Appendix 1 – Assigning categories of readmission

Cancer was defined as ICD10 chapter C and D00-D48. The list of chronic condition diagnostic categories was drawn from the PARR project definitions.[13]

A) <u>Potentially preventable: probable or possible suboptimal care</u>

Four combinations of diagnosis and admission codes were used to indicate where readmission might result from sub-optimal care arising in the index admission.

Category A1: Probable suboptimal care:

- Primary readmission diagnosis of "complications of surgical & medical care not elsewhere classified" (T80-T88) occuring in the readmission but not the index admission

Category A2: Possible suboptimal care:

- Diagnosis occuring in the readmission but not the index admission:
  - sequelae of injuries of poisoning & other consequences (T90-T98)
  - thrombo-embolism (I26.0, I26.9, I63.1, I63.4, I74, I80, I81, I82, T79.0, T79.1)
  - pneumonia (J13, J14, J153, J154, J157, J159, J168, J181, J188)
  - pressure sores (L89)
  - poisoning by drugs medicaments & biological substances (T36-T50)
- Index admission diagnosis of "symptoms and signs" (ICD10 chapter R) with a definite primary diagnosis on readmission
- Single emergency readmission for same diagnosis where patient has just one recorded emergency readmission in the six year study period (excluding cancer and chronic conditions)
- Emergency readmission on day of discharge (ie discharge date = readmission date)

Note some thrombo-embolism (T80.0, T81.7, T82.8) captured in category A1 and not counted in A2

B) <u>Anticipated but unpredictable hospital care:</u>

For some patients, multiple emergency (re)admissions within 30 days are common as part of an anticipated plan or pattern of care. Definitions for categories B1 and B2 were based on selected "Bridges to Health" model subgroups and included readmission patterns for two or more admissions in two or more years, excluding those in category A (above).

Category B1: Ill but Stable:

- individuals with two or more readmissions in two separate years but with relatively little variability over time

Category B2: Unstable deterioration:

- individuals with two or more readmissions in two separate years with variability over time (defined as a coefficient of variation of annual numbers of readmissions exceeding 0.5), or more than 10 readmissions in a single year

Category B3: Non-medical risk factors:

- individuals known to have potential health hazards related to their socioeconomic and psychosocial circumstances or behavioural issues (Z55-Z76, Z91 in either index admission or readmission). This represents individuals where substantial factors in their readmission may be beyond the control of the health service.

<u>C) Preference</u>

This category covers both patient and staff preferences. It includes self-discharge and identifiable patterns of discharge and readmission around public holidays, Christmas etc.

Category C1: Self-discharge:

- Patients who discharged themselves from their index admission against medical advice (dismeth = 2), excluding those in category A and B (above).

Category C2*: Holiday periods:

- We identified the excess of readmissions in the Christmas period, public holidays and associated weekends by comparing observed with expected values (applying the average daily readmission rate to the number of discharges for equivalent days, standardising for age, sex, index admission method, HRG, financial year and day of the week).

D) Artefact

Readmissions in this category are likely to be elective but have been mistakenly coded as an emergency readmission.

Category D1: Artefactual events:

- Primary readmission diagnosis of "follow up" (Z08, Z09, Z42, Z47, Z48) or patients with an excessively high number of emergency readmissions (one emergency readmission every two weeks or more over the six year data collection period - equivalent to 155 or more readmissions), excluding those in category A, B and C1 (above).

Category D2*: Defined periodicity:

- We identified the excess of readmissions on the 7^{th}, 14^{th}, $21^{st}$and 28^{th} days post-discharge (multiples of weeks) by comparing the observed number with an expected value, interpolating between the days either side of the ones in question.

E) Accident or coincidence- related to a different body system

These readmissions were defined as emergency 30-day readmissions in a different ICD10 chapter from the index admission and excluding codes for "factors influencing health status and contact with health services" (ICD10 Z codes). For these readmissions coding does not indicate a common factor between index admission and readmission. This category also excludes those in categories A, B, C1 and D1 (above). Two common anecdotal examples of coincidental readmissions are transport accidents and falls. New transport accidents and falls were defined as any readmission diagnoses in chapter V (transport accidents) or codes W00-W19 (falls) that were not noted in the discharge diagnoses.

F) Broadly related - related to the same body system

This category contains readmissions which are broadly related to the previous admission where index and readmission diagnoses match within ICD10 chapter after excluding all those in categories A, B, C1, D1 and E (above).

*The approach taken to categories C2 and D2 allows for identification of an excess of readmissions in the dataset although for these it is not possible to match to individual patient identifiers.