



### FLS-DB annual report 2026 analysis plan (based on 2024 data)

This report will focus on **2023 vs 2024** date of fracture data for England and Wales only. Analysis is not required for Northern Ireland patient records. In 2024 the lite dataset for services was introduced allowing them to identify the key fields they need to complete for their KPIs. Changes made to the dataset include addition of '*abaloparatide*' being added as a new drug (midway through 2024) and an additional fracture site being included: *wrist, humerus, pelvis, other*. This has been highlighted below.

#### FLS-DB key performance indicators (KPIs)

1. Data completeness
2. Identification of non-spine fragility fractures
3. Identification of spine fractures
4. Time to FLS assessment
5. Time to DXA
6. Falls assessment performed/ recommended / referred
7. Bone therapy recommended
8. Strength and balance training non-hip # patients only
9. Monitoring contact 12-16 weeks post fracture
10. Commenced bone therapy by 16 weeks post fracture
11. Adherent to a prescribed drug 12 months after fracture

#### Patient level data

1. There are three-time intervals of data to be analysed based on the fracture date (2023 and 2024 in the main (KPI 1-10); 2022 and 2023 for KPI 11), highlighted below:
  - a. Interval a: Patients index fracture date from 1.1.2016 to 31.12.16
  - b. Interval b: Patients index fracture date from 1.1.2017 to 31.12.17
  - c. Interval c: Patients index fracture date in 1.1.2018 to 31.12.2018
  - d. Interval d: Patients index fracture date in 1.1.2019 to 31.12.2019
  - e. Interval e: Patients index fracture date in 1.1.2020 to 31.12.2020
  - f. interval f: Patients index fracture date in 1.1.2021 to 31.12.2021
  - g. interval g: Patients index fracture date in 1.1.2022 to 31.12.2022
  - h. interval h: Patients index fracture date in 1.1.2023 to 31.12.2023
  - i. interval i: Patients index fracture date in 1.1.2024 to 31.12.2024
2. Key points to focus
  - a. Increased engagement with FLS community (number of participating FLSs i vs h)
  - b. Number of records per site (interval i & h)
  - c. Number of sites achieving >50% and >80% data completeness using KPI 1-10
    - i. Interval i vs h
  - d. Number of sites achieving >50% and >80% data completeness using KPI 11
    - i. Interval h & g



- e. Diversity and equity (given gender and age differences in fracture incidence and site do not include KPI 2 and 3) and test for significance for non-normal data (interval i & h)
  1. Men vs. Women for KPI 5,6, 7 and 7b,9,10,11
  2. Age <75 years and ≥75 years for KPI 5,6,7 and 7b, 9,10,11
  3. IMD ≤20% worst vs 80% highest IMD using postcode for KPI 1,2,3, 4,5,6,7 and 7b,8,9,10,11
  4. Analyse care home status for KPI 5, 6, 7 and 7b, 8, 9, 10, 11
- f. Summary KPI 1 -10 and 7b for intervals i vs h for England and Wales separately
- g. Summary for KPI 11 for intervals h vs g for England and Wales separately

### 3. Key data

1. Number of FLSs submitting any data in 2024
2. Number of FLSs actively participating > 50 patients in 2024
3. HQIP requirement - "headline numbers of cases, broken down by: age, sex, deprivation and" to be displayed on one table.
4. Total number of patients per site in 2024
5. For each KPI:
  - National aggregate data - For all questions
  - Between site data - For all questions
6. Create file which would be used to create the original orange and green graph (outlined below) for RCP to be able to create a different infographic on the same data for 2023 and 2024.

*For reference (NOT NEEDED): For each KPI stacked bar chart for number of orange and green sites for intervals i and h Figure 2 of 2024 report e.g:*

### Data cleaning notes

1. Remove FLS site = "YYY" – test FLS site
2. Renaming FLS names
  - a. FLS project team to confirm what NHFD site(s) the participating FLSs cover from facilities audit and new registrations in the year data being analysed in an excel file.
  - b. Any records for "RBE" sitecode were given the FLS name of "Royal Berkshire FLS"
  - c. Any records for "PET" sitecode were given the FLS name of "North West Anglia NHS Foundation"
  - d. Records for "NMH", "RFH" or "BEM" were given the FLS name "Enfield Bone Health and Fracture Liaison" "BEM"
  - e. Records for "DAR" or "DRY" were given the FLS name "UNIVERSITY HOSPITAL NORTH DURHAM DARLINGTON MEMORIAL HOSPITAL" "DAR"
  - f. Records for "WHH", "QEQ" or "KCC" were given FLS name "East Kent Hospital University NHS Trust" "KCC"
  - g. Records for "7A5T" "PCH", "POW" and "RGH" given the FLS "CTM UHB (7A5T)"
  - h. Records for "7A2T" "BRG", "WWG", "WYB" given the name "Hywel Dda UHB (7A2T)"
  - i. Records for "GWY" "CLW" and "WRX" given the name "Betsi Cadwaladr UHB (GWY)"
  - j. Records for "NOC", "RAD" or "HOR" were given FLS name "OXFORDSHIRE FRACTURE PREVENTION SERVICE" "RAD"
  - k. Records for "QEB", "EBH" were given the FLS name UNIVERSITY HOSPITAL BIRMINGHAM NHS FOUNDATION TRUST "QEB".



- I. Renaming FLS codes which were inconsistent with codes using in the NHFD, so the following changes to FLS codes were made for sake of getting identification KPI:
3. Remove cases with 'missing' NHS number artemis code.
4. Check for correct index fracture site order (hip is highest, then spine then humerus then wrist then pelvis then other)
5. Exclude FLSs with less than 50 cases in interval i = report them as non-participating
6. For duplicates records with same artemis number:
  - a. use the most recent complete record, i.e. combine duplicate records to use the most recent complete record that is not missing.
  - b. The exception to this is duplicate post code- use original post code
  - c. Date duplicates: Report FLS name, number of records if same artemis number and *same fracture date* from more than one FLS site. (e.g. Ealing / Northwick park, include FLS name and number of records, and FLS sites, however their cases are now split for their respective site as of early 2024)
  - d. Date < 7 days duplicates: Report FLS name, number of records if same artemis number and *different fracture date* less than 7 days
  - e. Date > 7 days duplicates: Report FLS name, number of records if same artemis numbers but different fracture date 7 days or more apart) to calculate number of re fracture.
7. Check for duplicates in linked NHFD sites

### Facilities audit

Facilities audit data to inform clinical commentary (national figures) - percentage breakdown of the national sample for each response option eg 50/61 FLSs (82%) or average for the below questions and only include sites where column B 'complete' = 'yes' :

1. Number of sites submitting facilities audit
2. Question 1.1
3. Question 1.4 (by year)
4. Question 1.5
5. Question 1.6 (% zero vs non zero, median and IQR for non zero values)
6. Question 1.7
  - a. (% zero vs non zero, median and IQR for non zero values for nurses, administrators, radiographers, physiotherapists)
  - b. Number of FLS with highest band nurse = 5, 6, 7, 8.
7. Question 1.8
8. Question 2.1 (median, IQR, range)
9. Question 2.2:
  - a. Percentage yes for each category
  - b. Commonest 3 combinations
10. Question 2.3 – percentage for each category
11. Question 2.3.1– percentage for each category
12. Question 3.1
  - a. Percentage yes for each category
  - b. Commonest 3 combinations
13. Question 3.2
  - a. Percentage yes for each category



- b. Commonest 3 combinations
- 14. Question 3.3
  - a. Percentage yes for each category
  - b. Commonest 3 combinations
- 15. Question 3.4
  - a. Percentage yes for each category
  - b. Commonest 3 combinations
  - c. List other
- 16. Question 3.5; percentage for each response
- 17. Question 3.6; percentage for each response
- 18. Question 4.1
  - a. Percentage yes for each category
  - b. Commonest 3 combinations
  - c. List other
- 19. Question 4.2; percentage for each response
- 20. Question 5.1; percentage for each response
- 21. Question 5.2
  - a. Percentage yes for each category
  - b. Commonest 3 combinations
- 22. Question 5.3; percentage for each response
- 23. Question 6.1; percentage for each response
- 24. Question 6.2
  - a. Percentage yes for each category
  - b. Commonest 3 combinations
  - c. List other
- 25. Question 6.2.1
  - a. Percentage yes for each category
- 26. Question 7.1
  - a. Percentage yes for each category
  - b. Commonest 3 combinations
- 27. Question 7.2
  - a. Percentage yes for each category
  - b. Commonest 3 combinations
- 28. Question 8.1
  - a. Percentage yes for each category
- 29. Question 8.2
  - a. Percentage yes for each category
  - b. Commonest 3 combinations
- 30. Question 8.3
  - a. Percentage yes for each category
  - b. Commonest 3 combinations
- 31. Question 9.1: Percentage yes for each category
- 32. Question 9.2 (new question):
  - a. Percentage yes for each category
- 33. Question 9.3:
  - a. median Iqr range
- 34. Question 9.4:
  - a. Percentage yes for each category



35. Question 9.5

- a. Percentage yes for each category
- b. Commonest 3 combinations

36. Question 10.1

- a. % zero
- b. Non zero median IQR range

37. Question 10.2: list text

- a. Question 10.3: Percentage yes for each category

Indicator	Numerator	Denominator	Comment
1. Data completeness	Number of Key performance indicators 2-11 with more than 80% patients' completeness	10 (KPI 2-11)	1. Calculate for <i>interval h and i</i> <ul style="list-style-type: none"> <li>Missingness in KPI 2 describes missingness in fracture type in original data (after that, where type of fracture was missing, fragility was assumed).</li> <li>For completeness stats of KPI 8 &amp; 10, excluding any records not followed up at 12-16 weeks</li> <li>For completeness stats of KPI 11 excluding records not followed up at 48-52 weeks</li> </ul> 1. National average
2. Identification of non-spine fractures (excluding spine fractures)	Total number of patients with fragility fracture submitted, excluding spine fractures	Estimated fragility fracture caseload using annualised data from National Hip Fracture database (NHFD) x4 for that year * 0.94 as an additional addition of a multiplier to take into account the NDO effect of 6% opt-out	1. For <i>interval h and i</i> overall change in KPI: <ol style="list-style-type: none"> <li>average number of patients per FLS</li> <li>average percentage of estimated caseload</li> </ol> 2. For <i>interval i</i> : by site, Table 4: <ul style="list-style-type: none"> <li>Plot figure below. X axis is sorted by FLS volume in decreasing order of non-spine fractures submitted. Y1 is total number cases submitted with black circle marker. Y2 is the proportion of first fractures divided into hip, non-hip, non-spine, spine as a stacked bar chart. See sample below</li> </ul> 3. 4. total number of hip cases and % of hip cases compared with total number of cases submitted: (Table 4) 5. National average
4. Time to bone health assessment within 90 days	Number of patients with date of fracture – date	Total number of patients submitted	1. For <i>interval h vs i</i> : overall <ul style="list-style-type: none"> <li>National average % assessed within 90 days.</li> <li>2. Need to table by FLS where the data of assessment is missing</li> </ul>

Indicator	Numerator	Denominator	Comment
	of assessment = 90 days or less		
5. Time to DXA within 90 days	Number of patients with Date of DXA - Date of fracture = 90 days or less	Total number of patients submitted minus a) number where DXA already done; where a DXA was not ordered or where DXA status was missing	<p>1. For <i>interval h vs i</i>: by FLS</p> <ul style="list-style-type: none"> <li>number DXA recommended or ordered</li> <li>number date of DXA within 90 days</li> <li>% within 90 days. (Table 6)</li> <li>Did not attend</li> </ul> <p>2. For all patients combined and stratified by age &lt; 75 years vs 75 years+</p> <p>3. National average</p>
6. Falls assessment	Number of patients with a falls assessment performed, recommended, referred for or already under falls service	Total number of patients submitted	<p>1. For <i>interval h vs i</i>: by FLS: table 7:</p> <ul style="list-style-type: none"> <li>National average</li> <li>Facilities question 6.1. How many perform a falls assessment</li> <li>number and percentage for all patients / number submitted total all ages and stratified by age &lt; 75 years vs 75 years+</li> </ul>
7. Bone therapy recommended as appropriate	Number of patients with a treatment recommendation as specific bone therapy, refer for further clinical	Total number of patients submitted for each fracture site hip, spine, humerus, wrist, pelvis, other	<p>1. for <i>interval h vs i</i> by FLS table 8 for all ages and add column for missing (for all)</p> <p>2. national average</p> <ol style="list-style-type: none"> <li>Combined: specific bone therapy OR refer for further clinical opinion OR refer to GP to decide</li> <li>By fracture site – hip, spine, humerus, wrist, pelvis, other (column) with row = each separate treatment options: <ul style="list-style-type: none"> <li>OralBP (alendronate, risedronate, ibandronate)</li> </ul> </li> </ol>

Indicator	Numerator	Denominator	Comment
	opinion, refer to GP to decide		<ul style="list-style-type: none"> <li>▪ Denosumab</li> <li>▪ Zolendronate</li> <li>▪ Teriparatide</li> <li>▪ Abaloparatide</li> <li>▪ Romosozumab</li> <li>▪ Other (Raloxifene/ strontium/ calcitriol, alfacalcidol, HRT)</li> <li>▪ Referred to GP to decide prescription (called “referGP” in Excels)</li> <li>▪ Referred for further clinical opinion (called “refer_opinion” in Excels)</li> </ul> <p>c. Value = %zero, non zero median , min/ max range</p> <p>N.b, answer for question 4.01 changed to include ‘<i>abaloparatide</i>’ to dataset in mid-2024.</p>
8. Strength and balance commenced	Number of non-hip fracture patients initiating a strength and balance class within 16 weeks of date of fracture	Number of patients with a bone therapy treatment recommendation or referred to GP or referred to other clinician minus patient dead where the fracture site is non-hip	<p>1. For interval h vs i, by FLS for all ages and stratified by age &lt; 75 years vs 75 years+</p> <p>2. National average</p>
9. Recorded Follow-up 12 – 16 weeks post index fracture	Number of patients followed up post fracture = yes & follow up is less than or equal to 16 weeks post	Number of patients with a bone therapy treatment recommendation or referred to GP or referred to other clinician minus	<p>1. for interval h vs i: columns for all fractures hip fracture vs. non-hip fracture, number eligible for monitoring all, hip, non-hip and then percentage monitored with FLS as rows (table 10)</p> <p>2. Does not include calcium / Vitamin D only</p> <p>3. National average + min / max range</p>



Indicator	Numerator	Denominator	Comment
	fracture diagnosis date	(patient dead and patient declined)	
10. Commenced bone therapy at 16 weeks	Number of patients commenced or continuing bone specific therapy within 16 weeks of date of fracture	Number of patients with a treatment recommendation or referred to GP or referred to other clinician minus (patient recorded as died and patient declined)	<ol style="list-style-type: none"> <li>for interval h vs i, by FLS n and %</li> <li>National average + min / max range</li> <li>KPI by fracture site <ul style="list-style-type: none"> <li>Hip, spine, humerus, wrist, pelvis and other</li> </ul> </li> </ol> <p>n.b. answers for 6.05 and 7.05 changed in 2020 to include treatment names from “Started recommended bone therapy” and “Switched recommended bone therapy”</p>
11. Did the patient confirm adherence to prescribed bone sparing drug at 12 months?	Number of patients continued taking recommended drug or switched drug at 12 months post fracture	Number of patients with a treatment recommendation or referred to GP or referred to another clinician minus (patient died and patient declined)	<ol style="list-style-type: none"> <li>for interval h vs i by FLS.</li> <li>include non-contactable in the denominator</li> <li>national average <ol style="list-style-type: none"> <li>Combined: specific bone therapy OR refer for further clinical opinion OR refer to GP to decide</li> <li>By fracture site – hip, spine and other (column) with row = each separate treatment options: <ul style="list-style-type: none"> <li>OralBP (alendronate , risedronate, ibandronate)</li> <li>Denosumab</li> <li>Zoledronate</li> <li>Teriparatide</li> <li>Abaloparatide</li> <li>Romosozumab</li> </ul> </li> </ol> </li> </ol>

Indicator	Numerator	Denominator	Comment
			<ul style="list-style-type: none"> <li>▪ Other (Raloxifene/ strontium/ calcitriol, alfacalcidol, HRT)</li> <li>▪ Not started</li> <li>▪ No longer appropriate (clinician)</li> <li>▪ Don't know</li> <li>▪ Informed decline</li> <li>▪ Refer for clinical opinion</li> </ul> <p>f. Value = %zero, non-zero median , min/ max range</p> <p>n.b. answers for 6.05 and 7.05 changed in 2020 to include treatment names from "Started recommended bone therapy" and "Switched recommended bone therapy"</p> <p>n.b from mid-2024 answers for 6.05 and 7.05 changed to include new drug 'abaloparatide' to dataset from mid-2024.</p>