

# New statistic model forecasts the effect of tobacco consumption on childhood asthma

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A scientific study recently published on *International Journal of Statistics in Medical Research* states that tobacco consumption must be decreased by 15% in Spain, particularly at home, in order to reduce the number of childhood asthma cases. The research is signed by professors Toni Monleón-Getino and Martín Ríos, from the Department of Statistics of the University of Barcelona, and experts Oriol Vall, Carme Puig, Òscar Garcia-Algar and Antonella Chiandetti, members of the Childhood and Environment Research Group of the Hospital del Mar Medical Research Institute (IMIM).

Asthma is the most common chronic illness during childhood and adolescence in industrialized countries. Several factors have been proposed to explain asthma. It affects between 10% and 17% of children and teenagers in Spain. There is no treatment to cure this illness which may decrease considerably patients' quality of life. Although its prevalence has been increasing over the last 40 years in many countries, no statistical or simulation model existed to forecast the evolution of childhood asthma in Europe.

## **A model based on conditional probability**

The study first presents a statistical and simulation model —based on the theory of conditional probability— to forecast the risk of childhood asthma episodes. The model includes several risk factors and has been designed with the data got from scientific literature and the project

Asthma Multicenter Infant Cohort Study (AMICS), developed by IMIM researchers in order to analyse the relationship between environmental factors and childhood asthma development in different phenotypes. On January 1, 2006, a law that set anti-tobacco regulations in Spain came into force. In 2011, more restrictive anti-tobacco regulations began to be applied. According to the research, in 2001 [tobacco consumption](#) was 35.2% and in 2007 it dropped to 23.7%, but this reduction did not produce any remarkable effect on asthma incidence among children.

## **Objective: to reduce childhood asthma**

Toni Monleón Getino, first author of the article, explains that "the statistic model indicates that childhood asthma incidence is stable. Tobacco consumption in adults is stable too; 22-23% of them are smokers". "If this percentage does not decrease significantly, particularly the number of fathers and mothers who smoke, a reduction of [childhood asthma](#) prevalence won't occur", alerts the researcher, who started the study together with the Italian National Institute of Health. Professor Martín Ríos states that "asthma is an illness caused by several factors (genetic propensity, environment, food, etc.) and tobacco triggers asthmatic crisis in children. "In other words —highlights the researcher—, the relationship between tobacco and asthma is not a cause-effect one, but tobacco, even environmental smoke or the one that remains on clothes, favours asthma episodes in children".

Data proves that the incidence of chronic obstructive pulmonary disease and asthma in adults has been reduced in the last years due to smoke-free policy. In the case of children, maternal smoking and environmental tobacco smoke are some of the main risk factors for inducing new cases of asthma. UB experts point out that "there is no doubt that smoking and respiratory diseases in children are related. Even if it is difficult to prove if alterations in respiratory functions begin to occur in the foetus or if they appear later, during lactation, altered respiratory function has been

found in those children whose mothers smoke during pregnancy, although they do not continue smoking after giving birth; this shows that first alterations happen in the foetus".

## Smokeless home

In epidemiology, simulation models are tools that may contribute to develop more effective health policies in the field of public health. Toni Monleón Getino and Martín Ríos, experts from the Multivariate and Computational Statistical Modelling Research Group of the UB and authors of other epidemiological studies of infectious diseases (tuberculosis, meningitis, etc.), alert that nowadays there are not enough measures to avoid children's exposure to tobacco. "Many children continue to be exposed to tobacco at home. It is necessary to improve health policies and raise society's awareness; efforts on the fight against tobacco, particularly at home, must be stronger", concludes Monleón Getino.

**More information:** Prediction of Childhood Asthma Using Conditional Probability and Discrete Event Simulation. T. Monleón-Getino, C. Puig, O. Vall, M. Ríos, A. Chiandetti and O. Garcia-Algar. *International Journal of Statistics in Medical Research*, 2013 Vol 2, No. 3 [dx.doi.org/10.6000/1929-6029.2013.02.03.2](https://doi.org/10.6000/1929-6029.2013.02.03.2)

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