

Regional life expectancy patterns in Lithuania

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Background: The objective of this study was to investigate levels and trends of inequalities in life expectancy in administrative regions of Lithuania during 1988–1996 and to analyse possible reasons for regional inequalities. **Methods:** Information about the population and the deceased was obtained from the Lithuanian Department of Statistics. Life tables of 55 administrative regions of Lithuania were compiled in 3 year intervals: 1988–1990, 1991–1993 and 1994–1996. The contribution of major causes of death to regional inequalities in life expectancy was assessed. Associations of the regional inequalities in life expectancy with the level of urbanisation, health care resources, level of education, marital status, and unemployment along with certain indicators of well-being were evaluated. **Results:** The life expectancy of males varied by 7.4–10.8 years and that of females by 5.6–7.2 years in different regions. The more favourable regions for both males and females were the major towns and the resort town of Druskininkai. Differences in mortality from external causes of death in males and cardiovascular diseases in females contributed most significantly to the regional inequalities in life expectancy. Inequalities correlated with the regional differences in the level of urbanisation, education and marital status. There were no associations observed with either the distribution of health care resources, level of unemployment or certain other economic aspects of well-being. **Conclusions:** Large-scale, individual-based data would need to be studied to explain the considerable regional inequalities in life expectancy and for equity-oriented policy and strategy application.

Keywords: evaluation, life expectancy, regional inequalities

Inequalities in health have been found in all countries where research in this field has been performed. Regional inequalities in life expectancy can be determined by many factors, such as differences in lifestyle, the ecological environment, access to social and health services and unequal distribution of incomes.^{1,2} We could expect health to be unevenly distributed in the Lithuanian society. However, investigations of inequalities in health have only been recently started in Lithuania. There had been no studies on regional inequalities in life expectancy performed in Lithuania prior to now.

The aim of our study was to assess levels and trends in inequalities in life expectancy in administrative regions of Lithuania from 1988 to 1996 and to analyse possible causes for regional inequalities.

METHODS

Information on deaths during the period 1988–1996 and characteristics of the deceased (sex, age, place of residence and cause of death) were derived from a computerised database obtained from the Lithuanian Department of Statistics. Life tables of 55 administrative units of Lithuania (11 towns and 44 rural regions) were compiled for males and females for the periods 1988–1990, 1991–1993 and 1994–1996. Three-year periods were selected in order

to circumvent annual fluctuations in the data which may have been occurring in these regions. Life expectancy at birth with 95% confidence intervals was assessed.

The size of the total Lithuanian population was rather stable throughout the period of investigation, accounting for 3.2–3.7 million people. Populations in the rural regions varied from 40,000 to 60,000, while in major towns the variation was 0.3–0.7 million.

The second part of the study sought to determine the contribution of the major causes of death, i. e. cardiovascular diseases (ICD-9 codes 390–459), cancer (140–209) and external causes of death (E800–E989), to regional inequalities in life expectancy, which was accomplished by using the method devised by Pollard.³

The third part of the study was the analysis of associations. Regional inequalities in life expectancy were compared with the level of urbanisation, health care resources (numbers of doctors and hospital beds per 10,000 population and inhabitant expenditures for health care in the region), level of education and marital status, as well as other socioeconomic factors, such as the level of unemployment, average monthly salary and number of individual cars registered in the region, as indicators of well-being. 44 rural regions were included in this part of the study. Information was acquired from censuses and the Lithuanian Department of Statistics. Factors associated with inequalities in life expectancy were explored by applying an analysis of linear regression. Ratios of the urban/rural populations were calculated for each region and a correlation with life expectancy at birth was assessed. Using the same procedure, the ratios of single/married populations and having primary education/uni-

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versity education were estimated for the regions and associations with life expectancy analysed.

RESULTS

The life expectancy at birth of Lithuanian males was 66.9 years in 1988–1990, 64.5 years in 1991–1993, and 63.8 years in 1994–1996. The shortest life expectancy was observed to be exceptionally prominent in the rural areas: 63.2 years during 1988–1990, 60.8 years during 1991–1993 and 59.3 years during 1994–1996. The longest life expectancy of males was noted in the major towns of Lithuania and, in particular, in the resort town of Druskininkai (70.6, 69.1 and 70.1 years respectively). The difference between the shortest and longest life expectancies of males was 7.4 years in 1988–1990 and reached 10.8 years in 1994–1996.

The shortest life expectancy of females was found in the rural regions also during the period of 1988–1996, while the longest occurred in Druskininkai, as was indicated for males. The differences between the shortest and longest life expectancies of females were smaller than in males. The differences were 6.8 years in 1988–1990, 7.2 years in 1991–1993 and 5.6 years in 1994–1996. Differences in the life expectancy of females almost remained stable, whereas in males they were greater and increasing (table 1).

Among the regions where the greatest inequalities in life expectancy were observed, 44.6–64.8% of the differences in males were caused by external causes and 25.4–28.7% by cardiovascular diseases. The major contribution to the regional inequalities in the life expectancy of females occurred as result of differences in mortality from cardiovascular diseases (35.7–55.6%) and external causes (11.3–23.7%).

The regions with higher proportions of urban in comparison to rural populations were considered as having a higher level of urbanisation. There was a positive correlation noted between the level of urbanisation and life expectancy of males at a correlation coefficient of 0.24 (figure 1). This correlation was weaker in females (0.18). Considerable differences in life expectancy were observed in some of the regions having very similar levels of urbanisation.

There was no correlation found between the regional levels in health care resources and in life expectancy in the rural regions. Though the number of doctors varied between 14.1 and 30.1 per 10,000 population and hospital beds between 29.3 and 195.1, the correlation coefficients

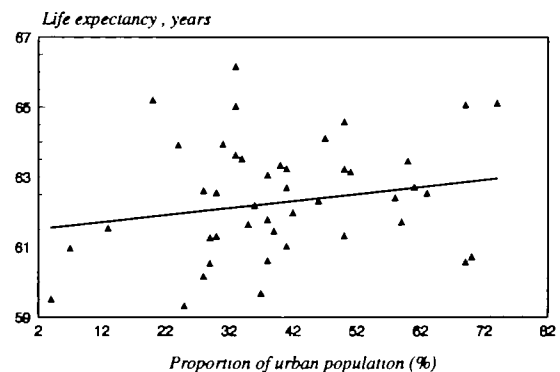


Figure 1 Association of life expectancy of males with the level of urbanisation (correlation coefficient = 0.24)

between these indicators and life expectancy were 0.18, and 0.05 ($p > 0.05$) respectively. In 1994, actual health care financing totalled 115.11 LTL on average, varying from 66.95 to 261.57 LTL per inhabitant in the various regions of Lithuania. However, there was no significant correlation observed between regional health care expenditures and life expectancy.

The statistical analysis demonstrated a correlation between regional variations by level of education (expressed by the ratio of primary education : university education) and life expectancy of males. With the increase in the proportion of males having primary or lower education in the region, life expectancy was found to be decreasing, as indicated by a correlation coefficient of -0.21 (figure 2). During the same time, there was no significant correlation between the regional level of education and life expectancy in females.

A correlation between marital status (expressed by the single : married ratio) and life expectancy was also observed. An increase in the regional proportion of a singles population was associated with a decrease in life expectancy for the region. This correlation was stronger in males in comparison to females, measuring correlation coefficients of -0.36 and -0.27 respectively (figures 3 and 4).

The average number of cars and levels of unemployment within the regions did not correlate with regional levels of life expectancy. The correlation observed between the average monthly salary of the population in the regions and life expectancy was weak and not statistically significant (correlation coefficient = 0.16 and $p > 0.05$).

Table 1 The longest and shortest life expectancies at birth (e_0) with 95% confidence intervals (CI) in Lithuania

Period	Males				Females			
	Average for Lithuania	Maximum e_0	Minimum e_0	Difference years	Average for Lithuania	Maximum e_0	Minimum e_0	Difference years
1988–1990	66.9 (66.8–67.1)	70.6 (68.5–72.6)	63.2 (62.1–64.2)	7.4	76.3 (76.2–76.4)	80.3 (78.5–82.1)	73.5 (72.2–74.9)	6.8
1991–1993	64.5 (64.3–64.6)	69.1 (67.3–71.0)	60.8 (59.3–62.4)	8.3	75.7 (75.5–75.8)	80.1 (78.2–82.0)	72.9 (71.9–73.9)	7.2
1994–1996	63.8 (63.6–63.9)	70.1 (68.1–72.1)	59.3 (57.8–60.9)	10.8	75.4 (75.3–75.5)	78.5 (76.8–80.2)	72.9 (71.9–73.8)	5.6

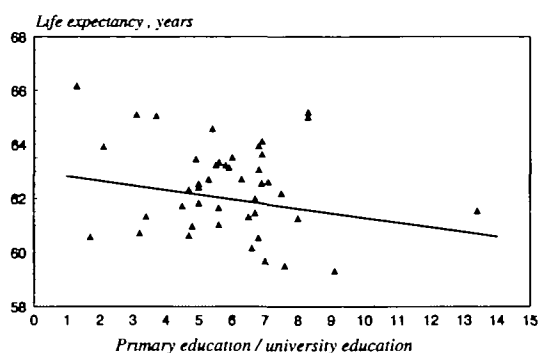


Figure 2 Association of life expectancy of males with the level of education (correlation coefficient = -0.21)

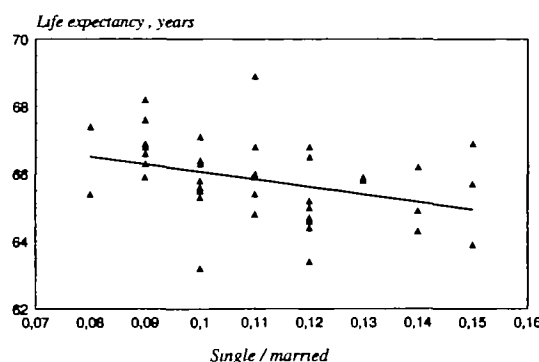


Figure 3 Association of life expectancy of males with marital status (correlation coefficient = -0.36)

DISCUSSION

Our study encompassed an important period in the development of the country, involving a shift from the status of being a Soviet socialist republic to that of an independent country with a newly developing market economy. Since the beginning of the political and economic reforms in 1990, the environment in Lithuania has changed dramatically and the population of the country has been exposed to new and unfamiliar social circumstances, along with the consequent increase in social stress caused by such fundamental changes. Life expectancy dropped in all the regions of Lithuania during the period of investigation; however, the regional pattern of life expectancy remained nearly stable. This finding suggests that the causes of regional inequalities in life expectancy within Lithuania had formed prior to the regaining of independence and were not strongly influenced by the new socioeconomic conditions.

Life expectancy has been shorter in rural areas in comparison to urban areas, in contrast to the tendencies observed in some other countries which have reported having better health and longer life expectancy in rural rather than urban areas.^{1,4-6} However, most of the Eastern European and Baltic countries have reported the urban population as having better health.^{7,8} The most favourable situation, for both males and females was observed in the major towns of Lithuania, particularly in the resort town of Druskininkai, whereas the shortest life expectancy was consistently reported for rural areas.

Males experienced the greatest and increasing variations in life expectancy throughout the period of 1988–1996, while in females life expectancy did not vary as significantly and the variations have remained virtually stable. Similar situations have been observed in many other countries, demonstrating differences in life expectancy for males of 2–4 years and for females regional variations which reach 1.5–3 years.⁹ Regional variations in life expectancy in Lithuania reached 10.8 years in males and 7.2 years in females. Findings reported in numerous studies have disclosed more pronounced socioeconomic mortality differences in males as compared to females.^{10,11} The smaller relative magnitude of inequalities among

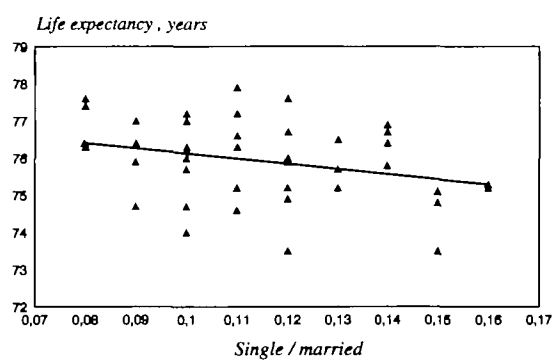


Figure 4 Association of life expectancy of females with marital status (correlation coefficient = -0.27)

females is explained by various viewpoints, usually from the perspective that the multiple social roles of females (worker, wife and mother) provide them with several advantages, including social support, resources and privileges attached to each role and social identities.^{12,13} The impact of the social and economic transition in Lithuania, which was exacerbated by a lack of social support and cohesion, was greater on male inequalities in health as compared to females. The fact that regional variations in the life expectancy of males are mainly caused by regional differences in mortality from external causes supports our hypothesis, because the major external cause of death in Lithuanian males is suicide, generally reflecting an inability to cope with life stress. It is not a new idea that males having difficulties in coping with problems are more inclined to self-destruction than females.¹⁴ At the same time, the greatest contribution to regional inequalities in the life expectancy of females was caused by cardiovascular diseases. Because the life expectancy of Lithuanian females varied between 72.9 and 80.3 years, it is logical to place this cause of death as being the major contributor to regional inequalities in life expectancy. The regional analysis of life expectancy in Russia demonstrated similar results for males, suggesting that the regional differences could be explained largely by

accidents and alcohol-related causes. However, in Russian females the results were similar to those found for males – the differences in life expectancy were primarily accounted for by deaths from accidents and alcohol-related causes. The regional variations in mortality trends in Russia were explained in light of the negative consequences of rapid social and economic changes and the lack of social cohesion.¹⁵ The health of the Lithuanian rural population as compared to the urban population, deteriorated considerably more during the period of transition, whereas in Russia the regions with the sharpest falls in life expectancy were predominantly urban during the same period.¹⁶ In modern society, health is mainly determined by social stress and, consequently, by lifestyle, which is associated closely with the socioeconomic status of population.¹⁷ The Lithuanian rural population has lower levels of education, income and social status in comparison to urban residents. It is not surprising that alcohol consumption, smoking and unbalanced nutrition is more prevalent among the Lithuanian rural population.¹⁸ During the period of transition, the rural population, particularly males, faced greater difficulties in social adaptation than urban men, causing even greater deterioration in their health. Inequalities in life expectancy, even in the rural areas, could be partially explained by the differences in the level of urbanisation, education and marital status.

The results of this study add to the growing evidence on the inequalities in health in relation to socioeconomic status and place of residence. Unlike many other studies performed in advanced countries, our period of investigation covered the unique, dramatic changes in the political, social and economic situation of the country and disclosed huge inequalities in health in this small and rather homogeneous country. This field requires considerably more research, because studies of this type have only been recently initiated.

CONCLUSIONS

- The life expectancy of males varied from 63.2 to 70.6 years in the different regions of Lithuania during 1988–1990, whereas that of females varied from 73.5 to 80.3 years. In 1994–1996, the shortest and longest life expectancies of males were 59.3 and 70.1 years and those of females were 72.9 and 78.5 years, respectively. Throughout the period of investigation, regional differences in the life expectancy of males increased from 7.4 to 10.8 years while those of females virtually remained stable.
- The more favourable regions for health for both males and females were the major towns of Lithuania and the resort town of Druskininkai.
- The differences in mortality from external causes of death in males and cardiovascular diseases in females contributed most significantly to the regional inequalities of life expectancy.

– The regional inequalities in life expectancy correlated with regional differences in the levels of urbanisation, education and marital status, while there were no associations observed with health care resources, level of unemployment or certain other economic aspects of well-being.

– Implementation of equity-oriented policies and strategies should be the priority for health care reform in Lithuania, along with the appropriate allocation of resources for social support systems and planning for health promoting measures.

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