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Spatial variations from causes amenable to medical care in Poland

During the period of the socio-economic transition Poland has experienced deep changes in the state of public health and the state of population's health. From 1991 to 2012 life expectancy at birth increased by 6,5 years for men and 5,8 years for women and in 2012 it was 72,7 years for men and 81 years for women. The positive changes recorded in the avoidable mortality trends suggest that health care has made a substantial contribution to reducing mortality in Poland. Mortality from conditions which have become amenable to medical intervention remains an important contributor to premature mortality, accounting for 17 % of deaths under age 75.

This study aimed to investigate the spatial variations in amenable mortality in Poland and to analyze whether the medical care supply characteristics can explain regional variations in mortality from these causes of death.

We examined the level in amenable mortality by calculating age-standardized death rates (SDR) for each of 379 districts in Poland (NUTS-4 level) using unit–record mortality data. Analyses were restricted to ages 0-75 years. The selection of causes of death considered amenable to health care follows the classification used in earlier work by Nolte and McKee (2003) with separate categories for ischaemic heart disease. Due to small numbers we pooled age-specific deaths rates and examined two points in time 1991-1996 and 2006-2010 to reduce variation.

The distribution of STD was analyzed using geographical and statistical methods. Country maps, Moran's I statistics and spatial error models were used to measure the spatial autocorrelation (GeoDa). To investigate the contribution of district's characteristics to spatial variation in amenable mortality the two-level regression model with random intercepts was used (MIXED procedure in SPSS). In the search for explanations of the geographical disparities in mortality we have looked at socio-economic differences (i.e. percentage of low-income families, percentage population with higher education), urbanization (percentage population in cities) and simply medical care characteristics (general practitioner density, hospital bed density).

The results indicate that mortality from conditions which have become amenable to medical intervention has generally decreased in all districts of Poland in the past decades. At the same time

the spatial differences in the SDR and significant spatial autocorrelation was observed. Both, spatial error models and multilevel models indicate a weaker relationship between amenable mortality and physician supply at districts level (NUTS-4). Geographical variation for considered amenable mortality was mainly explained by socioeconomic indicators, such as education and low-income (social assistance users). The multi-level models revealed a substantial remaining variation at the second level (voivodeship-NUTS 2), this imply that there are contextual influences on amenable mortality at this broad geographical level. It should be noted that this administrative level (NUTS 2) corresponds to the formal structure of the organization and financing health system in Poland.