

# Intestinal worms can influence allergy and asthma risk in humans

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With the prevalence of allergy and asthma on the rise around the world, the race is on to explain this increase and stem the tide. A recent study finds a clue in an unlikely source... intestinal worms.

It is known that children brought up on farms often develop an immune response to allergies, as their immune systems are trained through regular exposure to micro-organisms. Conversely, pathogenic infections early in life, for example those caused by the [respiratory syncytial virus](#) (RSV), can equally result in a remodelling of the pulmonary [immune system](#) which can actually result in an increased risk of allergies.

Findings, to which the EU-funded ALEC project contributed, recently revealed that youngsters infected with a particular species of helminths ([intestinal worms](#)), passed on from animals, were four times more likely to develop asthma and allergies, compared to others. Quoted by the University of Bergen, one of the lead researchers, Professor Cecilie Svanes states, 'Usually, we consider a 50 % higher risk as being high, but here we see a 400 % higher risk.'

## The intergenerational puzzle

Perhaps the most surprising aspect of the study's results was that the pronounced effect on asthma and allergies for carriers of the helminths (both the *Toxocara* and *Ascaris* species), seemed to only hold true for the younger generation, as it did not have the same affect on their parents. This is a finding that the researchers cannot readily explain, though they have hypothesised that being able to do so in the future will solve the riddle of the global increase in allergies over the past decades.

Writing in the journal *Clinical & Experimental Allergy* the researchers outlined how they worked on data-sets from two Norwegian cohorts: 171 parents born 1945—1972 and their 264 offspring, born 1969—2003. They recorded allergy prevalence through interviews and clinical examinations, which included serum Immunoglobulin E (IgE) blood allergy tests and skin prick tests.

Amongst the study participants, the researchers found antibodies against *Toxocara* (associated with pets, especially cats) and *Ascaris* (associated with livestock, especially pigs) in 12 % and 18 % respectively. They also discovered more exposure in the older parental cohort (those born 1945 – 1972) compared to the offspring cohort. A surprising finding was that paternal exposure to *Toxocara* increased the [allergy](#) risk in daughters, as maternal exposure seemed to do in sons. Additionally, adjusting the data for pet keeping made no difference to the associations, indicating that the findings could not simply be explained by shared environment.

## The worldwide rise of allergies

Extensive research shows that globally, over the last few decades, the prevalence of asthma and allergies has increased significantly. The reasons for this are not yet fully understood but researchers believe it is linked to our increasingly sterilised environment, whereby people come into contact with chemicals more often than microbes, which

could otherwise strengthen our immune systems. Added to this is the concomitant explosion of urbanisation, leading to less opportunities for contact with natural immune boosters.

The Horizon 2020-funded ALEC project, whose research contributed to this study, was set up to better understand the factors which lead to poor lung function, respiratory disability and the development of Chronic Obstructive Pulmonary Disease (COPD).

Through the investigation of various determinants of poor lung function such as behavioural, environmental, occupational, nutritional and genetic (including epigenetic) factors, the study is developing a predictive test. The project aims to build an online tool for personalised risk prediction to be freely available to patients and health care providers. It is anticipated that this will lead to improved preventative treatment.

**More information:** Ageing Lungs In European Cohorts (ALEC Study): [www.alecstudy.org/](http://www.alecstudy.org/)

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