Exploring Spatial Contrasts of Mortality Patterns in Ukraine

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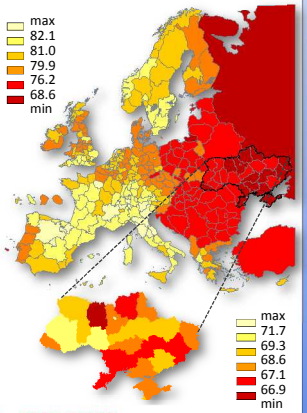
PROBLEMATIC: INTERREGIONAL VARIATION

Life expectancy in Europe and Ukraine, 2005-2010

Wedged between EU and Russia, Ukraine reveals large diversity among its regions

*Difference between max and min Life Expectancy is more than **5 years** (both sexes):*
***6.4 year** among males*
***4.7 year** among females*



METHOD: SPATIAL ANALYSIS

***Indicator:** Standardized Mortality Ratio (SMR)*
***Study unit:** district*

Indexes of spatial autocorrelation measure strength of association among districts:

-1 - strong negative ↙ ↘ *1 – strong positive*

Moran Index (MI)
global measure

$$I = \frac{\sum_{i,j} W_{ij}(SMR_i - \overline{SMR}) \cdot (SMR_j - \overline{SMR})}{\sigma^2(SMR)}$$

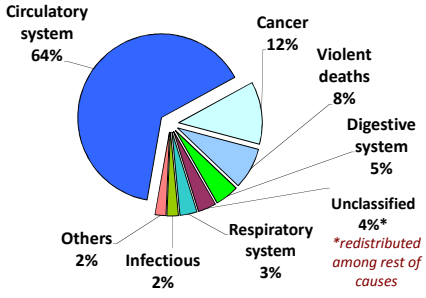
Lisa Index (LI)
measures association around one observation

$$I_i = \frac{\sum_{i,j} W_{ij}(SMR_i - \overline{SMR}) \cdot (SMR_j - \overline{SMR})}{\sum_i (SMR_i - \overline{SMR})^2}$$

ZONES OF SPATIAL ASSOCIATION BY CAUSES OF DEATH, 2005-2010

Mortality structure, 2005-2010

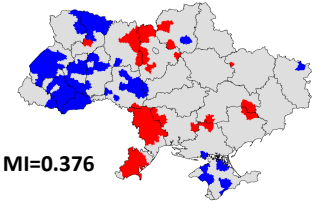
100% - 4.462 million deaths



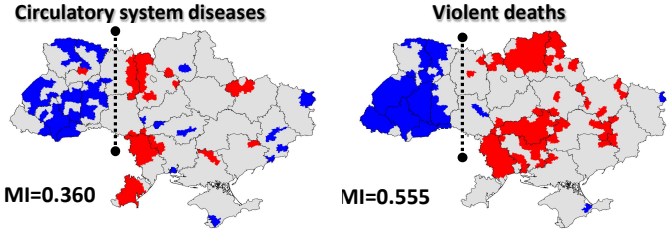
Categories of spatial association based on Lisa Index:

- *"Hot spots" – locations with high values with similar neighbors*
- *"Cold spots" – locations with low values with similar neighbors*
- *Spatial outliers*

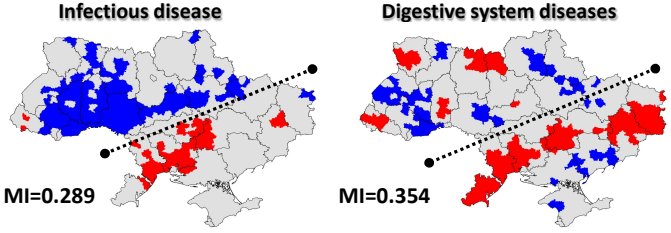
All causes



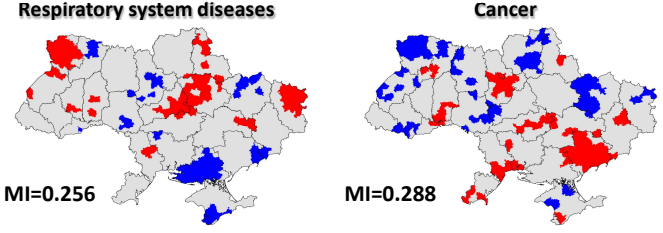
West vs East opposition



North-West vs South-East opposition



No clear opposition



RESULTS:

- *Western areas are the most geographically homogeneous in positive sense*
- *Areas of priority intervention for combating circulatory system diseases concentrate around the capital and on the south*
- *The highest spatial correlation is observed for violent deaths, which is a sign of significant effect of social environment*
- *In regard of infectious diseases districts are associated into a zone of risk along the lower reach of the river Dnepr*
- *There is no clear pattern of association from cancers and respiratory system diseases*

REFERENCES:

Anselin L. (2003) An Introduction to Spatial Autocorrelation Analysis with GeoDa. Spatial Analysis Laboratory.

Chung K. Et al. (2004) Health and GIS: Toward Spatial Statistical Analyses. Journal of Medical Systems, 28 (4), pp. 349-360.

Oliveau S. & Guilmoto C. (2005) Spatial correlation and demography. Exploring India's demographic patterns. Congrès International de la Population, Tours (France).

Data of EuroStat, WHO and of the State Stat Office of Ukraine. Maps are made using Philcarto 5.5. and GeoDa software.