



IMPACT OF SOCIOECONOMIC POSITION AND HOUSING ENVIRONMENT ON CHILDREN'S HEALTH IN BAVARIA, GERMANY



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BACKGROUND

- Housing conditions have a considerable impact on children's health [1, 2].
- Socioeconomic inequalities in environmental exposures and housing environment are supposed to contribute to health inequalities [3, 4].
- Issues of environmental justice are increasingly recognized in Germany [5].

AIM

- To assess the relationship between socioeconomic factors, built environment and children's health in urban and rural areas.

METHODS

- Cross-sectional survey: parents of 6350 preschool children aged 5-7 years in 3 urban and 3 rural districts of the federal state of Bavaria, Germany, completed a questionnaire in 2004/2005 (participation rate 78%, figure 1).
- Indicators of a child's socioeconomic position (SEP):
 - (1) Low income in terms of relative poverty was defined as an equivalent household income below 50% of the median income in the region.
 - (2) Low educational degree was defined as the highest graduation of either parent less than 10th grade.
- Housing environment: Parental report of housing conditions and perceived environmental exposures [6]. Index of adverse housing environment comprising 6 items (crowding, high-rise building, main street, heavy traffic, traffic jam, no green space) included as ordinal variable into regression models.
- Health outcomes: General child's health judged by the parents; lifetime prevalence of traffic accidents; period prevalence of respiratory disorders. Prevalence of obesity defined according to Cole et al. [7].
- Analyses were confined to those children (N=2863) without missing data in relevant variables. Predominantly data on household income were missing. Adjusted odds ratios (OR) with 95% confidence intervals (95% CI) were calculated for the associations between socioeconomic factors, housing conditions and health outcomes by logistic regression.

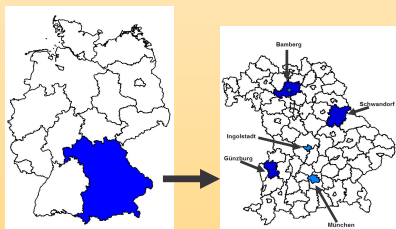


Figure 1. Study regions in Bavaria, Germany.

RESULTS: Study population and SEP indicators

- Characteristics of the study subjects stratified by urban/rural areas are given in table 1.
- Both indicators of SEP, low income and low education, correlated well and were also associated with being a single parent and with having another than German nationality.

Table 1. Characteristics of the study subjects [Percentages calculated without missings].

	Study population		Analysis population					
	Entire survey (N=6350)		Total (N=2863)		Urban (N=1320)		Rural (N=1543)	
	N	%	N	%	N	%	N	%
Sex: female	3030	47.7	1371	47.9	617	46.7	754	48.9
No siblings	1119	17.7	539	18.8	290	22.0	249	16.2
Other than German nationality	581	9.2	221	7.7	170	12.9	51	3.3
Single parent	679	10.9	341	12.0	197	15.2	144	9.4
Unemployment of father	242	4.2	105	3.9	52	4.2	53	3.6
Low income	765	24.6	641	22.4	286	21.7	355	23.0
Low educational degree	1720	28.0	621	21.7	209	15.8	412	26.7

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References: [1] Shaw (2004), Annu Rev Public Health 25: 397-418; [2] WHO Regional Office for Europe & European Environment Agency (2002), Environmental issue report No. 29; [3] Evans & Kantrowitz (2002), Annu Rev Public Health 23: 303-331; [4] Kohlhuber et al. (2006), Acta Paediatr (in press); [5] Bolte (2006), Umweltmed Forsch Prax 11: 161-172; [6] Kohlhuber et al. (2006), Environ Res 101: 246-255; [7] Cole et al. (2000), BMJ 320: 1240-1243.

RESULTS: SEP and housing environment (Figure 2)

- Children with a low SEP were more likely to live in a crowded flat and in a congested area (e.g. living at a main road and in a high-rise building).
- A low SEP was related to parent's perceived high exposure to air pollution and noise. Parents with a low SEP felt strongly disturbed due to the absence of accessible green space.
- Social disparities in exposures were more pronounced with low income as SEP indicator and present in urban as well as in rural areas.

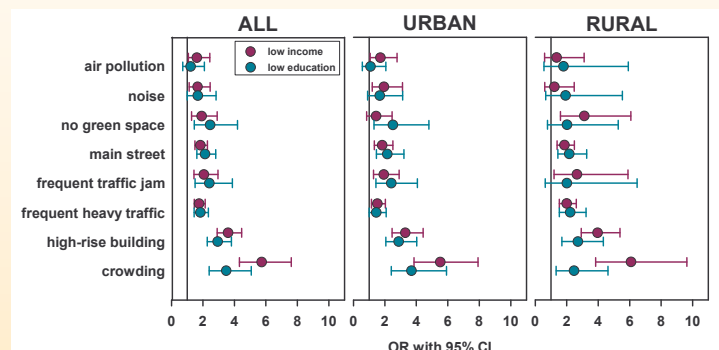


Figure 2. Social disparities in housing environment of children.

RESULTS: SEP and children's health

- A low SEP (defined by low income) was positively associated with
 - a child's bad health (1.66 [1.19-2.33]),
 - obesity (1.94 [1.21-3.10]),
 - bronchitis (1.47 [1.20-1.80]) and wheeze (1.46 [1.11-1.90]) during the past year,
 - traffic accident while walking or when using a child's vehicle (1.92 [CI 1.07-3.44]).
- Except for obesity, effect estimates obtained with parental education as SEP indicator were lower (data not shown).

RESULTS: SEP, housing and children's health (Table 2)

- Effect estimates of the association of SEP with children's health were attenuated by including indicators of environmental exposures into the regression models.

Table 2. Relationship between SEP (income), housing environment and health.

		Low income	Adverse housing environment
Bad health	model 1	1.66 [1.19-2.33]	-
	model 2	-	1.25 [1.10-1.41]
	model 3	1.47 [1.03-2.08]	1.20 [1.05-1.37]
Wheeze	model 1	1.46 [1.11-1.90]	-
	model 2	-	1.21 [1.10-1.34]
	model 3	1.30 [0.99-1.72]	1.19 [1.07-1.31]
Obesity	model 1	1.94 [1.21-3.10]	-
	model 2	-	1.35 [1.14-1.60]
	model 3	1.63 [1.00-2.66]	1.29 [1.08-1.54]

OR adjusted for sex and urban/rural area. Adverse housing environment: index included as ordinal variable.

DISCUSSION

- In both urban and in rural districts socioeconomic disparities in children's built environment and environmental health existed.
- Adverse housing conditions may partly explain the observed health disparities.

CONCLUSION

- Policy measures of health promotion and of housing improvement should aim to specifically tackle these environmental inequalities.