



# Maternal passive smoking and the risk of developing wheeze in children: how should we deal with it?

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**Cooperation is needed to create smoke-free environments, both private and public, for children and pregnant women** <http://ow.ly/hdm5300ExJ5>

Evidence regarding the adverse effects of maternal smoking and tobacco smoke exposure during pregnancy on the fetus has been recognised in a large number of studies; however, smoking during pregnancy is still common. Maternal smoking during pregnancy increases the risk of pregnancy complications (e.g. placental abruption, placenta praevia or premature rupture of the membranes) [1, 2] and poor infant outcomes (e.g. sudden infant death syndrome, lower respiratory tract illness, restricted fetal growth, pre-term related death, low birth weight infants, asthma or wheeze) [3–7]. Studies have shown that smoking exposure during pregnancy increases the risks of physician-diagnosed asthma and the development of wheeze in childhood [3, 8, 9]. The risks are even higher when the mother shows pre-natal psychological stress [10]. It is known that wheezing may resolve spontaneously during childhood but may persist into adulthood, particularly in young children with severe asthma [11–13], but the question is, can we cut the risk or even prevent it?

In this issue of the *European Respiratory Journal*, VARDAS *et al.* [14] report the results of a pooled analysis of 15 cohort studies that participated in the European project ENRIECO (Environmental Health Risks in European Birth Cohorts) [15] to assess the independent effects of active and passive smoking exposure, both pre- and postnatal, on the development of wheeze in children before the age of 2 years. Furthermore, this study describes the development of wheeze in children based on the different sources of exposure and timeframes of pregnancy (prenatal maternal active smoking, prenatal maternal passive smoking and children's postnatal passive smoking) and assessed them, both as independent and combined factors. In total, data from >37 000 mother-child pairs are presented, in >27 000 of which, second-hand smoke (SHS) exposure and wheeze data were available. The authors report that children exposed to both to passive and active smoking mothers during pregnancy had the highest risk of developing early wheeze. Risk of wheeze was further increased when children were exposed to passive smoke post- and prenatally. Specifically, prenatal exposure to passive smoke was found to have a higher risk of developing wheeze in children than postnatal; however, the combination of both timeframes exposures resulted in an even higher risk. The study also showed that children who had both a familial history of allergy and SHS exposure together with prenatal active smoking had an even higher risk of having wheeze. The study has major strengths in the pooled analysis of the included cohort studies that showed the relationships between the passive and active smoking, pre- and postnatally, with the development of wheeze in children. From this analysis, we can see that each factor, including passive or active smoking, or even tobacco exposure, pre- and postnatally, contributes to wheezing development in children up to 2 years of age.

The prevalence of active and passive smoking varies among countries [16]. While tobacco smoking rates among pregnant women have decreased over the past 10 years [1], the rates were unchanged in some low- and middle-income countries [17]. However, the use of different methods to report smoking status

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among pregnant women may contribute to the reliability of the smoking prevalence in pregnant women. The self-reported questionnaires that were most commonly used in antenatal clinics are often less accurate in identifying smokers among pregnant women [18]. With the majority of pregnant women not revealing their smoking status, the numbers of those who smoked during pregnancy could be underrated [18]. With so much pressure from social, perceived values, and the medical advice for pregnant women to quit smoking, women preferred not to report their smoking status, resulting in low access in any smoking cessation programmes for pregnant women [19]. Therefore, some studies proposed urinary cotinine level measurements or other biomarkers in addition to the self-reported SHS exposure questionnaires in pregnant women [20, 21]. Despite the underreported smoking prevalence figures in pregnant women, the methods used in reporting the effects of tobacco exposure in the development of wheeze also played a role. Relying on parental report for measuring outcomes such as wheeze may be subject to underreporting and recall bias, which is acknowledged by VARDAS *et al.* [14] as a study limitations.

Many smoking cessation programmes have been created and applied worldwide; however, the burden of disease from SHS exposure is still high [22]. We have learned from VARDAS *et al.* [14] that maternal passive smoking during pregnancy is an independent risk factor for developing wheeze in children up to the age of 2 years. Could the study be used to support the current evidence about the importance of protecting both pregnant women and infants from SHS exposure, either in private or public areas? The answer is “yes”. A novel and effective strategy needs to be designed and implemented to prevent tobacco exposure during pregnancy. A well-established public health campaign or clinical intervention could be effective in reducing tobacco exposure in public areas. In the developed world, such as the USA and European countries, both the cost and clinical effectiveness interventions have been well implemented; however, this is not the case in developing countries [23]. As most of developing countries face some barriers to implementation, including low socioeconomic status, low education and lack of support from policy-makers or governments, it is more difficult to implement the interventions. However, this does not mean that it is impossible to implement these interventions. Developed countries such as the USA [24] and Australia [25] have successfully implemented community and population-based interventions including mass media campaigns, telephone quit lines, reducing cost of treatment, tobacco advertising bans, taxation and raising tobacco prices. Most of these methods, particularly complete bans on tobacco advertising and tax increases, might be difficult to implement in developing countries, as some of those governments incomes rely on the money from advertising and taxation. An expensive programme, such as a quit line, could be difficult as well to implement in low-income countries. A national tobacco control programme involving community support might be possible, as it has been successfully implemented in Thailand and Brazil [26]. Less costly public campaigns such as smoking cessation posters or pictures about the harmful effects of passive and active tobacco exposure during pregnancy, placed in the public areas such antenatal clinics, could be helpful.

Finally, we know that tobacco exposure, particularly maternal passive smoking during pregnancy, is harmful for both maternal and neonatal outcomes, but most importantly, we should put more effort into the prevention of tobacco exposure in pregnant women. A close liaison between policy-makers, healthcare professionals and family members is warranted to create a smoke-free environment for pregnant women and children, both in private and public areas.

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