



# Association of blood trihalomethane concentrations with asthma in US adolescents: nationally representative cross-sectional study

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Among a representative sample of 2359 US adolescents, we found that exposure to THMs was associated with a greater risk of asthma, particularly among those who were co-exposed to tobacco smoke <https://bit.ly/3mpHxgq>

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## Abstract

**Background** Population studies show that the use of swimming pools is associated with the risk of asthma and allergic diseases among children. Our objective was to explore the associations between blood trihalomethane (THM) concentrations and asthma among US adolescents, and assess to what extent the association is modified by active tobacco smoke exposure.

**Methods** We included 2359 adolescents aged 12–19 years with measured blood concentrations of chloroform (trichloromethane (TCM)), bromodichloromethane (BDCM), dibromochloromethane (DBCM) and bromoform (tribromomethane (TBM)) from the National Health and Nutrition Examination Survey 2005–2012. Logistic regression models were fitted to assess the odds ratios for the association of blood THM concentrations (three or four categories) with the risk of self-reported current and ever (lifetime) asthma.

**Results** Blood DBCM concentrations were associated with a higher risk of ever asthma among all adolescents (OR 1.54 (95% CI 1.07–2.21), comparing the extreme exposure categories). The relationship was stronger among adolescents exposed to tobacco smoke (OR 3.96 (95% CI 1.89–8.30), comparing the extreme exposure categories). We also found positive relationships between blood brominated THM concentrations (sum of BDCM, DBCM and TBM) and risk of ever asthma and between blood DBCM and brominated THM concentrations and risk of current asthma among adolescents with tobacco smoke exposure. The relative excess risk of ever asthma due to the interaction between high blood DBCM and brominated THM concentrations and tobacco smoke exposure was 1.87 (95% CI 0.30–3.43) and 0.78 (95% CI 0.07–1.49), respectively.

**Conclusions** Exposure to THMs is associated with a higher risk of asthma in adolescents, particularly among those exposed to tobacco smoke.

