The Obstructive Lung Disease In Northern Sweden (OLIN)
longitudinal paediatric study I – the first 10 years

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CONCLUSIONS
The study indicates the need of careful phenotyping of asthma and the other diseases in order to understand the true nature of these diseases often regarded as solely “allergic diseases”. This longitudinal study with an exceptional good participation rate includes important sources of data for further analyses that will contribute to the understanding of the development and the nature of asthma and allergic sensitization. The study is still in progress and, thus, a new cohort is recruited in 2006.

BACKGROUND AND AIM
Prospective studies of asthma and allergic conditions generate data about the natural course of the conditions including prevalence, incidence, remission, relapse as well as risk factors. Longitudinal cohort studies based on the general population are scarce. School age is important since it includes the shift from childhood wheeze to adult asthma and major changes in environmental exposures.

A prospective study of school children in Northern Sweden was initiated in 1996 (1). The overall aim was to study incidence, remission and relapse of asthma, rhinitis, eczema and allergic sensitization, and related risk factors for the conditions. This poster summarizes the study design, methods and some important results from the first ten years of the first OLIN paediatric study.

STUDY DESIGN
In 1996 a cohort of 3,525 children aged 7/8 years in three towns in northern Sweden were invited to a questionnaire survey using an expanded ISAAC protocol, and 97% participated. The cohort has been followed up yearly with high participation rates.

Skin prick tests were conducted 1996, 2000 and 2006/07. Allergens were measured in dust from homes and schools. Large sub-samples have participated in interviews, lung function tests, bronchial hyperreactivity tests, and analyses of IgE and IgG antibodies in serum (Figure 1).

RESULTS
Prevalence, incidence and remission
The prevalence of asthma was 6% at age 7-8 years and increased by age. The incidence of physician-diagnosed asthma after the age of 7-8 years was around 1/100/year (Figure 2). The incident cases included several different phenotypes of asthma. The prevalence of positive skin prick test (SPT) increased from 21% at age 7-8 to 30% at age 11-12 years (Figure 3) and to 42% at age 19 years.

Figure 1. Study design and measures

Figure 2. Incidence rate of physician-diagnosed asthma during three years (children aged 7/8 years in 1996).

Figure 3. Prevalence of positive SPT at age 7/8 (1996) and 11/12 (2000).

Analyses of dust from homes and schools confirmed the absence of mite in this region. Validation of the skin tests by S-IgE showed good correlation. Remission of allergic sensitisation was rare, while asthma remission was 5% yearly.

The transition into teenage required a change in methodology, and from the age of 12/13 the children completed the questionnaires themselves. The agreement between the children’s and parents’ answers regarding asthma was excellent.

Risk factors
The main risk factor for asthma, allergic sensitisation, increased in importance with age from age 7 to teenage, while the impact of the hereditary component was constant. Asthma among both parents conferred a multiplicative effect (OR 10), while asthma among siblings was only a marker for parental asthma and not a risk in itself.

Table 1. Risk factors for asthma at age 7/8, by multiple logistic regression. Odds in Risks Ratios (OR).

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>allergic asthma OR</th>
<th>non-allergic asthma OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boy</td>
<td>1.3</td>
<td>1.0</td>
</tr>
<tr>
<td>Family history of asthma</td>
<td>&gt;0.001</td>
<td>&gt;0.001</td>
</tr>
<tr>
<td>House dampness</td>
<td>1.4</td>
<td>1.0</td>
</tr>
<tr>
<td>Mother smoker</td>
<td>1.2</td>
<td>1.0</td>
</tr>
<tr>
<td>Pets at home</td>
<td>0.6</td>
<td>1.0</td>
</tr>
<tr>
<td>Breast feeding &gt;12 months</td>
<td>1.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

At age 7-8 years, 50% of the asthmatics were sensitised, and allergic and non-allergic asthma had different risk factor pattern (Table 1). The allergic status was highly associated to both incidence and remission of asthma.

Environmental risk factors decreased in impact after the age of seven. Avoidance of pets at home did not protect from asthma or allergic sensitisation, indeed, the opposite was found.

SELECTED PUBLICATIONS