

Post communist transition and changes in mortality in Poland

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Abstract (short)

On the eve of the post communist transition, after three decades of stagnation or regress life expectancies in many countries of Central Europe started to increase rapidly and systematically. Poland, one of the most populous countries in the region, witnessed sudden shift in the mortality trend relatively early, that is in 1992. Since then the life expectancy has been increasing considerably for both sex, reaching in 2009 71 years for men and 80 years for women. This paper presents the most significant tendencies in mortality which allowed for this extension of life expectancy, with special reference to causes of death. On the basis of the single cause-of-death time series restored for the period 1970-2006, it is possible to prove crucial importance of diseases of the circulatory system for the recent mortality developments. A detailed analysis of single disease entities indicates also significance of changes in state's health care system and in individual attitudes towards one's health.

Background

In the last four decades European regions experienced very different changes in mortality trends. While the Western part of the continent witnessed progressive decline in mortality levels, mostly driven by prevention, abatement or delay of diseases of circulatory system, in most Central and Eastern European countries the health situation has been deeply worsening since the 1960s (Bourgeois-Pichat 1984; Chesnais 1983; Meslé 1991; Okólski 1985; Rychtaříková et al. 1988). In such countries as Czechoslovakia, Hungary, Poland and USSR of those days, the regress in life expectancy resulted mostly from the increase of adult male mortality from circulatory diseases and external causes of death. By contrast, after the fall of the Berlin Wall and on the eve of the post communist transition, the progress in life expectancy resumed right away and very rapidly in some Central European countries, like Czech and Slovak Republic, Hungary, Poland and then Romania and Bulgaria (Vallin, Meslé 2001). In some countries, however, such as Belarus, Russia and Ukraine, unfavourable health tendencies are still in action (Rychtaříková 2004).

Aim of the paper

Poland, one of the most populous countries in the region, serves as a perfect example illustrating changes in mortality patterns in Eastern Europe. In the communist period it experienced first increase and then decrease of the values of life expectancy, whereas the post communist transition brought about a sudden recovery to the path of systematic decline of mortality. It seems that the Polish case reflects the impact of political and economic changes on mortality patterns (that is level of mortality and cause-of death contribution). The aim of this paper is to present the life expectancy changes in Poland with a special emphasis on causes of death. For the periods 1970-1991 and 1991-2006 the contribution of the most important causes into life expectancy variations is provided. Also, a reference to social factors underlying mortality changes (such as people's behaviours and attitudes, organization of public health system, etc.) is made.

Data and method

A detailed longitudinal analysis of changes in mortality requires long-term continuous time series by single causes of death. Due to regular revisions of International classification of diseases and related health problems (ICD) a comparison of cause-of-death time series in the

long term is impossible. Jacques Vallin and France Meslé (Vallin, Meslé 1988; Meslé, Vallin 1996) proposed a method reconstructing single cause-of-death time series originating in subsequent revisions of ICD classification according to one revision. This method has been successfully applied to several European countries, to mention only France (Vallin, Meslé 1988), Russia (Meslé et al. 1996), Ukraine (Meslé, Vallin 2003) or West Germany (Pechholdová 2007). This paper presents first results of analogical reconstruction for Poland for the period 1970-2006 linking three different ICD revisions (8th, 9th and 10th). The reconstruction required also estimation of data lacking due to the strike of medical doctors that took place in Poland in the years 1996-2002 (Fihel, Meslé, Vallin 2010).

Apart from a comparative analysis of death rates and life expectancy trends, the decomposition of life expectancy gains/ losses is provided. The decomposition analysis quantifies the age- and cause-specific contributions into changes between values of life expectancy at birth (e_0) for two different years, 1 and 2. It is based on Evgueni Anreev's (1982) formula:

$$e_0^2 - e_0^1 = \frac{1}{2} \sum_{x=0}^{\omega} \{ [l_x^2 (e_x^2 - e_x^1) - l_{x+1}^2 (e_{x+1}^2 - e_{x+1}^1)] - [l_x^1 (e_x^1 - e_x^2) - l_{x+1}^1 (e_{x+1}^1 - e_{x+1}^2)] \}$$

where l_x is age-specific life table survivorship for year 1 or 2 (see also Andreev, Shkolnikov, Begun 2002).

Results

As far as mortality in Poland is concerned, in the postwar time three distinct periods can be distinguished (Fig.1). The first, taking place up to 1964 could be characterized by a relatively rapid increase in the life expectancy at birth for both sexes: it increased from 1950 to 1964 by 10 years (for men and women). Although the death rates at all ages diminished, the increase in the life expectancy resulted mostly from the suppression of mortality of infants and older children. It was the result of preventive state's policy against infectious and parasitic diseases among the youngest (Okólski 2004).

FIG.1 INSERT HERE

In contrast to first postwar decades, the period 1965-1991 was characterized by decrease (in the case of men) or stagnation (women) of life expectancy at birth. This was due to two opposite tendencies: (1) continuing suppression of infant mortality (both sexes) and (2) systematic increase (men) or stagnation/ slight decrease (women) of death rates at all ages

above 29. The increase in adult male mortality was so significant that it provoked a drop in life expectancy at any age, even at birth. In the case of women only the life expectancy at birth rose, whereas the life expectancy at adult ages remained almost constant.

In the period 1970-1991 the life expectancy at birth decreased for men by .32 years and increased for women by 2.20 years. The decomposition of life expectancy loss/ gain by age and causes of death reveals that the drop in infant mortality had the most beneficial effect on the life expectancy change (Fig.2). Had the mortality at age 0 remained constant, the life expectancy at birth would have decreased by 2 years for males or increased by less than 1 year for females. In the case of the latter the contribution of age groups older than 0-1 and different causes of death into the life expectancy gain was slight and rather ambiguous.

FIG.2 INSERT HERE

However, in the case of males a negative contribution at ages 15-69 and 80-84 was registered. This effect was pronounced in the middle age: rising death rates at the age 35-69 shortened the life expectancy by 2 years. The group of diseases of circulatory system was mostly responsible for this loss: it shortened the male life expectancy at birth by 1.55 years, therein 1.34 years was due to unfavourable mortality trends at age 35-69. However, the impact of neoplasms and external causes of deaths was also significant: the former shortened the life expectancy at birth by .62 years (therein .60 years due to increasing mortality at the age 35-69), whereas the latter by .54 years (.46 years, respectively). Thus, in the communist period the positive impact of decreasing infant death rate was outbalanced by rising/ constant adult mortality from diseases of circulatory system, neoplasms and external causes. Similar results were obtained for other communist countries of Eastern Europe (Meslé et al. 1996; Meslé, Vallin 2003).

The post communist transition brought about an unprecedented change in the mortality pattern in Poland. Already in 1992, 3 years after the first democratic parliamentary elections, the adult death rates started to drop and this decrease has persisted till today. As a result, the life expectancy at birth started to increase considerably for both sex reaching in 2009 71.53 years for men and 80.05 years for women. Thus, in the span of 17 years it increased by 5.05 or 4.4 years, respectively.

The decomposition analysis made for the period 1991-2006 proves that the drop in the infant death rate contributed the most to the life expectancy gain (.93 years for men and .82 years for women, Fig.2). However, the progress has also been achieved due to an immediate

and substantial drop in death rates at adult ages. For instance, the contribution of the age group 35-69 was 2.28 years for males and 1.44 years for females. Interestingly, for the latter the largest progress took place after the 64th year of life (2.40 years). In the case of both sexes the main causes of death responsible for the increase in life expectancy were: (1) certain conditions originating in the perinatal period (in the infancy), (2) external causes of death (at the age 10-34), almost exclusively transport accidents and (3) diseases of circulatory system (mostly after 34th year of life). Thus, three different patterns of mortality improvement could be distinguished according to the age and causes of death.

After 1991 the role of diseases of circulatory system was crucial for improvement in life expectancy. The drop in death rates from diseases of circulatory system was so sudden and substantial (Fig. 3) that it entailed the life expectancy increase by 2.83 years for males and 2.99 years for females. In this way Poland experienced the reduction of cardio-vascular mortality that started in West European countries in the 1970s (Vallin, Meslé 2004). The ischaemic heart diseases, with the acute myocardial infarction and chronic ischaemic heart disease as the most important, constituted the most important group of diseases of circulatory system responsible for the life expectancy extension (1.46 years for males and .95 years for females, Fig.4). Interestingly, this group of diseases, apart from its large contribution, followed the same tendency as the overall mortality: a gradual increase till 1991 and a sharp decrease since 1992 (Fig.3).

FIG.3,4 INSERT HERE

The diseases of arteries, arterioles and capillaries, with atherosclerosis as the most important disease entity, represented the second most prevalent group of diseases of circulatory system (Fig.3). Also, this group contributed largely to the life expectancy improvement in the post communist period (Fig.4). As a matter of fact, mortality from atherosclerosis is exceptionally high in Poland, which causes serious problems for international comparisons. The study of the Central Statistical Office of Poland (2007) proved that medical doctors filling the death certificates and medical coders responsible for coding the underlying cause of death are likely to report atherosclerosis (especially generalized and unspecified atherosclerosis, I70.9) in the place of acute myocardial infarction (I21.9), atherosclerotic cardiovascular disease (I25.0), heart failure, unspecified (I50.9), stroke, not specified as hemorrhage or infarction (I64), or even diabetes mellitus (E10-E14). Despite the

CSO recommendations, this abuse of the disease entity of atherosclerosis is still persistent and contributes to the country-specific coding practice in Poland.

Mortality from cerebrovascular diseases started to diminish with a certain delay: 2 years later for men and 9 years later for women as compared to ischaemic heart diseases or diseases of arteries, arterioles and capillaries. Since then this group of causes of death has followed the same tendency of continuous decrease. For other diseases: other forms of heart disease and other diseases of circulatory system the improvement has been persistent since 1970.

To sum up, in the post communist period the mortality level in Poland started to decrease systematically and rapidly. The life expectancy started to make up for the decades of the 1960s, 1970s and 1980s when the unfavourable tendencies were in action. As in the previous period, the progress was due to diminishing infant mortality. As opposed to the previous period, a significant contribution was made by decreasing young adult mortality from transport accidents and adult and old adult mortality due to diseases of circulatory system. The role of the latter was the most important and such disease entities as ischaemic heart diseases, diseases of arteries, arterioles and capillaries and cerebrovascular diseases should be listed.

Discussion

The deterioration of health situation and increase in adult mortality during the communist period has been attributed to the spread of autodestructive behaviours and lowering of life conditions. The autodestructive behaviours, such as alcohol abuse, tobacco smoking, not taking care of one's health, rest and diet could be linked with general feeling of hopelessness, helplessness and disappointment caused by limited spatial and social mobility, and also by lack of prospects for occupational and economic improvement in the communist regime (Siegrist 2000). The political and economic transition successfully taking place in Poland since 1989 changed this attitude and had strong and beneficent impact on health, death rates and life expectancy values.

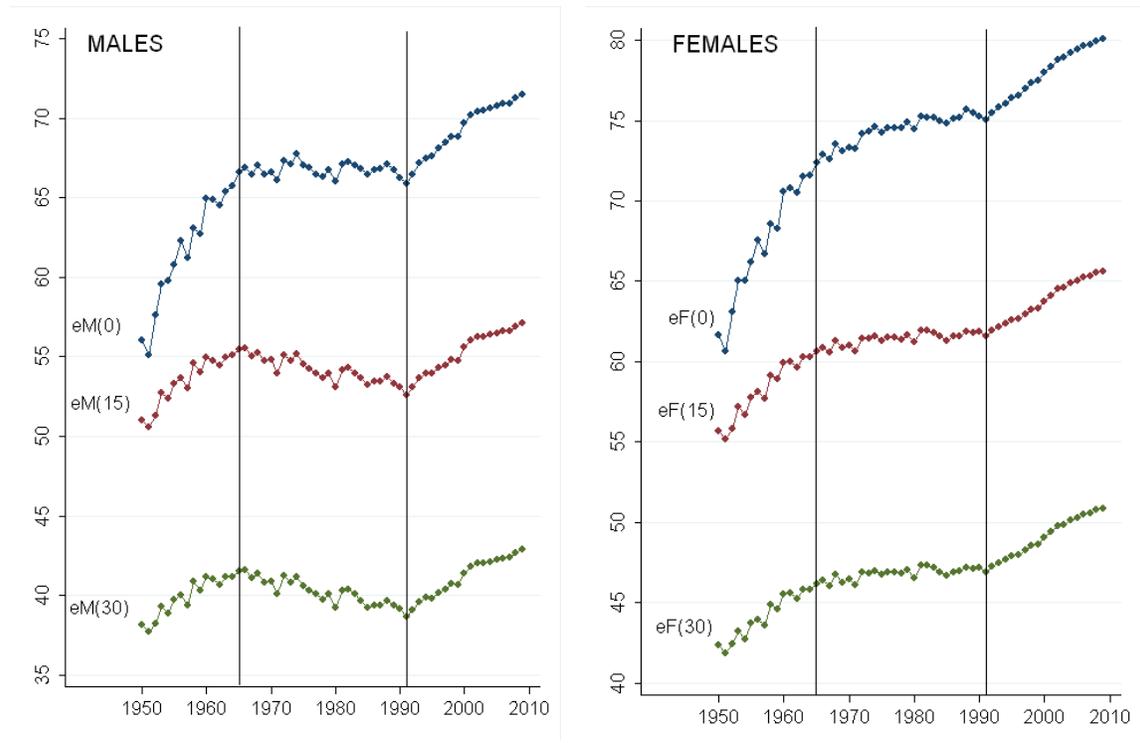
This is the first extensive analysis focusing on recent mortality trends in Poland by single causes of death. The cause-of-death time series allowed for distinguishing diseases that contributed to significant increase in the value of life expectancy. However, the aggregated dataset, that is not including individual characteristics of the deceased (such as their health behaviours or medical treatment received), makes it impossible to quantify the impact of each epidemiologic and socio-economic factor on the drop in mortality. It is clear, however, that many factors played a role.

The change in diet must have had an important effect on the mortality decline. According to Zatoński (2001), in the transition period the consumption of fruits, vegetables and fat of plant origin increased, whereas of fat of animal origin decreased. The change in consumption referred also to reduction of saturated fat in favour of unsaturated fat (Zatoński, Willett 2005). Also, the prevalence of tobacco smoking significantly diminished among men, from approximately 55% of daily-users among adults in the middle of the 1980s to 35% in 2009-2010 (Ministerstwo Zdrowia 2010). This drop has not been registered for women, for whom the prevalence rate remained at the level of 20%. Other authors quote popularization of sport activities (especially jogging) and adaption of widely-defined healthy lifestyles (Religa 2003).

Last, but not least, the progress in medical treatment must be mentioned. In the years 1993-2001 the National Program of Heart Protection was implemented in order to improve cardiologic and cardiosurgical treatment in Poland (Religa 2003). As a result, newly established 11 regions became self-sufficient in the domain of invasive and non-invasive diagnostics, interventional cardiology and cardiosurgery. Due to this program the number of diagnostic screenings increased seriously. Without this improvement in the health care the drop of mortality from diseases of circulatory system would not be possible.

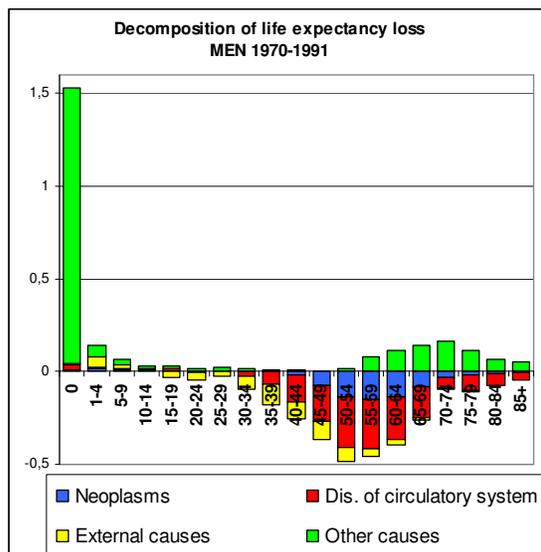
FIGURES

Fig.1. Life expectancy at birth, age of 15 and 30 for Poland 1950-2009, by sex

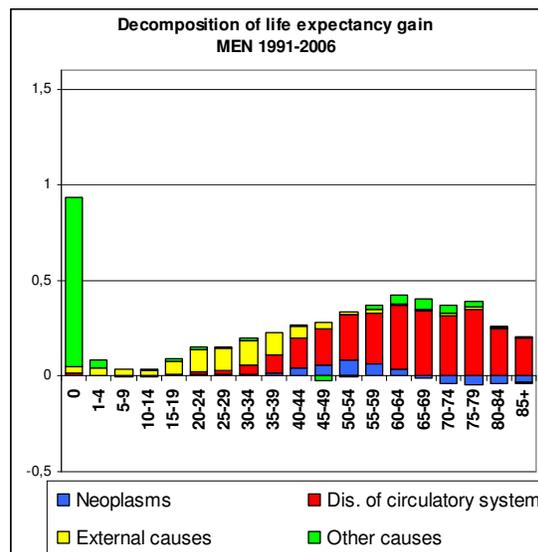


Source: based on Bolesławski (2010).

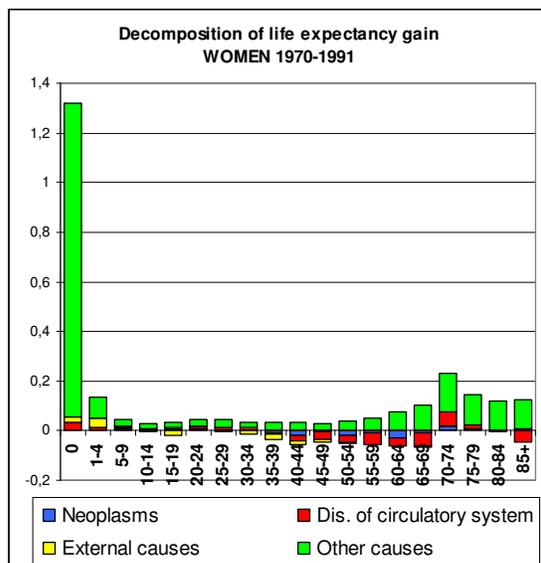
Fig.2. Decomposition of life expectancy gain/ loss for men (top) and women (bottom) for the periods 1970-1991 and 1991-2006, by age and four main groups of causes of death



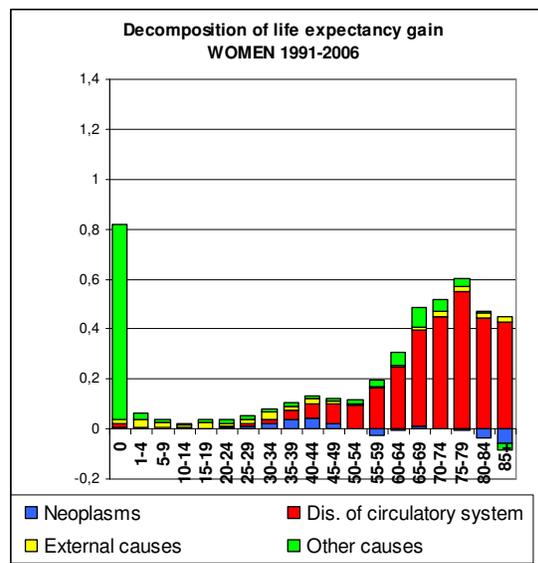
Note: Loss by 0.32 years.



Note: Gain by 5.05 years.



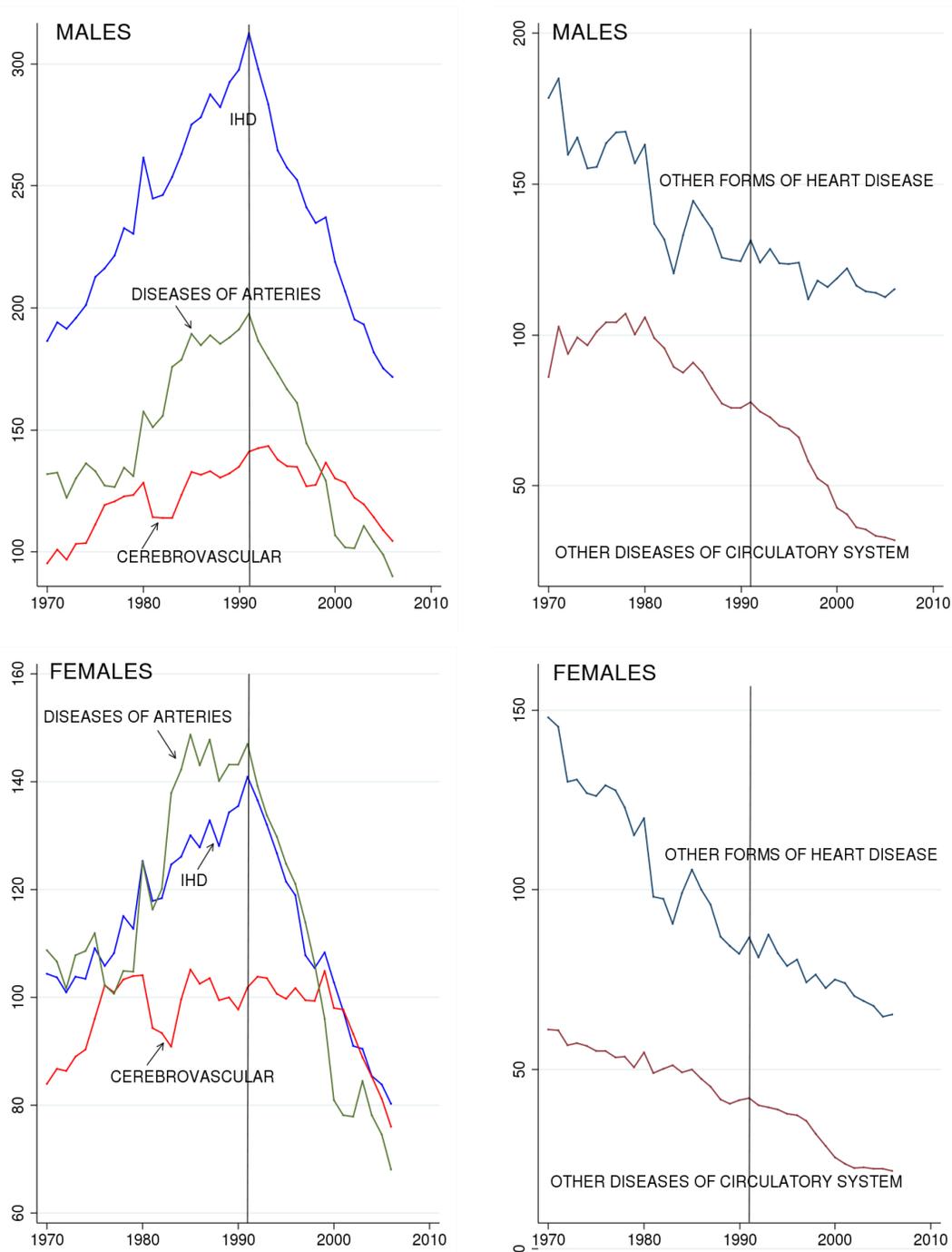
Note: Gain by 2.20 years.



Note: Gain by 4.51 years.

Source: own calculations on the basis of data provided by the Central Statistical Office of Poland.

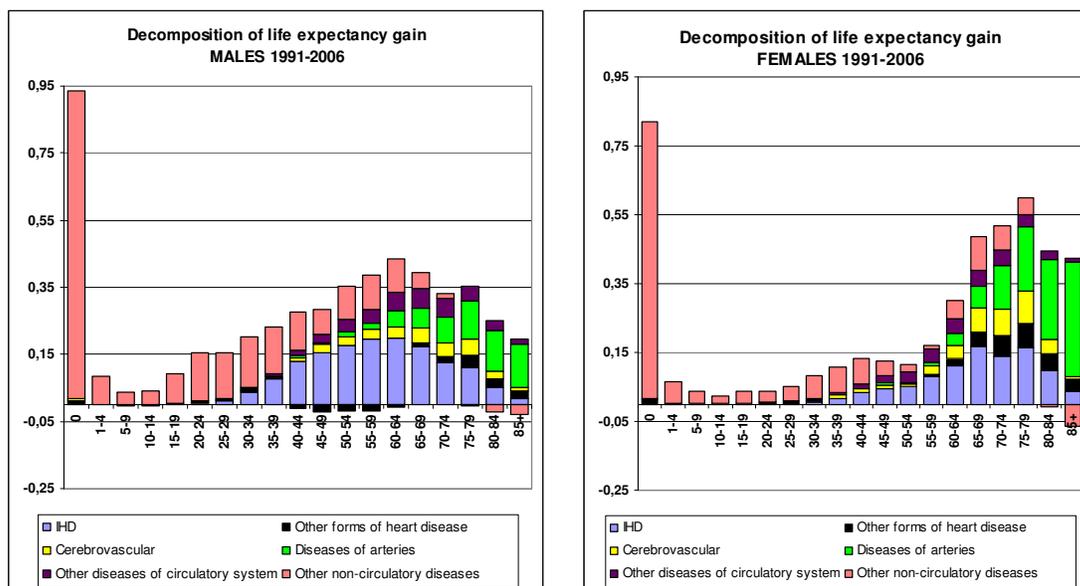
Fig.3. Standardized death rates (per 100,000) for diseases of circulatory system, Poland 1970-2006



Notes: IHD - Ischemic heart diseases (I20–I25), Diseases of arteries - Diseases of arteries, arterioles and capillaries (I70–I79), Cerebrovascular diseases (I60–I69), Other forms of heart disease (I30–I52), Other diseases of circulatory system (I00–I15, I26–I28, I80–I99).

Source: own reconstruction based on data provided by the Central Statistical Office of Poland.

Fig.4. Decomposition of life expectancy gain for men and women for the period 1991-2006, by age and groups of causes of death



Notes: IHD - Ischemic heart diseases (I20–I25), Diseases of arteries - Diseases of arteries, arterioles and capillaries (I70–I79), Cerebrovascular diseases (I60–I69), Other forms of heart disease (I30–I52), Other diseases of circulatory system (I00-I15, I26-I28, I80-I99).

Source: own calculations on the basis of data provided by the Central Statistical Office of Poland.

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