Spatial Inequalities in Health of Ethnic German Immigrants in the Federal Republic of Germany

- A Comparative Analysis of Contextual Effects on Regional Morbidity Differences -

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Extended Abstract
(Preliminary results – work in progress)

Intention:

In 2005, more than 2 million Ethnic German Immigrants (also called "(Spät-)Aussiedler") lived in the Federal Republic of Germany. Thus, the Ethnic German Immigrants are the quantitatively largest subgroup of migrants in Germany. In comparison to other groups of migrants, such as immigrants from Turkey or former Yugoslavia, Ethnic German Immigrants are characterized by a large inter-group heterogeneity, e.g. in regard to their country of origin, their German and mother language skills and cultural identities. Ethnic German Immigrants underlie special statutory rules of immigration. The entitlement of naturalisation and access to social security is guaranteed immediately after immigration for a person classified as an Ethnic German Immigrant. However, the choice of residence is often not as freely as it is for other (legal) immigrants in Germany (except of asylum seekers). Considering the specific characteristics and the size of this Immigrant group, the examination of inequalities or even illegal and unethical inequities in health of Ethnic German Immigrants compared to Native Germans (means Germans without a migration background)., is important.

Theoretical background:

Proven in numberless studies in public health research, inequalities in health and health risks are systematically linked to personal characteristics, such as age, sex, and socioeconomic status. Especially, health inequalities caused by social and economic disadvantages (so called "social gradient of health") were in focus of the research discussion. Investigating regional health differences, disparities are still persistent even when controlling for individual characteristics. Two effects have to be separately considered by interpreting regional morbidity differences: the compositional and the contextual effects (Mielck 2008). Compositional effects can be described as effects of a specific population composition on the regional health state. In contrast, contextual effects are effects on the population level having an impact on the health state of all persons in a region, independent of individual characteristics. Contextual effects may be exposed by controlling for factors on the individual level. It has been assumed that environmental inequalities have a measurable impact on regional health differences. One of these approaches is called the concept of environmental justice (e.g., Mielck 2005). An example of differences in environmental conditions is the divergent level of air pollution affecting people in urban and rural regions (e.g., Schulz & Northridge 2004). Additionally, differences in life style, such as smoking habits and physical activity, exist between people living in urban and rural areas (Völzke et al. 2006, Galea & Vlahov 2005). Thus, the settlement structure of neighbourhoods may have an influence on personal morbidity.

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Furthermore, the regional economic and social situation may have an effect on the health state of persons living in that region. For instance, a high level of regional income inequality and financial uncertainty may lead to a situation of social stress, which may have a negative impact on personal health (Wilkinson & Pickett 2006). The effect of the regional economic performance on morbidity risk will be evaluated in the following chapters.

Data and Methods:

The main data sources of the following analyses are the German Microcensus 2005 and the INKAR-Database of the German Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR). The Microcensus is a multi-topic and large-scale survey, which is organised and conducted by the Federal Statistical Office and the Statistical Offices of the Länder. With a case number of nearly 800.000 persons, the German Microcensus is not only the largest regular repeated survey in Europe, it is also representative on the regional level.

The German Microcensus is regulated by the Microcensus Law, which was basically reformed and enlarged by a new module of "migration and integration" in 2004. With the additional module and the extended questionnaire, the Microcensus 2005 has become more precise in detecting the population of Ethnic German Immigrants. Due to the sensitivity of geo-coded data, all calculations are only allowed to be done by controlled teleprocessing (including a censoring process).

The INKAR-Database ("Informationen und Karten"/"Information and maps") as the second data source is a collection of regional and structural indicators, calculated and published by the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR) and based on official data from the Federal Statistical Office.

All persons from age 18 onwards are included in the analysis. The response variable measures if the respondent had been sick in the last four weeks before interview. Since the statement on the health status is voluntary, almost 13% of both subgroups denied answering the question. After excluding persons with missing answers and ages under 18, the basic population, used in the further analysis, consists of nearly 414.000 Native Germans (ca. 218.000 females and ca. 196.000 males) and nearly 11.200 Ethnic German Immigrants (ca. 5.900 females and 5.300 males).

Binary logistic regressions are used to analyse the regional disparities in health by calculating age standardised morbidity prevalence rates (ASMPs) for each spatial planning region ("Raumordungsregion") in separate models for both sexes, Native Germans and Ethnic German Immigrants. Applying methods of correlation analysis, these regional ASMPs are compared among the sexes and population subgroups. Logistic regression models are constructed to study the effects of individual characteristics (e.g., demographic specifics, status of migration, socioeconomic status) and regional attributes (e.g., settlement structure and economic performance) on health. To reduce the compositional bias, all contextual effects are controlled for individuals' age, family status, type of municipality, education, income, body-mass-index, smoking habits, and additionally, for Ethnic German Immigrants for age at migration and length of stay.

Results:

In the following part, a short overview of the most important results is given. Since this project is still in progress, methodological improvements and further results are expected in future analysis.

One major result is the detection of notable regional divergences in morbidity of Ethnic German Immigrants and Native Germans. The age standardised morbidity prevalence rates (ASMPs) for each spatial planning region are shown in figure 1 to 4. Due to a different underlying standard age structure caused by separate modelling for the sexes and the subgroups, the prevalence rates' absolute values are not comparable. To be able to compare between sexes and subgroups, the regional ASMPs are categorized in quintiles on the regional level (except of regions without data).

Figure 1 to Figure 4: Regional age standardised morbidity prevalence rates (ASMDs) in quintiles by sex and subgroups (Native Germans and Ethnic German Immigrants), Spatial planning regions, Germany, 2005

Figure 1: Female Ethnic German Immigrants

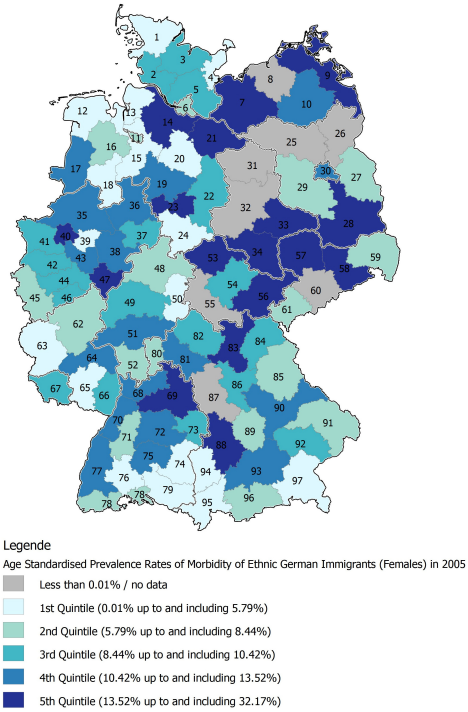


Figure 2: Female Native Germans

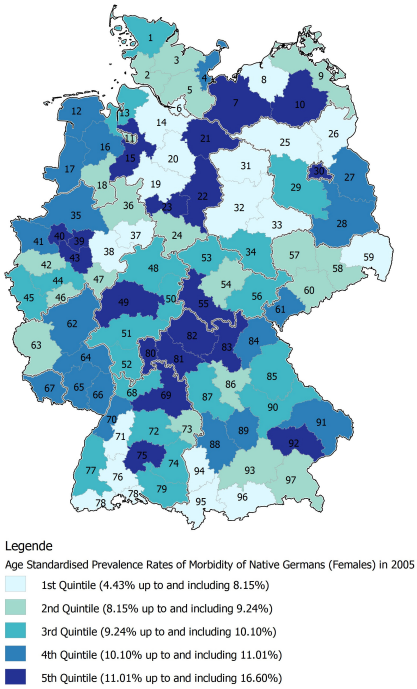


Figure 3: Male Ethnic German Immigrants

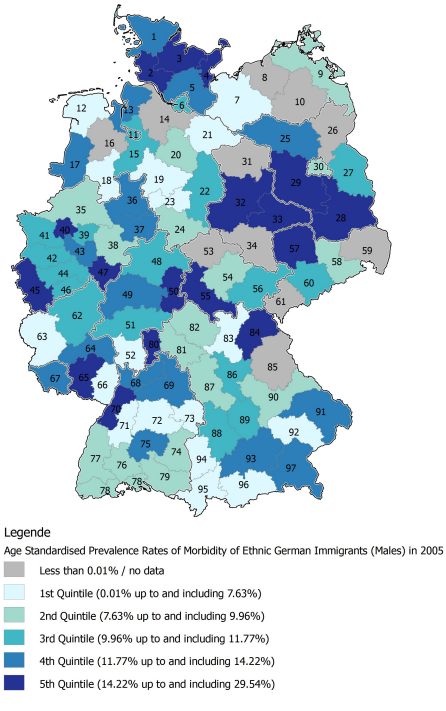
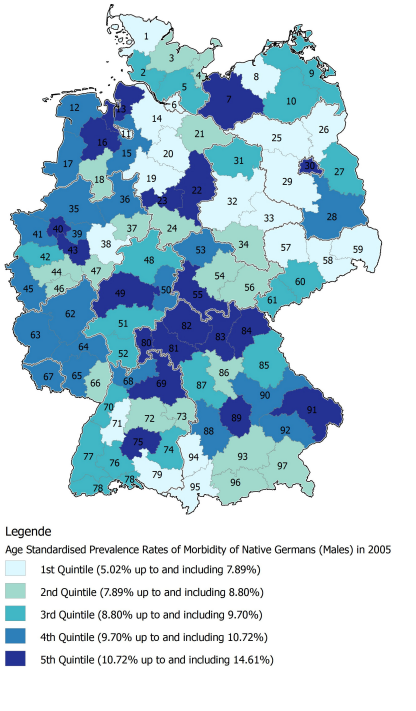


Figure 4: Male Native Germans



Note: Reference category: Berlin (30), age 40 to 45

Source: Microcensus 2005, own calculations and illustrations

The mapping of regional ASMPs illustrates no clear geopolitical clusters of morbidity of the two population subgroups. Only for Ethnic German Immigrants (both sexes), a cluster of high regional ASMPs is observed in Eastern German regions south of Berlin, while, there is a cluster of high morbidity for Native Germans in Northern Bavaria. Further analyses exposed a strong correlation between the regional ASMPs of Native German males and females (Pearsons's $r_{male/females}$=0.819, sign<0.001), but only a weak correlation for male and female Ethnic German Immigrants (Pearson's $r_{male/females}$=0.2035, sign<0.100). No correlation exists between the regional ASMPs of Native Germans and Ethnic German Immigrants (for males Pearson's $r_{Native\ G./Ethnic\ G.\ Imm.}$=-0.165, n.s., for females Pearson's $r_{Native\ G./Ethnic\ G.\ Imm.}$=0.030, n.s.). This missing relationship can be interpreted as an indicator of different patterns of health and influences on health of Native Germans and Ethnic German Immigrants.

As a second step of analysis, binary logistic regression models are constructed, which include variables of individual and regional specifics. In the following overview, only the results of the final models including all individual and regional variables are evaluated. The main aim of the analysis is to detect the contextual effects, while controlling for individual attributes, like age, sex, income, education, family status, migration specifics, body-mass-index, and smoking habits. The interpretation of the individual effects on morbidity is neglected. The macro indicators are categorised in quintiles on the regional level, that means e.g., the first quintile of regional population density includes people living in 20% of the regions with the lowest population density. The six chosen macro variables can be differentiated into indicators of settlement structure (population density and centrality of population distribution) and economic performance (Gross Domestic Product per head, unemployment rate, percentage of social welfare recipients, and percentage of less skilled employees).

Both indicators of regional settlement structure illustrate a trend of higher morbidity risks (measured by odds-ratio higher than 1) for Native Germans in regions with a high population density and aggregation level (figure 5 and figure 6 in the Appendix). This trend is even less evident for Ethnic German Immigrants due to notable variations in the risk of morbidity. On average (both sexes and subgroups), the morbidity risk is more than 20% higher for people living in regions with the highest population density and highest grade of centrality than for people in the most sparsely populated German regions.

The last four macro factors can be classified as indicators of regional economic performance and economic structure. However, only the regional Gross Domestic Product per head shows an interpretable influence on morbidity of the two subgroups and both sexes (figure 7 in the Appendix). Thus, a person living in a region with a higher GDP per head has a lower risk of morbidity than a person living in a region with a low economic performance. This trend exists for males and females as well as for Native Germans and Ethnic German Immigrants. On average, the morbidity risk of persons in the 5th quintile (highest GDP per head) is nearly 25% lower than the morbidity risk of persons in the 1st quintile (lowest GDP per head).

The models show no clear relationships between the individual risk of morbidity and the regional unemployment rate, the percentage of social benefit recipients and the percentage of less skilled employees (figure 8 to 10 in the Appendix). For both sexes and subgroups the morbidity risks unsystematically fluctuate without obvious tendencies.

Short discussion of the quality of the results and further steps:

Due to the large number of cases for the Native Germans, most of the odds-ratios for the macro indicators are significant, while only very few effects for the Ethnic German Immigrants are. Because of a missing analysis of variance (e.g. a decomposition of variances of the two levels of analysis), the interpretation of significances needs to be done carefully. To improve the quality of the analyses, multilevel models will be applied to control for different levels of variances in the future steps of the analyses.

References:

Mielck, A. (2005): Soziale Ungleichheit und Gesundheit. Einführung in die aktuelle Diskussion. Bern: Hans Huber.

Mielck, A. (2008): Regionale Unterschiede bei Gesundheit und gesundheitlicher Versorgung: Weiterentwicklung der theoretischen und methodischen Ansätze. In: Bauer, U., Bittlingmayer, U. H. & Richter, M. (ed.). Health Inequalities. Determinanten und Mechanismen gesundheitlicher Ungleichheit. Wiesbaden: VS Verlag für Sozialwissenschaften: 167-187.

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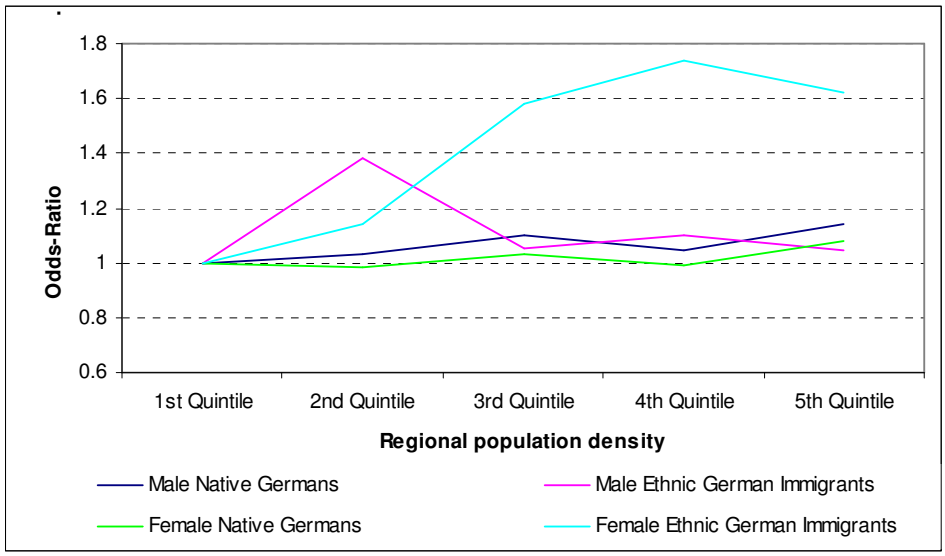
Völzke, H., Neuhauser, H., Moebus, S., Baumert, J., Berger, K., Stang, A., Ellert, U., Werner, A. & Döring, A. (2006): Urban-rural disparities in smoking behaviour in Germany. BMC Public Health 6: 146.

Wilkinson, R.G., Pickett, K.E. (2006): Income inequality and population health: a review and explanation of the evidence, Social Science & Medicine 62.

Appendix

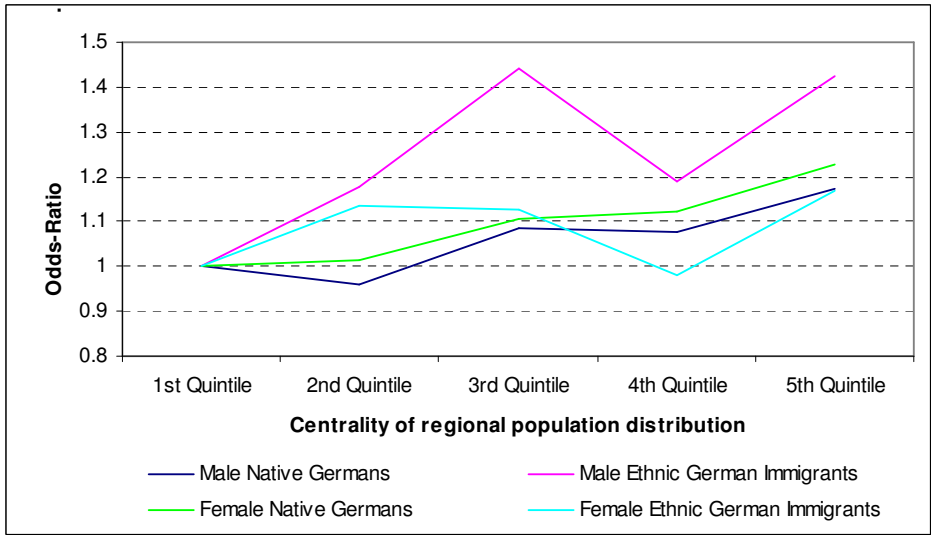
Figure 5: Effects of the regional population density on the risk of being sick in the last 4 weeks before interview (reference: persons in regions with the lowest population density)



Note: Controlled for age, family status, education, income per head, type of municipal, body-mass-index and smoking habits, and additional for Ethnic German Immigrants for age at migration and length of stay
1st quintile=20% of regions with the lowest population density, reference category
5th quintile=20% of regions with the highest population density

Source: Microcensus 2005; INKAR 2007, own calculations and illustration

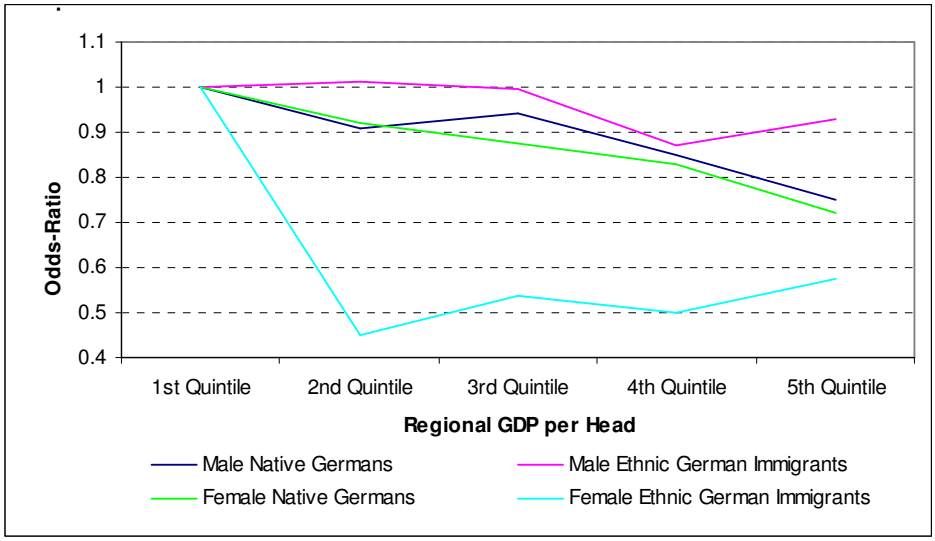
Figure 6: Effects of the grade of centrality of regional population distribution on the risk of being sick in the last 4 weeks before interview (reference: persons in regions with the lowest grade of centrality)



Note: Controlled for age, family status, education, income per head, type of municipal, body-mass-index and smoking habits, and additional for Ethnic German Immigrants for age at migration and length of stay
1st quintile=20% of regions with the lowest grade of centrality of population distribution, reference category
5th quintile=20% of regions with the highest grade of centrality of population distribution

Source: Microcensus 2005, INKAR 2007, own calculations and illustration

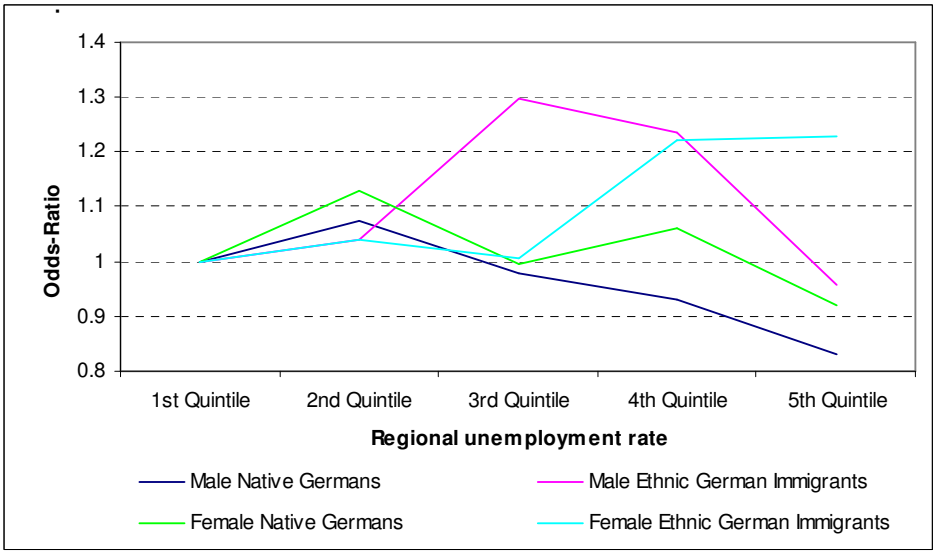
Figure 7: Effects of the regional Gross Domestic Product per Head on the risk of being sick in the last 4 weeks before interview (reference: persons in regions with the lowest GDP per Head)



Note: Controlled for age, family status, education, income per head, type of municipal, body-mass-index and smoking habits, and additional for Ethnic German Immigrants for age at migration and length of stay
1st quintile=20% of regions with the lowest Gross Domestic Product per Head, reference category
5th quintile=20% of regions with the highest Gross Domestic Product per Head

Source: Microcensus 2005, INKAR 2007, own calculations and illustration

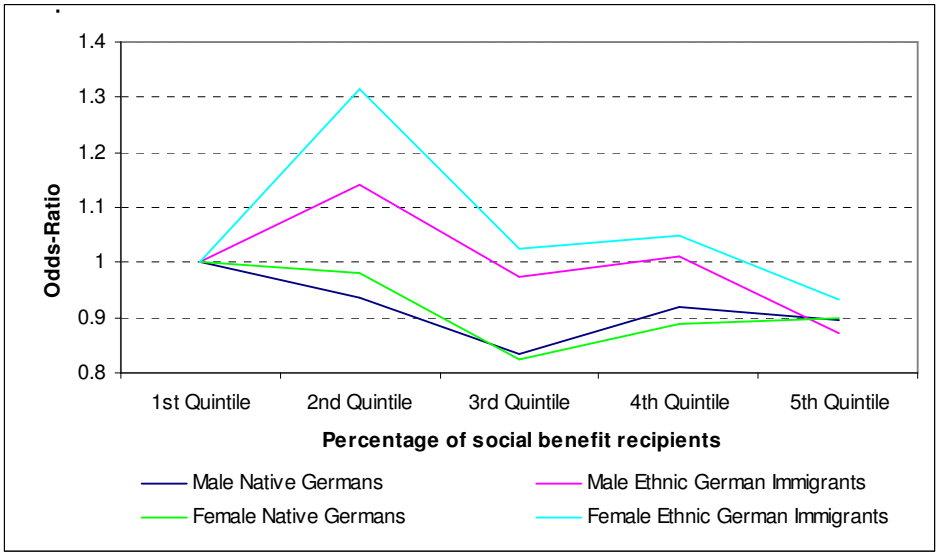
Figure 8: Effects of the regional unemployment rate on the risk of being sick in the last 4 weeks before interview (reference: persons in regions with the lowest unemployment rate)



Note: Controlled for age, family status, education, income per head, type of municipal, body-mass-index and smoking habits, and additional for Ethnic German Immigrants for age at migration and length of stay
1st quintile=20% of regions with the lowest unemployment rate, reference category
5th quintile=20% of regions with the highest unemployment rate

Source: Microcensus 2005, INKAR 2007, own calculations and illustration

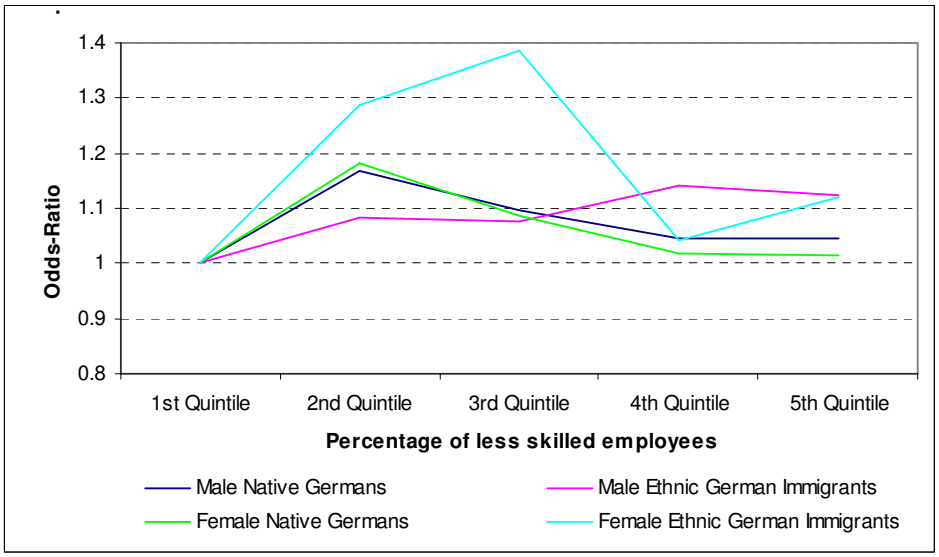
Figure 9: Effects of the percentage of social benefit recipients on the risk of being sick in the last 4 weeks before interview (reference: persons in regions with the lowest percentage of social benefit recipients)



Note: Controlled for age, family status, education, income per head, type of municipal, body-mass-index and smoking habits, and additional for Ethnic German Immigrants for age at migration and length of stay
1st quintile=20% of regions with the lowest percentage of social benefit recipients, reference category
5th quintile=20% of regions with the highest percentage of social benefit recipients

Source: Microcensus 2005, INKAR 2007, own calculations and illustration

Figure 10: Effects of the percentage of less skilled employees on the risk of being sick in the last 4 weeks before interview (reference: persons in regions with the lowest percentage of less skilled employees)



Note: Controlled for age, family status, education, income per head, type of municipal, body-mass-index and smoking habits, and additional for Ethnic German Immigrants for age at migration and length of stay
1st quintile=20% of regions with the lowest percentage of less skilled employees, reference category
5th quintile=20% of regions with the highest percentage of less skilled employees

Source: Microcensus 2005, INKAR 2007, own calculations and illustration