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Reconstruction of Continues Time Series by Causes of Death in Belarus

Extended Abstract

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INTRODUCTION

The reconstruction of continues time series by causes of death in Belarus is a part of the international project "European Convergence and Divergence in Causes of Death". The main goal of the project is to provide coherent data on cause-specific mortality, link them with the socio-economic indicators, and explore the impact of health policies on mortality trends. Such investigations are essential in revealing determinants influencing the mortality trends across the countries of Eastern and Western Europe over the last four decades.

Exploring the mortality trends in Belarus represents a valuable contribution towards the understanding the nature of the health crisis in the former USSR. Furthermore, mortality trends in Belarus since 1990 alone are of particular interest. They deviate from those observed in the neighboring countries such as Russia, and Lithuania, for example. To explain such divergence it is necessary to deal with cause-specific mortality as mortality from certain causes of death is correlated with specific risk factors and behavioral patterns. The analysis of causes of death plays a vital role in establishing causal links between mortality and its determinants. Unfortunately, it is complicated by the changes made in the ICD revisions. Since 1965, the classification of causes of death in Belarus has been revised and modified four times: three times during the Soviet period (in 1970, 1981, and 1988) and once in 2002, when a specific abridged version of the ICD-10 was implemented. To overcome the raptures produced in the statistical series by the changes in the cause-of-death classification, it is necessary to apply a special reconstruction method. As the result, it is expected to obtain the coherent cause-specific mortality trends in Belarus since 1965 onwards in terms of the last classification, the abridged version of the ICD-10. The paper provides an overview of the ongoing reconstruction work, describes its methodological aspects and technical details, and highlights the importance of the anticipated outcome for mortality research in European context.

DATA AND METHOD

We used original data on causes of death by sex and five year age groups for the period 1965-2007. Methodologically, the work is based on the *reconstruction method*[1]. As the first step, the method assumes the construction of correspondence tables. It is based on the systematical comparison of the medical content between two successive revisions of causes of death. Afterwards, the items are gathered in elementary associations, the smallest possible clusters of causes of death sharing the same medical content within two successive revisions. Elementary associations allow estimating *transition coefficients* (positive values between 0 and 1 indicating the arithmetical correspondence between items in 'old' and 'new' revisions). Finally, transition coefficients are applied to death counts of the 'old' revision (get redistributed). By this the coherent time series in terms of the 'new' classification are obtained. The above described procedure is applied in the same manner for each transition.

RECONSTRUCTION: GENERAL OVERVIEW

Since 1965, the classification of causes of death in Belarus has been revised and modified four times: three times during the Soviet period (in 1970, 1981, and 1988) and once in 2002, when the abridged version of the ICD-10 was implemented. The following sequence of major steps was accomplished in order to obtain the coherent time series by causes of death in terms of the ICD-10 (Figure 1).

Figure (1)
The Major Stages of the Reconstruction Work

Stage 0	**1965-1969** **210 (+13)***	**1970-1980** **185 (+10)***	**1981-1987** **185 (+10)***	**1988-2001** **175 (+10)***	**2002-2007** **277 (+44)***
Stage I	1965-1980				
Stage II	1965-1987				
Stage III	1965-2001				
Stage IV	1965-2007				

Notes: (I) Transition to the Soviet Classification of 1970 based on the ICD-8 (SC 1970);
(II) Transition to the Soviet Classification of 1981 based on the ICD-9 (SC 1981);
(III) Transition to the Soviet Classification of 1981 and modified in 1988 (SC 1988);
(IV) Transition to the abridged version of the ICD-10.
*number of items in a classification. The figure in parentheses indicates the number of items used for the double classification of external causes of death by character of trauma

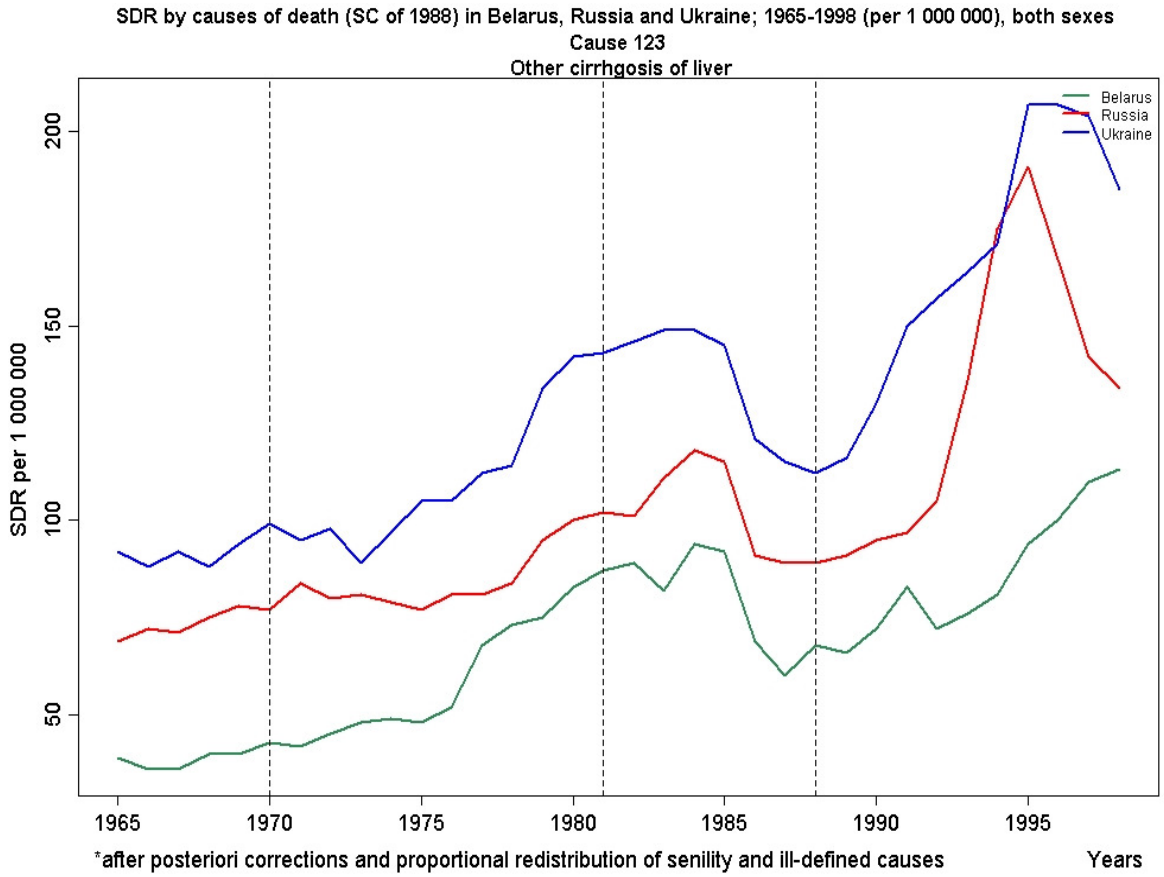
[1] For detailed description of the method see Meslé, France and Vallin, Jacques, 1996. – Reconstructing long-term series of causes of death, *Historical methods*, vol.29, n 2, p.72-87.

The first major step was to overcome the transition of 1970 and obtain coherent time series for 1965-1980 in terms of the Soviet Classification of causes of death (SC) of 1970. The next task was to reconstruct cause-specific mortality trends in terms of the SC 1981 for the period 1965-1987, and then in terms of the SC of 1988 for the period 1965-2001. Finally, we reconstructed the obtained time series in terms of the ICD-10.

EXPECTED OUTCOME

It is expected to obtain harmonized data by causes of death for 1965-2007 in terms of the abridged version of the ICD-10. The data will be used for the in-depth mortality research in Belarus and the comparative analysis with other countries. An example of the reconstructed trend in terms of the Soviet classification of 1988 is presented below:

Figure (2)



The trend of item 123 'Other cirrhosis of liver' in Belarus is being contrasted with that in Russia and Ukraine[2].

[2] Reconstruction of continues time series by causes of death in Russia and Ukraine were accomplished previously by applying the same methodology