

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

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Please use the following format when citing this report: Paediatric Intensive Care Audit Network report on COVID-19 confirmed cases in PICU (published 8th July 2021): 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) or Republic of Ireland (ROI). These children **may not primarily be in PICU because of COVID-19** but all tested positive to the virus either prior to or during their PICU admission.
- This report includes data for children diagnosed with COVID-19 **both with and without** a Paediatric Multisystem Inflammatory Syndrome temporally associated with COVID-19 (PIMS-TS) diagnosis.
- COVID-19 positive children are identified for inclusion in this report based on information collected via the PICANet customised audit on COVID-19.
- 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 **300 PICU care episodes** (see Section 6 for definition) **for 291 children** (<18 years) where the child tested positive for COVID-19 via polymerase chain reaction (PCR) test prior to or during their admissions to a PICU in the UK or ROI. (Note: this report includes children with confirmation of COVID-19 via PCR recorded on the PICANet database at the point of data cut off point on the 11 Jun 2021).
- Of the 291 children included in this report, 262 had a date recorded for when they first tested positive for COVID-19 via PCR test, this ranged between 14 March 2020 and 26 May 2021.
- Peak weekly admissions occurred in the week commencing 11 Jan 2021. There were 10 or more PICU admissions per week in the week commencing 06 Apr 2020, 23 Nov 2020 and seven consecutive weeks from 28 Dec 2020 to the end of the week commencing 08 Feb 2021 (Figure 1).

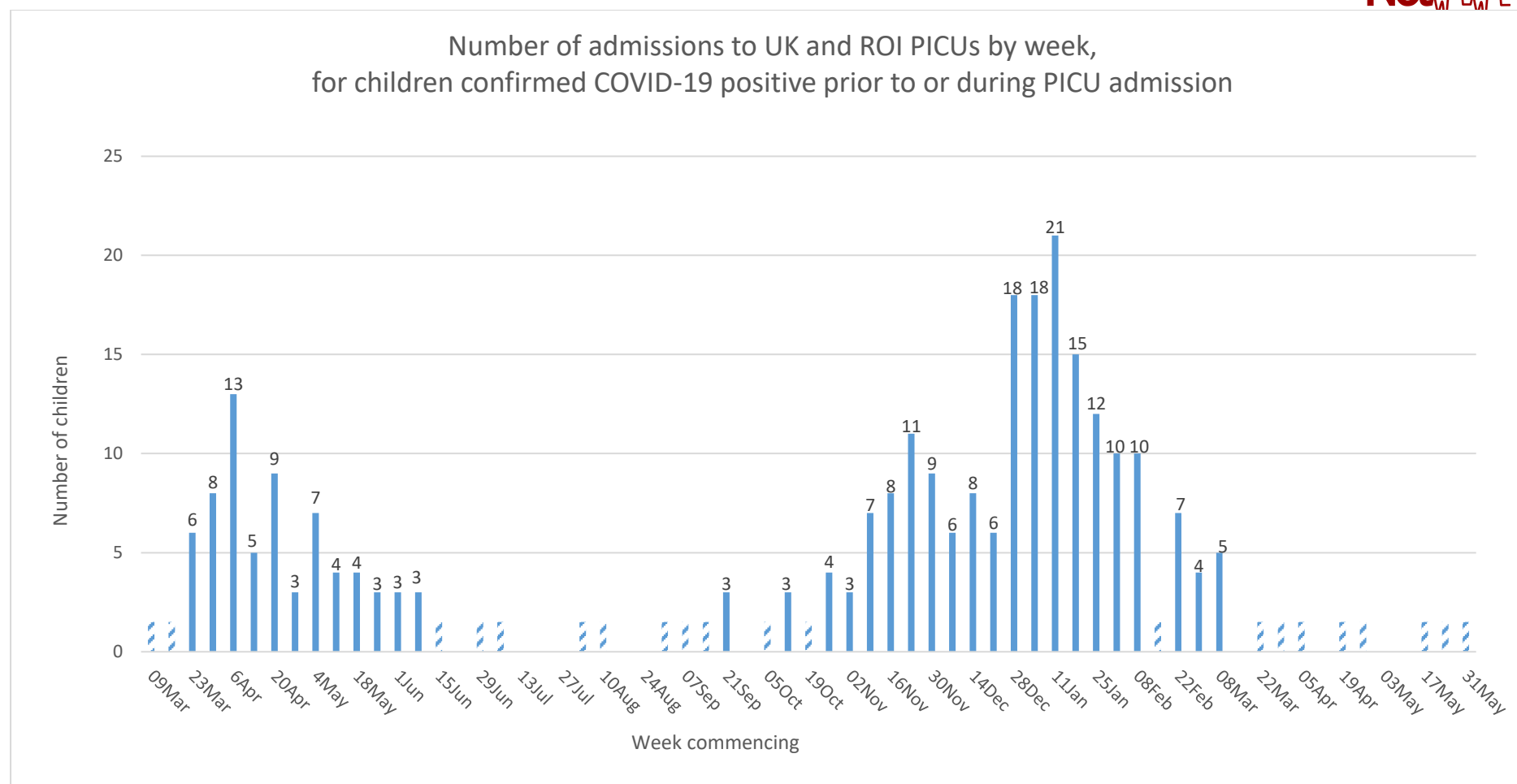


Figure 1: PICU admissions for COVID-19 positive children by week

The number of children admitted to UK and ROI 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=290). 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.

3. Patient characteristics

Characteristics of the 291 children included in this report are presented in Table 1.

- The **median age** of COVID-19 positive children when first admitted to PICU was **10 years** (interquartile range (IQR): 3-13 years).
- **61%** of the children were **male**.
- **Two-fifths** of children were **White (40%)**, just under **one third** were **Asian (29%)** and approximately **one-sixth** were **Black (16%)**. Data on ethnicity were **unavailable** for 7% of children.
- **Over half (54%)** of children were admitted to PICU **for infections or respiratory conditions** with a further 19% for endocrine/metabolic reasons and 8% for neurological problems.
- **93% (n=270)** of the initial admissions for these children were **unplanned admissions** to PICU (where the admission was not expected and therefore was an emergency admission). Admission type was unknown for one child.
- 32% had laboratory confirmation of COVID-19 on a date prior to their first PICU admission (n=92), 40% had confirmation on the date of admission (n=120).

Table 1: Characteristics of the 291 children treated in UK PICUs who were laboratory confirmed positive for COVID-19.

	n=291
Age at admission (years)	
Median (IQR)	10 (3-13)
Min-Max	0-17
Sex*	
Male, n(%)	178 (61.2%)
Female, n(%)	113 (38.8%)
Ethnicity	
White, n(%)	116 (39.9%)
Asian, n(%)	83 (28.5%)
Black, n(%)	47 (16.2%)
Other, n(%)	15 (5.2%)
Mixed, n(%)	11 (3.8%)
Unknown, n (%)	19 (6.5%)
Primary diagnosis group	
Infection/Respiratory, n(%)	157 (54.0%)
Endocrine/metabolic, n(%)	54 (18.6%)
Neurological, n(%)	24 (8.3%)
Cardiovascular, n(%)	21 (7.2%)
Gastrointestinal, n(%)	12 (4.1%)
Other, n(%)	20 (6.9%)
Unknown, n(%)	3 (1.0%)
Laboratory confirmation timing	
Prior to first PICU admission, n(%)	93 (32.0%)
On date of first PICU admission, n(%)	120 (41.2%)
Post date of first PICU admission [‡] , n(%)	49 (16.8%)
No first positive date available, n(%)	29 (10.0%)

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

‡Only child who testing positive for COVID-19 via PCR test before or during a PICU admission are included in analysis, any child with only confirmation dates following their last recorded discharge from PICU are excluded from this report.

4. Treatment provided in the 300 PICU care episodes for the 291 children who tested positive for COVID-19

This section presents information on treatment provided at any point during the 300 PICU care episodes, including treatment given before confirmation of COVID-19 where applicable. Three 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 two episodes are included in analysis and the denominator, but only include treatment recorded to date of download.

- **Invasive ventilation** (the highest level of respiratory support) was required in **49% of care episodes** (n=146) for a median of five days (IQR: 3-11 days).
- **Renal support** was required in nine of the 300 care episodes (**3%**).
- The child received a **continuous vasoactive infusion** in 134 care episodes (**45%**)
- **Extracorporeal membrane oxygenation (ECMO)** was received in less than 5 care episodes (**<2%**).

5. Patient outcomes

- At the time of data cut off, **three children remained on PICU**. Here we present the outcomes for the remaining 288 children:
- **277 had been discharged (95%)** 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 COVID-19 positive test prior to or during their PIC admission or at post-mortem.
- **11 children died in PICU (3.8%)**: seven were aged 12 years or older and nine had other pre-existing health conditions/co-morbidities.
- The overall **median length of stay** for the 297 care episodes in these 288 children was **3.8 days** (IQR: 1.8-8.3 days).
- The median length of stay for children who died in PICU was longer than that for children who survived PICU at 10.8 days (IQR: 1.4-41.6) compared with 3.7 days (IQR: 1.8-7.9). The former group included an outlying observation of a stay exceeding 100 days and once this was removed, the median fell to 7.6 days (IQR: 1.4-13.5).

Appendix

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.

Acknowledgements

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