

Exploring variation in treatment targets across paediatric diabetes units in England and Wales

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Background: Achievement of treatment targets in children and young people (CYP) with diabetes represents an important intermediary step between delivery of care and 'hard' outcomes such as complications. Funnel plots have been proposed as a useful tool for visualising variation in performance indicators across centers and distinguishing between common-cause (centers lying within the control limits) and special-cause variation (centers lying outside the control limits exhibiting more variation than expected).

Methods: Aggregate data collected from Paediatric Diabetes Units (PDUs) across England and Wales in 2011-2012 as part of the National Paediatric Diabetes Audit (NPDA) were analysed. Percentage of CYP who achieved the NICE recommended HbA1c level of <7.5% was used as an outcome and performance indicator of diabetes control. Each PDU outcome was plotted against PDU size and the 95 and 99.8% control limits around the mean calculated using the binomial distribution. The relationship between PDU size and outcome was also examined.

Results: Of the 169 PDUs included in the analysis, 42 (24.9%) lay outside the 95% control limits and 13 (7.7%) fell outside the 99.8% limits. The coefficient for the regression of the PDU size (per 100 patients) on the percentage of CYP with HbA1c <7.5% was 1.2 (95% CI from -0.6 to 3.1%, $P=0.19$).

Discussion: The percentage of CYP achieving the glycaemic target HbA1c <7.5% varied considerably across PDUs with one in four units exhibiting more variation than expected by chance. There was a non-significant trend for larger PDUs to achieve greater numbers reaching this performance indicator. Further work on individual-level data is needed to examine the extent to which the observed variation is warranted, i.e. due to differences in the sociodemographic and ethnicity profile of the populations served by different clinics, or unwarranted and potentially attributed to how local services organize and deliver diabetes care.

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