Original Research

Socio-economic mortality inequalities in Lithuania during 2001–2009: the record linkage study

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ABSTRACT

Objectives: To present socio-economic inequalities in mortality and their trends in Lithuania using routinely collected data and record linkage for the years 2001–2009, as related to educational level, occupation, economic activity, marital status and household size.

Study design: Retrospective cohort study.

Methods: Record linkage was performed using personal identification number between three data sources: 2001 population census, national mortality register for years 2001–2009 and population register, including individuals of age 30 years and older. The linked data set consisted of 2,061,481 records, including 338,652 death cases. Age-standardized mortality rates were calculated for socio-economic groups and compared in terms of rate differences (RD) and rate ratios (RR).

Results: Significant mortality inequalities were found for all socio-economic variables. Both among males and females the highest RR were observed for the occupation (males − 3.4, females − 2.8) and economic activity status (males − 2.7, females − 3.1). RR were the highest in mid-ages and declined with ageing. RD increased with the increase in total mortality during 2005–2007, while decline in inequalities was observed in later years.

Conclusions: Lower education, manual occupations, unemployed, economically inactive and unmarried groups of population appeared in the most unfavourable position in terms of mortality and contributed most to the mortality increase in Lithuania throughout 2005–2007.

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Introduction

After regaining independence in 1990, Lithuania entered a new era with many radical changes. The population of the country has been exposed to the new and unfamiliar socio-economic environment. The first decade of independence was the period of major socio-economic changes. It was expected to enter gradually a more stable stage of development, however, the later years were marked by economic crisis and continuing reforms in health system and other related areas, which inevitably affected health of the population. During the last 25 years, Lithuania experienced large mortality

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fluctuations, namely an increase in mid 1990s and during 2005−2007, followed by decline in later years.[1] Nothing similar was observed in Western countries or even in the most of other Central and Eastern European countries.

The importance of reduction of the socio-economic (SE) inequalities in health for the improvement of population health status is well known. There are numerous studies demonstrating strong association between social determinants, such as educational level or occupation, and the negative trends in mortality rates or other health status indicators in many countries.[2−6] This knowledge helps to understand better the impact of SE factors on mortality trends. It should also facilitate developing more adequate and effective health policies and interventions for improvement of population health status. It is particularly important in the countries with high mortality levels and/or unfavourable trends, like in Lithuania and other Baltic States.

Studies on SE mortality inequalities in Lithuania were started relatively recently compared to Western countries. So far, the issue of SE health inequalities is still mostly of interest to the research community rather than being a part of national routine regular health reporting system. This is mainly caused by the lack of necessary data due to high costs of data collection via special surveys. The situation, however, is gradually changing, thanks to the development of computerised national information systems which accumulate required data anyway for other, usually administrative or statistical purposes. The linkage of required data items from different national databases can be performed practically at no costs. Such data also allows more detailed analysis and could be used for more regular reporting on SE mortality inequalities. This study illustrates the process of record linkage and the kind of data it can produce. It is the second assessment of socio-economic mortality inequalities in Lithuania using census-linked data. It covers a longer time period, additional SE variables, focuses on trends and age-specific differences. The earlier work was limited to 2001−2005 period and three SE variables.[7,8]

The aim of this study is to present socio-economic inequalities in mortality and their trends in Lithuania using routinely collected data and the record linkage for the years 2001−2009, as related to educational level, occupation, economic activity, marital status and household size. In parallel, it also demonstrates the potential for establishing regular monitoring of SE mortality differentials based on data linkage from existing national information sources.

Methods

Study design: retrospective cohort study using national routine data collection systems covering entire Lithuanian population.

Data from the following three data sources were used:

1) Data of population census conducted by the Lithuanian Department of Statistics in 2001 − individual records containing information on sex, date of birth, educational level, occupation, economic activity status, marital status and household size;
2) National mortality register which has been maintained by the Department of Statistics up to 2009 − individual cause of death records containing ICD-10 codes of the cause of death, sex, dates of birth and death;
3) Population register − date of emigration of individuals who declared emigrating from Lithuania during the period of 2001.04.06−2009.12.31.

Individual records from these databases have been linked using personal identification (ID) numbers by the staff at the Department of Statistics who have access and the necessary permissions to handle data containing personal ID numbers. After the linkage was done, ID numbers were removed and this anonymous data set was used for further analysis.

The linked data set contained the records of individuals who were 30 years old or older at the time of population census on April 6, 2001. It consisted of 2,061,481 records, including 338,652 death cases. Out of all registered deaths in the mortality register data base, 18,786 cases (5.3%) were unlinked, i.e. no corresponding personal ID numbers were found in the population census database. These cases were excluded from the analysis.

Records covering the entire nine year period were further split into yearly intervals enabling the calculation of annual mortality rates for the assessment of trend. The total number of such yearly records reached 17,199,871 and this file was the basis for most of subsequent analyses. The total volume of follow-up data was 16,439,647 person-years. Mortality rates were age-standardized using European Standard Population.

Detailed categories and their frequencies of five SE variables, as they were available from the census questionnaire, are presented in web appendix Table A1. Four variables (education, occupation, economic activity and marital status) are more or less frequently used in studies on SE inequalities. The fifth (household size) is relatively new and was included assuming that it may reflect social/family support aspects. In case of occupation, the difficulty was in measuring this variable by some meaningful and practical scale which would correlate with an increase or decline in mortality risk. The classical approach is to construct some scale on manual − non-manual axis. The national classification scheme used during 2001 population census was based on ISCO 88. Although up to six digit occupation codes were available, it was decided to use only the first level of broad groups of professions, supplemented by additional categories of unknown/not answered and inactive persons to ensure the full population coverage.

For simplicity of the assessment of SE mortality differentials by year and age, the detailed categories of SE variables were grouped into two broad categories. Mortality inequalities were evaluated by comparing mortality rates between higher and lower risk groups in absolute and relative terms, i.e. the absolute difference in age-standardized mortality rates (RD) and the rate ratio (RR).[9] More complex indexes like Slope or Relative indexes of inequality were not used at this stage of data analysis.