

# Monthly Variation in New Radiotherapy Episodes in the UK



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## BACKGROUND

The national radiotherapy dataset (RTDS), established in April 2009, is used to report the monthly activity of each English radiotherapy provider to benchmark and recognise national trends, necessary for service planning at both local and national level.

The radiotherapy centre of the lead author experiences variations in patient referrals from month to month, often causing peaks in demand which can be difficult to manage. Some patterns emerge from year to year, and the authors were keen to explore whether these local variations in workload pattern were unique.

## METHOD

The first day of radiotherapy treatment delivery recorded in RTDS for each radiotherapy episode was analysed for each English radiotherapy centre between January 2010 and December 2014.

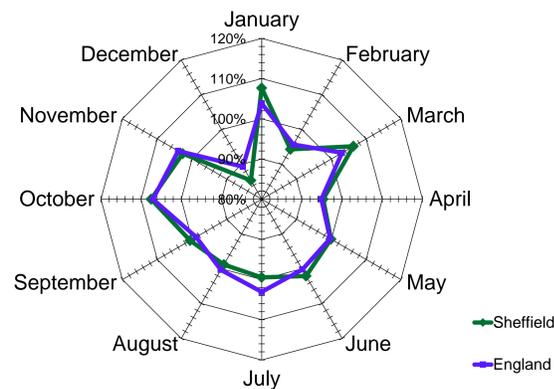
A single monthly Corrected Average New Episode Rate (CANER) for each centre across the 5-year period was used. Significant changes in a provider's activity across the 5-years are not accounted for, and we did not analyse changes in the monthly trends across the 5-year period. Centres which only came on stream during the 5-year period had their mean calculated for the active years only.

Recognising that the number of working days in a calendar month is not fixed, each centre's CANER was calculated by dividing the average number of new episodes by the number of working days in that month and multiplying by 21, which is the average number of working days per month.  $\Delta$ CANER is then expressed as a percentage of the annual average CANER for each centre, so that the figure is comparable across large and small centres. We have assumed Monday-Friday working.

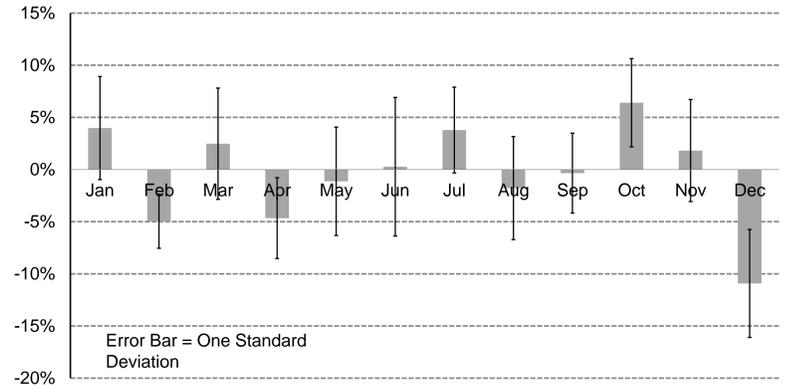
The working day correction removes the direct effect on radiotherapy treatment activity of the loss of episodes due to public holidays and days in the month. Some centres will start radiotherapy treatments on Bank Holidays anyway

## RESULTS

Monthly variations in CANER seen in Sheffield are remarkably close both in size and direction to the national trend (Figure 1).

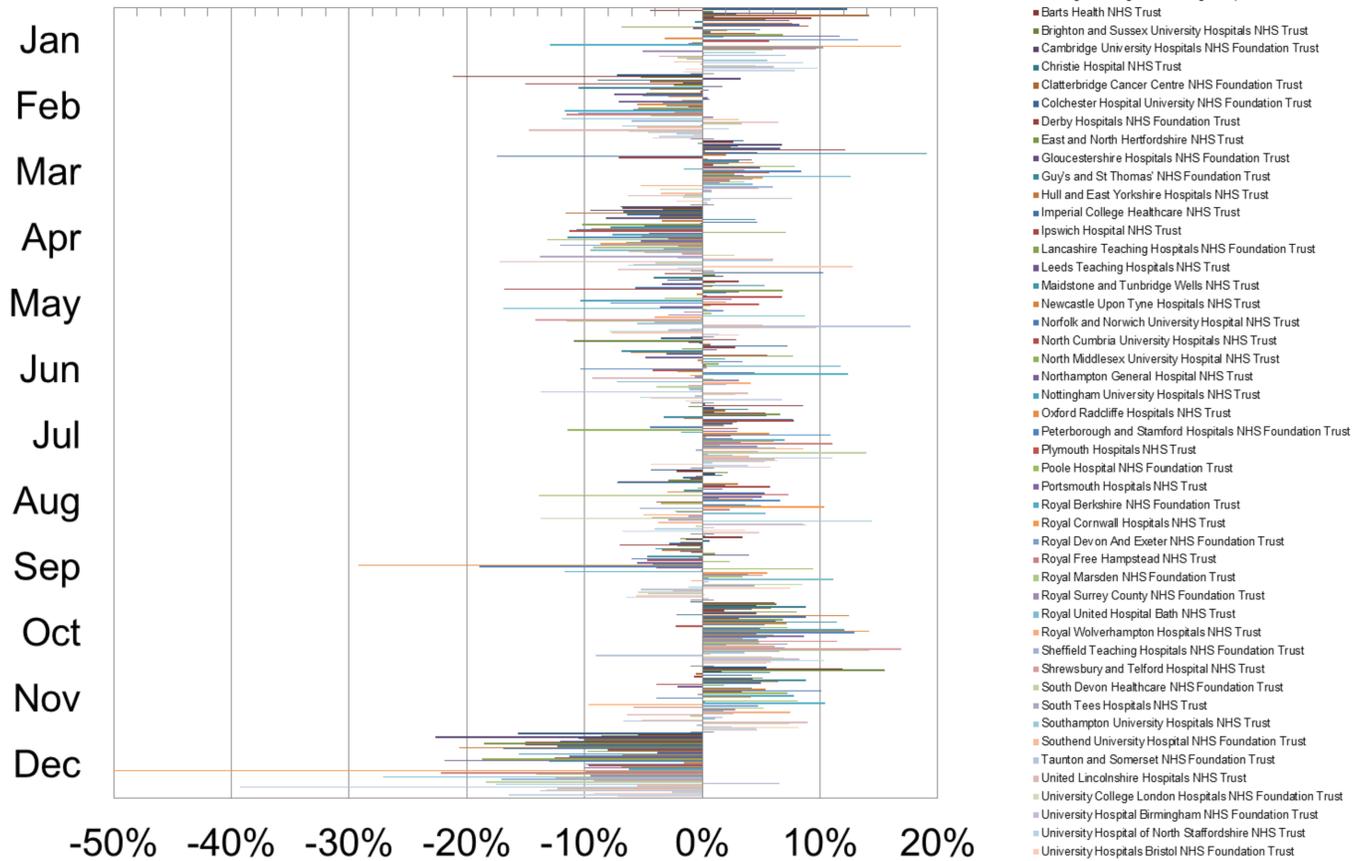


**Fig. 1 Monthly variations in corrected average new episode rate ( $\Delta$ CANER) for Sheffield and England.**



**Fig. 2 Standard deviations of  $\Delta$ CANER for England**

Figure 2 shows that the monthly variations are not necessarily statistically significant but the strongest trends are peaks of activity in January, July and October, with troughs in February, April and, most significantly, December. Figure 3 shows the data for each provider graphically, to give a different perspective.



**Fig. 3 Detailed monthly variations in corrected average new episode rate ( $\Delta$ CANER) for England.**

## DISCUSSION

- Patients often opt to put off the start of their treatment until after the Christmas/New Year period and this is reflected clearly in the data.
- When the direct effect of Bank Holidays and the number of days in a month has been removed, other trends are less significant, but there do seem to be common patterns.
- We have analysed the start of radiotherapy episodes and not actual activity (attendances per day) or referrals as such. As a surrogate for variation in treatment planning and pre-treatment workload this is probably adequate, but does not necessarily mean that actual attendances for radiotherapy treatment vary to the same extent. Analysis of variation in waiting time would probably be the most clinically relevant analysis for future work.
- The February and April troughs could be related to delays in patients treatment caused by staff leave as these correspond to half-term and Easter school holidays, but no such trough is seen in October.
- Another possibility is that staff absences or holiday periods within referring services may have a delayed impact on new radiotherapy activity.

