



# Association of asthma and smoking with lung function impairment in adolescence and early adulthood: the Isle of Wight Birth Cohort Study

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**Asthma is associated with reduced lung function growth between 10 and 18 years; smoking is associated with decline between 18 and 26 years. Both may increase susceptibility to COPD, emphasising a potential benefit of intervention to prevent lung damage.** <http://bit.ly/33yPZyM>

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**ABSTRACT** We investigated associations of asthma and smoking with lung function and airway reversibility from childhood to early adulthood.

The population-based Isle of Wight Birth Cohort (n=1456) was assessed at birth, and at 1, 2, 4, 10, 18 and 26 years. Asthma was defined as physician diagnosis plus current wheeze and/or treatment. Spirometry was conducted at 10 (n=981), 18 (n=839) and 26 years (n=547). Individuals were subdivided into nonsmokers without asthma, nonsmokers with asthma, smokers without asthma and smokers with asthma, based on asthma and smoking status at 26 years. Their lung function trajectories from 10 to 26 years were examined using longitudinal models.

Nonsmokers with asthma had smaller forced expiratory volume in 1 s (FEV<sub>1</sub>), FEF<sub>25–75%</sub> (forced expiratory flow at 25–75% of forced vital capacity (FVC)) and FEV<sub>1</sub>/FVC ratio compared to nonsmokers without asthma at age 10 and 18 years, with differences reduced after bronchodilator (pre-bronchodilator FEV<sub>1</sub> at 26 years 3.75 L *versus* 4.02 L, p<0.001; post-bronchodilator 4.02 L *versus* 4.16 L, p=0.08). This lung function deficit did not worsen after 18 years. Smokers without asthma had smaller FEF<sub>25–75%</sub> and FEV<sub>1</sub>/FVC ratio (but not FEV<sub>1</sub>) at 26 years compared to nonsmokers without asthma, with the deficit appearing after 18 years and persisting despite bronchodilator response (for FEV<sub>1</sub>/FVC ratio at 26 years 0.80 *versus* 0.81, p=0.002; post-bronchodilator 0.83 *versus* 0.85, p=0.005). Smokers with asthma had worse lung function compared to other groups.

Lung function deficits associated with asthma and smoking occur early in life. They are not fully responsive to bronchodilators, indicating a risk for long-term lung health, which highlights the need to institute preventive measures in adolescence and early adult life before irreversible damage occurs.