

# Social Health Inequalities in the Czech Republic

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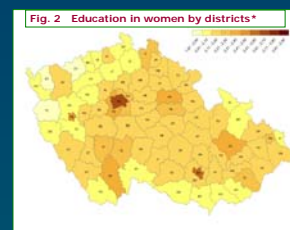
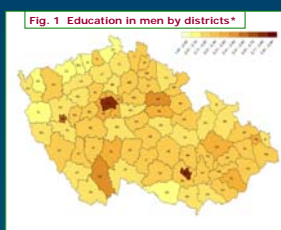
## Introduction:

Routine health data in the Czech Republic are collected in the most detail on the level of 77 districts and unable itself for analysis of socioeconomic differences between districts. The socioeconomic factors might be one of the determinants of the differences in health indicators between the districts. The goal of the presented analysis was to identify the associations between available socioeconomic data and health indicators.

## Methods:

The total SMR, SMR for all cancers, breast cancer in women, lung cancer in men; cardiovascular, respiratory and gastrointestinal tract diseases; and incidence of all cancers and diabetes mellitus were analyzed by weighted average educational level of each district, the composition of households (proportion of complete and incomplete families or individuals living alone) and density of housing, average income, total unemployment rate and number of physicians per 1,000 inhabitants.

The health indicators were based on routinely collected data (2001), the socioeconomic characteristics of districts were based on 2001 Census data. The weighted educational level by sex was used separately for health indicators of men and women. The index of education was based on 5-degrees scale – basic (1), apprenticeship, secondary, higher and university degree (5). As the educational level of 3 of the districts (Prague, Brno and Plzen) was outlier (higher proportion of university degree education due to the concentration of universities), these 3 districts were dropped from the final analysis. The linear regression was used for the analysis. The GIS (Geographical Information System) was used for visualization of the presented results (Fig. 1 and 2)



\*Education – weighted average  
Outlier level – Prague, Brno, Plzen



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## Results:

Out of the investigated health indicators (mortality, morbidity, incidence) SMR was the most susceptible indicator of social health inequalities between districts – see Table 1 and 2. The results showed the differences in the relationships by sex. Except of SMR for breast cancer all causes mortalities were adversely correlated with educational level, mostly with the total SMR ( $r=-0.38$  in women and  $-0.56$  in men). While specific mortality in women showed weaker relationships with education, in men the specific mortality was more strongly correlated with education, especially for lung cancer ( $r=-0.60$ ) and all cancers ( $r=-0.50$ ). The total and also specific SMR was also in association with the composition of households – the proportion of complete families in population was in adverse correlation with SMR especially for cancers ( $r=-0.45$  in men and  $-0.62$  in women), lung cancer in men ( $r=-0.57$ ), breast cancer in women ( $r=-0.41$ ), and total SMR ( $r=-0.43$  in men and  $-0.57$  in women). This findings were confirmed by the positive correlations between SMR and proportion of incomplete families and individuals living alone. The total and specific SMR was also associated with unemployment rate (more in men – total SMR  $r=0.62$ ). Weaker adverse correlations were found for relationship between SMR for CVD in both sexes ( $r=-0.25$  in men and  $r=-0.31$  in women) and number of physicians. The incidence of cancers was adversely correlated with education ( $r=-0.24$  in men and  $r=-0.33$  in women) and positively correlated with unemployment rate and density of housing, especially in men ( $r=0.44$ ; resp.  $r=0.31$ ). No significant relationship was found between health indicators and average income. The detail overview of results is shown in Tables 1 and 2, and Figures 3 and 4.

Table 1 Correlations between SMR/incidence and SES factors in men

Men	Mortality						Incidence		
	Total	All cancers	Lung cancers	Respir. diseases	CVD	Gastroint. diseases	Injuries	All cancers	Diabetes
Education	<b>-0.56</b>	<b>-0.50</b>	<b>-0.60</b>	-0.15	-0.36	-0.22	-0.23	-0.24	-0.04
Incomplete families	0.34	0.35	0.38	0.12	0.09	0.34	0.19	-0.06	-0.03
Singles	<b>0.40</b>	0.39	<b>0.50</b>	0.24	0.12	0.08	0.22	0.10	0.22
Complete families	<b>-0.43</b>	<b>-0.45</b>	<b>-0.57</b>	-0.24	-0.10	-0.19	-0.25	-0.17	-0.17
Density of housing	0.04	0.04	0.15	-0.12	0.07	0.10	0.02	0.31	0.09
Average income	-0.01	0.01	0.11	0.17	-0.06	-0.01	-0.10	-0.22	0.05
Unemployment rate	<b>0.62</b>	<b>0.44</b>	0.31	-0.02	<b>0.53</b>	<b>0.49</b>	0.18	<b>0.44</b>	0.18
Nr. of physicians/per 1,000	-0.13	0.01	0.02	0.09	-0.25	-0.01	-0.03	0.18	0.33

Table 2 Correlations between SMR/incidence and SES factors in women

Women	Mortality						Incidence		
	Total	All cancers	Breast cancers	Respir. diseases	CVD	Gastroint. diseases	Injuries	All cancers	Diabetes
Education	-0.38	-0.21	0.02	-0.07	-0.24	-0.23	-0.09	-0.33	-0.07
Incomplete families	0.26	0.39	0.19	0.15	-0.02	0.15	0.05	0.07	-0.03
Singles	<b>0.62</b>	<b>0.60</b>	<b>0.47</b>	0.24	0.18	0.18	0.15	0.21	0.17
Complete families	<b>-0.57</b>	<b>-0.62</b>	<b>-0.41</b>	-0.28	-0.09	-0.24	-0.12	-0.28	-0.14
Density of housing	-0.02	0.08	-0.07	-0.08	-0.11	0.06	0.03	0.26	0.15
Average income	0.13	0.20	0.18	0.07	0.07	-0.08	-0.10	-0.09	-0.01
Unemployment rate	<b>0.40</b>	0.15	0.06	0.07	0.34	<b>0.44</b>	-0.10	0.16	0.24
Nr. of physicians/per 1,000	-0.16	0.04	0.02	0.09	-0.31	0.04	-0.08	0.04	0.30

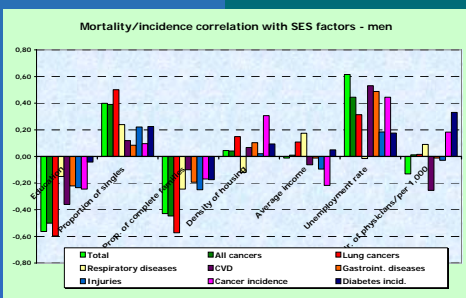


Fig. 3 Correlations between health indicators and SES factors in men

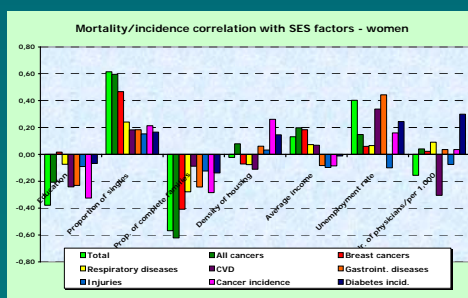
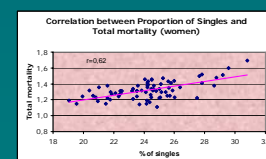
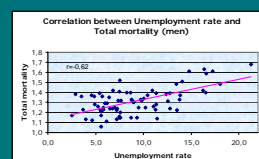
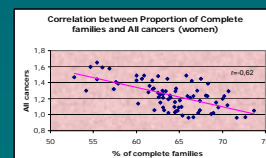
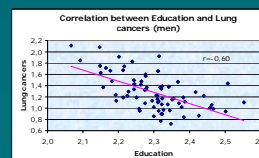


Fig. 4 Correlations between health indicators and SES factors in women



## Discussion:

The results of our study confirmed the social health inequalities between the districts in our country. As visible from the Fig. 1 and 2 education level is higher in men than women especially in the Western and Southern part of the country. The question should be asked whether the higher correlations of education and health indicators in men are confounded by the higher educational level itself, or if it is associated with sex differences in life-style reported in other studies. The „protective“ health effect of living in a complete family was confirmed for both sexes, more in women. This finding might be explained by a natural psychological need of women to be placed in a safety home. On the other hand the higher correlations between unemployment rate and health indicators is probably related to a responsibility of men as a head of the family. Specific SMR for CVD and gastrointestinal diseases might be related with a chronic stress caused by unemployment as it was confirmed in various research studies. Income as one component of SES was expected to be correlated with health outcomes, but the correlations were weak and the direction of the associations was not consistent. This fact might be explained by still persisted equalitarianism of income.

## Conclusions:

In the Czech Republic there exist social health inequalities between

- men and women
- groups by attained education level
- groups by marital status (singles versus complete families)
- districts with the different unemployment rate

Health indicators are significantly correlated with

- education (more in men) – total SMR, all and lung cancers SMR
- family status (more in women) – total SMR, all and breast cancers SMR
- unemployment rate (more in men) – total and all cancers SMR, CVD and gastrointestinal SMR and incidence of cancers

Density of housing, average income and access to health care (Nr. of physicians per 1,000 inhabitants) did not show any consistent association with the health outcomes. The socio-economic health inequalities need to be investigated in further research that will bring explanation of the presented differences.