TRENDS IN PAEDIATRIC HOSPITAL ADMISSION AND PRESCRIBING FOR ASTHMA IN IRELAND OVER A TEN YEAR STUDY PERIOD.

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Background:

- Ireland has the 4\textsuperscript{th} highest recorded rate of asthma in the world and its prevalence worldwide is rising.\textsuperscript{1}

- However, hospital admissions for asthma have decreased in many developed countries.

- It has been hypothesised that this downward trend in hospitalisations may be due to better prescribing and better primary care.\textsuperscript{2}


Background:

- No published studies in Ireland on examining trends in hospital admission in children with asthma and the possible association between prescribing patterns for asthma medications.
Aim of the study:

- To investigate ten year hospital admissions and prescribing trends for children with asthma in Ireland.
Method:

- **Data extracted from Health Atlas database**
  - **Morbidity data** based on HIPE data. All hospital discharges for patients aged <15 years with principal diagnosis of asthma (ICD-9 Codes 493) from 2000-2004 and (ICD-10 Codes J45-J46) from 2005-2009.
  - **Prescribing data** based on Primary Care Re-imbursement System (PCRS). Asthma-related drugs were identified using ATC Codes R03
Statistical analyses:

- Data analysed using JMP, SAS and StatsDirect.

- Rates were age-standardized to the EU standard population (direct method).

- Poisson regression was used and significance set at p<0.05.

- Further trend analysis was carried out in StatsDirect.
Results- No. discharges/patients <15 yrs with principal diagnosis asthma:

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of discharges</th>
<th>No. of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>2,534</td>
<td>2,241</td>
</tr>
<tr>
<td>2001</td>
<td>2,411</td>
<td>2,129</td>
</tr>
<tr>
<td>2002</td>
<td>2,171</td>
<td>1,900</td>
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<td>2003</td>
<td>2,280</td>
<td>2,010</td>
</tr>
<tr>
<td>2004</td>
<td>2,536</td>
<td>2,186</td>
</tr>
<tr>
<td>2005</td>
<td>2,567</td>
<td>2,226</td>
</tr>
<tr>
<td>2006</td>
<td>2,654</td>
<td>2,338</td>
</tr>
<tr>
<td>2007</td>
<td>1,935</td>
<td>1,656</td>
</tr>
<tr>
<td>2008</td>
<td>1,910</td>
<td>1,664</td>
</tr>
<tr>
<td>2009</td>
<td>1,799</td>
<td>1,565</td>
</tr>
<tr>
<td>Total</td>
<td>22,797</td>
<td>19,915</td>
</tr>
</tbody>
</table>

*12% are repeat admissions*
Results:

Figure 1. Age standardised hospital discharge rate 1,000 population for those aged 0-14 year with a principal diagnosis of asthma.

Test for trend: $p=0.03$

Jean do you know of any reason why significant reduction in hosp. discharges in 2007??
JEAN: THIS IS IN HERE TO SHOW THAT THE REDN. IN HOSP ADMS IN 2007 NOT SEEN IN OTHER DISEASES SO LIKELY TO BE REAL!

Test for trend: p>0.08
Results:

Figure 3. Age-specific rates for those with a principal diagnosis of asthma on hospital discharge.

Significant linear trend for age-groups 0-4 years and 10-14 years.
Results-Demographic profile:

- Male to Female Ratio 1.82:1
- Most common age group – 0-4 years
- 22,705 (99.5%) discharged home
- 8,531 (37.4%) discharges medical card holders
- Median LOS 2 days (range 1-47)
- Significant reduction in Median LOS from 2006 onwards (2 days vs. 1 day, p<0.001)
- 46,363 bed days used over ten year study period.
- 155 (0.7%) discharges involved stay in ICU – 304 ICU bed days.
Results-Prescribing data:

- In 2000, 50,447 children received asthma medications which had increased to 73,184 children by 2009.

- Males and the youngest age were most likely to receive asthma medication.
Results-Prescribing

Figure 3. Age-standardised rate for asthma prescribing in children (0-15 years) 2000-2009

*significant upward linear trend, p<0.001
NOTE FOR JEAN: This is all RO3 prescribing for children – is this what you would like to see – is this evidence of good prescribing???

Figure 4. Prescribing of asthma medications to children (0-15yrs) for years 2000-2009 by type of drug.
Strengths and Limitations:

- First study of its kind in Ireland to look at prescribing patterns and hospital discharges.

- Study covers a long time period – essential to minimize random variation.

- Although there was a change in ICD code during study period it has been suggested that ICD-9 and ICD-10 codes for asthma are strongly correlated – so decrease not likely to be a coding issue.
Strengths and Limitations:

- Morbidity data from HIPE based on those <15 years for ease of calculation of age standardised rates.

- Prescribing data from PCRS based on data obtained from the General Medical Services (GMS) scheme different age groups.

- Eligibility for the PCRS scheme is means-tested for those under 70 yrs of age.

- Cannot be considered representative of the entire population - socially disadvantaged and elderly over-represented.

- Captures approx. 28% of all prescribing in this age-group.
Strengths and Limitations:

- Data from PCRS on demographic details of patient, information of drugs prescribed but **no** diagnostic data.

- No data on A&E attendances the reduction in hospital admissions may be due to better care in A&E.

- We are currently working with A&E consultants.
Summary:

- The number and age standardised rate for hospital discharges for asthma has decreased significantly over the 10 year study period- similar to findings in Finland.

- There has also been a significant increase in the number and rate of prescribing of asthma drugs. (Jean which drug is indicative of good prescribing?)

- This study suggests that increased or can I say better? (is this true) prescribing is associated with decreased risk of hospitalisation for children with asthma.

- Further studies need to be carried out to determine if there has been a concomitant decrease in A&E admissions for paediatric asthma over the study time-period.
Acknowledgements:

- All co-authors in particular Dr. Kathleen Bennett who provided us with the PCRS data and Dr. Howard Johnson for providing the Health Atlas Data.