3. Data overview

Introduction

Data presented in this report have been acquired from a number of sources. Initially, the two consultants caring for the patient completed questionnaires on the care given by their teams. Further data were then obtained from the NCEPOD advisors who reviewed the deceased cases. This section aims to provide an overview of the data received and an insight into the study population.

Hospital participation

261 hospitals were identified as having a Level 3 adult, general, intensive care unit.

197 hospitals submitted at least one clinical questionnaire and we had an overall participation rate of 88% (229/261).

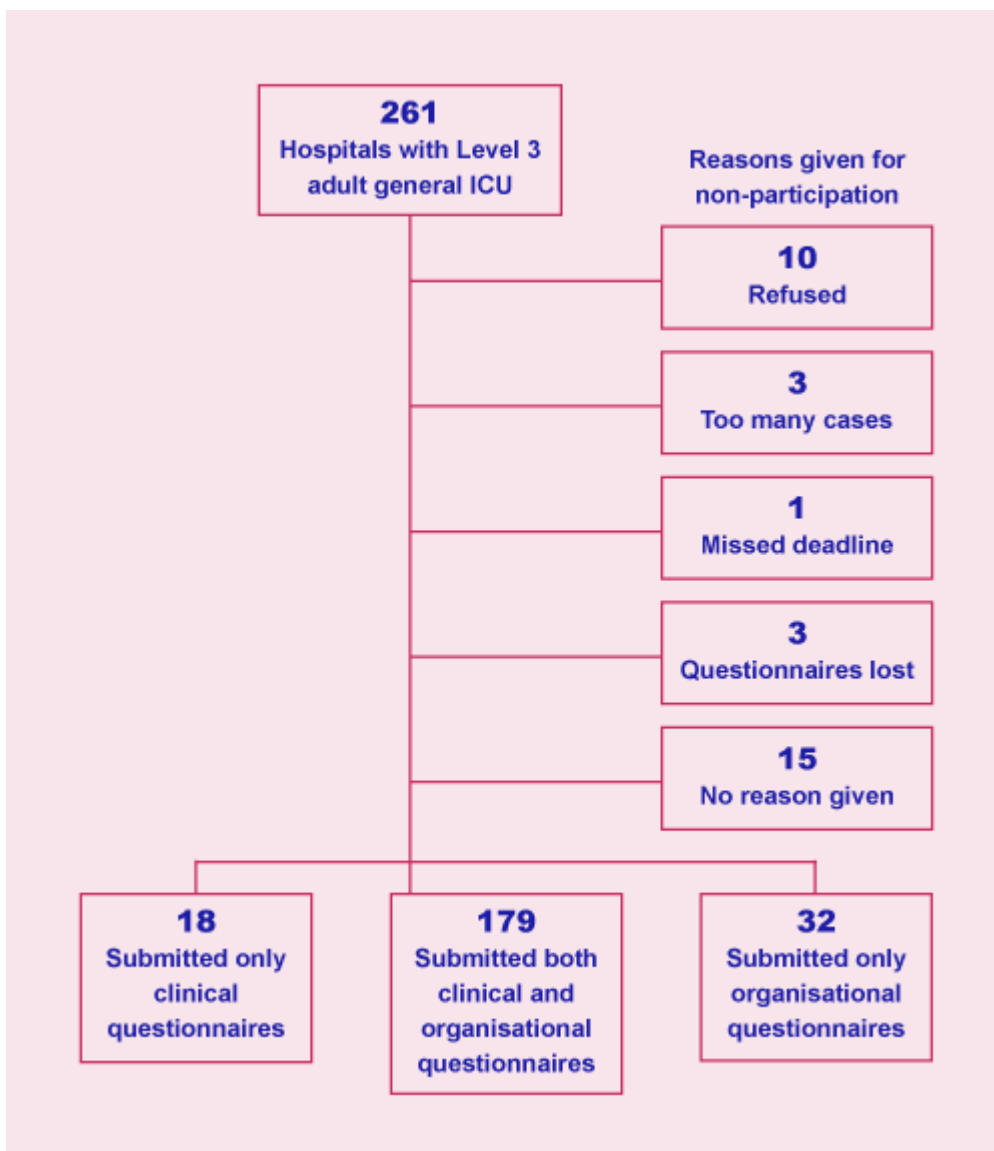The reason for the non-participation of the remaining 32 hospitals is shown in Figure 1.

Figure 1. Reason for non-participation

Initially the estimated sample size was 6,000 patients admitted to ICU with 20-30% of patients expected to die during the data collection period. As data collection began and the lists of suitable patients and

questionnaires were returned to NCEPOD, it became apparent that the expected sample size would not be reached. To evaluate this further, hospitals were contacted and asked to provide additional information on the total number of admissions to their ICU during one year and the number of these admissions that were general medical admissions.

42 hospitals provided this extra information. Based on this, the average number of admissions to an ICU over one year was 468. Of these, only 40% were medical admissions. Therefore the average number of medical admissions per unit would have been approximately 15 in a one month period. This figure was more consistent with the numbers associated with the study period.

By taking the above findings into account, it was proposed that the original estimate had been overestimated by approximately 60% and a more realistic sample size to be expected was in the region of 2,400 cases. It was likely that the overestimation arose from the fact that the multiplication factor of 7 and the number of estimated beds were not for medical patients only.

These calculations did not take into account different sizes of units, bed numbers or the time of the year that the study was run, all of which may have impacted on the final sample size. However, it did provide a crude indication to the number of cases expected.

Clinical questionnaires

Figure 2 provides an overview of the number of questionnaires returned. 1,235 questionnaires were received from referring physicians and 1,596 from intensive care clinicians. More intensive care questionnaires were received because single intensive care questionnaires would have been received if the patient had been transferred from another unit, and this may indicate the higher proportion of these questionnaires compared with single referring physician questionnaires.
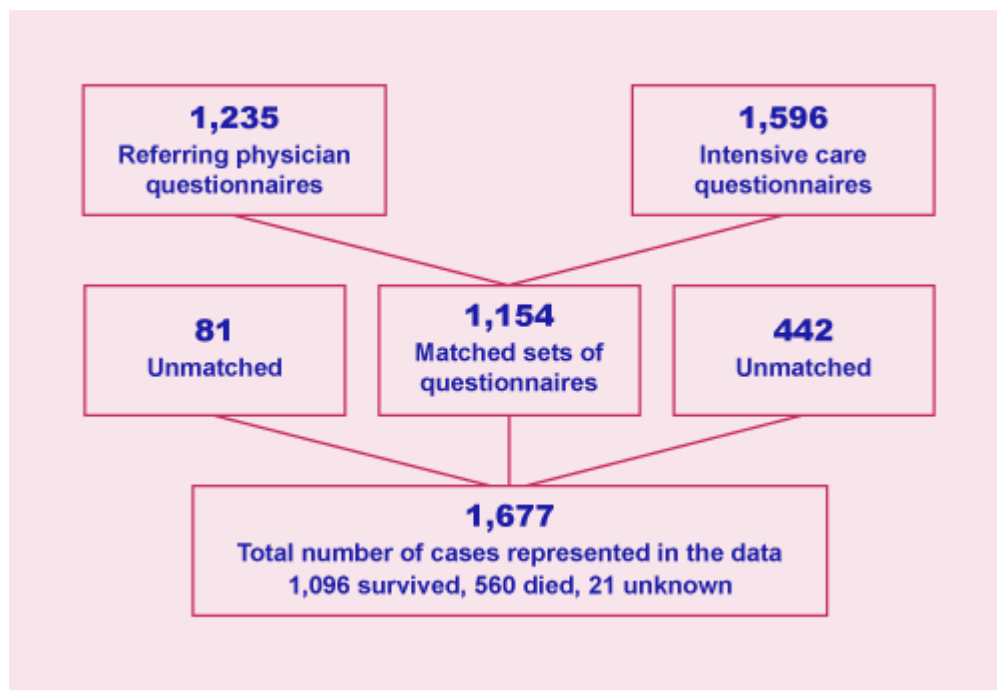

Figure 2. Overview of questionnaires returned

Organisational questionnaire

Of hospitals having a Level 3 adult general intensive care unit, 81% (211/261) returned this questionnaire. Of the 50 that did not return it, 18 had returned a clinical questionnaire.

Age and sex

Figure 3 demonstrates the distribution of age of patients included in this study. The median (range) age of this group of patients was 60 (16 to 95) years and 55% were male.
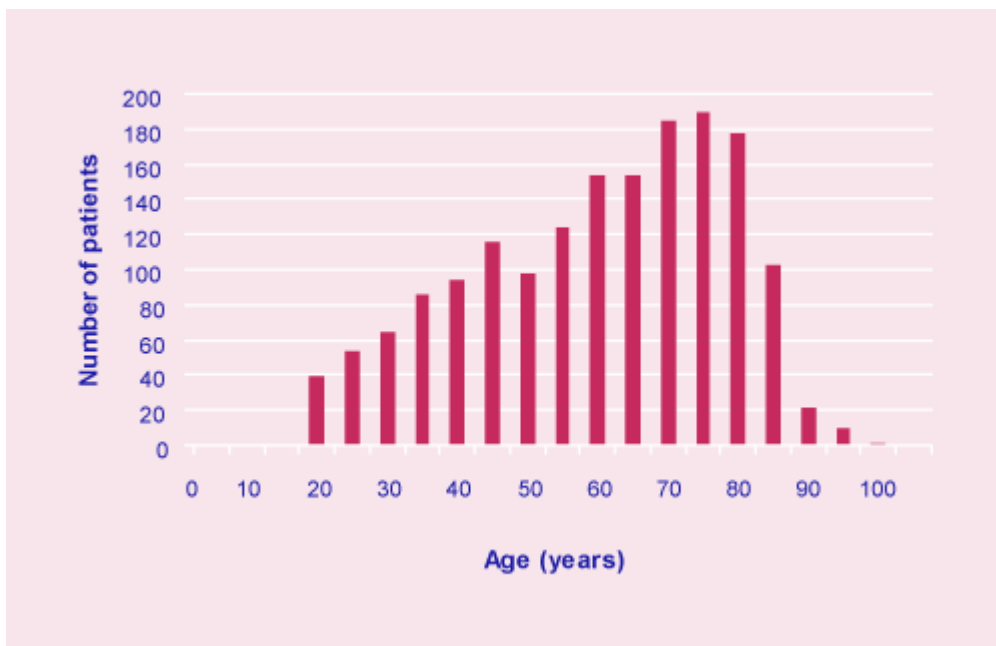

Figure 3. The age distribution of the study population (note that entry to the study was restricted to patients aged 16 or over) *n=1,665*

Admission method to hospital

Of the 1,235 cases with a completed referring physician questionnaire, 1,154 (93%) were emergency admissions and 34 (3%) were elective admissions. The question was unanswered in 47 (4%) of cases.

Source of admission to the ICU

Of patients admitted to the ICU, 43% (683/1,596) were admitted from the accident and emergency department of the same hospital and 537/1,596 (34%) were admitted to the ICU from a ward in the same hospital. Figure 4 demonstrates the range of admission sources as detailed on the intensive care questionnaire.
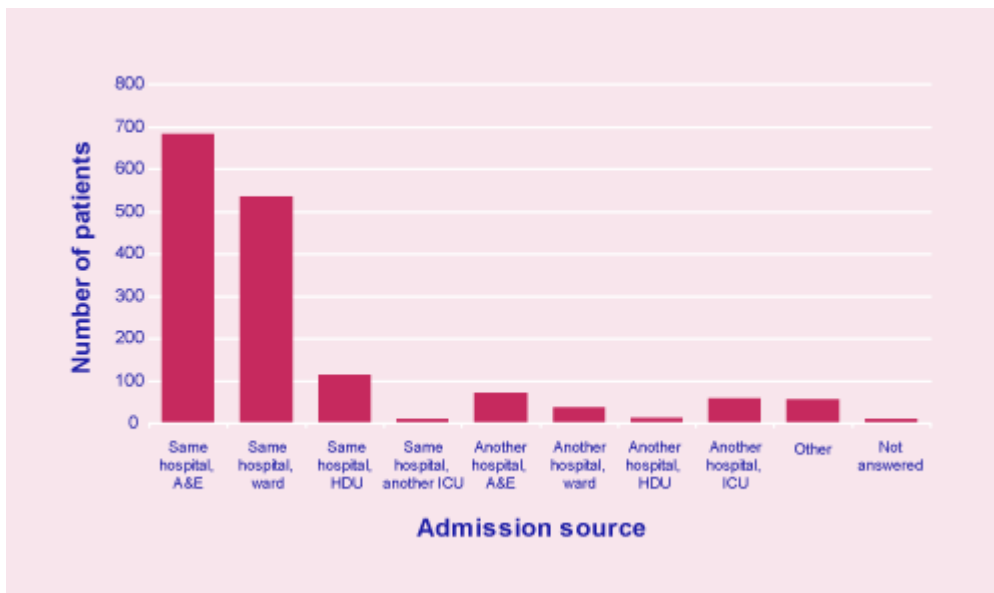
Figure 4. Source of admission to the ICU *n=1,596*

Figure 5 shows that the most common clinical reason for referral to ICU was respiratory disease, followed by cardiovascular and neurological disease. This data was taken from the ICU questionnaire.
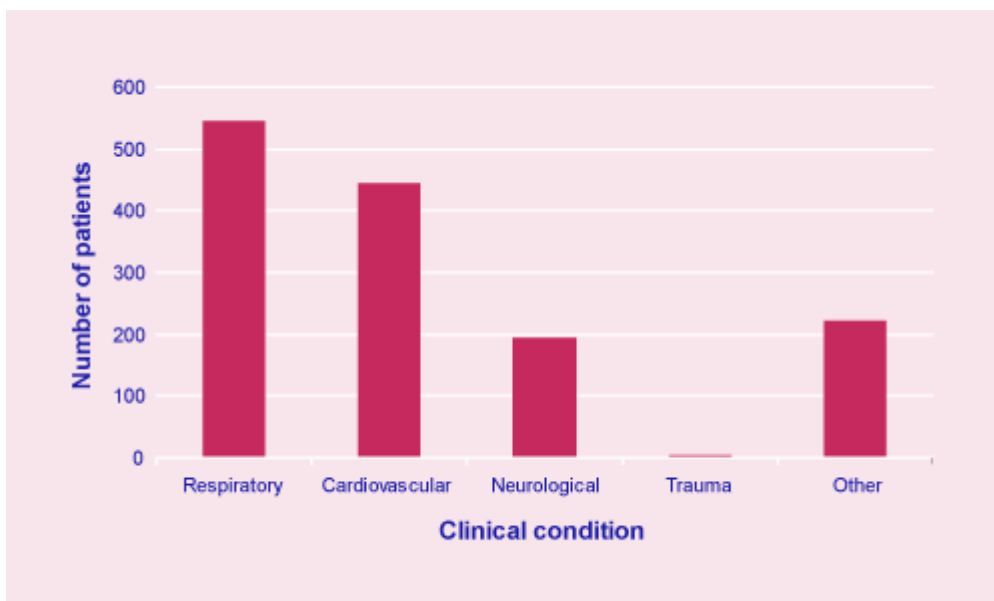

Figure 5. Clinical reason for referral to ICU*n=1,596*

Severity of the patient's condition

The Barthel Index [13], the APACHE II score [14], the Modified Early Warning Score [15] and the Glasgow Coma Score [16] were all requested as a means to assess the severity of the patient's condition. The data provided on these parameters were reviewed with some caution for two main reasons:

- The high number of accident and emergency admissions meant that an accurate understanding of the patient condition prior to hospital admission was unknown. For example, many patients would have had a low Barthel Index on arrival at hospital but may have scored much higher a matter of hours earlier. Similarly, it was not always possible to calculate the Modified Early Warning Score.

- As there were no time intervals stated in the questions relating to the APACHE II score and the Glasgow Coma Score, it was difficult to interpret these data clearly. In both cases the clinician was asked for their first score on admission to ICU but this may have been at one hour or 24 hours and there was no consistency to when it would have first been recorded.

Where the scores had not been provided but enough clinical factors were available to calculate the score, this was done by NCEPOD. Charted below are the findings from the four scores where the score was available.

The Barthel Index is an assessment of the ability of individuals to perform activities of daily living[13]. The maximum score, indicating a fully active and independent person, is 20. There were 73% (905/1,235) of cases where the Barthel Index had been completed in full on the physician questionnaire, 15% (183/1,235) of cases where it was incomplete and 12% (147/1,235) of cases where the question was not answered. Figure 6 shows the distribution of scores by number of patients for those that were completed in full.
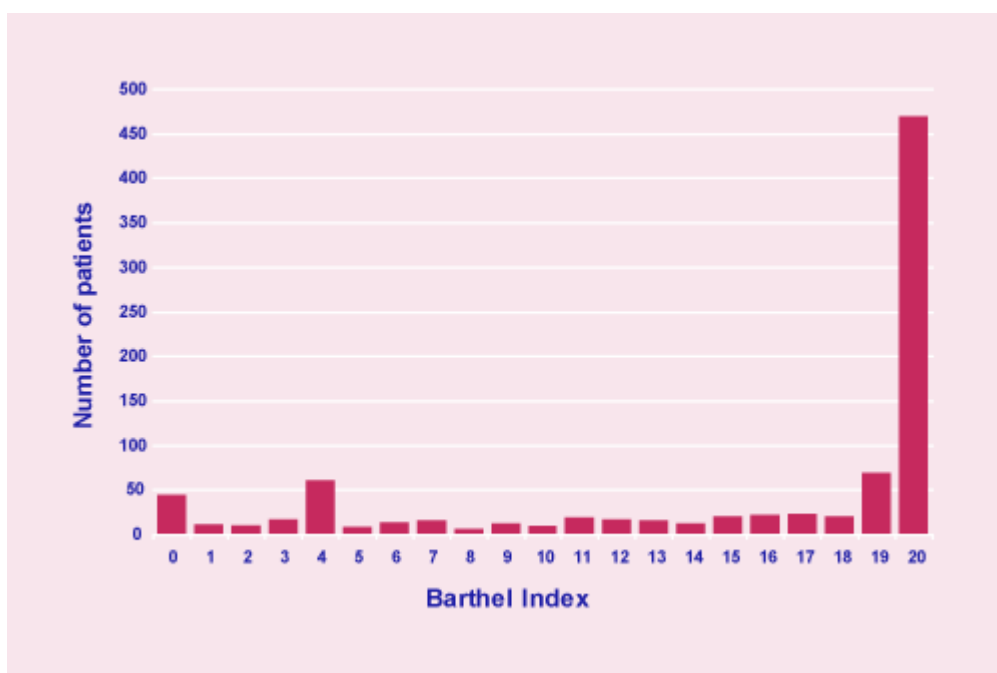

Figure 6. Barthel Index *n=1,235*

The APACHE II score is a severity of illness score that measures the degree of acute physiological impairment, but also takes into account age and chronic health problems[14]. The APACHE II score was provided, or calculated from the physiological variables provided on the intensive care questionnaire, in 78% (1,241/1,596) of cases. The physiological variables were incomplete in 22% (354/1,596) cases and absent in one. Figure 7 shows the distribution of scores by number of patients for those that were completed in full.
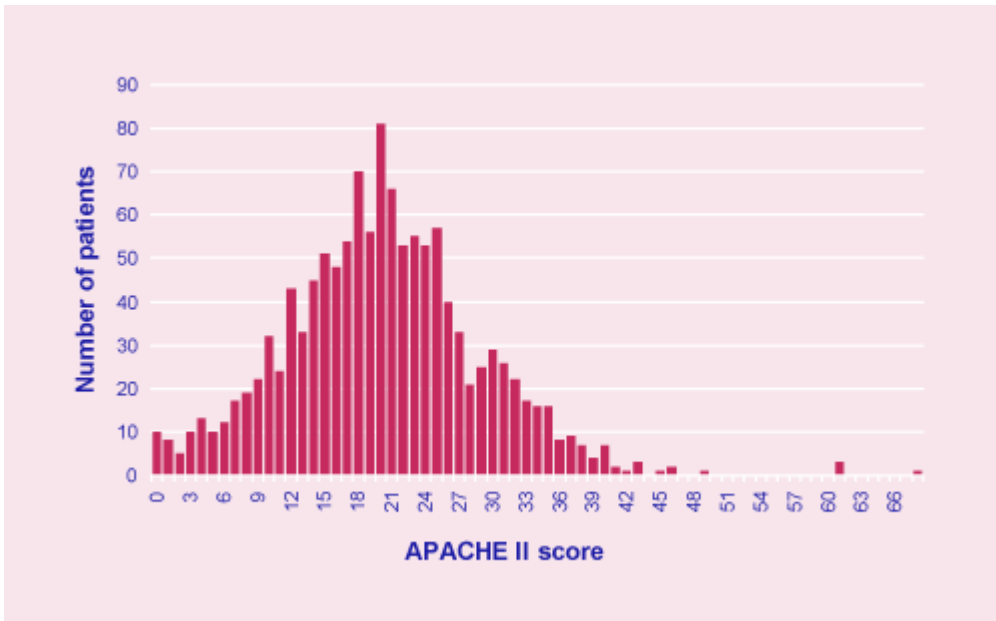
Figure 7. APACHE II score *n=1,596*

There were 64% (795/1,235) of cases where the Modified Early Warning Score [15] had been completed in full on the physician questionnaire, 22% (275/1,235) of cases where it was incomplete and 13% (165/1,235) of cases where the question was not answered. Figure 8 shows the distribution of scores by number of patients for those that were completed in full.
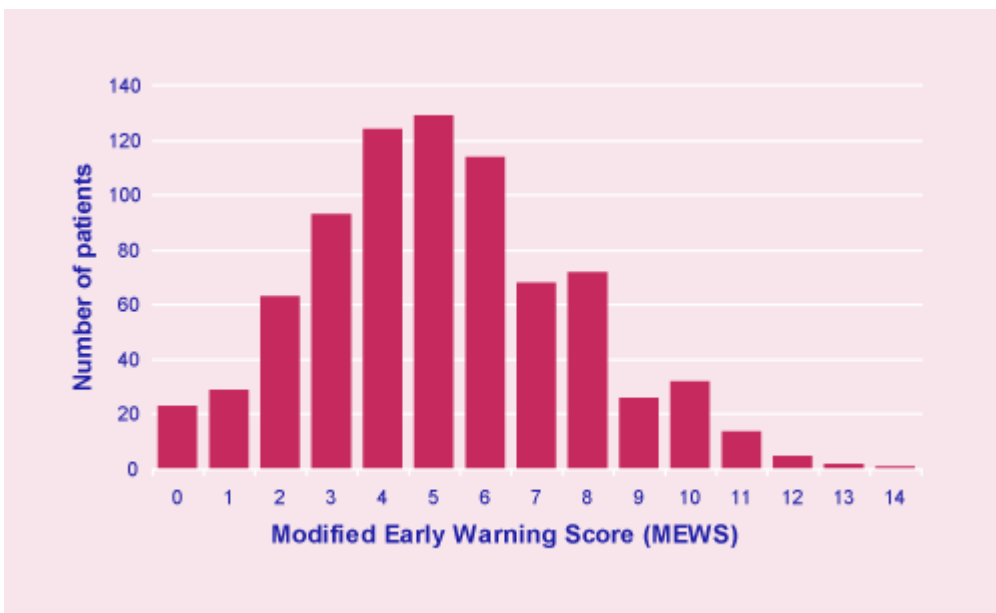

Figure 8. Modified Early Warning Score *n=1,235*

The Glasgow Coma Score [16] was provided in 90% (1,431/1,596) of cases on the intensive care questionnaire. The score was incomplete in three cases and not answered in 162 cases. Figure 9 shows the distribution of scores by number of patients for those that were completed in full. The unusual distribution of Glasgow Coma Score is probably a reflection that many sedated patients were incorrectly assigned to a Glasgow Coma Score of three, rather than the pre-sedation Glasgow Coma Score, as it is unlikely that such a high number of patients actually had such a low coma score.
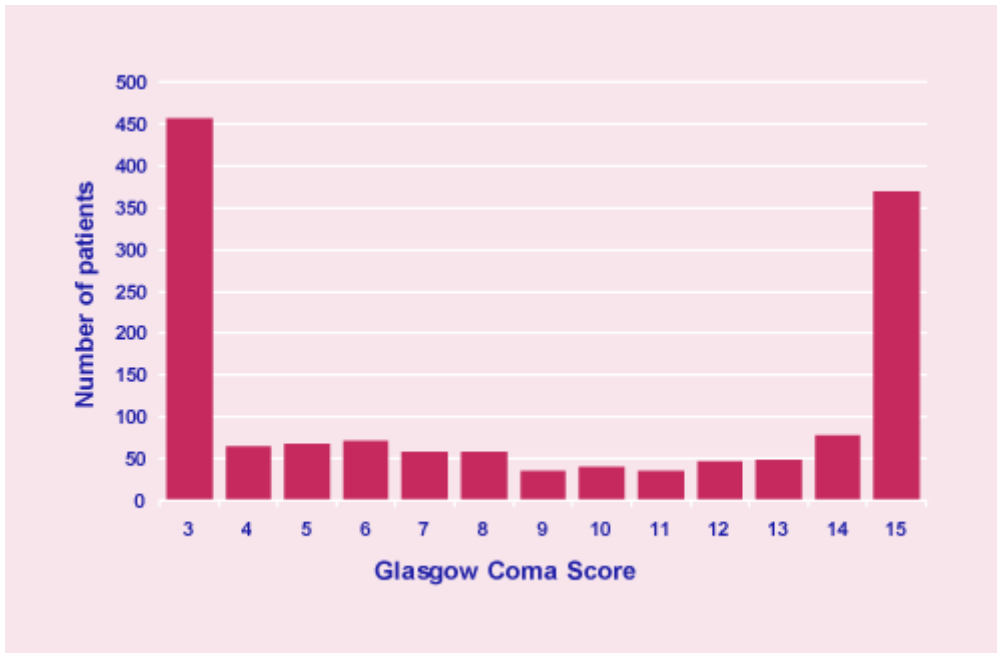
Figure 9. Glasgow Coma Score *n=1,596*

As the data were available for most, though not all, patients for each score, it is believed that the sample presented is representative of the population.