The feasibility of calculating inpatient hip fractures (IHF) rates - methods paper

There are significant limitations to using the rates of reported falls to compare the success of fall prevention practice between organisations. However, the rates of IHF reported to the national hip fracture database (NHFD) are potentially more reliable, as all hip fractures in the treating trust will be captured by the NHFD and are attributed to the trust where the fall that caused the fracture occurred.

This provides an opportunity to evaluate the feasibility of calculating IHF rate using number of inpatient hip fractures per year against the occupied bed days in that year for each trust. This could be used to better understand and learn from what is happening in trusts with particularly low or high rates of IHF. Such organisations will be contacted to discuss their data. Those with significantly higher than average rates would be contacted to inform them of this observation, to discuss explanatory factors and to offer support in improvement activities. Those with significantly low rates would be contacted to find out what others could learn from them.

We will not encourage direct comparison of IHF rates between organisations. However, it may be useful for trusts to receive information on their own position as a baseline against which to measure future performance.

To evaluate the feasibility of collecting IHF rates we assessed:

- The accuracy of the occupied bed day (OBD) data submissions
- Whether there was significant variability in the age profile of inpatients between trusts
- Whether any such variability in the age profile of inpatients had an impact on IHF rates

Accuracy of OBD data submissions is vital to the calculation of an accurate IHF rate. Of the 161 participating trusts, 116 (72%) could be linked to NHFD data as the fall that caused the fracture occurred in a trust with an NHFD site.

Thirteen (8% of total submissions) did not submit OBD data and 8 (5% of all submissions) provided OBD data that was particularly low and thought to be inaccurate. These OBD data were removed from the national analysis and the organisations informed. Figure 2 illustrates the quality and completeness of data submitted for IHF rate calculation.

If data from non-NHFD registered trusts and health boards could have been incorporated into these analyses, we would have been able to calculate IHF rates for 87% of trusts. We will look to improve the accuracy and completeness of occupied bed day data for next year's report.

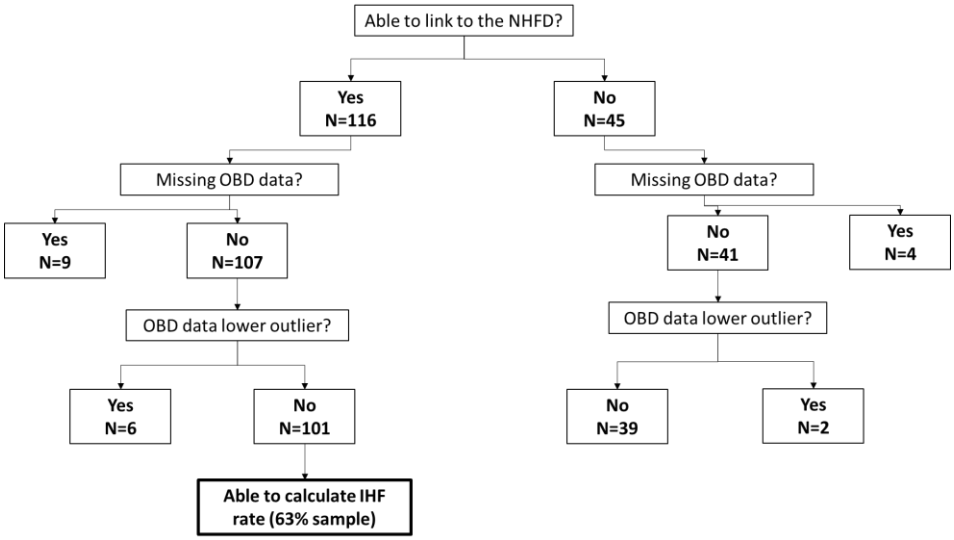


Figure 1. Data quality for IHF rate calculation

Variability in age profiles across trusts was calculated using facilities data submitted on "proportion of admissions aged ≥75" in 2019. This age was chosen as it reflects a population with a higher risk of hip fracture. We hypothesised that organisations with a higher proportion of over 75s would experience higher rates of IHF and therefore in order to effectively identify those with very high or low rates, adjustment may be needed for age of the inpatient cohort. Figure 3 demonstrates variability in the proportion of people aged over 75 admitted to different trusts which ranges from 13% to 62%.

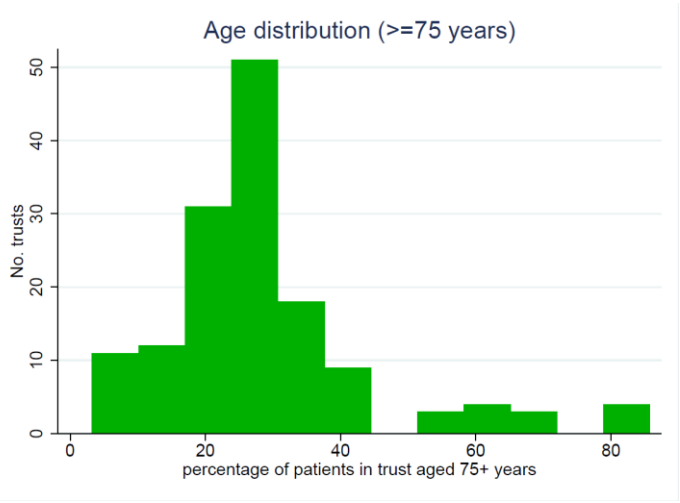


Figure 2 Distribution of proportion of patients aged over 75 admitted in 2019.

In 2019, the mean number of inpatient hip fractures per trust was 17.7 (SD 11.4) and this translated into a mean IHF rate per 1,000 OBD of 0.06 (ranging between 0.007 – 0.16).

Since there appears to be variability in the proportion of patients aged over 75 across organisations, IHFs rates were calculated for each quartile of the proportion aged ≥75. IHF rates were lower in the organisations in the lower two quartiles – see figure 4. The variability may reflect the trust type (i.e. how many beds are used for paediatrics / obstetrics but also local demographics.

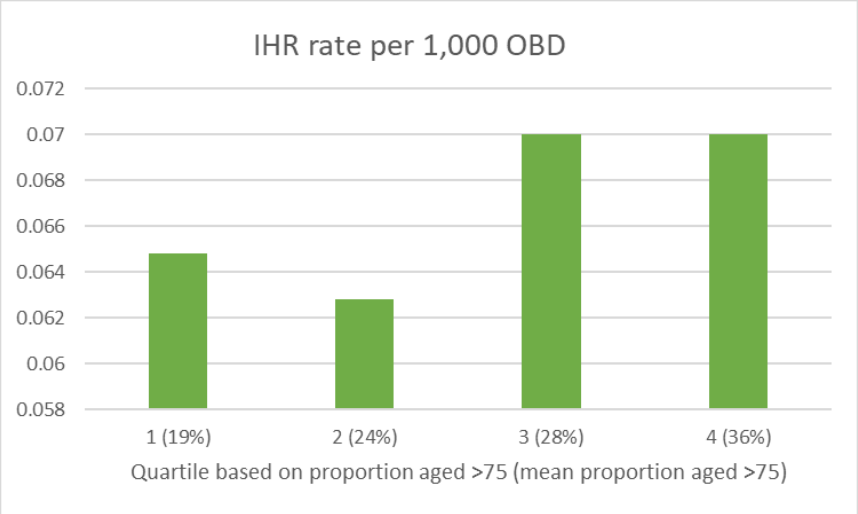
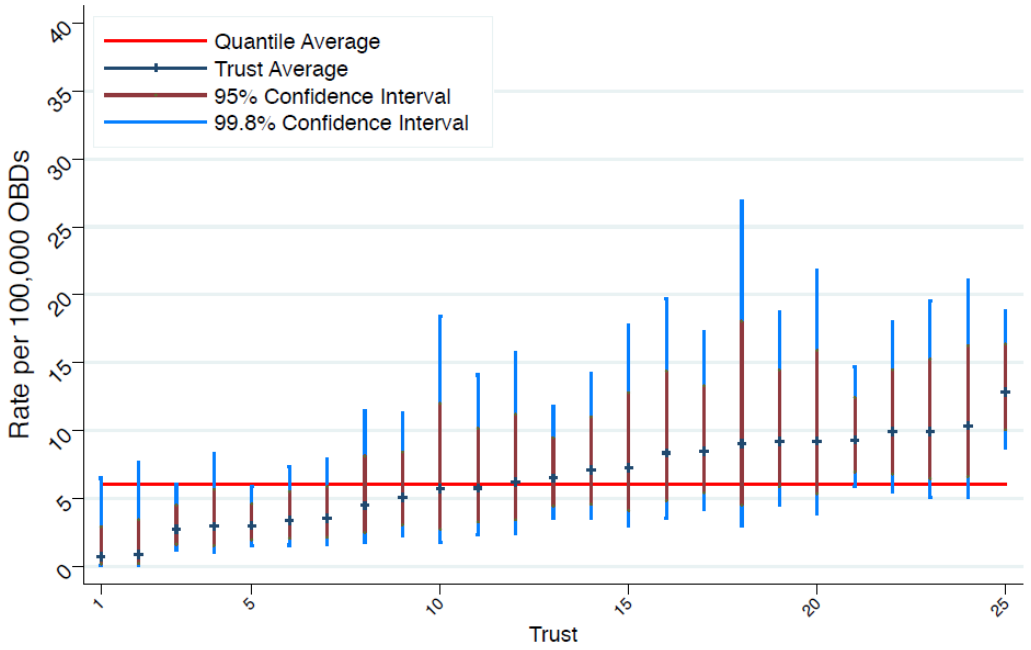


Figure 3. IHF rate by quartile of proportion of patients aged ≥75 admitted in 2019

Figure 5 presents two "caterpillar plots" that show the variability of IHF rates between organisations in the lowest and highest quartile for proportion aged ≥75.

A limitation to this approach is that data on the proportion of patients admitted were used to adjust for age. Using this data assumes that the proportion of OBDs is the same as the proportion of admissions. This is probably an unsound assumption as over 75s are known to have comparatively longer lengths of stay [3]. Therefore, the data collected for this report are not of sufficient quality to be shared with trusts.

Variability in rate of hip fracture patients admitted as inpatient: Age Q1



Variability in rate of hip fracture patients admitted as inpatient: Age Q4

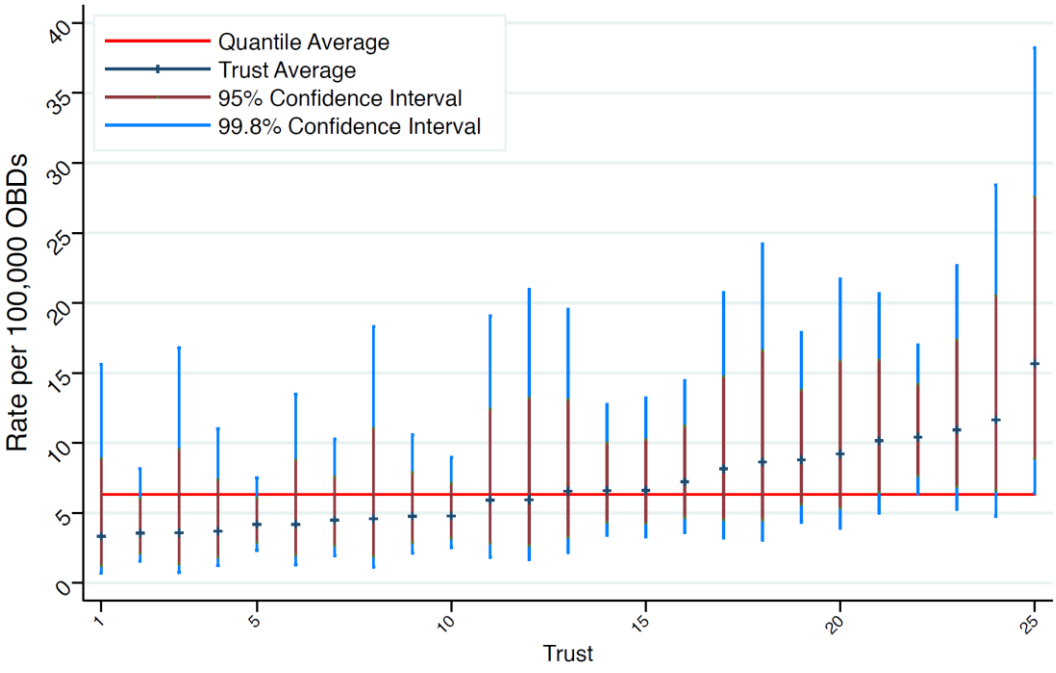


Figure 4. Variability in IHF rate per 100,000 OBD for trusts in the lowest and highest quartile for proportion of admissions aged ≥75

In order to be able to conduct and disseminate this analysis next year, the following objectives must be met:

- Capability to link IHFs to trusts not registered with NHFD (for >80% trusts)
- Adequate completeness (>95%) and accuracy of OBD data
- Collection of data on the proportion of OBD attributed to patients aged ≥75 instead of proportion of admissions aged ≥75.