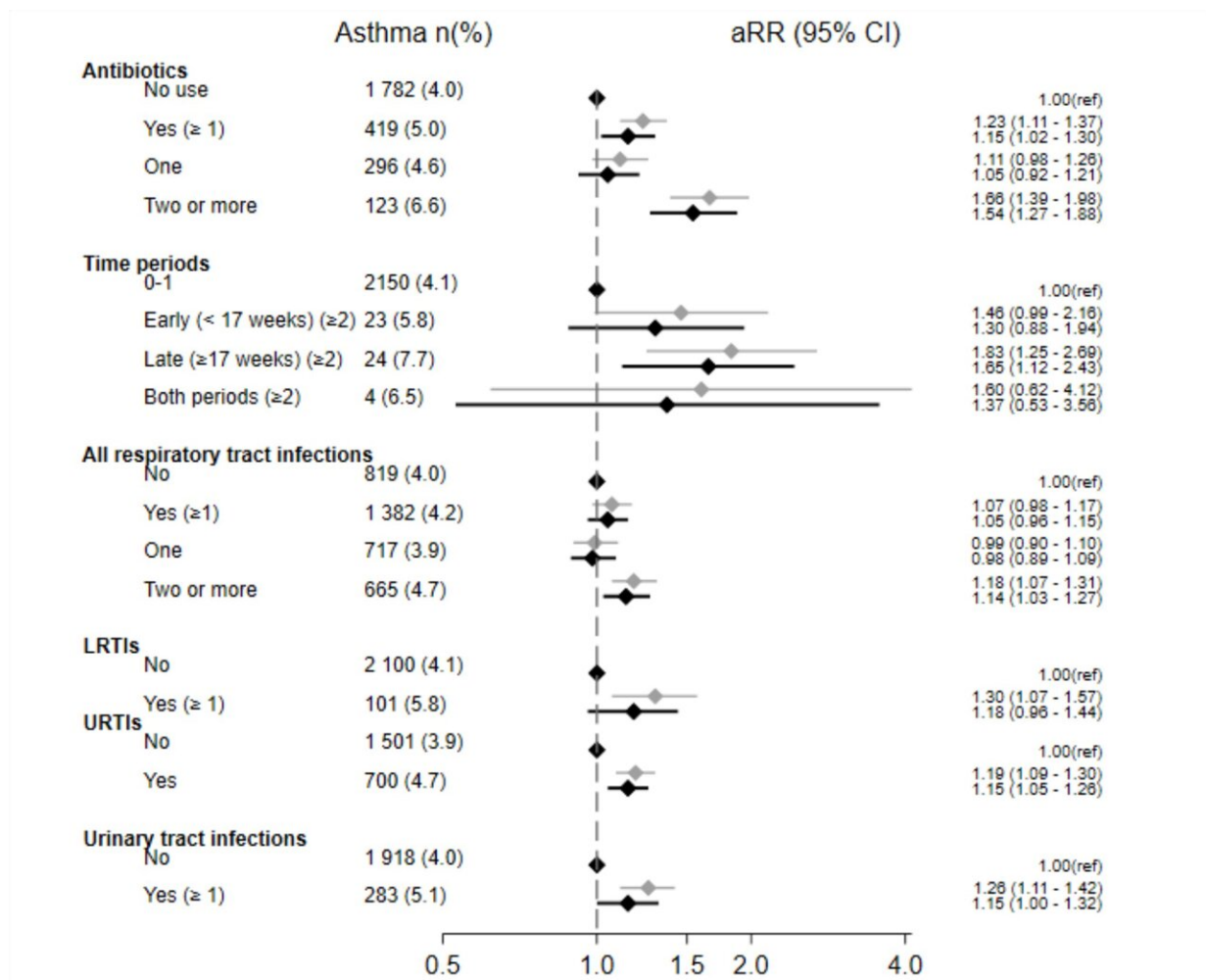


# Antibiotic use during pregnancy linked to childhood asthma

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Forest plot of antibiotic use and infections during pregnancy and risk of asthma at 7 years in MoBa (n = 53 417). Risk ratios (aRR) adjusted for maternal characteristics such as maternal age, parity, pre-pregnancy BMI, asthma, smoking during pregnancy and education are in the top lines marked with a gray

color. Risk ratios in addition adjusted for other exposures such as maternal respiratory and urinary tract infections during pregnancy (in the association between maternal antibiotics and asthma) or maternal antibiotic use (in the association between maternal infections and asthma) are in the bottom line, marked with a black color. LRTI, lower respiratory tract infections; URTI, upper respiratory tract infection. Credit: *European Journal of Epidemiology* (2022). DOI: 10.1007/s10654-022-00897-y

Around 4% of seven-year-olds in Norway have asthma. It is established that antibiotic use during pregnancy has been linked to asthma in children, but it has been unclear whether it is antibiotics or the infections that is the main cause.

In this study, now published in the *European Journal of Epidemiology*, researchers from the Norwegian Institute of Public Health and the University of Oulu, Finland, set out to distinguish the effect of [antibiotics](#) from infections during pregnancy on childhood [asthma](#).

The researchers analyzed data from two population-based cohorts, including 53,417 [children](#) in the Norwegian Mother, Father and Child Cohort Study (MoBa), and 541,036 children in the Medical Birth Registry in Norway. Information about infections during pregnancy was available in the MoBa [cohort](#) but not in the register-based cohort.

## **Antibiotics associated with asthma**

- In both cohorts, maternal [antibiotic use](#) during pregnancy was associated with asthma at seven years of age.
- In the MoBa cohort, children of mothers who used two or more antibiotics during pregnancy had a 54% increased risk of asthma at seven years of age compared to children of mothers who did

not take antibiotics. They did not however find this trend in the register-based cohort.

- The risk of asthma was higher if mothers took antibiotics in later stages of pregnancy (17 weeks or later) in the MoBa cohort, but not in the register-based cohort.

The main author of the study, Aino Rantala, explains: "We found that in the MoBa cohort the association was dose-dependent, which means that the more antibiotics you take, the greater the risk. The risk also seems to increase with antibiotic use later in pregnancy. This may be because in later pregnancy, antibiotic use has the strongest influence on the infant's microbiota, which is important in immune system development."

The association between maternal antibiotic use and [childhood asthma](#) decreased when the researchers controlled for maternal infections during pregnancy. This indicates that maternal infections during pregnancy also play a role in the risk of asthma.

## Maternal infections and asthma

In the MoBa cohort, children of mothers who had two or more respiratory tract infections had 14% higher risk of asthma at age seven than children of mothers without these infections.

Interestingly in MoBa, children of mothers who had lower [respiratory tract infections](#) during pregnancy but who did not use antibiotics had a higher risk of asthma, compared to children of mothers who used antibiotics for specific infections.

Aino Rantala therefore emphasizes the importance of only taking antibiotics when necessary.

"Since untreated infections during pregnancy may pose an even greater

risk of asthma in children than simply taking antibiotics, it is advisable to take prescribed antibiotics that are known to be effective for specific infections. However, since using two or more antibiotics during pregnancy also increases risk of asthma, it is probably not wise to take antibiotics just in case. In other words, [pregnant women](#) should still use antibiotics, but only when necessary."

The results from both cohorts differed somewhat, which might be due to the differences between the two population cohorts. The findings reported here were controlled for numerous exposures that could have had an effect, including maternal age, smoking during [pregnancy](#), and mode of delivery, but there may be also other factors involved that they did not control, such as genetic or other environmental exposures.

**More information:** Aino K. Rantala et al, Maternal antibiotic use and infections during pregnancy and offspring asthma: the Norwegian Mother, Father and Child Cohort Study and a nationwide register cohort, *European Journal of Epidemiology* (2022). [DOI: 10.1007/s10654-022-00897-y](#)

Provided by Norwegian Institute of Public Health

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