

Air pollution, greenness, and the risk of paediatric-onset inflammatory bowel disease

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Pollution was not associated with paediatric-onset IBD Greenness during childhood was protective of paediatric-onset IBD

Background

- Inflammatory bowel disease (IBD) is a chronic immune-mediated condition comprising Crohn's disease (CD) and ulcerative colitis (UC)
- Environmental factors related to urbanisation may be implicated in inflammatory bowel disease etiology
- Air pollution has been previously investigated with mixed results. Greenness has never been investigated

Objective

To investigate independent effects of greenness and air pollution on risk of paediatric-onset IBD

Methods

- A cohort of all registered births in Ontario, Canada from 1991-2013 was created
- Exposure 1: pregnancy and time-varying childhood estimates of NO₂, PM_{2.5}, and O₃ obtained using a temporal interpolation of satellite and land-use regression techniques
- Exposure 2: pregnancy and childhood averaged levels of greenness measured using normalized difference vegetation index (NDVI)
- Outcomes: IBD, CD, UC before age 18
- Mixed effects Cox proportional hazards models were adjusted for sex, maternal IBD status, rurality, and neighborhood income

Results

Out of 2,731,403 children, there were 3474 cases of IBD (1917 CD, 1257 UC, 300 unclassifiable)

Figure 1. Continuous exposures and IBD

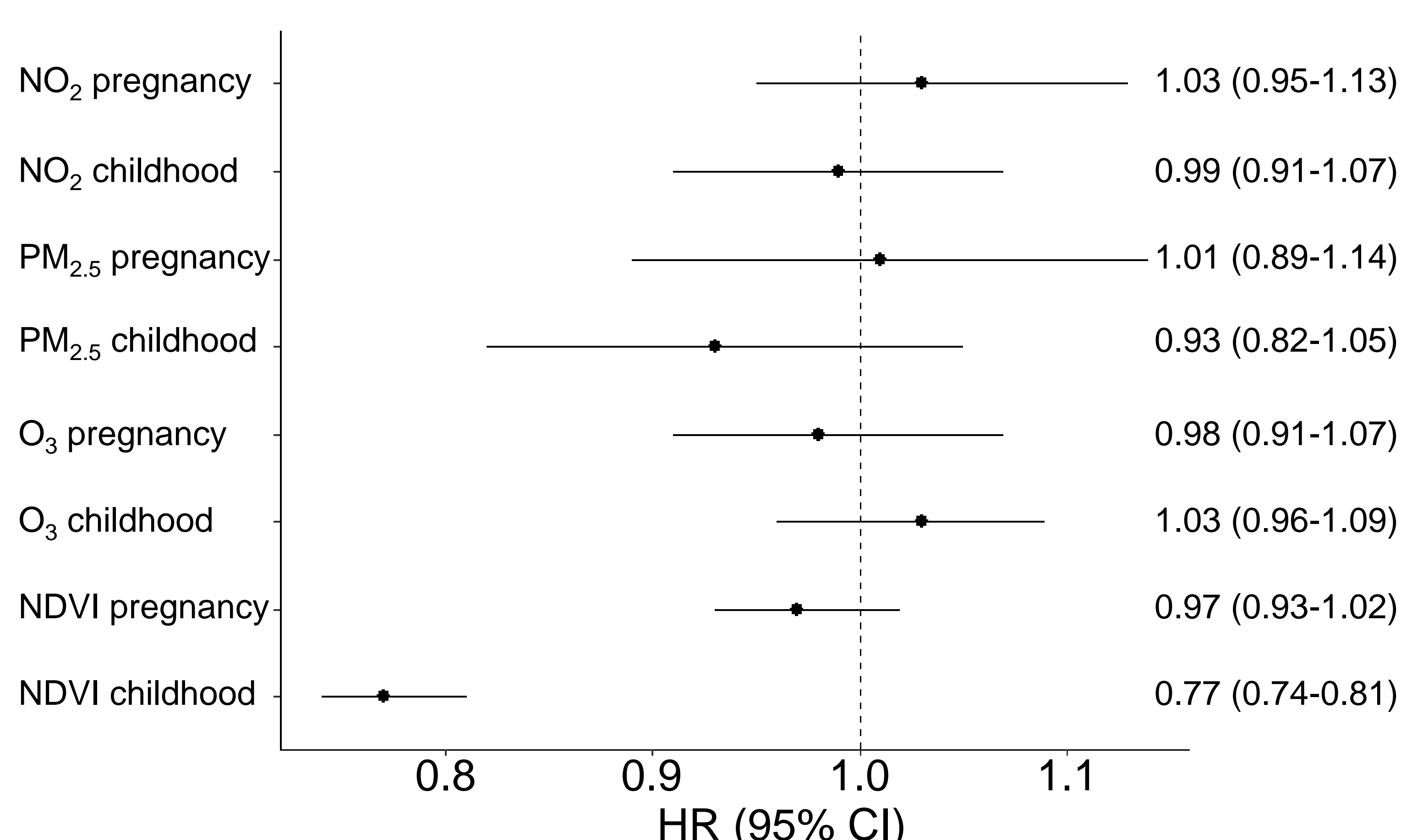
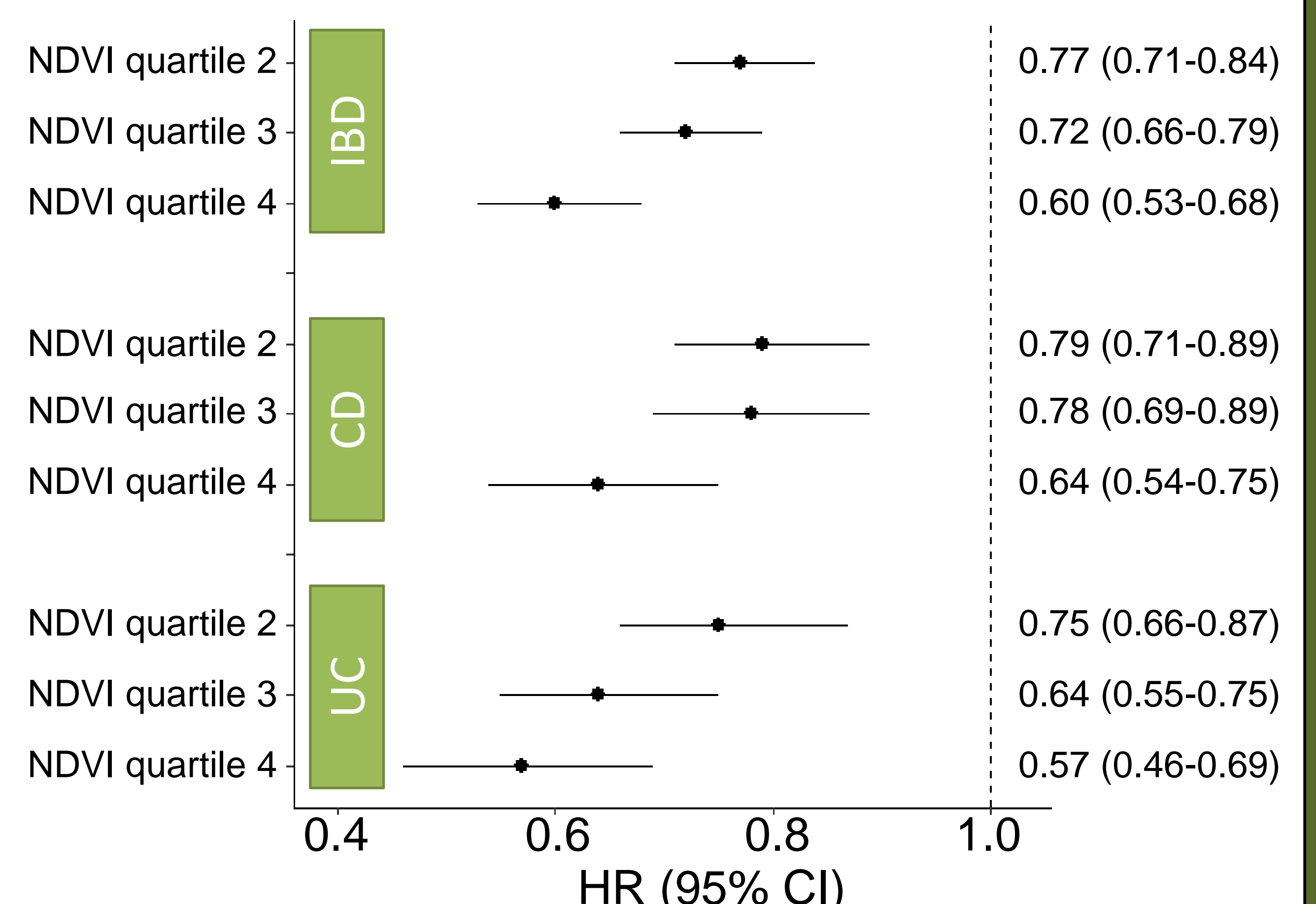


Figure 2. Categorical greenness and IBD, CD, UC



Discussion

Childhood exposure to greenness was found to be protective of paediatric-onset IBD. This relationship showed a linear concentration-response pattern and may be mediated by many factors affecting the gut microbiome including increased physical activity or exposure to microbial factors

