

## Short Report

# Change in marital status structure as an obstacle for health improvement: evidence from six developed countries

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The aim of this study is to estimate the contributions of changes in population distribution by marital status to the changes in adult mortality in six developed countries. The change in total mortality was decomposed into the contributions of: (i) mortality changes within each marital status category; and (ii) changes in population composition by marital status. The study provides evidence that changes in population composition contributed to increases in male mortality in Russia and Lithuania, whereas in the remaining male populations this was a significant obstacle for faster health improvements. The compositional changes had only small impacts on female mortality.

## Introduction

Research evidence consistently confirms the health advantage of the married people.<sup>1,2</sup> It has been shown that mortality differences by marital status have been increasing in time and that the widening of the mortality gap occurs together with notable changes in distributions of population by marital status.<sup>2,3</sup>

Studies attempting to quantify the contributions of changes in the composition of the population to the total increase or decrease in mortality of entire populations are rare. It has been shown that improvements in education in Russia and Estonia throughout the 1990s partly counterbalanced the overall decreases in life expectancy in the two countries.<sup>4</sup>

The aim of this article is to estimate contributions of the changes in population distribution by marital status to the overall changes in adult mortality in six developed countries.

## Methods

Unpublished data on deaths and population exposures by marital status for Finland (1978–79, 1998–2000) and England and Wales (1980–82, 2001) have been provided by the Statistics Finland and the Office for National Statistics of the UK. For Hungary (1980, 2001), the data were downloaded from the online database of the Hungarian Central Statistical Office.<sup>5</sup> For the USA (1980, 1999–2001), the counts of deaths were obtained from the National Center for Health Statistics public use datasets, and the denominators were taken from the breakdowns of population from Census 1980 and Census 2000 (published by the US Census Bureau). The census and death counts for Lithuania and Russia for 1979 were obtained from the unpublished official tables by the Goskomstat of the USSR. The most recent data on Russia were provided by the Federal State Statistics Service and use tabulated deaths and estimated mid-year population by marital status (calculated using interpolation between the micro-census of 1994 and the census of 2002) for 1998. The corresponding tables for Lithuania for 2001–04 stem from the aggregated dataset provided by Statistics Lithuania.<sup>6</sup> The study uses cross-sectional census-unlinked data except census-linked data for Finland and Lithuania (only for 2001–04). The four conventional marital status categories were used: married, never married, divorced and widowed. People living in consensual unions were classified as

never married. In the USA, the married category also includes 'common-law' marriages, a small category dating back to earlier periods in history. Such marriages are currently granted in only 11 states, and are apt to comprise a small fraction of the married category. In the subsequent analyses, the first time point is denoted as '~1980', whereas '~2000' stands for the second period.

Total standardized death rates (SDRs) for ages 30–69 years were calculated as a weighted average of the total age-specific death rates, where weights represent the WHO European standard (direct standardization). Total age-specific death rates were derived as a weighted sum of death rates by marital status category within each age group. Thus, the total SDRs were estimated from two matrices: (i) a matrix of age-specific death rates by marital status; (ii) a matrix of age-specific population weights by marital status. The decomposition of the change in the total SDR was performed using a stepwise replacement of each element of the two matrices containing age- and marital status-specific mortality rates and population weights in the first time point by the corresponding elements from the matrices of mortality and population weight estimates in the second time point. The numerical effect of each replacement on the change between the two total SDR values reflects the age-specific contributions of either mortality rates or population weights. More detailed information about this method is available in prior publications.<sup>4,7,8</sup>

## Results

Table 1 shows that during the period covered, male mortality decreased in Finland, England and Wales, the USA and Hungary. In the meantime, Lithuanian and Russian males experienced upward mortality trend. As for females, mortality declined in all countries except Russia. However, the decrease in Lithuania was much smaller than in Western countries and Hungary.

The reduction in mortality among married males and females made the largest contribution to the decrease in mortality in England and Wales, USA, Finland, Hungary and Lithuania (females only) (table 1). On the other hand, the mortality of Russian married males deteriorated and contributed to the rise in overall mortality. The effects of mortality improvements in the remaining marital status groups in England and Wales, USA and Finland were less important. Among Russian and Lithuanian

**Table 1** Contributions of changes in age-specific death rates (mortality component) and of changes in marital status structure (compositional component) to the total change in male and female SDRs<sup>a</sup> at ages 30–69 years in six countries, 1980–2000

Country	SDR (per 1000 persons)		Total change in SDR	Due to changes in age-specific death rates of				Due to changes in marital status structure
	~1980	~2000		Married	Never married	Widowed	Divorced	
<b>Males</b>								
England and Wales	9.28	5.56	-3.72	-3.23	-0.31	-0.27	-0.34	0.43
USA	10.58	7.08	-3.50	-2.89	-0.25	-0.38	-0.78	0.80
Finland	11.86	7.36	-4.51	-4.11	-0.68	-0.17	-0.56	1.02
Russia	18.08	19.63	1.55	0.19	-1.33	0.13	0.39	2.17
Lithuania	13.60	14.92	1.32	-0.40	0.21	-0.21	0.20	1.52
Hungary	14.14	13.73	-0.40	-1.66	-0.07	0.11	-0.21	1.43
<b>Females</b>								
England and Wales	5.14	3.44	-1.70	-1.20	-0.12	-0.27	-0.18	0.07
USA	5.67	4.31	-1.36	-0.86	0.00	-0.37	-0.20	0.07
Finland	4.34	3.01	-1.33	-0.98	-0.11	-0.17	-0.15	0.08
Russia	6.70	6.94	0.24	-0.33	-0.21	0.56	0.23	-0.01
Lithuania	5.46	4.93	-0.53	-0.51	-0.15	0.11	0.06	-0.05
Hungary	7.00	5.64	-1.36	-1.08	-0.07	-0.23	-0.16	0.17

<sup>a</sup>SDRs (per 1000 persons) were calculated using the WHO European standard population.

Note: due to rounding (up to two decimals), the contributions do not always sum to give the exact total change in the SDR.

males, the mortality decreases in the married (Lithuania), never married (Russia) and widowed (Lithuania) groups were outweighed by worsening mortality in other groups or by unfavourable changes in population composition (table 1). Reductions in mortality among married and never married females in Russia and Lithuania contributed to the decrease in overall mortality. In Lithuania, these improvements were responsible for the overall decrease in the total SDR. In Russia, the aforementioned reductions were outweighed by worsening mortality in the widowed and divorced groups.

Compositional changes played a significant role only for males (table 1). The 'worsening' marital status structures in Lithuania and Russia were the biggest contributors to the increases in overall male mortality in these countries. If the population composition by marital status remained unchanged over the period 1980–2000, Russian and Lithuanian male mortality in 2000 would have been at least moderately lower than in 1980. Under the same condition, the overall health gains would have been higher in Hungary, Finland, USA and England and Wales. Among females, the contributions of compositional changes were less important. In England and Wales, USA, Finland and Hungary compositional changes contributed to the rise in overall mortality, whereas these changes in Russia and Lithuania contributed to the decrease in overall mortality.

## Discussion

Although for Russia, Hungary, England and Wales, the USA and Lithuania we used cross-sectional unlinked data, we believe that the misreporting of marital status on death records does not lead to major distortions of our findings. A prior study comparing the census-linked and unlinked cross-sectional mortality estimates in Lithuania supports this assumption.<sup>8</sup> In our data, people living in consensual unions were classified as never married. Since the share of cohabiting people differs from country to country, mortality estimates for never married group are not fully comparable across the countries. We believe that the inclusion of 'common-law' marriages within the married category in the USA has a negligible effect on our results.

Similar changes in population composition took place in all six countries: the proportion of married adults decreased, while the share of non-married population increased (Supplementary table 2). There were inter-country differences in the magnitude of compositional changes. The fastest reduction in the proportion of married males and females was observed in Finland and England and Wales. The decrease was much slower in Hungary, Lithuania (females only) and Russia. The

compositional changes significantly contributed to the changes in male mortality. In Russia and Lithuania, these changes were entirely responsible for an increase in mortality, whereas in the remaining cases this was an obstacle for faster health improvements. Compositional changes had much smaller impacts on the changes in female mortality. In Finland, England and Wales, USA and Hungary, their small contributions to mortality increase were outweighed by notable contributions due to mortality decreases. Interestingly, Lithuanian and Russian females were the only two cases showing opposite (favourable) impacts of the compositional changes. The sex differences in the role of compositional changes can be explained by the fact that female mortality is less dependent on marital status than male mortality.<sup>2</sup> This relationship is especially pronounced in Russia and Lithuania, where male mortality differences by marital status are striking.<sup>6,9</sup>

## Supplementary data

Supplementary data are available at *EURPUB* online.

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*Conflicts of interest:* None declared.

*Disclaimer:* This documentation does not pertain to work in progress at the US Census Bureau. Any views expressed on statistical, methodological, technical, or other issues are those of the authors and not necessarily those of the US Census Bureau.

## Key points

- This study provides the first empirical evidence about the consequences of changes in marital status structures on adult mortality trends in developed countries.
- The overall male health gains in England and Wales, USA, Finland and Hungary would have been greater if marital status structures remained fixed at the 1980 level. Moreover, compositional changes were responsible for the increase in male mortality in Russia and Lithuania. Changes

in marital structure had much smaller effects on female mortality trends.

- The recent decline in official marriages and growing importance of non-marital unions suggest that overall mortality will increasingly depend on the health situation in other than officially married groups.
- There is a need for more in-depth studies on the trends and determinants of the striking excess non-married male mortality in Eastern Europe.

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## Short Report

# Successful deinstitutionalization of mental health care: increased life expectancy among people with mental disorders in Finland

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To assess impact of deinstitutionalization of mental health care, we studied life expectancy for 341 630 people with hospitalization or early retirement pension for mental disorders in 1981–2003 in Finland. Life expectancy at the age of 15 years was significantly shorter for men/women with serious mental disorder (59.0/70.8 years) than in the general population (75.3/82.1 years) in 2001–03. Life expectancy increased for people with schizophrenia and other psychoses, mood disorders and neurotic disorders, but decreased for people with substance use disorders. Deinstitutionalization and decentralization of mental health services did not affect life expectancy negatively. Policy measures to control adverse effects of alcohol and substance abuse have failed.

## Introduction

In most developed countries, mental health services have been transformed from hospital-centred to integrated community-based services. Social inclusion and empowerment of people with mental disorders has gradually replaced institutional care and paternalistic attitudes. However, evidence to support or challenge the change in mental health policy is scant and system-level outcome studies are rare.<sup>1</sup>

In Finland, a deinstitutionalization process began in the 1980s and the number of psychiatric hospital beds has decreased by 75% since the 1970s.<sup>2</sup> Psychiatric services were merged with other secondary-level health services in 1991 and funding of mental health services was transferred to the autonomous municipalities in 1993. The annual number of psychiatric inpatients, however, has remained remarkably stable: approximately 30 000 people annually (round 6 per 1000 inhabitants).

People with serious mental disorders have considerable excess mortality, even excluding the effect of suicides.<sup>3</sup> Mental disorders are also associated with low socioeconomic status and negative lifestyle factors that can contribute to excess mortality.<sup>4</sup>

## Materials and methods

The study population was mainly retrieved from the 1981–2003 Finnish Hospital Discharge Register (HDR), kept by the National Institute for Health and Welfare (THL). The HDR contains information on all patients treated at any hospital in Finland. To maximize the coverage of people with serious mental disorders, we retrieved 1981–2003 data from the National Pension Register, kept by the Finnish Centre for Pensions. After excluding people treated for an organic mental disorder