atroph*)).tw.
12	((abnormal* or secondary or early or prematur*) adj4 skeletal* adj4 (los* or reduc* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit* or atroph*)).tw.
13	((low* or reduc* or decreas* or los*) adj4 skeletal* adj4 (mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*)).tw.
14	metabolic bone disease/ or exp bone demineralization/
15	fragility fracture/
16	(fragil* adj4 (fracture or fractures)).tw.
17	((low-impact* or low-energy or low-trauma* or insufficien*) adj4 fracture*).tw.
18	((risk* or frequen* or inciden* or suscept* or suspect* or predict* or prevent* or stop*) adj4 fracture*).tw.
19	((recurrent or recurring or repeat* or history or chronic or previous or prior or habitual) adj4 fracture*).tw.
20	refracture*.tw.
21	or/1-20
22	health economics/
23	exp economic evaluation/
24	exp health care cost/
25	exp fee/
26	budget/
27	funding/
28	budget*.ti,ab.

29	cost*.ti.
30	(economic* or pharmaco?economic*).ti.
31	(price* or pricing*).ti,ab.
32	(cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab.
33	(financ* or fee or fees).ti,ab.
34	(value adj2 (money or monetary)).ti,ab.
35	or/22-34
36	21 and 35
37	Limit 36 to dd=20140101-20250822
38	Limit 36 to dc=20140101-20250822
39	37 or 38

NHS EED and HTA (CRD) search terms

1	MeSH DESCRIPTOR osteoporosis EXPLODE ALL TREES
2	(((osteopor* or osteo-por* or osteopeni* or osteopaeni* or osteo-peni* or osteopaeni*)))
3	(((age-relat* or agerelat* or perimenopaus* or peri-menopaus* or postmenopaus* or post-menopaus* or menopaus* or pathologic*) adj4 bone* adj4 (los* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or demineral* or strength* or quality or quantit*)))
4	(((abnormal* or secondary or early or prematur*) adj4 bone* adj4 (los* or reduc* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*)))
5	(((low* or reduc* or decreas* or los*) adj4 bone* adj4 (mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*)))
6	(((age-relat* or agerelat* or perimenopaus* or peri-menopaus* or postmenopaus* or post-menopaus* or menopaus* or pathologic*) adj4 BMD))
7	(((low* or los* or reduc* or decreas* or abnormal* or secondary) adj4 BMD))
8	((bone* adj4 (deteriorat* or weak* or fragil* or decalc* or brittle* or atroph*)))
9	(((trabecula* or cancellous) adj4 (loss* or thin* or reduc* or decreas* or deteriorat* or low* or abnormal*)))

10	((((age-relat* or agerelat* or perimenopaus* or peri-menopaus* or postmenopaus* or post-menopaus* or menopaus* or pathologic*) adj4 skeletal adj4 (los* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or demineral* or strength* or quality or quantit* or decalc* or atroph*))))
11	((((abnormal* or secondary or early or prematur*) adj4 skeletal* adj4 (los* or reduc* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit* or atroph*))))
12	((((low* or reduc* or decreas* or los*) adj4 skeletal adj4 (mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*))))
13	MeSH DESCRIPTOR Bone Diseases, Metabolic
14	MeSH DESCRIPTOR osteoporotic fractures
15	((fragil* adj4 (fracture or fractures)))
16	(((low-impact* or low-energy or low-trauma* or insufficien*) adj4 fracture*))
17	(((risk* or frequen* or inciden* or suscept* or suspect* or predict* or prevent* or stop*) adj4 fracture*))
18	(((recurrent or recurring or repeat* or history or chronic or previous or prior or habitual) adj4 fracture*))
19	(refracture*)
20	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19

INAHTA search terms

1	("Osteoporosis"[mhe])
2	(((osteopor* or osteopeni* or osteopaeni*))[Title] OR ((osteopor* or osteopeni* or osteopaeni*))[abs])
3	(((age-relat* or agerelat* or perimenopaus* or peri-menopaus* or postmenopaus* or post-menopaus* or menopaus* or pathologic*) AND bone* AND (los* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or demineral* or strength* or quality or quantit*)))[Title] OR (((age-relat* or agerelat* or perimenopaus* or peri-menopaus* or postmenopaus* or post-menopaus* or menopaus* or pathologic*) AND bone* AND (los* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or demineral* or strength* or quality or quantit*)))[abs]

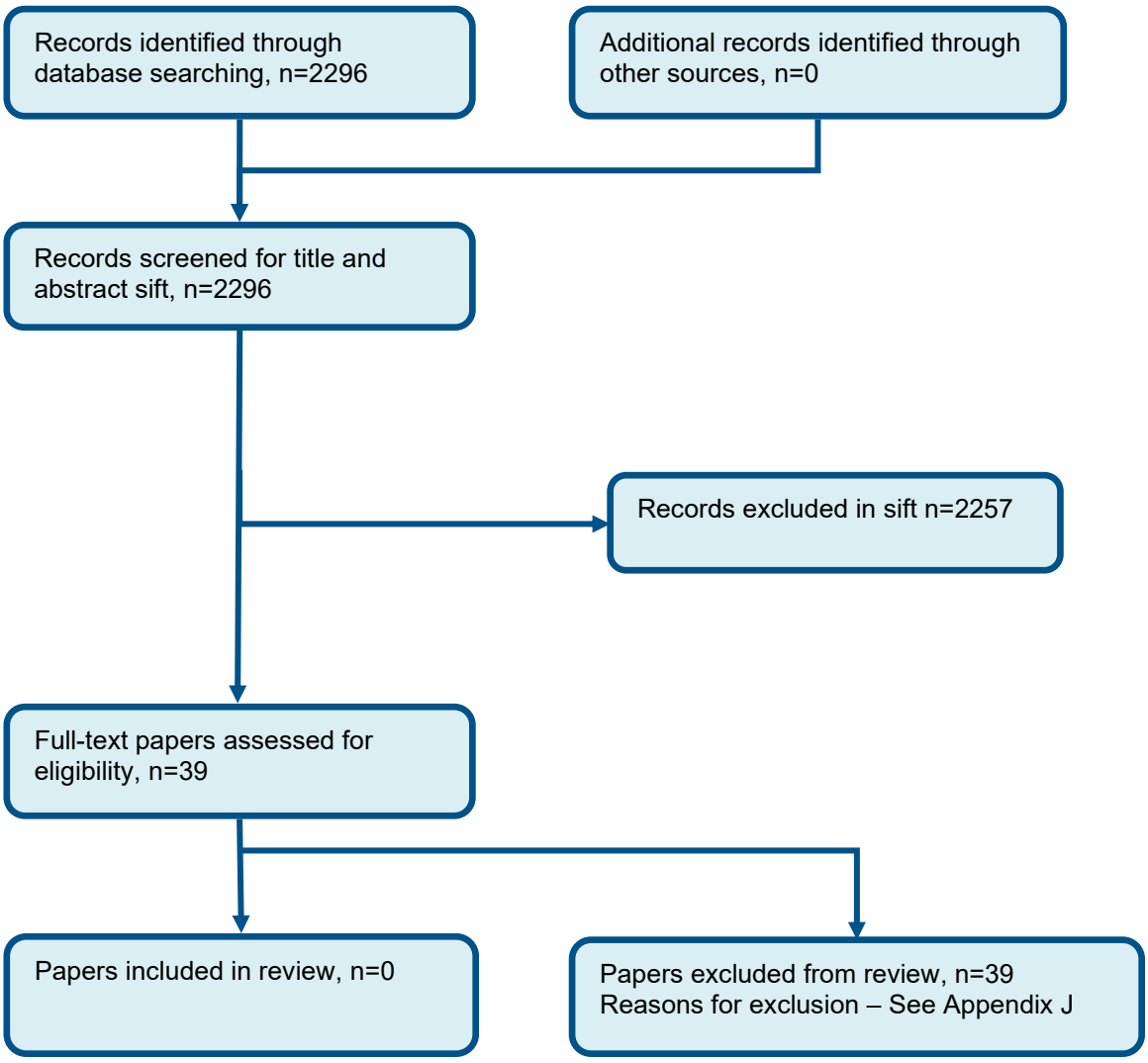
4	(((abnormal* or secondary or early or prematur*) AND bone* AND (los* or reduc* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*)))[Title] OR (((abnormal* or secondary or early or prematur*) AND bone* AND (los* or reduc* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*)))[abs]
5	(((low* or reduc* or decreas* or los*) AND bone* AND (mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*))) OR (((low* or reduc* or decreas* or los*) AND bone* AND (mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*)))
6	(((age-relat* or agerelat* or perimenopaus* or peri-menopaus* or postmenopaus* or post-menopaus* or menopaus* or pathologic*) AND BMD))[Title] OR (((age-relat* or agerelat* or perimenopaus* or peri-menopaus* or postmenopaus* or post-menopaus* or menopaus* or pathologic*) AND BMD))[abs]
7	((low* or los* or reduc* or decreas* or abnormal* or secondary) AND BMD))[Title] OR (((low* or los* or reduc* or decreas* or abnormal* or secondary) AND BMD))[abs]
8	((bone* AND (deteriorat* or weak* or fragil* or decalc* or brittle* or atroph*)))[Title] OR ((bone* AND (deteriorat* or weak* or fragil* or decalc* or brittle* or atroph*)))[abs]
9	(((trabecula* or cancellous) AND (loss* or thin* or reduc* or decreas* or deteriorat* or low* or abnormal*)))[Title] OR (((trabecula* or cancellous) AND (loss* or thin* or reduc* or decreas* or deteriorat* or low* or abnormal*)))[abs]
10	(((age-relat* or agerelat* or perimenopaus* or peri-menopaus* or postmenopaus* or post-menopaus* or menopaus* or pathologic*) AND skeletal AND (los* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or demineral* or strength* or quality or quantit* or decalc* or atroph*)))[Title] OR (((age-relat* or agerelat* or perimenopaus* or peri-menopaus* or postmenopaus* or post-menopaus* or menopaus* or pathologic*) AND skeletal AND (los* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or demineral* or strength* or quality or quantit* or decalc* or atroph*)))[abs]
11	(((abnormal* or secondary or early or prematur*) AND skeletal* AND (los* or reduc* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit* or atroph*)))[Title] OR (((abnormal* or secondary or early or prematur*) AND skeletal* AND (los* or reduc* or mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit* or atroph*)))[abs]

12	(((low* or reduc* or decreas* or los*) AND skeletal AND (mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*)))[Title] OR (((low* or reduc* or decreas* or los*) AND skeletal AND (mass or architectur* or microarchitectur* or micro-architectur* or dens* or mineral* or content or strength* or quality or quantit*)))[abs]
13	"Bone Diseases, Metabolic"[mh]
14	"Osteoporotic Fractures"[mh]
15	(fragil* AND (fracture or fractures))
16	((low-impact* or low-energy or low-trauma* or insufficien*) AND fracture*)
17	((risk* or frequen* or inciden* or suscept* or suspect* or predict* or prevent* or stop*) AND fracture*)
18	((recurrent or recurring or repeat* or history or chronic or previous or prior or habitual) AND fracture*)
19	refracture*
20	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19

1

Appendix C Electronic records to identify adults at risk of fragility fracture evidence study selection

Figure 1: Flow chart of clinical study selection for the review of electronic health and social care records for identifying adults who should be assessed for fragility fracture risk



Appendix D Effectiveness evidence

No evidence identified.

Appendix E Forest plots

No forest plots.

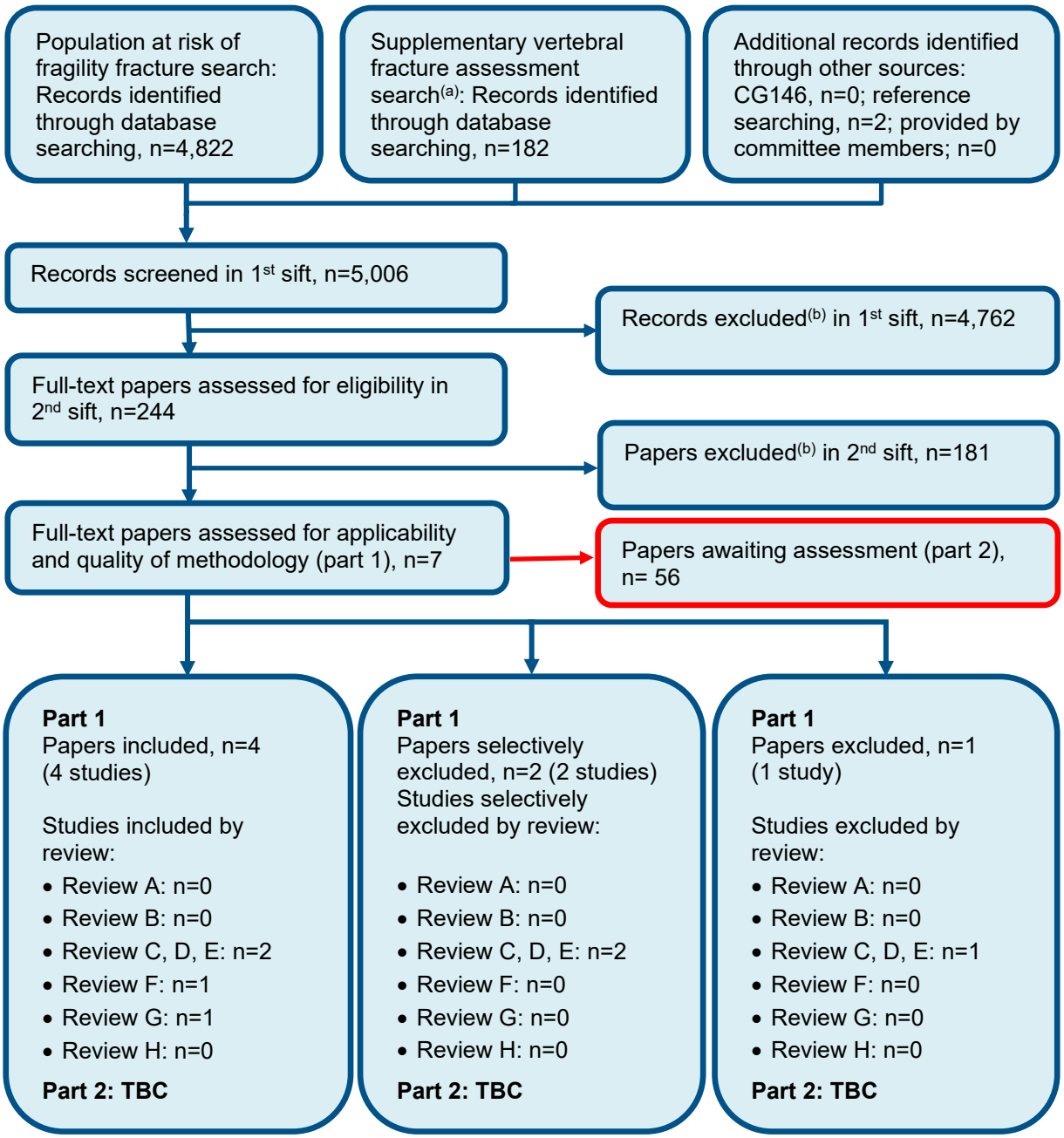
Appendix F GRADE tables

No GRADE tables.

Appendix G Economic evidence study selection

Note that this guideline is being consulted on it two parts, but the health economic review search covered the full guideline. Only studies related to part 1 are included below. Studies that may be relevant to part 2 are noted but are not finalised.

Figure 2: Flow chart of economic study selection for all guideline reviews



TBC= to be checked. These review questions will form the second instalment of this guideline update.

(a) Supplementary search for review questions F and G. Search methods in Appendix B of relevant evidence reports.
(b) Non-relevant population, intervention, comparison, design or setting; non-English language.

Appendix H Economic evidence tables

No health economic studies were included in this review.

Appendix I Health economic model

No original economic modelling was undertaken.

Appendix J Excluded studies

J.1 Clinical studies

Table 4: Studies excluded from the clinical review

Study	Exclusion Reason
Aspray, Terry J (2015) Fragility fracture: recent developments in risk assessment. Therapeutic advances in musculoskeletal disease 7(1): 17-25	- Study design not relevant to this review protocol
Barr, R J, Stewart, A, Torgerson, D J et al. (2010) Population screening for osteoporosis risk: a randomised control trial of medication use and fracture risk. Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA 21(4): 561-8	- Study does not contain an intervention relevant to this review protocol
Calikyan, Anoush; Silverberg, Jillian; McLeod, Katherine M (2023) Osteoporosis Screening Disparities among Ethnic and Racial Minorities: A Systematic Review. Journal of osteoporosis 2023: 1277319	- Study design not relevant to this review protocol
Chiang, Arthur, Jones, Judith, Humphreys, John et al. (2006) Osteoporosis--diagnosis and treatment in a general practice population. Australian family physician 35(3): 166-8	- Study does not contain an intervention relevant to this review protocol
Clark, Emma M, Gould, Virginia, Morrison, Leigh et al. (2012) Randomized controlled trial of a primary care-based screening program to identify older women with prevalent osteoporotic vertebral fractures: Cohort for Skeletal Health in Bristol and Avon (COSHIBA). Journal of bone and mineral research : the official journal of the American Society for Bone and Mineral Research 27(3): 664-71	- Study does not contain an intervention relevant to this review protocol
Gates, Michelle, Pillay, Jennifer, Nuspl, Megan et al. (2023) Screening for the primary prevention of fragility fractures among adults aged 40 years and older in primary care: systematic reviews of the effects and acceptability of screening and treatment, and the accuracy of risk prediction tools. Systematic reviews 12(1): 51	- Study does not contain an intervention relevant to this review protocol
Gupta, Amit, Maslen, Christina, Vindlacheruvu, Madhavi et al. (2022) Digital health interventions for osteoporosis and post-fragility fracture care.	- Study design not relevant to this review protocol

Study	Exclusion Reason
Therapeutic advances in musculoskeletal disease 14: 1759720x221083523	
Hoiberg, M P, Rubin, K H, Holmberg, T et al. (2019) Use of antiosteoporotic medication in the Danish ROSE population-based screening study. Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA 30(6): 1223-1233	- Study does not contain an intervention relevant to this review protocol
Honkanen, K, Honkanen, R, Heikkinen, L et al. (1999) Validity of self-reports of fractures in perimenopausal women. American journal of epidemiology 150(5): 511-6	- Study design not relevant to this review protocol
Johansson, Helena, Oden, Anders, Johnell, Olof et al. (2004) Optimization of BMD measurements to identify high risk groups for treatment--a test analysis. Journal of bone and mineral research : the official journal of the American Society for Bone and Mineral Research 19(6): 906-13	- Study does not contain an intervention relevant to this review protocol
Kesman, Rebecca L, Rahman, Ahmed S, Lin, Eleanor Y et al. (2010) Population informatics-based system to improve osteoporosis screening in women in a primary care practice. Journal of the American Medical Informatics Association : JAMIA 17(2): 212-6	- Study design not relevant to this review protocol
Lafata, Jennifer Elston, Kolk, Deneil, Peterson, Edward L et al. (2007) Improving osteoporosis screening: results from a randomized cluster trial. Journal of general internal medicine 22(3): 346-51	- Study does not contain an intervention relevant to this review protocol
Levy, Barcey T, Hartz, Arthur, Woodworth, George et al. (2009) Interventions to improving osteoporosis screening: an Iowa Research Network (IRENE) study. Journal of the American Board of Family Medicine : JABFM 22(4): 360-7	- Study does not contain an intervention relevant to this review protocol
Loo, Timothy S, Davis, Roger B, Lipsitz, Lewis A et al. (2011) Electronic medical record reminders and panel management to improve primary care of elderly patients. Archives of internal medicine 171(17): 1552-8	- Study design not relevant to this review protocol
McArthur, Caitlin, Ioannidis, George, Jantzi, Micaela et al. (2020) Development and validation of the fracture risk scale home care (FRS-HC) that predicts one-year incident fracture: an electronic record-linked	- Study design not relevant to this review protocol

Study	Exclusion Reason
longitudinal cohort study. BMC musculoskeletal disorders 21(1): 499	
McCloskey, Eugene, Johansson, Helena, Harvey, Nicholas C et al. (2018) Management of Patients With High Baseline Hip Fracture Risk by FRAX Reduces Hip Fractures-A Post Hoc Analysis of the SCOOP Study. Journal of bone and mineral research : the official journal of the American Society for Bone and Mineral Research 33(6): 1020-1026	- Study does not contain an intervention relevant to this review protocol
Merlijn, T, Swart, K M A, van der Horst, H E et al. (2020) Fracture prevention by screening for high fracture risk: a systematic review and meta-analysis. Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA 31(2): 251-257	- Study does not contain an intervention relevant to this review protocol
Merlijn, Thomas, Swart, Karin Ma, van Schoor, Natasja M et al. (2019) The Effect of a Screening and Treatment Program for the Prevention of Fractures in Older Women: A Randomized Pragmatic Trial. Journal of bone and mineral research : the official journal of the American Society for Bone and Mineral Research 34(11): 1993-2000	- Study does not contain an intervention relevant to this review protocol
Morris, C.A., Cheng, H., Cabral, D. et al. (2004) Predictors of Screening and Treatment of Osteoporosis: A Structured Review of the Literature. Endocrinologist 14(2): 70-75	- Study design not relevant to this review protocol
Nelson, HD and Helfand, M (2002) Screening for Postmenopausal Osteoporosis. U.S. Preventive Services Task Force Evidence Syntheses, formerly Systematic Evidence Reviews	- Study design not relevant to this review protocol
Parsons, C M, Harvey, N, Shepstone, L et al. (2020) Systematic screening using FRAX R leads to increased use of, and adherence to, anti-osteoporosis medications: an analysis of the UK SCOOP trial. Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA 31(1): 67-75	- Study does not contain an intervention relevant to this review protocol
Petersen, Tanja Gram, Abrahamsen, Bo, Hoiberg, Mikkel et al. (2024) Ten-year follow-up of fracture risk in a systematic population-based screening program: the risk-stratified osteoporosis strategy evaluation	- Study does not contain an intervention relevant to this review protocol

Study	Exclusion Reason
(ROSE) randomised trial. EClinicalMedicine 71: 102584	
Phillips, J., Krist, A., Wilder, L. et al. (2003) Is osteoporosis screening in postmenopausal women effective?. Journal of Family Practice 52(4): 331-333	- Study design not relevant to this review protocol
Qaseem, A., Snow, V., Shekelle, P. et al. (2008) Screening for osteoporosis in men: A systematic review for an American College of Physicians guideline (Annals of Internal Medicine (2008) 148, (685-701)). Annals of Internal Medicine 148(11): 888	- Study does not contain an intervention relevant to this review protocol
Rubin, K H, Rothmann, M J, Holmberg, T et al. (2018) Effectiveness of a two-step population-based osteoporosis screening program using FRAX: the randomized Risk-stratified Osteoporosis Strategy Evaluation (ROSE) study. Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA 29(3): 567-578	- Study does not contain an intervention relevant to this review protocol
Rubin, Katrine Hass, Holmberg, Teresa, Rothmann, Mette Juel et al. (2015) The risk-stratified osteoporosis strategy evaluation study (ROSE): a randomized prospective population-based study. Design and baseline characteristics. Calcified tissue international 96(2): 167-79	- Study design not relevant to this review protocol
Rubin, Katrine Hass, Moller, Soren, Holmberg, Teresa et al. (2018) A New Fracture Risk Assessment Tool (FREM) Based on Public Health Registries. Journal of bone and mineral research : the official journal of the American Society for Bone and Mineral Research 33(11): 1967-1979	- Study design not relevant to this review protocol
Schilcher, Jorg, Nilsson, Alva, Andlid, Oliver et al. (2024) Fusion of electronic health records and radiographic images for a multimodal deep learning prediction model of atypical femur fractures. Computers in biology and medicine 168: 107704	- Study design not relevant to this review protocol
Schneider, Diane L, Worley, Karen, Beard, Mary K et al. (2010) The primary care osteoporosis risk of fracture screening (POROS) study: design and baseline characteristics. Contemporary clinical trials 31(4): 336-44	- Study design not relevant to this review protocol
Shepstone, L, Fordham, R, Lenaghan, E et al. (2012) A pragmatic randomised controlled trial of the effectiveness and cost-effectiveness of screening	- Study design not relevant to this review protocol

Study	Exclusion Reason
older women for the prevention of fractures: rationale, design and methods for the SCOOP study. Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA 23(10): 2507-15	
Shepstone, Lee, Lenaghan, Elizabeth, Cooper, Cyrus et al. (2018) Screening in the community to reduce fractures in older women (SCOOP): a randomised controlled trial. Lancet (London, England) 391(10122): 741-747	- Study does not contain an intervention relevant to this review protocol
Smallwood, A J, Schapira, M M, Fedders, M et al. (2017) A pilot randomized controlled trial of a decision aid with tailored fracture risk tool delivered via a patient portal. Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA 28(2): 567-576	- Study does not contain an intervention relevant to this review protocol
Solomon, Daniel H, Katz, Jeffrey N, Finkelstein, Joel S et al. (2007) Osteoporosis improvement: a large-scale randomized controlled trial of patient and primary care physician education. Journal of bone and mineral research : the official journal of the American Society for Bone and Mineral Research 22(11): 1808-15	- Study does not contain an intervention relevant to this review protocol
Soreskog, E, Borgstrom, F, Shepstone, L et al. (2020) Long-term cost-effectiveness of screening for fracture risk in a UK primary care setting: the SCOOP study. Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA 31(8): 1499-1506	- Study does not contain an intervention relevant to this review protocol
Torgerson, D J, Thomas, R E, Campbell, M K et al. (1997) Randomized trial of osteoporosis screening. Use of hormone replacement therapy and quality-of-life results. Archives of internal medicine 157(18): 2121-5	- Study does not contain an intervention relevant to this review protocol
Turner, David A, Khioe, Rebekah Fong Soe, Shepstone, Lee et al. (2018) The Cost-Effectiveness of Screening in the Community to Reduce Osteoporotic Fractures in Older Women in the UK: Economic Evaluation of the SCOOP Study. Journal of bone and mineral research : the official journal of the American Society for Bone and Mineral Research 33(5): 845-851	- Study does not contain an intervention relevant to this review protocol

Study	Exclusion Reason
Versluis, R G, Papapoulos, S E, de Bock, G H et al. (2001) Clinical risk factors as predictors of postmenopausal osteoporosis in general practice. The British journal of general practice : the journal of the Royal College of General Practitioners 51(471): 806-10	- Study does not contain an intervention relevant to this review protocol
Viswanathan, M, Reddy, S, Berkman, N et al. (2018) Screening to Prevent Osteoporotic Fractures: An Evidence Review for the U.S. Preventive Services Task Force. U.S. Preventive Services Task Force Evidence Syntheses, formerly Systematic Evidence Reviews	- Study does not contain an intervention relevant to this review protocol
Warriner, Amy H, Outman, Ryan C, Feldstein, Adrianne C et al. (2014) Effect of self-referral on bone mineral density testing and osteoporosis treatment. Medical care 52(8): 743-50	- Study does not contain an intervention relevant to this review protocol

J.2 Health Economic studies

If any published health economic studies relevant to this question met the inclusion criteria (relevant population, comparators, economic study design, published 2009 or later and not from non-OECD country or USA) but were excluded following appraisal of applicability and methodological quality they are listed below with reasons. See the health economic protocol for more details.

None.

Appendix K Recommendation for research

What is the clinical and cost-effectiveness of searching and analysing electronic health records and social care records (including GP practice lists) to help identify adults who should have a fragility fracture risk assessment?

K.1.1 Why this is important

Fracture risk is currently assessed opportunistically for primary prevention. The committee discussed that osteoporosis is likely significantly underdiagnosed with a significant proportion of this population having not ever had a fracture. The committee discussed how primary care health record lists are already searched for secondary prevention, but searching for primary prevention is not routinely done. Electronic health records and social care records contain information that could be used to identify patients at high risk of fracture. A study is needed to determine if using these records would help identify people in primary care at risk of osteoporotic fractures that would have otherwise been missed. This is important to reduce number of fractures and related morbidity through assessment and treatment.

K.1.2 Rationale for the recommendation for research

Importance to 'patients' or the population	New evidence could provide effective ways to identify people at risk of osteoporotic fractures that could subsequently be offered treatment. This would improve patients' quality of life whilst reducing fractures and related morbidity.
Relevance to NICE guidance	High: the research is essential to inform future updates of key recommendations in the guidance. It will help reduce geographical variability.
Relevance to the NHS	The aim would be to identify people in primary care at risk of fragility fracture who may need treatment to reduce the risk of fractures or subsequent fractures.
National priorities	High relevance to the NICE guideline for Osteoporosis. Consistent with 10-year plan to move from analogue to digital, move management into the community and focus on prevention.
Current evidence base	There is no evidence for this question and therefore research is required.
Equality considerations	People without electronic health records or not registered with a GP may not be addressed by this question. Electronic health records would increase opportunity to identify at risk patients that do not attend GP surgeries. High risk patients might not attend GPs for example due to frailty or mobility problems.

K.1.3 Modified PICO table

Population	Inclusion: Adults who are 50 years and older.
Intervention	Searching and analysis of electronic patient record and social care record databases used to identify people who should be assessed for fragility fracture risk.
Comparator	No searching and analysis
Outcome	• Number of people identified for further assessment • Number of people identified as needing treatment on the basis of further assessment • Fragility fracture • Generic health-related quality of life • QUALEFFO-41 will be included for studies with vertebral fractures
Study design	Randomised controlled trials.
Timeframe	Medium term – in time for the next update.