

Abstract



## Place of Residence Is Associated with Dietary Intake and BMI-SDS in Children and Adolescents: Findings from the DONALD Cohort Study<sup>†</sup>

Janosch Klemm<sup>1,\*</sup>, Ines Perrar<sup>2</sup>, Christian Borgemeister<sup>1</sup>, Ute Alexy<sup>2</sup> and Ute Nöthlings<sup>2</sup>

<sup>1</sup> Center for Development Research (ZEF), University of Bonn, Genscherallee 3, 53113 Bonn, Germany

<sup>2</sup> Institute of Nutrition and Food Sciences (IEL)-Nutritional Epidemiology, University of Bonn,

Friedrich-Hirzebruch-Allee 7, 53115 Bonn, Germany

- \* Correspondence: jklemm@uni-bonn.de
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Abstract: Background and objectives: To determine whether location of residence in the German urban food environment is associated with habitual dietary intake (energy, macronutrient and food groups) and body mass index (standard deviation score of BMI, BMI-SDS) in children and adolescents (6-18 years). Methods: For the cross-sectional analyses of DONALD study data, we grouped participants according to their geocoded residence in the north or south of Dortmund, following available socio-economic neighborhood indices. We applied robust multi-level mixed effects regression models using residence as predictor and (1) BMI-SDS or (2) dietary data (daily intake of energy (kcal), macronutrients (energy percentage) or food groups (g/1000 kcal)) as outcome. Analysis was carried out on 935 3-day weighed dietary records, collected annually from 292 participants (1267 anthropometric measurements from 360 participants) between 2014 and 2019. Models were adjusted for age, sex and household socioeconomic status (SES, derived from household education and occupation data). Results: We observed that 52 (14.4 %) participants reside in the north and 308 (85.6 %) in the south of Dortmund. In the fully adjusted models, residence in the south was associated with lower BMI-SDS ( $\beta = -0.42$ , p = 0.02), lower intake of sugar-sweetened beverages  $(\beta = -48.24, p = 0.04)$  and higher intake of vegetables ( $\beta = 11.69, p = 0.03$ ). No significant association was found for intakes of macronutrients or other food groups (meat and fish, fruit, dairy, grains, sweets). Discussion: Our results suggest that place of residence may play a role in explaining variation in dietary intake, beyond the SES of the household. This indicates that dietary intake may at least in part be impacted by factors beyond individual-level indicators. Further research is required to identify more specific pathways of location of residence on nutrition and quantify the food environment in different city areas across socio-economic background variables.

Keywords: dietary intake; children; adolescents; urban settings; spatial trends

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