RESEARCH REPORT

Socioeconomic differences in children's and adolescents' hospital admissions in Germany: a report based on health insurance data on selected diagnostic categories

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Study objective: The extent of social inequalities in children's hospitalisation risks was examined in terms of socioeconomic status and parents' nationality. This was considered in terms of inpatient treatment attributable to a number of diagnoses (ICD-9), especially infectious diseases and psychiatric disorders.
Design and setting: Analyses were performed with records of a German statutory health insurance comprising 48 412 (52.8% male and 47.2% female) children and adolescents of 15 years of age or younger who were co-insured between 1987 and 1996. Classification of socioeconomic position was based on parental occupational position.
Results: Social inequalities in terms of hospital admissions attributable to acute diseases were rather small. The only exception were infections of the respiratory organs: in the highest status positions as compared with the lowest one the relative risk for being admitted was RR=0.22 (95% CI 0.06 to 0.89). However, length of stay in hospital was significantly related to socioeconomic position for infections of the upper respiratory tract and infections of the respiratory organs, with children and adolescents with the lowest socioeconomic background having spent the longest periods in hospital. With regard to nationality, pneumonia/flu was the only diagnostic category where relative risks for being admitted were higher in non-German children and adolescents (RR=1.5; 95% CI 1.2 to 1.8). Conversely, hospital admissions attributable to psychiatric diagnoses were significantly lower among non-German patients (RR=0.43; 95% CI 0.30 to 0.61), thus suggesting differential utilisation patterns according to nationality.
Conclusions: Health inequalities in children's and adolescents' hospital admissions in Germany are small and inconsistent if parents' socioeconomic status and nationality are taken as criterion. Yet, children of lower status background stay longer in hospital if suffering from highly prevalent infectious diseases. This last observation may be attributable to more severe disease conditions.

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Social inequalities in health are a robust and universal finding for men and women beyond the age of 20.[1–3] While in adulthood inequalities become manifest in terms of general health status, incidence of chronic diseases and premature mortality, the situation is less clear in childhood and adolescence, at least with regard to morbidity including chronic impairment. In one study based on data from the General Household Survey (GHS) West [4] concluded that for the age group 12–19 social differences in longstanding illness may not exist in Great Britain. In a later study on 15 years olds, self reported health status and information from parents on adolescents' health were collected. Again no social class differences emerged,[5] and the same conclusion can be drawn from a Finnish study.[6] On the other hand, data from the British census in 1991 indicate that social differences in long term limiting illness do exist below the age of 16. The two most affected groups were adolescents with parents in unskilled occupations, and adolescents where social class information was missing.[7] Finally Cooper *et al*, based on the 1992–1994 GHS data reported social gradients for longstanding illness in the age group 5–10, but not for the younger or the older (11–16 years) group. [8] These data are somewhat difficult to evaluate because the illness rates were comparably low and no confidence intervals had been reported.

Additional research focusing on specific diseases show a somewhat less ambiguous situation. In a recent panel study from Brazil conducted by Viana *et al*[9] it was found that socioeconomic status was one of the strongest predictors of the course of childhood leukaemia. Over an observation period of more than four years, children from materially disadvantaged households had shorter disease free intervals and a higher rate of relapse of acute lymphoblastic leukaemia. An Italian study on dental health reported large social differences in the prevalence of caries and dental decay among 11–12 year old children,[10] and similar results became evident from a cross sectional study with 1043 adolescents at the age of 12 in Germany where dental health in children with less qualified parents turned out to be worse than in children whose parents holding highest educational degree.[11]

Social differentials in health may also exist in some preclinical conditions, such as impaired hearing or impaired sight. Studies using data from routinely performed medical examinations before school enrolment have confirmed this assumption.[12] Moreover, the risk of psychiatric disorders and behavioural disturbance was shown to be increased among lower socioeconomic groups.[13] Yet, not all health conditions follow the pattern discussed so far. For instance neurodermitis, a frequent skin disease, shows an opposite social pattern: its occurrence increases with higher socioeconomic position.[13–15]

Mortality data in general document a higher risk of death among lower socioeconomic children, in particular perinatal and infant mortality and child mortality from accident and injury. Yet, the bulk of evidence in European countries comes from the United Kingdom and Scandinavian countries. Few data are available, for instance, for France [12 16] or Germany.[3] For younger children with parents of lower social status as compared with higher status parents in Sweden, Vagerö and

Table 1 Distribution of gender and socioeconomic status, assigned according to parents' occupational position (number of cases and row percentages)

	Unskilled/ semi-skilled	Skilled manuals	Skilled non-manuals	Intermediates/ professionals	Unclassified	Total
Male	11787/46.1%	5675/22.2%	1490/5.8%	205/0.8%	6427/25.1%	25584/100%
Female	10112/44.3%	5085/22.3%	1415/6.2%	207/0.9%	6009/26.3%	22828/100%
Total	21899	10760	2905	412	12436	48412

Ostberg [17] reported a relative mortality risk of RR=1.4, with the difference for males being more pronounced than for females. For the age groups between 5 and 9 years, the gradient was reduced (RR=1.42 for males and RR=1.1 for females), and up to the age of 15 it almost disappeared. In a recent report from the United Kingdom children of single mothers were shown to be exposed to a threefold increase in mortality risk, compared with children from the most favourable socioeconomic background.[18] In a German study on perinatal mortality including 1626 mothers, both the rates of stillbirths and of perinatal mortality strongly decreased with increasing educational level, but insufficient statistical control of confounders restricts the interpretation of findings.[19] An impressive Dutch study reported a consistent social gradient in perinatal mortality, using historical data from 1854 onwards.[20] Although perinatal mortality decreased substantially over time, the social gradient remained.

While research on social determinants of mortality and morbidity in childhood largely focused on conventional measures of socioeconomic position, additional markers of social inequality are needed. One particular indicator concerns immigrant status or nationality of origin. With the increasing number of immigrants in many European countries, differences in health between the native population and the health of immigrants have become a topic of concern, but not many studies so far investigated the issue of health among immigrant children and adolescents. In a recent Dutch study[21] the relative mortality risks of Turkish and Marocan immigrants aged 0–15 turned out to be twice as high than in native Dutch children and adolescents. This was mainly attributable to infectious diseases and accidents. Children of African origin also had comparably high perinatal mortality.[22] In a German study the separate effects of nationality and socioeconomic status were examined, taking hospital admission information as the database.[23] Non-German children had higher rates of admissions, but when controlling for socioeconomic status, effects were considerably reduced. However, as the majority of immigrant parents held unskilled and semi-skilled positions, controlling for socioeconomic status may result in overadjustment.

In this paper we focus on socioeconomic status—and immigrant status—related differences in the prevalence of selected diagnoses for hospital admission of children in Germany. In particular, most common diagnoses are considered, such as infectious diseases and psychiatric conditions. The following analyses are based on health insurance data on hospitalisation and respective main admission diagnoses, date of hospital admission and length of stay.

METHOD

The data for this study were provided by a statutory health insurance. They were recorded between 1987 and 1995 and actually determined for accounting purposes. The study population eligible for analysis consisted of 48 412 (52.8% male and 47.2% female) children and adolescents up to 15 years (table 1), the majority of them having a parent holding unskilled and semi-skilled occupational positions. Infants (less than 1 year old) had not been considered. Some 70.2% had German nationality; the largest non-German groups were Turkish (n=6644; 13.7% of participants), Italian (n=2074; 4.3%), Yugoslavian (includes all nationalities of the former Yugoslavia: n=1517; 3.1%), Greek (n=1205; 2.5%) and Marocan (n=1106; 2.3%) immigrants.

The catchment area is the district of Mettmann, an urban or urbanised area west of the city of Duesseldorf. Parents of our study population were employed either in the production industry or in the service sector with an overrepresentation of the "old" industries.

The clientèle of local health insurances does not correspond to the status distribution of the German population. Because of peculiarities of the German health insurance system, lower socioeconomic groups are overrepresented, while relatively few individuals with higher occupational status are included.

Disease classifications after hospital admissions were made according to ICD-9. Hospital data transferred to the health insurance included diagnosis, date of admission and duration of stay of every registered member. For the purpose of our analyses we choose the most frequent diagnoses of hospital admissions in this age group—that is, acute infections of the respiratory organs (ICD9–460 to 466), infections of the upper respiratory tract (ICD9–470 to 478), pneumonia/flu (ICD9–480 to 487), chronic obstructive airways diseases (ICD9–490 to 496), leukaemia (ICD9–204 to 208) and neurotic, depressive and anxiety disorders (ICD9–300, 311 and 313). We excluded accidents and injuries from this report as respective findings have been published earlier in a separate paper.[24]

In the study population hospital admissions attributable to infections of the upper respiratory tract were most common

Table 2 Hospitalisation rates for gender and nationality

	Infections of the upper respiratory tract (n=2494)	Infections of respiratory organs (n=1178)	Chronic obstructive airways diseases (n=469)	Pneumonia/flu (n=413)	Neuroses, anxiety, depression (n=213)
Gender					
Male (n=25584)	1346 (5.3)	666 (2.6)	291 (1.1)	254 (1.0)	130 (0.5)
Female (n=22828)	1148 (5.0)	512 (2.2)	178 (0.8)	159 (0.7)	83 (0.4)
Nationality					
German (n=33998)	1743 (5.1)	858 (2.5)	335 (1.0)	239 (0.7)	174 (0.5)
Other nationality (n=14414)	751 (5.2)	320 (2.2)	134 (0.9)	174 (1.2)	39 (0.3)

Percentages shown in parentheses.

Table 3 Hospitalisation rates for age groups

	Up to 4 years	5 to 9 years	10 to 15 years
Hospitalised	839 (5.2)	2222 (7.5)	1381 (3.8)
Not hospitalised	15236 (94.8)	27560 (92.5)	34881 (96.2)
Total	16075	29782	36262

Percentages shown in parentheses.

(table 2). For the diagnosis of leukaemia we observed 13 cases only, a number too small to be included in multivariate analysis. The total number of deaths within the observation period was 71. Again, the numerical basis was too weak for an appropriate test of our main hypotheses.

If hospitalisations are considered by age groups it has to be borne in mind that the analyses are individual centred, thus in table 3 one individual may be counted more than once if the insurance period exceeds one of the age intervals considered here. The disease categories of interest are counted with the date of the first diagnosis.

Classifications of socioeconomic status were performed according to the position of the the main household earner. We first applied the three digit occupational classification issued by the German Labour Authority.[25] In a second step, these many categories were reduced into five, and finally four groups, following the British registrar general classification: "unskilled and semi-skilled positions", "skilled manuals", "skilled non-manuals", "intermediates" and "professionals". Because of the small number of professionals, intermediate positions and professionals had to be combined into one group. As information on occupational changes was available we used the highest level obtained. Wherever occupational information was ambivalent we consulted the classification of occupational qualifications available for Germany to choose the appropriate category.[26]

For a considerable proportion of the present sample, socioeconomic status information was not available for several reasons (very low income, long term unemployment, early retirement, disability without employment, or welfare recipient). Despite its heterogeneity we included the unclassified as a separate group into our analysis.

Statistical analyses

The following analyses are based on Cox regression[27 28] in order to estimate (individual-based) relative risks for hospital admissions in the multivariate analyses. Regression analysis using the Cox proportional hazards model is appropriate here as it takes time (in the following analyses age) into consideration. It can handle insurance periods of differing lengths—that is, individuals leaving the population before the age of 15 will not lead to biased results. In our dataset the situation is even more complex as the observation periods "at risk" may vary over subjects. For some, the age span from the age of one to 10 may be recorded in our data, and in some the observation period may start at a later age and may end before the age of 15. In calculating the relative risks the lengths of the individual observation periods are taken into account. Cox regression depicts a time process whereas it is assumed that an event (in the present case mortality) will occur as a function of time having elapsed. Some proportion of the population will fall ill within the observation period (here: until the age of 15), and the remaining individuals will not. If covariates are introduced (in the present case socioeconomic status and gender), for every covariate it will be estimated to what extent the time process is changed—that is, whether the respective risks of illness events for defined groups may decrease or increase. Thus adjusting for age is not appropriate.

In earlier studies on health inequalities in children and adolescents, age stratified analyses had been performed.[7] This had been done in order to consider environmental influences that may vary over different developmental stages. To take such effects into account, we conducted additional analyses for stratified age groups (1–5 years, 5–10 years, 11–15 years). Findings with respect to socioeconomic status classification resulting from these stratified analyses were difficult to evaluate because of small cell numbers. Thus we decided to present the main findings on socioeconomic status and hospital admissions for the total age group, and in addition for males versus females. However, when considering immigrant status we report the age specific effects in addition to the ones concerning the total group. If relative risks are estimated, usually the highest socioeconomic position is used as reference category. In the present case this leads to very large confidence intervals as the number of subjects in the highest category is small, and the number with a given disease is even smaller. Thus the results will be presented with the lowest socioeconomic position as reference category.

The dependent variable is the risk of the respective type of illness (until age 15).

For data management and basic statistics SPSS 6.1 on PC [29] was used, the Cox regressions were computed with STATA 6.0.[30]

RESULTS

In tables 4 and 5, results of the regression analyses are presented. The relative risks for hospital admissions and the respective 95% confidence intervals for different socioeconomic positions and for gender are displayed. The relative risks are given for the whole population—that is, for all age groups.

Socioeconomic status

For infections of the upper respiratory tract (table 4) as the most common diagnosis leading to hospital admission, no differences according to socioeconomic status emerged. The widths of the confidence limits do not permit any substantial

Table 4 Relative risks and 95% confidence intervals for the diseases in childhood and adolescence for all age groups

Intermediates/ professionals*	Skilled non- manuals*	Skilled manuals*	Unclassified*	Gender†
Infections of the upper respiratory tract (ICD9: 470–479)				
1.30 (0.87 to 1.95)	1.17 (0.99 to 1.40)	1.03 (0.93 to 1.14)	1.06 (0.96 to 1.16)	0.96 (0.89 to 1.04)
Infections of respiratory organs (ICD9: 460–466)				
0.22 (0.06 to 0.89)	1.03 (0.79 to 1.34)	0.91 (0.78 to 1.04)	1.19 (1.03 to 1.36)	0.87 (0.77 to 0.98)
Chronic obstructive airways diseases (ICD9: 490–496)				
0.59 (0.14 to 2.37)	1.34 (0.91 to 1.95)	1.04 (0.83 to 1.32)	1.16 (0.94 to 1.45)	0.69 (0.57 to 0.83)
Pneumonia/flu (ICD9: 480–487)				
0.58 (0.14 to 2.32)	0.66 (0.40 to 1.10)	0.75 (0.57 to 0.97)	1.03 (0.82 to 1.30	0.71 (0.58 to 0.86)
Neuroses, anxiety and depression (ICD9: 300, 311, 313)				
0.58 (0.08 to 4.19)	0.86 (0.45 to 1.65)	0.81 (0.57 to 1.16)	1.06 (0.77 to 1.46)	0.73 (0.55 to 0.95)

*Reference category: Unskilled/semi-skilled positions (risk=1); †reference category: males (risk=1), that is, the risks for females are displayed.

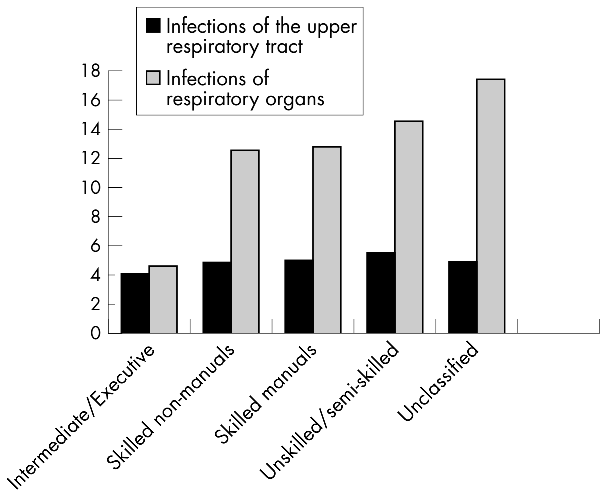

Figure 1 Infections of the upper respitatory tract and for infections of respiratory organs: mean lengths of stay in hospital in days.

interpretation of the observed relative risks. Moreover, there is no gender difference. Yet, when taking duration of hospital stay into account consistent differences between the status groups emerged. From highest to lowest socioeconomic status a steady increase in mean duration of hospitalisation (from mean 4.2 to 5.6 days; $p<0.01$) was observed (fig 1).

For infections of the respiratory organs, a large social gradient appears if children and adolescents from the highest as compared with the lowest ones are considered—that is, the relative risk for the first mentioned group is only 22% of the last one. Again, as for the disease category infections of the upper respiratory tract, mean duration of hospitalisation (fig 1) increases from 4.8 days for children and adolescents with highest socioeconomic status to 14.5 days for children with lowest socioeconomic status ($p<0.0001$). The unclassified group exhibits the longest hospital period (mean 17.4 days).

For the remaining three diagnostic categories the results suggest the absence of health inequalities. Although the estimates point to increased risks to the detriment of individuals from lower socioeconomic background, the confidence limits preclude substantial interpretations. A similar picture evolves with respect to duration of hospital stay. Unlike in the case of infections of the respiratory tract a clear cut social gradient is not observed. Interestingly, for four of the five disease categories, girls are less likely to be hospitalised than boys.

Immigrant status

In table 5, different risks of hospital admission according to immigrant status are analysed for the total group as well as for three age groups. Effects are adjusted for gender and socioeconomic status. In general, immigrant status is not associated with an increased hospitalisation risk, except for pneumonia. By contrast, the likelihood of hospital admission for infections of the respiratory tract and for neurosis, anxiety and depressive disorders is even smaller in immigrant children as compared with children with German nationality. As mentioned above, controlling for socioeconomic status may result in an overadjustment. In this special case, an additional multivariate analysis exploring the separate and combined effects of the two indicators of social inequality, occupational status and immigrant status, on the risk of hospital admission was not possible because some 83% of all children with non-German origin belonged either to the lowest occupational group or to the group with unclassified parents.

Again, mean duration of hospital stay was analysed according to immigrant status. When adjusting for socioeconomic status and gender no systematic difference was observed. For instance, mean duration of hospitalisation in German children was higher for the disease category "infections of the respiratory organs" (16.8 versus 9.5 days; $p<0.001$), "chronic obstructive airways" (26.0 versus 14.9 days; $p<0.001$) and "psychiatric conditions" (36.6 versus 25.2 days; $p=0.05$), but it was higher in immigrant children for the disease category "infections of the upper respiratory tract" (5.5 versus 5.1 days; $p<0.01$).

DISCUSSION

This study investigated the issue of socioeconomic differences in hospital admissions among children and adolescents. Increased risks of hospital admissions for subjects of lower socioeconomic background emerged for infections of respiratory organs (ICD 460–466), but only if the extreme ends of the socioeconomic scale were compared. When immigrant status was chosen as an indicator of socioeconomic inequality, an increased risk of pneumonia became obvious, but for the remaining diagnostic categories the results could not be interpreted. With respect to immigrant status, reduced rather than increased risks of hospital admissions emerged in the case of respiratory infections and psychiatric disorders (although this was not true for all age groups). When considering mean lengths of hospitalisation according to socioeconomic status, social gradients were found for the two most common diagnostic categories—that is, "infections of the upper respiratory tract" and "infections of the respiratory organs": the lower the children's socioeconomic position, the longer their hospitalisation periods. In particular, considering infections of respiratory organs, children whose parents were not classified in terms of occupational status exhibited the longest inpatient periods. Finally, our results confirm that boys had higher risks of being hospitalised compared with girls, irrespective of the diagnosis of hospital admission, and after adjusting for the effects of socioeconomic status or immigrant status (see also references [8 31 32]).

These findings confirm at least in part that children and adolescents from families with lower socioeconomic status, and especially boys, exhibit a higher burden of respiratory infections as measured by duration of hospital stay compared with boys with a more privileged family background. It is

Table 5 Inpatient treatment for diseases for German and non-German nationality of different age groups and gender after controlling for socioeconomic status (occupational position of the main wage earner) and gender; relative risks and 95% confidence intervals*

	All age groups	Up to 4 years	5 to 9 years	10 to 15 years
Infections of the upper respiratory tract	0.84 (0.77 to 0.92)	0.75 (0.59 to 0.91)	0.80 (0.71 to 0.90)	1.10 (0.94 to 1.28)
Acute infections of respiratory organs	0.73 (0.64 to 0.83)	1.43 (1.10 to 1.87)	0.60 (0.49 to 0.73)	0.67 (0.53 to 0.85)
Pneumonia/flu	1.48 (1.21 to 1.80)	1.47 (1.10 to 1.96)	1.44 (1.04 to 1.99)	1.67 (1.04 to 2.61)
Chronic obstructive airways diseases	0.78 (0.63 to 0.95)	1.50 (1.06 to 2.12)	0.74 (0.53 to 1.05)	0.47 (0.32 to 0.69)
Neuroses, anxiety, depressive disorders	0.43 (0.30 to 0.61)	0.58 (0.19 to 1.75)	0.33 (0.17 to 0.65)	0.46 (0.30 to 0.72)

*The numbers give the relative risks for individuals with non-German nationality. Reference category are children and adolescents with German nationality (risk=1).

commonly assumed that length of hospital stay reflects the severity of a disease condition. Thus, the observed stepwise gradient in duration of hospitalisations for these two diagnostic categories may indicate more severe status of illness among lower socioeconomic status children.

If pneumonia as a particularly severe condition of respiratory disorders is considered, our results indicate that children with immigrant status exhibit a more severe burden of illness. The majority of them belong to families with unskilled or unclassified occupations. Point prevalence of pneumonia/flu is also markedly increased when the total group of unskilled and unclassified subjects is considered, but large confidence intervals preclude firm conclusions.

Delay in help seeking or differences in physicians' referral behaviour may play a part in explaining the fact that duration of inpatient periods are longer among lower socioeconomic status subjects, taking the two most widely prevalent causes of hospital admissions into account. Although the almost complete health insurance coverage in Germany excludes the severest financial barriers to health care and waiting lists do not exist, less visible obstacles may be effective. Difficulties to contact a hospital or a doctor, cultural or language differences may explain differential illness behaviour. Moreover, other socially different patterns of help seeking may explain in part the inconsistencies observed in hospital admission rates. For instance, in the case of less frequent hospitalisations because of psychiatric conditions among immigrant status children and adolescents, studies on stigmatisation of individuals with psychiatric impairment may offer an explanation. Although the anxiety of being devaluated and rejected is a common phenomenon [33 34] this may be more pronounced in the non-German population resulting in more reluctance to admit the presence of a psychiatric condition.[35–37] Thus, data on hospital admissions because of psychiatric disturbances, even more than those because of other conditions, might reflect utilisation patterns concerning medical services rather than true prevalence rates. This may lead to higher proportions of untreated mental disorders in the immigrant population.

As mentioned, social differences in duration of hospitalisations are assumed to reflect severity of disease as a consequence of delayed help seeking. Because of sociocultural differences in illness behaviour physician utilisation and hospitalisation is likely to be postponed.[38] Several investigations support this conclusion, in particular with respect to mothers' help seeking behaviour.[39–42]

The limitations of this study need to be mentioned: The choice of a single indicator of parents' socioeconomic status may be subject to debate.[43–46] In the analyses presented in this paper we have considered socioeconomic status differences by using the main household earners' occupational status for classifying children and adolescents. This left us with a large subgroup with missing information. As pointed out earlier, the unclassified are heterogeneous in composition. Based on additional information there is reason to assume that between 60% and 70% of them either receive very low payment or they are long term unemployed, on early retirement, disabled or on social security.[7 47] In the case when income had been chosen as indicator valid information had been available for less than half of our insurance population. This was because of the lack of regular incomes, to exceptional payments (for example, compensations payed by the employer for leaving the job prematurely), or the incomes remained unrecorded because the insurance fees were based on other criteria than on parents' wages. Information on education was available, but the distribution of educational degrees in this population was uneven.[48] Even so, we conducted additional analyses taking educational degree as indicator of socioeconomic status. Although effects in general were weaker, similar tendencies evolved from these analyses. In view of a major role of a parental occupational status in defining children's psychosocial and material living conditions [49] we restricted our analysis to this indicator.[8 43] In order to further validate information on occupational status we repeated the analysis by replacing the highest occupational position as evidenced in the health insurance files by the occupational position held by the main parental wage earner in the family. The results in general did not change.

With regard to a second indicator of social inequality, immigrant status, this variable in fact turned out not to provide substantial additional information as more than 80% of immigrant status children belonged to the group of parents with unskilled or unclassified occupations.

A second limitation of our findings is the fact that the population insured by this health insurance company is not representative for the German population. Rather, lower middle class and lower class people are overrepresented to the detriment of upper middle class people.[48] The low proportion of children from parents with professional or intermediate occupational status in our sample illustrates this argument. Given this fact, social differences in hospitalisation rates and the length of inpatient periods we may rather have been underestimated than overestimated.

A third limitation points to a shortcoming in that our data were collected for accounting purposes. We could not consider variables indicating health needs, for example health status perceptions or comorbidity that had not been treated.

Finally, we do not have data on incidence or prevalence rates concerning the diseases of interest for the age groups considered here. This does not permit us to draw conclusions about differences between morbidity and hospitalisation.

Our analyses did not include data on hospital admissions attributable to accidents or mortality data, two categories with repeatedly reported social gradients.[7] The question for social inequalities concerning accidents in children and adolescents of 16 years and below had been dealt with in an earlier paper by using the same health insurance data.[24] If subjects from the highest as compared with the lowest socioeconomic position were compared, the latter displayed an excess risk of 40%, but the differences became insignificant after having stratified into three age groups. These findings are in line with the results presented in the current report. With regard to mortality data we conducted a respective analysis with "immigrant status" as predicting variable, adjusting for gender and socioeconomic status. As a relative mortality risk of 1.7 (95% CI 0.95 to 3.20) among immigrant status children was observed there is a tendency of higher mortality in this group, compared with native German children. A similar difference between immigrant status and native children was

Key points

- In children and adolescents hospital admissions attributable to infectious diseases in general do not show pronounced social gradients. The only exception are infections of respiratory organs.
- Among the socioeconomic groups considered, children and adolescents with lower status background spent the highest number of days in hospital. This suggests that parents may have postponed timely hospital treatment, and consequently diseases may have developed to more advanced stages upon hospital admission.
- Considering differences in hospital admissions between German and non-German children and adolescents in terms of infectious diseases, the results are inconsistent. For some categories the numbers of hospital admissions for non-German are lower, for some they are higher.
- For psychiatric disorders, the number of hospital admissions for non-German children and adolescents are markedly smaller than for Germans, suggesting parents' increased anxiety of being stigmatised and thus higher rates of untreated cases in the population.

recently reported from the Netherlands.[21] Again, childhood mortality being a relatively rare event, respective analyses for the five occupational groups could not be performed in our dataset.

With these limitations in mind we conclude that socioeconomic differences in selected diagnoses of hospital admission and, in particular, of duration of hospital stay, in children and adolescents are rather small. It is likely that variations in parents' help seeking behaviour play an important part in explaining these differences. If validated by further studies these findings could point to an important role of improved health related counselling in parents with lower socioeconomic and with immigrant status.

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