PATTERNS OF REGIONAL MORTALITY IN UKRAINE FROM SOVIET TIME TO NOWADAYS

Svitlana PONIAKINA

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The special interest in Ukraine

Difference in Life Expectancy among regions is large (≈5 years)

Life expectancy at birth in Europe and Ukraine, 2005-2010

Crisis following the collapse of Soviet Union made caused changes in mortality patterns
Research questions:

1. How large are geographical variations in mortality in Ukraine?
2. How have they changed over time?
3. What are causes of death behind variations?
**Data**

**Data of State Statistics Office of Ukraine:**

**26 administrative units:**
- 24 regions (oblasts)
- Autonomous Republic of Crimea
- Capital Kyiv

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- Population by age (rn2)
- Death by age and by cause (C8)
Method:

Standardized Death Rates:

\[ SDR_j = \sum_x m_{x,j} \times p_{x}^{st} \]

- \( m_{x,j} \) - death rate at age \( x \) for a region \( j \)

- \( p_{x}^{st} \) - proportion of the population at age \( x \) in standard population

Decomposition of change in life expectancy by causes of death

\[ e_x^2 - e_x^1 = \sum_{y=x}^{W} n \varepsilon_y \]

- difference in life expectancy in 2 periods

\[ n \varepsilon_y = \sum_{c} n \varepsilon_{y,c} \]

- contribution produced by the difference in mortality in the age group \( y, y+n \)

\[ n \varepsilon_{y,c} = \frac{n M_{y,c}^1 - n M_{y,c}^2}{n M_y^1 - n M_y^2} \times n \varepsilon_y \]

- central death rate for age group \( y, y+n \) and cause of death \( c \)

\[ n M_{y,c} \]

- central death rate for age group \( y, y+n \) and all causes
Three time periods at a focus:

1) around census of 1989 – last census in Soviet Union
2) around census of 2001 – first all-Ukraine’s census
3) latest years – nowadays

Soviet Union  |  Independence

Census 1989, begin of the year | Census 2001, end of the year | Nowadays
After two decades LE returned to its initial values observed at the end of Soviet epoch. What happened during this period with mortality patterns?
I. Life expectancy at birth by regions: males

        max-min = 4.4 year

2000-2003: LE- 62 years
        max-min = 6.3 year

2007-2010: LE – 64.3 year
        max-min = 6.5 year

South and North (around Chernobyl) have lost the most in LE.
South and West have contributed the most to its recovery.
I. Life expectancy from past till now: females

1988-1992: LE – 74.6 year  
max-min = 2.9 year

2000-2003: LE – 73.5 year  
max-min = 4.1 year

2008-2012: LE – 74.4 year  
max-min = 4.6 year

South – Eastern belt have lost the most in LE.  
Western regions even gained after recovery.
II. Nosological structure of mortality*: males

Mix type:

- High share of chronic conditions and of “man-made” diseases
- Communicable diseases are still important

With course of time this contradiction only strengthened

*According to standardized death rates based on all-Ukraine’s population of 2001 used as a standard
II. Nosological structure of mortality: females

*According to standardized death rates based on all-Ukraine’s population of 2001 used as a standard
III. Contribution to difference in LE by causes:


Increased mortality from circulatory system diseases, external causes and infectious diseases have the most contributed to the decline of life expectancy.
Decreased mortality from Circulatory system diseases (for females) and External causes (for males) have the most contributed to the recovery of LE. Digestive system diseases Infectious diseases constantly contribute to deterioration in LE.
III. Contribution to difference in LE by causes: males
(two periods together)


- Only external causes covered back loses in LE (eastern regions concerned)
- Circulatory system diseases – only partly
- Digestive system diseases continue to generate loses
- Cancers and respiratory system diseases continue to generate gains (western regions concerned)
### III. Contribution to difference in LE by causes: females
(two periods together)

#### 2007-2010 comparing to 2000-2003

- Circulatory system diseases external causes covered back loses in LE (eastern regions concerned)
- Digestive system and infectious diseases continue to generate loses
- Cancers and respiratory system disease continue to generate gains (western regions concerned)
- Other causes contributed to gains


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- Other causes contributed to gains
IV. Contribution to difference in LE by causes and regions:
Circulatory system diseases: males


2007-2010 comparing to 2000-2003

- East and North are responsible for major losses though situation on the East have recovered, West and North still contribute to decrease in LE
IV. Contribution to difference in LE by causes and regions: Circulatory system diseases: females


2007-2010 comparing to 2000-2003

- Degradation was about the same over entire Ukraine
- Improvement is particular for the South and West
Conclusions:

• **During two decades life expectancy in Ukraine experienced sharp decrease, then stagnation followed by a recovery.**

• **Though average values at the end of Soviet times and now are close, regional and cause-specific patterns changed.**

• **The biggest killer, pathologies of circulatory system, contributed a lot to the losses in life expectancy and their role is still crucially important even after a recovery.**

• **As for geography mortality improved more in the regions where situation was already favorable (West), and degraded where it was already difficult (East-South) bringing western regions to the second stage of a health transition.**