PICANet report on COVID-19 confirmed cases admitted to paediatric intensive care

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Data cut off for inclusion in this report: 29 Sep 2020

Please use the following format when citing this report: Paediatric Intensive Care Audit Network report on COVID-19 confirmed cases in PICU (published 12th November 2020): Universities of Leeds and Leicester.

1. Data collection and caveats

- This report presents data on children with a confirmed COVID-19 diagnosis treated in a paediatric intensive care unit (PICU) in the United Kingdom (UK). These children may not primarily be in PICU because of COVID-19 but all have tested positive to the virus either prior to or during the PICU admission.

- This report includes data from children both with and without a Paediatric Multisystem Inflammatory Syndrome temporally associated with COVID-19 (PIMS-TS) diagnosis.

- On a real-time weekly basis, PICUs were asked to return brief information on testing information on patients who are screened for COVID-19. This information was collated with routinely collected PICANet data and data from a customised audit on COVID-19 for analysis in this report.

- As with all data collection, there is a lag in terms of reporting and therefore information presented here is provisional and subject to change.

2. Patient numbers

- This report contains data on 94 PICU care episodes (see Section 6 for definition) for 90 children (<18 years) where the child tested positive for COVID-19 and was treated in a PICU in the UK, who had data recorded on the PICANet database up to the data cut off point (29 September 2020). This is an increase of 21 care episodes and 20 children from our previous report published 23rd June 2020.

- PICANet are also aware of one additional admission for which data were not available at the time of data download.

- These 90 children tested positive between 14 March and 25 September 2020.

- Peak weekly admissions occurred in the week commencing 06 April 2020 (Figure 1).
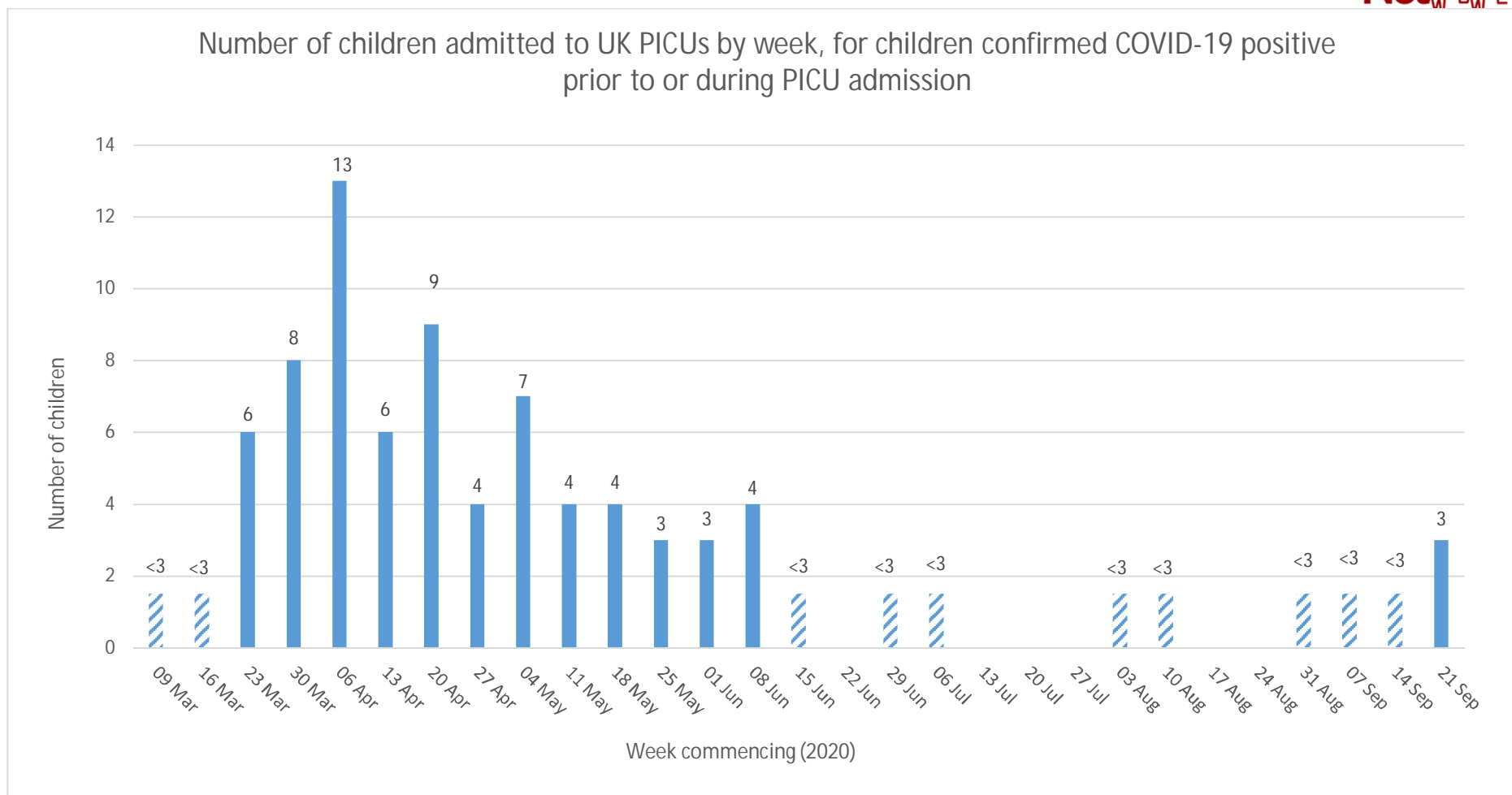
Number of children admitted to UK PICUs by week, for children confirmed COVID-19 positive prior to or during PICU admission

Figure 1: PICU admissions for COVID-19 positive children by week

The number of children admitted to UK PICUs, from the week commencing 09 March 2020, where the child was confirmed COVID-19 positive prior to or during PICU stay, presented by week based on date of admission for the child's first PICU care episode. One child admitted before 09 March 2020 has been excluded from this figure (n=89). Hashed bars indicate where statistical disclosure control has been applied due to small numbers and represent that fewer than three admissions occurred during a specific week.

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3. Patient characteristics

Characteristics of the 90 children included in this report are presented in Table 1.

- The median age of COVID-19 positive children when admitted to PICU was 9 years (interquartile range (IQR): 1-13 years).

- 60% of the children were male.

- Approximately two-fifths of children were White (38%), just under one third were Asian (30%) and approximately one- fifth were Black (19%). Data on ethnicity were unavailable for 3% of children.

- Over half (54%) of children were admitted to PICU for infections or respiratory conditions with a further 14% for endocrine/metabolic reasons and 10% for neurological problems.

- 92% (n=83) of the initial admissions for these children were unplanned admissions to PICU (where the admission was not expected and therefore was an emergency admission).

- 18% had laboratory confirmation of COVID-19 prior to their first PICU admission (n=16).

Table 1: Characteristics of the 90 children treated in UK PICUs who were laboratory confirmed positive for COVID-19.

	n=90
Age at admission (years)	
Median (IQR)	9 (1-13)
Min-Max	0-17
Sex	
Male, n(%)	54 (60.0%)
Female, n(%)	36 (40.0%)
Ethnicity	
White, n(%)	34 (37.8%)
Asian, n(%)	27 (30.0%)
Black, n(%)	17 (18.9%)
Other, n(%)	9 (10.0%)
Unknown, n (%)	3 (3.3%)
Primary diagnosis group	
Infection/Respiratory, n(%)	49 (54.4%)
Endocrine/metabolic, n(%)	13 (14.4%)
Neurological, n(%)	9 (10%)
Cardiovascular, n(%)	8 (8.9%)
Other, n(%)	11 (12.2%)
Laboratory confirmation timing	
Prior to first PICU admission, n(%)	16 (17.8%)
On date of first PICU admission, n(%)	47 (52.2%)
Post first PICU admission, n(%)	27 (30.0%)

Abbreviations: IQR=Interquartile range; Min=minimum; Max=maximum

4. Treatment provided in the 94 PICU care episodes for the 90 children who tested positive for COVID-19

This section presents information on treatment provided at any point during the 94 PICU care episodes including before confirmation of COVID-19, where applicable. Four PICU care episodes were ongoing at the time of data cut off. One of these records did not have treatment data available at the time of analysis but is included in the denominator when calculating percentages; the other three episodes are included in analysis and the denominator but only represent treatment recorded to date of download.

- Invasive ventilation (the highest level of respiratory support) was required in 58% of care episodes (n=54) for a median of 5 days (IQR: 3-11 days).

- Renal support was provided in fewer than 5 of the 95 care episodes (<5%).

- The child received a continuous vasoactive infusion in 42 care episodes (45%)

- Extracorporeal membrane oxygenation (ECMO) was received in fewer than 5 care episodes (<5%).

5. Patient outcomes

- At the time of data cut off, four children remained on PICU. Of the remaining 86 children, 7 died in PICU and 79 had been discharged (88%) either to an alternative intensive care facility, another ward or unit within hospital or home. It is not possible to say that any of the deaths on PICU were as a direct result of COVID-19, merely that these children had a positive COVID-19 test prior to or during their PIC admission or at post-mortem.

- Of the 7 children who died, 6 were aged 12 years or older and all had other pre-existing health conditions/co-morbidities.

- The median length of stay for the 90 care episodes for the 86 children who were no longer in PICU was 4.3 days (IQR: 2.3-10.1 days).

6. Methods

If a child was transferred between PICUs or was readmitted to PICU less than 48 hours post PICU discharge then the child's care is classed as a continuous care episode. For children readmitted to PICU more than 48 hours post PICU discharge the re-admission is considered separately as a new episode of PICU care. Analysis based on PICU care episodes uses the first available patient characteristics and admission details and the last available discharge information. Treatment provided in a care episode is an aggregate of all information available. Length of stay is calculated based on PICU care episode as the difference in days between the admission date for the care episode and the discharge date from the episode; in cases where the child was re-admitted to PICU within 48 hours of PICU discharge or transferred, the calculation of length of stay includes the period where the child was not being treated within a PICU.

Length of stay in days was calculated as the difference in days between the admission date and discharge date. Days of invasive ventilation includes any day where invasive ventilation was given at any point.

7. Acknowledgements

Source: PICANet database