New collaboration opportunities to meet the 21\textsuperscript{st} Century challenge of developing accurate asthma diagnostic tools

**Workshop 1:** Predicting future asthma in preschool children

**Facilitator:** Dr Erika Kennington

**Opening remarks:** Lucia Garcia – Marcos

**Supporting staff:** Derry Begho

**Attendees (as per workshop recommendations):** Graham Roberts, Lucia Garcia – Marcos, Katy Pike, Edwina Wooler, Mark Ironmonger, Derry Begho

**Summary:**
Predicting future asthma in preschool children is one of the top three priority challenges in asthma diagnostics, as identified by the European Asthma Research and Innovation Partnership (EARIP). This workshop aimed to discuss the challenges, outlined below, and solutions to the issues.

**Challenges**
1. Develop a tool that combines biomarkers with a predictive test to accurately diagnose asthma in preschool children
2. Improve the quality of indices that focus on allergy and wheezing to predict asthma in preschool children

**Feedback**
Attendees were informed that these challenges are the result of a European wide consensus exercise to identify and define the top priorities in asthma research with the potential to generate the biggest impact for people with asthma. They were then presented with figures on the international prevalence and frequency of recurrent wheezing during the first year of life. Based on this data the group went on to discuss both challenges and at the end of the session came to consensus on a research application to help meet this priority.

**Insights from presentations**
In this slide the yellow line shows a vast number of children wheeze in the first three years of life. Children who start wheezing in their 1\textsuperscript{st} years of life carry on to ages 3-6 then again at age 11. These children are most likely end up becoming asthmatics.

The group felt research hasn’t advanced too much from this graph and that most of the indexes, mainly clinical indexes, trying to predict asthma are more effective.

It was noted the graph doesn’t show the other effects of wheeze and amongst preschool wheezers, clinical staff find it difficult to determine who will develop asthma and who wouldn’t. The group agreed broader trials were required to predict which age group in preschool children responds best to what treatment.
Brain storm of existing test for preschool children

➢ Monitor cough although the spectrum of a cough is enormous as cough can be caused by different things. It was also noted that house dust mites are more common in this group and presents cough, so cough isn’t a good measure. Although it was agreed that night cough and cough during/after exercise links to asthma.
➢ Family history of asthma is a good indicator
➢ General consensus that objective tests are required

Research application

Objective: To investigate what biomarker to combine with what predictive test? The group agreed it would be best to focus on blood eosinophils, plus explore others such as breath omics, urine, objective wheeze and cough.

Research Questions: Does baseline eosinophil count predict responsiveness to steroids, and is blood eosinophil count predictive of asthma in young children?

What does the study look like? 500 early wheezers (age 2-3); randomise ICS, motelukast, placebo; collect ongoing environmental history and follow up long term to see who has asthma age 5-6.

Cost and funding: Circa £3M and possible funders to include Wellcome, European Union and NIHR through the Efficacy and Mechanism Evaluation and Health Technology Assessment.

Next steps

The group decided on the following:

• Asthma UK to explore potential funders in July- August 2017
• Asthma UK to convene a working group to further develop the above application. Attendees to consider: workshop attendees plus additional expertise. Potential date in Quarter 4 2017
• Experts required in primary care and eNose.

-End