Selecting units with a similar admission profile for the CMP Quarterly Quality Report

In the Case Mix Programme Quarterly Quality Report (QQR), quality indicator results for the critical care unit are compared with those for a group of units with a similar admission profile. This document describes the process used to select the group of units with a similar admission profile for reporting in the QQR.

Specialist critical care units

For critical care units in the following categories, units with a similar admission profile are all other critical care units in the same category:

- specialist neurosciences critical care units;
- combined general and neurosciences critical care units;
- specialist cardiothoracic critical care units;
- non-NHS (independent sector) critical care units.

For the one specialist liver critical care unit, units with a similar admission profile are adult general critical care units with at least 10% of admissions having a liver-related condition as either the primary or secondary reason for admission to the critical care unit.

For critical care units in specialist cancer hospitals, units with a similar admission profile are adult general critical care units with at least 10% of admissions having either metastatic disease or haematological malignancy in their past medical history.

Standalone high dependency units and post-operative critical care units

For standalone high dependency units and post-operative critical care units (where the majority of care delivered is at Level 2), units with a similar admission profile are other critical care units in this category with a similar proportion of admissions direct from theatre and recovery in the same hospital.

This proportion is calculated for each unit based on the data for the current year to date and the entire of the preceding year. The difference in the proportion between the unit on which the report is being run and all other units is calculated and all units that are within a distance of ±0.15 (i.e. 15% above or below) are selected as units with a similar admission profile. If this does not identify at least 10 units with a similar admission profile, then the distance is increased up to a maximum of 0.75 until 10 units with a similar admission profile are identified.
General critical care units

For all other critical care units, units with a similar admission profile are selected according to how similar they are on the following factors:

- the number of admissions per quarter (square root transformation with weight 1/20);
- the proportion of admissions direct from theatre and recovery in the same hospital (with weight 1);
- the proportion of bed days of care delivered at Level 3 (with weight 1); and
- the proportions of admissions with each of the following codes recorded as the specialty code prior to admission to the unit (each with weight 1):
  - Surgical Specialties:
    - Urology (101);
    - Transplantation surgery (102);
    - Colorectal surgery (104);
    - Hepatobiliary & pancreatic surgery (105);
    - Upper gastrointestinal surgery (106);
    - Vascular surgery (107);
    - Trauma & orthopaedics (110); and
    - Thoracic surgery (173);
  - Medical Specialties:
    - Gastroenterology (301);
    - Cardiology (320); and
    - Respiratory medicine (340).

The specialties above were identified based on substantial variability in the proportions of admissions across units, i.e. many units with none or very low proportions and some units with substantial proportions (>10% of admissions).

Each of the above values is calculated for each unit based on the data for the current year to date and the entire of the preceding year. The distance between the unit on which the report is being run and all other units is calculated and all units that are within a distance of ±0.15 are selected as units with a similar admission profile. If this does not identify at least 20 units with a similar admission profile, then the distance is increased to 0.2. If, despite this increase, this does not identify at least 10 units with a similar admission profile, then the distance is increased up to a maximum of 0.75 until 10 units with a similar admission profile are identified.
Example

The following example illustrates the approach using only two of the above factors (number of admissions per quarter and proportion of bed days at Level 3). Suppose we are running a report for a general critical care unit for the period 1 April to 30 September 2019.

1. Load all data from general critical care units from 1 April 2018 to 30 September 2019 and calculate for each unit:
   - the square root of the number of admissions per quarter divided by 20; and
   - the proportion of bed days of care delivered at Level 3.

2. We can plot the values of these two factors for each unit in a scatter plot. The point for the unit whose report we are running is highlighted in orange:

3. Units with a similar admission profile are selected by drawing a circle around the orange point. The example below uses a distance (the radius of the circle) of 0.15:

4. The units with a similar admission profile are all units within the shaded orange circle. If the circle did not include at least 20 units, we would use a distance of 0.2. If this still did not include at least 10 units, we would make it larger until 10 units were included (or the maximum distance of 0.75 was reached).