

Uwe Helmert¹, Andreas Mielck², Steven Shea^{3,4}

¹ Division of Health Policy, Occupational and Social Medicine, Centre for Social Policy Research, Bremen University

² Institute for Medical Informations and System Research (Medis), Munich

³ Division of Epidemiology, Columbia University, School of Public Health, New York

⁴ Division of General Medicine, Columbia University, New York

Poverty and health in West Germany

Summary

The relationship between poverty and several health-related characteristics in West Germany was investigated. Data were derived from the National and Regional Health Surveys conducted in West Germany from 1984 to 1992. 25 544 males and 25 719 females with German nationality aged 25–69 years were examined. Poverty was defined as a household income of 50% less than the mean for West Germany. Multiple logistic regression analysis was used to analyze the relationship between poverty and four health variables: individual health behavior, subjective assessment of health status, cardiovascular disease risk factors, and self-reported prevalence of lifetime chronic diseases. 10.2% of males and 12.8% of females were classified as being below the poverty line. For most but not all health parameters, less favourable results were found for the segment of the population with a household income below the poverty line. The most striking poverty-related differences were observed for lack of regular sport activities, subjective health satisfaction, obesity and myocardial infarction/stroke. Significantly lower prevalence rates for study subjects below the poverty line were observed for hypercholesterolemia in females only. Allergic disorders were the only chronic diseases reported significantly less often in males and females below the poverty line. Poverty has strong effects on individual health status and the prevalence of chronic diseases. Due to the rising unemployment rates in Germany in the last years it is very likely that the strong negative consequences of poverty for health are increasing.

An increasing prevalence of poverty has been documented in West Germany since the early 1980s^{1–3}. One indicator of poverty, the percentage of the population living on welfare, increased in the eleven “old” federal states of Germany from 2.4% in 1965, to 3.3% in

1975, 4.6% in 1985, and 6.2% in 1992⁴. Other studies have found an increasing disparity in the overall income distribution for the German population⁵. Research in this area has concentrated on demographic correlates of poverty such as age, sex, family status, educa-

tion, living conditions, unemployment and deviant behavior. However, studies addressing health consequences of poverty in West Germany have not been reported.

The relationship between poverty and health has been studied in depth for a number of years in the United States^{6,7} and in Great Britain⁸. A more recent epidemiological study in the U.S. reported that the proportion of mortality attributable to poverty has increased in recent decades and is now comparable to that attributable to cigarette smoking⁹. In contrast, in Germany there have been few studies concerning the relationship between poverty and health. In standard reports of national health statistics the issue of poverty is generally not considered in an explicit way. Conversely, in the systematic studies of poverty that have been conducted in recent years in Germany^{2,10}, there is very little information about health or health problems. Likewise, in sociological investigations in the field of poverty in Germany^{11,12} the subject of health plays only a minor role. This neglect of the topic “poverty and health” can also be found in social-epidemiological studies^{13,14}. Little has been published addressing the health status of segments of the population living in poverty in

Germany, or disadvantaged subgroups such as the homeless¹⁵ or one-parent families, which contain a high proportion of people living in poverty or near poverty.

Recently, however, public awareness regarding the relationship between poverty and health status has increased in Germany, as indicated by two national workshops on the topic "poverty and health", organized by the Science Center Berlin¹⁶ and the German Association for Health Sciences¹⁷. In this context, we analyzed data from three large national health surveys in Germany to assess the relationship between poverty and individual health behavior, self-rates overall health status, prevalence of cardiovascular disease risk factors, and lifetime prevalence of chronic diseases.

Definition of poverty

In general, there are two concepts of poverty: absolute poverty and relative poverty. Absolute poverty implies a status of general deficiency inconsistent with the ability to maintain physical existence. The poverty line based on absolute poverty is defined as the amount of goods (nutrition, garments, housing etc.) needed to sustain physical existence¹. In industrialized nations with established social security systems, absolute poverty is a marginal problem, and some investigations have argued that it is not possible to define absolute poverty at all¹⁸.

Relative poverty is defined as a deficiency of the resources needed to provide a living standard which reaches a specified social and cultural level. Most often the poverty line is defined as a certain percentage of the mean income of a population. A common definition of relative poverty is based on an income less than 50% of the population mean income. An income level of 50 to 62.5% of the population mean is defined as "near poor"¹⁹.

The reference frame for the income level is the family or household income, because the family or household is the social unit in which income is pooled and decisions are made regarding consumption. However, when dealing with data about household income, a weighting scheme that takes into account the size and type of the household should be used. A common method for this procedure is the "equivalence scale"²⁰. The unweighted indicator "per capita income per household" gives all persons in the household the same weight, while the "equivalence scale" was developed to take into account economies of scale in households with several members.

Material and methods

Subjects and data source

Data for this study were derived from the National and Regional Health Examination Surveys, and the National Interview Survey of the German Cardiovascular Prevention Study (GCP). The GCP is a community-based intervention study of the primary prevention of cardiovascular diseases. It was carried out from 1984 to 1992 in the eleven "old" federal states of the Federal Republic of Germany, and the term "national" refers to Western Germany only. The study design and the main study results have been described elsewhere^{21,22}. Included in the survey were persons with German nationality aged 25–69 years. Study subjects were randomly selected from compulsory population registries. All examinations were carried out by intensively trained medical staff. The examination procedures and the methods for quality assessment have been described in detail elsewhere^{23,24}. 15439 persons were examined in the three National Health Survey,

28927 persons were included in the Regional Health Surveys, and 10945 persons participated in the National Interview Survey, which was carried out only once in 1984 to 1986. Response rates were between 66.0 and 71.4% in the National Health Surveys, between 65.9 and 83.3% in the Regional Health Surveys, and 69.6% in the National Interview Survey.

For this study of poverty and health, we excluded all participants for whom there was no information on income (5.5% of the males and 9.1% of the females). Non-response for income increased with increasing age and increasing number of household members. Study subjects with low educational attainment yielded a higher non-response for income compared to study subjects with high educational attainment (8.3% versus 3.2%). The analysis included 25544 males and 25719 females with German nationality in the age group 25–69 years, who were examined in the years 1984 to 1992.

Definition of the poverty line using the GCP-questionnaire

The wording for the question on household income in the GCP-questionnaire was as follows: "What is your monthly household income; that means the net income of yourself and all other household members added together, after deducting taxes and dues for social security?" There were eleven pre-coded answering categories: less than 1000 German marks (DM), 1000–1499 DM, 1500–1999 DM, 2000–2499 DM, 2500–2999 DM, 3000–3499 DM, 3500–3999 DM, 4000–4499 DM, 4500–4999 DM, 5000–5999 DM, 6000 DM or more. The mid value of each category was defined as the household income. For the lowest income category (<1000 DM) the income was set to 1000 DM, and for the highest category (>=6000 DM) the income was set to 6500 DM.

In order to adjust the household to the number of household members we used the concept of equivalence scales (see above). For one-person households, the equivalence income is identical with the household income. For households with more than one member we adopted the equivalence parameters from Hanesch et al.², which are based on the German Federal Social Security Law²⁵. These equivalence parameters are as follows: head of household = 1.0; person in the household older than 18 years = 0.80; person in household from 15 to 17 years = 0.90; person in household 8 to 14 years = 0.65; person in household younger than 8 years = 0.50 for two-parent households, and 0.55 for single-parent households. Using these weights, the equivalence income in households with more than one member was defined as the household net income divided by the sum of the equivalence parameters for each household member. For example, the equivalence income of a family with one child aged 10 years and a total household net income of 4000 DM is 4000 DM divided by 2.45 (1.00 [head of household] + 0.80 [person older than 18 years] + 0.65 [child 8 to 14 years]), which equals 1633 DM.

The poverty line was defined by an equivalence income 50% less than the mean income in the German population. As cutoff points we used the corresponding poverty lines (50% threshold) reported by Hanesch et al.² for the time period 1984 to 1992 for West Germany. The cutoff for poverty based on equivalence household income were as follows: year 1984: 611 DM per month; 1985: 623 DM; 1986: 661 DM; 1987: 685 DM; 1988: 702 DM; 1989: 733 DM; 1990: 790 DM; 1991: 860 DM.

A limitation of these data is that the GCP-questionnaire provided no further differentiation for households with an income of less than 1000 DM per month. We therefore

defined all one-person households with an income less than 1000 DM per month as being below the poverty line. This correction procedure increased the number of study subjects defined as below the poverty line by 1,327. Therefore, the number of study subjects below the poverty line was slightly overestimated for single-person households.

Health variables

The following four sets of health-related variables were analyzed: individual health behavior, subjective assessment of health status, prevalence of cardiovascular disease risk factors, and self-reported prevalence of lifetime chronic disease. These variables were selected because they encompass different dimensions of health and were assessed with sufficient reliability.

Individual health behavior

All variables for individual health behavior were based on self-reporting. For smoking behavior, current smoking, ex-smoking and heavy smoking (20 and more cigarettes per day) were each considered. All study subjects reporting no regular sports activities were defined as being physically inactive. Regular alcohol consumption was defined as daily consumption of any type of alcoholic beverage.

Subjective assessment of health status

Three variables for the assessment of personal health status were included in the analysis. First, study subjects were asked how they would assess their general health status (response categories were: very good, good, fair, less than good, poor). Persons answering that their health status was poor or less than good were classified as having an unfavourable health

status. Another questionnaire item was aimed at health satisfaction. For this purpose we administered the so-called "faces-scale"²⁶. The question wording was: "How satisfied are you with the following domains of your life?". One of these domains was health. The response categories consisted of seven faces representing a scale from "very dissatisfied" to "very satisfied". Study subjects who checked one of the three most unsatisfied faces were classified as not being satisfied with their present health status. Finally, we asked whether the study subjects were hindered in carrying out their daily activities due to health restrictions.

Cardiovascular disease risk factors

Cardiovascular disease risk factors were defined as follows:

Uncontrolled hypertension: systolic blood pressure ≥ 160 mmHg and/or diastolic blood pressure ≥ 95 mmHg, second blood pressure reading. Blood pressure was measured twice (3 minutes apart) using the right arm in a sitting position. The measurement were carried out by trained nurses using a random-zero-device. Korotkoff-phase V was used to determine diastolic blood pressure.

Hypercholesterolemia: total serum cholesterol ≥ 250 mg/dl. Non-fasting venous blood samples were drawn after the blood pressure reading, and determination of total serum cholesterol was performed by means of the enzymatic CHOD-PAP method (Boehringer Mannheim, Germany)^{27,28}.

Low HDL-cholesterol: males: HDL-cholesterol ≤ 35 mg/dl, females: HDL-cholesterol ≤ 45 mg/dl.

Obesity: body-mass-index ≥ 30 . These cardiovascular diseases risk factors were assessed in the National and Regional Health Surveys (N = 41122), but not in the National Interview Survey (N = 10141).

Self-reported prevalence of lifetime chronic diseases

Self-reported lifetime prevalence of chronic diseases was assessed in the GCP-questionnaire by a checklist of 30 chronic disease. The study subject was asked whether the specific disease had ever been present. For this analysis we considered the following nine chronic diseases: myocardial infarction/stroke, diabetes mellitus, hyperuricaemia/gout, rheumatic disorders, intervertebral disc damage, chronic bronchitis, peptic ulcer, allergies, and cancer.

Statistical analysis

All analyses were conducted separately for males and females. Because age is a confounding factor for the relationship between health and poverty, all analyses were adjusted by age, using weighting factors for 5-year age groups. Firstly, the age-adjusted prevalence for the health variables were computed for study subjects above and below the poverty line. Secondly, to estimate measures of the effect of poverty on prevalences of the dependent variables, adjusted prevalence odds ratios (POR)²⁹ and 95 %-confidence intervals (CI) were computed by multiple logistic regression analysis. In these regression analyses the variable age (range 25–69) was included throughout as an additional control variable. All statistical analyses were performed with the Statistical Analysis System (SAS).

Results

Poverty and sociodemographic variable

Based on the definition of poverty by Hanesch², and the additional convention that all study subjects living in one-person households

| Age | Males | | Females | | Total | |
|-------|-------|--------------------------------|---------|--------------------------------|-------|--------------------------------|
| | N | income below poverty line in % | N | income below poverty line in % | N | income below poverty line in % |
| 25–29 | 3559 | 12.7 | 3329 | 13.7 | 6688 | 13.2 |
| 30–34 | 2910 | 9.1 | 3064 | 15.1 | 5974 | 12.2 |
| 35–39 | 2816 | 11.6 | 2807 | 15.4 | 5623 | 13.5 |
| 40–44 | 3176 | 12.1 | 2964 | 13.4 | 6140 | 12.8 |
| 45–49 | 3533 | 11.9 | 3354 | 11.7 | 6887 | 11.8 |
| 50–54 | 3167 | 10.6 | 2822 | 11.3 | 5989 | 10.9 |
| 55–59 | 2750 | 7.4 | 2608 | 10.9 | 5358 | 9.1 |
| 60–64 | 2260 | 7.3 | 2704 | 11.0 | 4964 | 9.3 |
| 65–69 | 1573 | 5.0 | 2067 | 11.5 | 3640 | 8.7 |
| Total | 25544 | 10.2 | 25719 | 12.8 | 51263 | 11.5 |

N = all study subjects.

Table 1. Study subjects with equivalence income below the poverty line by sex and age.

and reporting an income of less than 1000 DM per month were classified as being below the poverty line, we found that 10.2 % of the males and 12.8 % of the females belonged to this group (Table 1). Poverty rates were generally higher in younger age groups than older and among females compared to men.

The poverty rates for specific household types are shown in Table 2. The poverty rates were lowest among both men and women for families without children living in the household (males: 3.9 %, females: 4.6 %). In families with one child living in the household, the percentage of people below the poverty line was similar to the percentage in the general population. Families with two children in the household had a poverty rate about 50 % higher than in the general population. Families with three or more children had a substantially higher poverty rate (36.1 % in males and 41.3 % in females). The highest poverty rates were found for females living alone with children (one

child: 28.6 % in poverty, two children: 42.9 %, three or more children: 60.0 %).

Poverty and health

Individual health behavior

For the three smoking-related variables, namely current smoking, heavy smoking and ex-smoking, significant differences were found for both sexes for study subjects living above and below the poverty line (Table 3). Persons with an equivalence income below the poverty line were more often current and heavy smokers and less often ex-smokers. The age-adjusted prevalence odds ratio for current smoking was 1.29 (95 % confidence interval (C): 1.18–1.40) for males below the poverty line and 1.20 (95 % C: 1.10–1.31) for females, using the highest income quartile as reference category. Both males and females living in poverty reported significantly less regular vigorous physical activity. Daily alcohol consumption was significantly more frequent for subjects

| Age (years) | Males | | | Females | | | total | | | % poor | | |
|----------------------------|-------|-------|-------|---------|-------|-------|-------|--------|-------|--------|---|--------|
| | 25–39 | 40–54 | 55–69 | 25–39 | 40–54 | 55–69 | N | % poor | N | % poor | N | % poor |
| One-person-household | 19.0 | 14.5 | 12.8 | 2650 | 16.5 | 15.2 | 13.5 | 19.8 | 3617 | 17.4 | | |
| Family no children | 3.3 | 4.2 | 3.9 | 11545 | 3.9 | 4.2 | 4.5 | 4.8 | 10642 | 4.6 | | |
| Family with 1 child | 6.3 | 13.3 | 22.3 | 4743 | 11.3 | 7.9 | 16.2 | 27.6 | 4294 | 12.5 | | |
| Family with 2 children | 13.5 | 18.7 | 36.8 | 3501 | 16.3 | 16.1 | 22.8 | 23.3 | 3293 | 18.0 | | |
| Family with 3+ children | 32.5 | 39.8 | * | 912 | 36.1 | 40.1 | 43.6 | * | 922 | 41.3 | | |
| Single parent: 1 child | 14.6 | 12.6 | * | 301 | 15.0 | 27.9 | 28.9 | 31.2 | 779 | 28.6 | | |
| Single parent: 2 children | 21.8 | * | * | 92 | 21.7 | 50.0 | 35.9 | * | 280 | 42.9 | | |
| Single parent: 3+ children | * | * | * | 35 | 22.9 | 66.7 | * | * | 75 | 60.0 | | |
| Other household types | 13.1 | 11.2 | 7.8 | 1765 | 11.7 | 13.4 | 12.6 | 18.0 | 1817 | 14.8 | | |
| Total | 11.2 | 11.6 | 6.8 | 25544 | 10.2 | 14.7 | 12.2 | 11.1 | 25719 | 12.8 | | |

Only children living in the patients' household are considered.
* Not included, because n<50.

Table 2. Percentage of persons below the poverty line by type of household.

with an income below the poverty line in males.

Subjective assessment of health status

In both sexes, higher prevalence rates for poor self-assessed health status were found among study subjects living in poverty (Table 4). These differences were more pronounced in males than females. The POR for the variable "Personal health status is poor or less than good" for persons below the poverty line was 1.92 (95% CI: 1.71–2.16) in males and 1.70 (95% CI: 1.54–1.88) in females.

Cardiovascular disease risk factors

For both sexes, the most pronounced poverty-related differences were observed for obesity (Table 5). The age-adjusted POR for obesity was 1.43 (95% CI: 1.26–1.63) for males living in poverty, and 1.84 (95% CI: 1.64–2.05) for females. An increased POR for persons with an income below the poverty line was found for uncontrolled hypertension and low HDL-cholesterol in females only, while for hypercholesterolemia a significantly lower age-adjusted POR of 0.85 (95% CI: 0.77–0.94) was observed for females with an income below the poverty line. In males, we observed no significant poverty-related differences in the age-adjusted PORs for uncontrolled hypertension, hypercholesterolemia, or low HDL-cholesterol.

Self-reported prevalence of lifetime chronic diseases

For myocardial infarction/stroke and chronic bronchitis (Table 6) significantly increased age-adjusted PORs were found for both males and females living in poverty. Increased PORs were found in males living in poverty for rheumatic disorders (1.13; 95% CI: 1.01–1.27) and intervertebral disc damage (1.21; 95% CI: 1.10–1.33),

| | N | Prevalence in % | | Equivalence income | | | |
|-----------------------------|-------|-----------------|----------|--------------------|--------------|--------------|---------------------------|
| | | poor | non-poor | Inc 1 POR | Inc 2 POR | Inc 3 POR | below poverty line POR |
| Males | | | | | | | |
| Smoking at present | 25529 | 47.7 | 41.2 | 1.00 | 1.09 | 1.12 | 1.29 |
| Heavy smoker | 25529 | 13.8 | 11.9 | 1.00 | 1.05 | 1.00 | 1.20 |
| Ex-smoker | 25529 | 26.3 | 33.1 | 1.00 | 0.94 | 0.95 | 0.68 |
| No regular sport activities | 24875 | 53.0 | 35.7 | 1.00 | 1.15 | 1.41 | 2.47 |
| Daily alcohol consumption | 25452 | 25.1 | 28.1 | 1.00 | 0.99 | 1.03 | 1.19 |
| Females | | | | | | | |
| Smoking at present | 25256 | 29.8 | 26.6 | 1.00 | 1.00 | 0.95 | 1.20 |
| Heavy smoker | 25256 | 5.3 | 4.1 | 1.00 | 1.11 | 1.05 | 1.18 |
| Ex-smoker | 25356 | 12.9 | 18.7 | 1.00 | 0.91 | 0.83 | 0.60 |
| No regular sport activities | 25016 | 58.2 | 44.0 | 1.00 | 1.08 | 1.40 | 2.09 |
| Daily alcohol consumption | 25419 | 6.2 | 6.7 | 1.00 | 0.81 | 0.75 | 0.86 |

POR = age-adjusted prevalence odds ratios.

Inc 1 = Equivalence income more than 100% higher than mean equivalence income (reference category).

Inc 2 = Equivalence income up to 100% higher than mean equivalence income.

Inc 3 = Equivalence income up to 50% lower than mean equivalence income.

Table 3. Health behavior for study subjects above and below the poverty line.

| | N | Prevalence in % | | Equivalence income | | | |
|---|-------|-----------------|----------|--------------------|--------------|--------------|---------------------------|
| | | poor | non-poor | Inc 1 POR | Inc 2 POR | Inc 3 POR | below poverty line POR |
| Males | | | | | | | |
| Health status less than good or poor | 25506 | 20.1 | 13.3 | 1.00 | 1.26 | 1.26 | 1.92 |
| Health status hinders performance of daily duties | 25465 | 18.1 | 9.7 | 1.00 | 1.41 | 1.48 | 2.78 |
| Not satisfied with health status | 25181 | 15.3 | 8.4 | 1.00 | 1.42 | 1.44 | 2.51 |
| Females | | | | | | | |
| Health status less than good or poor | 25691 | 21.9 | 15.4 | 1.00 | 1.21 | 1.29 | 1.70 |
| Health status hinders performance of daily duties | 25648 | 13.1 | 8.9 | 1.00 | 1.10 | 1.19 | 1.62 |
| Not satisfied with health status | 25379 | 13.5 | 8.7 | 1.00 | 1.26 | 1.23 | 1.82 |

POR = age-adjusted prevalence odds ratios.

Inc 1 = Equivalence income more than 100% higher than mean equivalence income (reference category).

Inc 2 = Equivalence income up to 100% higher than mean equivalence income.

Inc 3 = Equivalence income up to 50% lower than mean equivalence income.

Table 4. Subjective assessment of health status by study subjects above and below the poverty line.

| | N | Prevalence in % | | Equivalence income | | | |
|----------------------|-------|-----------------|----------|--------------------|--------------|--------------|---------------------------|
| | | poor | non-poor | Inc 1 POR | Inc 2 POR | Inc 3 POR | below poverty line POR |
| <i>Males</i> | | | | | | | |
| Hypertension | 20108 | 19.6 | 19.6 | 1.00 | 1.02 | 1.00 | 1.06 |
| Hypercholesterolemia | 19768 | 33.0 | 34.0 | 1.00 | 0.94 | 0.96 | 0.96 |
| Low HDL-cholesterol | 18488 | 11.3 | 10.6 | 1.00 | 0.96 | 1.00 | 1.09 |
| Obesity | 20035 | 18.7 | 14.8 | 1.00 | 1.11 | 1.25 | 1.43 |
| <i>Females</i> | | | | | | | |
| Hypertension | 20537 | 17.1 | 14.3 | 1.00 | 0.97 | 1.03 | 1.27 |
| Hypercholesterolemia | 19861 | 32.2 | 34.6 | 1.00 | 0.93 | 0.92 | 0.85 |
| Low HDL-cholesterol | 18585 | 14.6 | 10.7 | 1.00 | 1.03 | 1.33 | 1.52 |
| Obesity | 20451 | 23.5 | 15.6 | 1.00 | 1.09 | 1.32 | 1.84 |

POR = age-adjusted prevalence odds ratios.

Inc 1 = Equivalence income more than 100 % higher than mean equivalence income (reference category).

Inc 2 = Equivalence income up to 100 % higher than mean equivalence income.

Inc 3 = Equivalence income up to 50 % lower than mean equivalence income.

Table 5. Cardiovascular disease risk factors by study subjects above and below the poverty line.

| | N | Prevalence in % | | Equivalence income | | | |
|----------------------------|-------|-----------------|----------|--------------------|--------------|--------------|---------------------------|
| | | poor | non-poor | Inc 1 POR | Inc 2 POR | Inc 3 POR | below poverty line POR |
| <i>Males</i> | | | | | | | |
| Myocard. infarction/stroke | 25544 | 5.5 | 4.2 | 1.00 | 1.12 | 1.33 | 1.59 |
| Diabetes mellitus | 25544 | 5.2 | 5.0 | 1.00 | 0.92 | 1.18 | 1.07 |
| Hyperuricaemia/gout | 25544 | 11.1 | 13.1 | 1.00 | 0.91 | 1.04 | 0.87 |
| Rheumatic diseases | 25544 | 19.1 | 18.1 | 1.00 | 1.01 | 1.12 | 1.13 |
| Intervertebral disc damage | 25544 | 28.8 | 26.2 | 1.00 | 0.96 | 1.00 | 1.21 |
| Chronic bronchitis | 25544 | 13.4 | 9.3 | 1.00 | 1.07 | 1.18 | 1.56 |
| Peptic ulcer | 25544 | 28.0 | 27.1 | 1.00 | 0.95 | 0.94 | 1.00 |
| Allergies | 25544 | 15.9 | 17.9 | 1.00 | 0.92 | 0.87 | 0.82 |
| Cancer | 25544 | 1.4 | 1.4 | 1.00 | 1.06 | 0.97 | 1.10 |
| <i>Females</i> | | | | | | | |
| Myocard. infarction/stroke | 25719 | 2.8 | 1.9 | 1.00 | 1.19 | 1.24 | 1.55 |
| Diabetes mellitus | 25719 | 5.5 | 4.1 | 1.00 | 1.31 | 1.14 | 1.43 |
| Hyperuricaemia/gout | 25719 | 5.7 | 5.6 | 1.00 | 0.98 | 1.00 | 1.04 |
| Rheumatic diseases | 25719 | 21.5 | 22.7 | 1.00 | 0.94 | 0.91 | 0.90 |
| Intervertebral disc damage | 25719 | 22.4 | 23.1 | 1.00 | 0.93 | 0.82 | 0.92 |
| Chronic bronchitis | 25719 | 7.1 | 6.2 | 1.00 | 1.08 | 1.01 | 1.20 |
| Peptic ulcer | 25719 | 22.4 | 24.2 | 1.00 | 0.96 | 0.85 | 0.86 |
| Allergies | 25719 | 22.1 | 25.6 | 1.00 | 0.93 | 0.84 | 0.76 |
| Cancer | 25719 | 1.4 | 1.6 | 1.00 | 0.80 | 0.80 | 0.86 |

POR = age-adjusted prevalence odds ratios.

Inc 1 = Equivalence income more than 100 % higher than mean equivalence income (reference category).

Inc 2 = Equivalence income up to 100 % higher than mean equivalence income.

Inc 3 = Equivalence income up to 50 % lower than mean equivalence income.

Table 6. Self-reported prevalence of lifetime chronic diseases for study subjects above and below the poverty line.

while in females a significantly increased POR was observed for diabetes mellitus (1.43; 95% CI: 1.19–1.72). Significantly reduced PORs for people with an income below the poverty line were observed for allergies in both sexes (males: 0.82; 95% CI: 0.73–0.92, females: 0.76; 95% CI: 0.70–0.84), for hyperuricaemia/gout in males, and for rheumatic disorders and peptic ulcer in females.

Discussion

The percentage of people living in relative poverty in West Germany (11.5%) ascertained by the GCP-Surveys between 1984 and 1992 is similar to the figures reported by Hanesch et al.² In that study, the percentage of persons living in poverty was between 8.7 and 11.8% for the years 1984 to 1992. Consistent with the findings in the GCP, Hanesch et al.² found an increasing rate of poverty with increasing number of children in the household. In both studies the highest poverty rates were found in single-parent households.

The main result of our analysis was that for most but not all health parameters less favourable health status was found among those with a household income below the poverty line. The most striking poverty-related differences were observed for lack of regular exercise, general health satisfaction, obesity, and lifetime prevalence of myocardial infarction/stroke. Significantly lower prevalence odds ratios for persons with a household income below the poverty line were found for hypercholesterolemia in females. Males below the poverty line reported significantly less often hyperuricaemia/gout and allergies, and females below the poverty line reported significantly lower prevalences of rheumatic disorders, peptic ulcer and allergies.

The cross-sectional study design has several limitations when study-

ing the relationship between poverty and health. In recent years, research about poverty in Germany has been complemented by cohort studies aiming at a more "dynamic poverty research methodology"^{3,30,31}. The main focus of these studies is on duration of poverty and on determinants of the beginning and ending of periods of poverty. Results of these studies show that a significant number of people move into or out of poverty each year. One study of children in the United States found that poverty-related health problems were more severe as the duration of poverty increased³². It would be desirable to restrict the analysis to persons who have lived in relative poverty for a specified time period. Our data do not allow such a longitudinal analysis. It is important to note, however, that the health consequences associated with relative poverty of longer duration are likely to be more pronounced than those reported here.

An additional consideration is that poor health in one or more members of a family may cause deterioration of the family's economic situation by reducing the earning ability of one or both wage earners. Our cross-sectional data confirm the relationship between poverty and a number of adverse health indicators in Germany but do not permit assessment of the effects of poor health on economic status. Another methodological limitation relates to the information about household income. It was not possible to assess the validity of the self-reported income levels. Furthermore, no data were available about other aspects of the respondent's economic situation such as savings, debts, or house ownership.

It is possible that selection factors influenced the study results. It is known that persons living in poverty are less likely to participate in health surveys. Selective omission of the poorest of the poor, who are

likely to have worse health problems, would have had the effect of leading to underestimation of the odds ratios between poverty and health.

Two general hypotheses regarding the relationship between poverty and health are current: that poor health causes poverty, and that the conditions of poverty have an adverse impact on health. While our data cannot address this question directly, because of the cross-sectional design of the study, we nonetheless would suggest that the hypothesis that poor health produces poverty has limited explanatory power in our study because of the existence of a well-established, mandatory health insurance system in Germany³³. Thus, families are relatively protected economically from the direct health care costs of illness through the health insurance system, and also to some extent from the indirect impacts on wage earning capacity through the social insurance system. These protections are incomplete, and serious illness or death can clearly have adverse economic impacts on families. No data are available to estimate the extent of this process, and we recognize that it may be of some importance.

We nonetheless believe that the second process is likely to be of greater importance. Lower educational attainment and lower socio-economic status have been found repeatedly and in a number of populations to be associated with adverse patterns of health-related behaviors that in turn have been strongly linked to adverse health outcomes including cancer, heart disease, and other chronic and infectious diseases^{34–38}. Due to the rising unemployment in Germany in the last years it is very likely that the considerable negative consequences of poverty for health are increasing.

Zusammenfassung

Armut und Gesundheit in Westdeutschland

Es wird untersucht, welche Zusammenhänge zwischen Armut und verschiedenen gesundheitsbezogenen Merkmalen bestehen. Datenbasis sind die nationalen und regionalen Gesundheitssurveys, die in den Jahren 1984 bis 1992 in Westdeutschland durchgeführt wurden. 25 544 Männer und 25 719 Frauen mit deutscher Nationalität im Alter von 25 bis 69 Jahren wurden einbezogen. Armut wurde definiert als ein Haushaltseinkommen, das um 50% niedriger ist als das mittlere Einkommen in Westdeutschland. Die statistische Auswertung erfolgte mittels multipler logischer Regressionsanalyse. 10,2% der Männer und 12,8% der Frauen hatten ein Haushaltseinkommen unterhalb der Armutsgrenze. Die ausgeprägtesten armutsbezogenen Unterschiede wurden beobachtet für den Mangel an körperlicher Bewegung, die subjektive Gesundheitszufriedenheit, das starke Übergewicht und die kardiovaskulären Krankheiten. Signifikant niedrigere Prävalenzen für Personen mit Einkommen unterhalb der Armutsgrenze ergaben sich bei den Frauen für den Risikofaktor Hypercholesterinämie. Allergien waren die einzige chronische Krankheit, die bei beiden Geschlechtern signifikant seltener in der von Armut betroffenen Bevölkerungsgruppe berichtet wurde. Vor dem Hintergrund der in den letzten Jahren stark angestiegenen Arbeitslosigkeit in Deutschland ist zu befürchten, dass die negativen Konsequenzen der Armut für die gesundheitliche Lage deutlich zugenommen haben.

Résumé

Pauvreté et santé en Allemagne de l'Ouest

Les rapports entre pauvreté et différents indices sanitaires ont été examinés. Les données proviennent des surveys de santé nationales et régionales, réalisées en Allemagne de l'Ouest durant les années 1984 à 1992. 25 719 femmes et 25 544 hommes de nationalité allemande entre 25 et 69 ans ont participé. Le seuil de pauvreté a été fixé à un revenu égal à 50% du revenu moyen en Allemagne de l'Ouest. On a analysé les indices sanitaires suivants: le comportement sanitaire individuel, l'auto-estimation de sa santé, les facteurs de risque cardio-vasculaires et la prévalence des maladies chroniques. L'analyse statistique a été réalisée par régression logique multiple. 12,8% des femmes et 10,2% des hommes avaient un revenu inférieur au seuil de pauvreté. Pour la majorité des indices sanitaires on a trouvé des résultats défavorables pour la groupe ayant un revenu au-dessous du seuil de pauvreté. Le manque de mouvement, l'auto-estimation de sa santé, l'excès de poids et les maladies cardio-vasculaires sont les indices qui diffèrent, relativement à la pauvreté, le plus. Les femmes ayant un revenu au-dessous du seuil de pauvreté ont des pourcentages de prévalence inférieurs significatifs pour le facteur de risque hypercholestérolémie. Les allergies sont les seules maladies qui existent significativement moins souvent chez les deux sexes de la groupe des pauvres. En résumé, la pauvreté présente un désavantage pour la santé individuelle et la prévalence des maladies chroniques. Sachant que le taux de chômage s'est aggravé pendant les dernières années, il est à craindre que les effets négatifs de la pauvreté sur la situation sanitaire ont nettement augmenté.

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Address for correspondence

Dr. Uwe Helmert
 Zentrum für Sozialpolitik
 Universität Bremen
 Parkallee 39
 D-28209 Bremen