# Predictors of Unplanned Re-attendance at a Large Paediatric Emergency Department in South London, 2015 – 2016

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## Aims
-To assess the rate of re-attendance in a paediatric emergency department (ED)
-To identify risk factors—either modifiable or non-modifiable— which predict re-attendance to emergency departments amongst a paediatric patient cohort.

## Background
Unplanned re-attendances to paediatric EDs pose a significant burden on the operability and efficiency of such departments by diminishing resources [1]. The reasons for unplanned re-attendances are highly variable and are influenced by a myriad of factors, such as co-morbidites [2]. Identifying predictors of re-attendance may pave the way for further research and strategy implementation to reduce potentially avoidable re-attendances.

Surprisingly, little research has been conducted to identify predictors for re-attendance. Nevertheless, there is data available to suggest that factors such as age and doctor's seniority at first visit may predict re-attendance to the ED. This study seeks to reproduce such results in children, as well as to identify other predictors which, as of yet, have not been formally researched.

## Material/Methods

We conducted a retrospective review of available data from the electronic database used by the emergency department at the hospital.

The individuals were selected from a group of patients enrolled in the CABIN project, a quality improvement project which sought to assess the efficacy of point of care testing in diagnosing individuals with specific illnesses. As a result, the data of 490 children aged up to 16 years old— who had attended the emergency department between December 2015 and March 2017— were collected and analyzed. Data collected included: age, length of stay of first visit, doctor seniority during the first visit, and patient disposition during first visit.

Categorical variables were compared using the chi-squared test, with statistical significance being set at p < 0.05. In addition, odds ratios were calculated for variables with statistical significance. We used Microsoft Excel and open source software to carry out these calculations. [3]
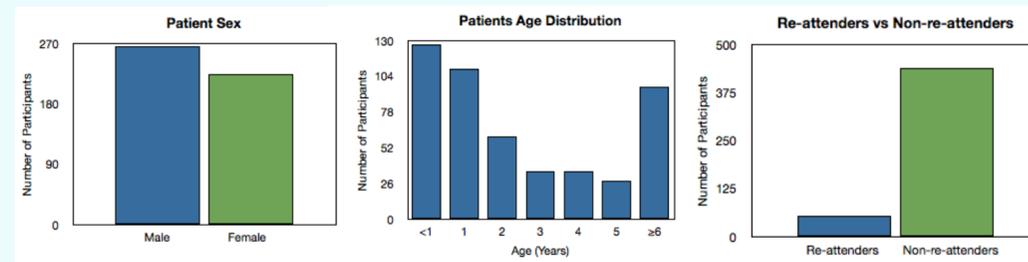
## Results

### Fig. 1,2,3: Patient Demographics



### Table 1. Predictors of Paediatric Re-attendance within 28 Days

| Characteristic | No. Re-attenders n = 53 (%) | No. Non-re-attenders n = 437 (%) | p-value |
|---|---|---|---|
| **Age** | | | 0.038 |
| <3 Years | 39 (74) | 257 (59) | |
| ≥3 Years | 14 (26) | 180 (41) | |
| **Antibiotic TTO** | | | 0.424 |
| Yes | 16 (30) | 110 (25) | |
| No | 35 (66) | 311 (71) | |
| **Disposition** | | | 0.248 |
| Ward | 11 (21) | 102 (23) | |
| PAU | 14 (26) | 76 (17) | |
| Sent Home | 27 (51) | 258 (59) | |
| **Grade of Doctor †** | | | 0.642 |
| F1/F2 | 0 (0) | 4 (<1) | |
| SHO | 18 (34) | 173 (40) | |
| Clinical Fellow | 3 (6) | 32 (7) | |
| SpR | 17 (32) | 103 (24) | |
| Consultant | 8 (15) | 57 (13) | |
| **Length of Stay** | | | 0.109 |
| Short | 21 (40) | 218 (50) | |
| Long | 32 (60) | 207 (47) | |

† Data for >5% of participants is missing since grade of doctor at first visit could not be identified

Of the five predictors analyzed, only age was found to be significant (p = 0.038). The odds ratio for this predictor was calculated to be 1.95 with a 95% confidence interval of 1.03 - 3.70.

## Discussion
The implications of our results are two-fold. Firstly, it has been demonstrated that children under the age of 3 are at a significantly increased chance of unplanned ED re-attendances. Secondly, variables such as doctor's seniority at first visit, do not appear to play a role in subsequent ED re-attendances. Such results were not expected, particularly given the fact that similar studies found significance in variables such as median length of stay and doctor's seniority at first visit [4].

Limitations:
- Relatively small sample size that would benefit from recruiting more children.
- Data were collected from a single center and may not be generalisable to other populations.
- A thorough assessment of predictors of re-attendance would include a multivariable regression analysis for more accurate results.

Age as a significant predictor of unplanned re-attendance may be due to a variety of reasons, including family members being particularly concerned about and sensitive to changes in the health status of very young children. Consequently, resources (e.g. information leaflets) could be offered in the future to highlight the red flags for when to bring such children into the ED. ED pathways could also be implemented specifically for children under the age of 3. These pathways may, for example, seek to triage under 3 year olds separately from older children, effectively managing unplanned re-attendance in this high risk patient group.

## Conclusion
The study demonstrates that, of a variety of potential predictors for unplanned re-attendance, only age was found to be a significant predictor. Patient education and pathway implementation may serve as means to minimizing unplanned re-attendances in the future.

## References
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