Greater Risk of Asthma and Allergic Rhinitis, But Not Eczema, Associated with Living Close to Green Space in European Children. The Heals Project

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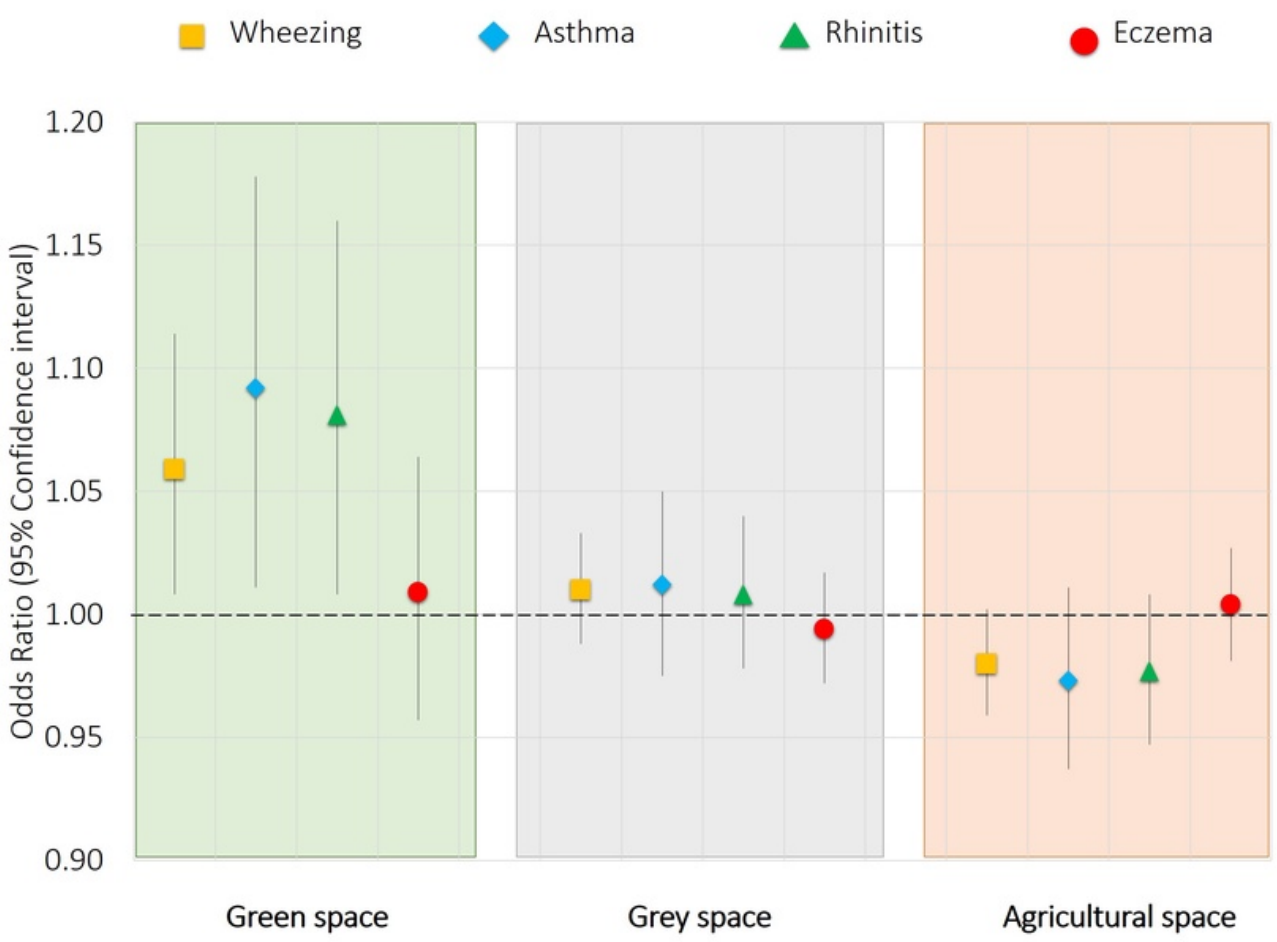
Rationale: While recent research has shown an overall beneficial impact of surrounding green space on general health, there are contradictory and non-conclusive results regarding the relation between residential green space and the development of respiratory and allergic diseases. Aims: This study aims to evaluate the associations of residential land cover (green, grey, and agricultural space) with childhood allergic and respiratory diseases. A secondary analysis was also conducted to investigate the effects of proximity to different types of forests (deciduous, coniferous, and mixed) and health outcomes. Methods: Data from over eight-thousand children, aged 3-14 years, were obtained from nine European population-based studies participating in the HEALS consortium (“Health and Environment-wide Associations based on Large population Surveys”, www.heals-eu.eu). Information on lifetime occurrence of wheezing, asthma, rhinitis and eczema, family lifestyle and socio-demographic characteristics were collected through parental-administered questionnaires. Land-cover within a 500 m buffer from children’s home addresses was computed using data from the Coordination of Information on the Environment (CORINE) inventory. Logistic regression models were fitted to estimate the associations of the health outcomes with CORINE land-cover features within each study, adjusting for sex, age, body mass index, maternal education, parental smoking, and parental history of allergy. The pooled effects across studies were estimated using meta-analyses. Results: The results from the meta-analyses showed that a 10% increase in green space coverage was significantly associated with an increased risk of wheezing (odds ratio [95% confidence interval]: 1.059 [1.008-1.114]), asthma (1.092 [1.011-1.178]) and rhinitis (1.081 [1.008-1.160]), but not eczema (1.009 [0.957-1.064]). The estimates did not depend on gender and age and were confirmed using different buffer radii and after controlling for outdoor residential NO2 and PM10 levels. A lower risk of respiratory symptoms in subjects exposed to residential agricultural space was also observed, but did not reach statistical significance. Grey (urban) space was not associated with any of the considered outcomes. In secondary analyses, living close to forests of conifers, but not other forest types, was significantly associated with greater odds of wheezing (3.95 [2.08-7.49]), asthma (2.54 [1.10-5.82]) and rhinitis (3.39 [1.83-6.30]). Conclusions: Our findings provide further evidence that exposure to green space is associated with increased risk of wheezing, asthma, and allergic rhinitis in childhood. Moreover, our results suggest that living in proximity to coniferous forests may influence the onset of respiratory diseases probably due to the exposures to pollen, moulds and biogenic volatile organic compounds.



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