The most common diagnoses and costs of paediatric emergency department visits: A population-based cohort study

Acute illnesses represent the most frequent reason for paediatric emergency department (ED) visits and hospital admissions in children. Most of the previous studies of paediatric EDs have focused on chief complaints or reported only selected diagnoses.\(^1\)\(^-\)\(^3\) Here, we set out to investigate the diagnoses and costs of paediatric ED visits in a population-based cohort study in Finland.

The study cohort represented a population-based cohort of acutely ill children from September 2014 to August 2015.\(^4\) We have earlier presented the aetiology of acute infectious diseases in the same cohort. The paediatric ED of Oulu University Hospital, Finland, serves as a referral clinic for all acutely ill patients under 16 years of age and up to 18 years of age for patients with chronic diseases. During the study, the hospital region’s primary catchment area had 87 082 children under 16 years of age and 22 549 children under 5 years of age. Children with minor or major trauma were not included. We retrieved ICD-10 (International Classification of Diseases, Tenth Revision) diagnoses registered by physicians. The direct costs of ED visits, including laboratory and radiology costs, were obtained from the hospital’s electronic reimbursement system. The Ethics Committee of Oulu University Hospital approved the study protocol. We calculated the proportions and population-based incidence with a 95% confidence interval (95% CI). We analysed the data using the IBM SPSS Statistics version 27 software (IBM Corp).

During the study period, a total of 3486 individual patients made 4621 paediatric ED visits. 2473 patients were boys (54%). Altogether, 16% (n = 761) of patients were younger than three months, and 29% (n = 1351) were younger than one year of age. The annual population-based incidence of paediatric ED visits was 261/1000 (26%, 95% CI 249–273) for children under one year of age, 75/1000 (7.5%, 95% CI 72–79) for children aged one to five years and 26/1000 (2.6%, 95% CI 25–27) for children aged five to 16 years. The mean duration of a paediatric ED visit was 2.48 h (SD 2.0 h). During the year, the total number of patients at the busiest hour of the day (n = 357, 12:00–12:59 PM) was 19-fold higher compared with the quietest hour (n = 19, 06:00–06:59 AM).

Forty-nine per cent of all ED visits involved the ten most common diagnoses, which were bronchiolitis or viral wheezing (J21*, 8.7% [*indicates that all subgroups under J21 were included]), upper respiratory tract infection (J06*, 7.8%), gastroenteritis (A09* & A08*, 6.0%), unspecified viral infection (B34.9, 5.7%), febrile seizures or other seizures (R56.0 & R56.8, 4.6%), otitis media (H66*, 3.8%), acute abdominal pain (R10*, 3.7%), pneumonia (J18*, 3.3%), pyelonephritis (N10, 3.0%) and diabetes (E10*, 1.9%) (Figure 1). The most common neonatal diagnoses were hyperbilirubinaemia (1.4%, n = 64) and feeding problems (0.6%, n = 27). The neonatal sepsis diagnosis code.

![Figure 1](https://example.com/image1.png) (A) The most common diagnoses of ED visits. The cumulative proportion of ED visits is presented with a line (% right Y-axis). (B) The highest annual costs of paediatric ED visits. The cumulative cost of the most common diagnoses within all ED costs is presented with a line (% right Y-axis).

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was given for nine infants (0.2%). Altogether, the proportion of patients admitted to the PICU was 1.7% (n = 80). The most common reasons for PICU admission were diabetes (E10.1, E10.9, n = 11), febrile seizure or other seizure (R56.0, R56.8, n = 8), viral wheezing (J21.90, n = 5) and intoxication (T51.0, Y91.1, T36, n = 5). None of the patients died at the ED or within two weeks of the first ED visit (0%, 97.5% CI 0%-0.08%). The mean cost of a paediatric ED visit was 332 euros (SD 103 €), ranging from 101 € to 1126 €. The highest total annual costs were caused by bronchiolitis or viral wheezing (J21, 8.4%), upper respiratory tract infections (J06, 7.2%) and acute gastroenteritis (A08, A09, 6.0%) (Figure 1).

This study had several strengths. A large cohort of consecutive, acutely ill children allowed us to produce an estimate of population-based incidences of paediatric ED visits. In addition, we had reliable data on the direct costs of each paediatric ED visit. However, this study had some limitations. During the study year, the number of respiratory syncytial virus infections was lower than average, whereas the number of influenza infections was as usual.4 In addition, bronchiolitis caused by respiratory syncytial virus and viral wheezing caused by rhinovirus are likely different diagnostic entities. Yet, they are presented together in the present study due to the ICD-10 diagnosis code system with the same diagnosis code (J21*). There also may be variation between physicians in selecting different diagnoses.

In this register-based cohort study, bronchiolitis and viral wheezing were the most common diagnoses and caused the highest annual costs of ED visits. Common respiratory infections have produced the most costs of paediatric ED visits in earlier studies as well.5

ACKNOWLEDGEMENT
This study was supported by the Finnish Foundation for Pediatric Research and The Maud Kuistila Memorial Foundation.

CONFLICT OF INTEREST
All authors declare no conflict of interest.

REFERENCES