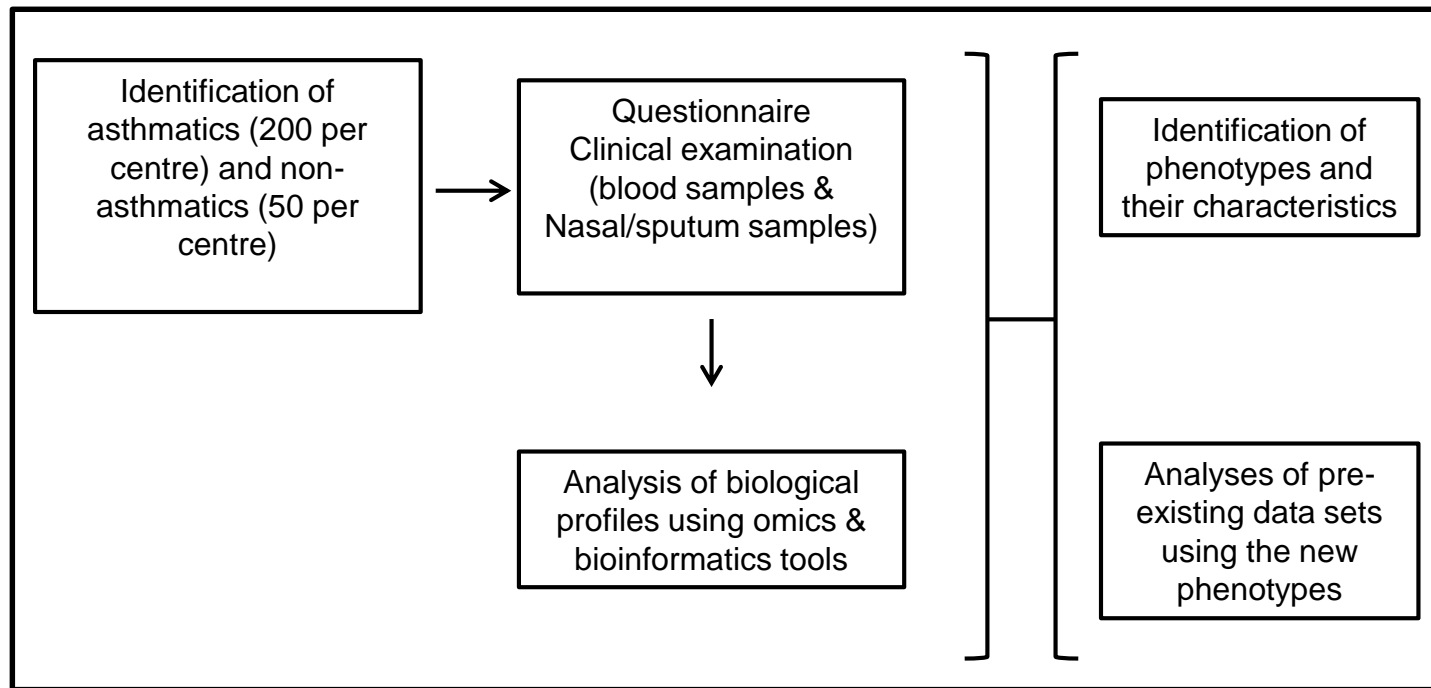# Understanding asthma phenotypes

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# AsthmaPhenotypes

The overarching objectives of this study are to:

1. better understand and characterize asthma phenotypes in HICs and LMICs, and in high/low prevalence centres;

2. to compare their characteristics, including clinical severity;

3. assess the risk factors for each phenotype;

4.  assess how the distributions of phenotypes differs between high prevalence and low prevalence centres.

| Centres | Characteristics | Study type | Data available/to be collected |
|---|---|---|---|
| **Avon Longitudinal Study of Parents and Children (ALSPAC), Bristol, United Kingdom** | A high prevalence centre in a HIC | Birth cohort study with extensive detailed longitudinal information; new data collection at age 24-25 | The next round of data collection is planned for 2015-2018, and we will 'add on' the additional data collection required for the current analyses |
| **Centre for Public Health Research (CPHR), Wellington, New Zealand** | A high prevalence centre in a HIC | Cross-sectional study of asthma in children age 12-16 years | We have previously conducted several studies involving the data collection required for the current analyses, but we will collect data in additional participants in order to obtain sufficient numbers for the current analyses |
| **Social Change, Asthma and Allergy in Latin America (SCAALA), Salvador, Brazil** | A high prevalence centre in a LMIC | Cross-sectional study of asthma in children age 12-16 years | We have previously conducted several studies involving the data collection required for the current analyses, and will now collect new data in schoolchildren attending schools in Esmeraldas Province |
| **Social Change, Asthma and Allergy in Latin America (SCAALA), Ecuador** | A medium prevalence centre in a LMIC | Cross-sectional study of asthma in children age 12-16 years | New data collection will be conducted for the current study |
| **Entebbe childhood asthma case-control study, Uganda** | A low prevalence centre in a LMIC | Cross-sectional study of asthma in children age 12-16 years | An asthma case-control study is being conducted, and we will 'add on' the additional data collection required for the current analyses. |

| Identification of asthmatics (200 per centre) and non-asthmatics (50 per centre) | → | Questionnaire Clinical examination (blood samples & Nasal/sputum samples) | | Identification of phenotypes and their characteristics |
| | | ↓ | | |
| | | Analysis of biological profiles using omics & bioinformatics tools | | Analyses of pre-existing data sets using the new phenotypes |

**Figure 2: AsthmaPhenotypes study design**

# Data collection

- Questionnaire (risk factors and symptoms)
- Skin prick tests (atopy)
- Lung function testing
- Blood samples (IgE, genetics)
- Sputum induction and nasal lavage (markers of allergic inflammation, innate immunity)

# Other possible analyses of samples

- Airways remodelling
- Airways microbiome
- Epigenetics
- Markers of neural involvement

[all of these are probably subject to finding more funding to analyse the stored samples]

# Data analysis

- Descriptive analyses comparing asthmatics and non-asthmatics
- New phenotypes
  - Latent class analysis
  - Other methods
- Repeat of descriptive analyses using new phenotypes

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