

## SIMILARITIES AND DIFFERENCES BETWEEN NATURAL MOVEMENT OF SLOVAK AND JAPAN POPULATION

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**Abstract:** The quoted features of long-term population development are observable in population of Slovakia and Japan although these populations are quite different from the point of view of economic, social, cultural, political and other characteristics. Along with the common trend in the development of natural population movement indicators, at the present time in case of several indicators, approximately the same level in Japan and in the SR is observable. However, there also exist considerable differences in the long-term development of natural movement indicators between Slovakia and Japan, in speed and in intensity of this development, also at the level of numerous indicators in time.

**Key words:** natality, fertility, mortality, natural increase, reproduction

### 1. INTRODUCTION

Long-term trends of population development generally considered the natural part of social processes possess similar features in the majority of world populations. These long-term changes are characterised by, for instance, decrease of indicators such as the crude birth rate, total fertility rate, net reproduction rate, natural increase and by increase of indicators such as the average age of woman at the birth of the first child, age of maximum fertility, life expectancy, and the like.

The quoted features of long-term population development are also observable in population of Slovakia and Japan although these populations are quite different from the point of view of economic, social, cultural, political and other characteristics. The differences in populations processes are particularly connected with the quoted differences of studied populations. These appear in intensity and speed of changes of the individual indicators of population's natural movement in time.

The aim of this paper is the comparison of development and the present level of the individual components of natural movement of population – natality and fertility,

mortality, natural increase and reproduction in Slovakia and Japan – connected with identification of the common and different developmental features based on time data series accessible in both countries and with establishment of dominant factors of demographic development.

## **2. DEVELOPMENT OF NATALITY AND FERTILITY INDICATORS**

Development of natality and fertility is influenced by a complex of socio-economic, individual and demographic changes which show a number of differences existing between the studied countries. The pronounced natality and fertility rate decrease in Japan is connected with economic growth (1960s and 1970s) and with such factors like change of woman's position in society and family, changes in the „value of child“ which becomes an economic burden. The natality rate decrease in Slovakia is connected with negative socio-economic changes in the society under transformation after 1989 (growth of cost implicated in care after a child, decrease of real income in households, financial inaccessibility of flats, reduced loans for newly married couples, and regulation of child allowances). Similar individual factors (changes in value orientation of people, increasing individualism and emancipation of women, secularisation), and demographic factors (increased average wedding age, decrease of married women percentage at reproduction age) are observable in both countries. The natality rate level in Japan is also influenced by strong traditions (traditional wedding behaviour, sex-linked division of tasks).

### **2.1 Development of the crude birth rate**

During the last 100 years the crude birth rate in the Slovak Republic (SR) decreased from 40 – 43‰ to 10 – 12‰ while in Japan it was only from 30 – 33‰ to 9 – 10‰. The decreasing birth rate trend was not regular; it was interrupted by several short periods of increase.

The crude birth rate in Japan increased until the First World War in comparison with the Slovak Republic where it decreased (Fig. 1, 2). It dramatically decreased to 14.6‰ during the First World War in the Slovak Republic, while it decreased only by 2‰ in Japan which was not so engaged in the War. The after-war compensation phase of birth rate was more striking in the SR (38.2‰ in 1921) than in Japan (36.2‰ in 1920). The decrease of birth rate was deepened by the world economic crises again more strikingly in Slovakia. The increasing level of birth rate in the period of the Second World War was caused above all by the fact that the strong years born after the First World War reached their reproduction age. The compensation phase was more striking in Japanese population (34.3‰ in 1947) and its onset was quicker than in the SR (28.7‰ in 1951).

The compensation phase was followed by decrease of birth rate connected with the onset of communism in the SR and capitalism in Japan. Pro-natal policy in the 1970s in the SR and reaching of reproduction age by the strong after-war years interrupted the decrease of birth rate. The decrease of crude birth rate accelerated after 1989 from 15.1‰ to 9.5‰ in 2001. Meanwhile, in Japan two periods of accelerated birth rate

decrease were observable in the 1950s and between the mid-1970s and mid-1980s. Since then it maintains at the level around 10‰ (9.3 in 2001). In 1966 (pursuing the Chinese astrology, the „Year of Fire Horse“) the birth rate dramatically decreased in the effort to reduce the number of newborn girls in the above-mentioned year as they, according to astrology, were deemed to have problems with entering the married and reproductive life.

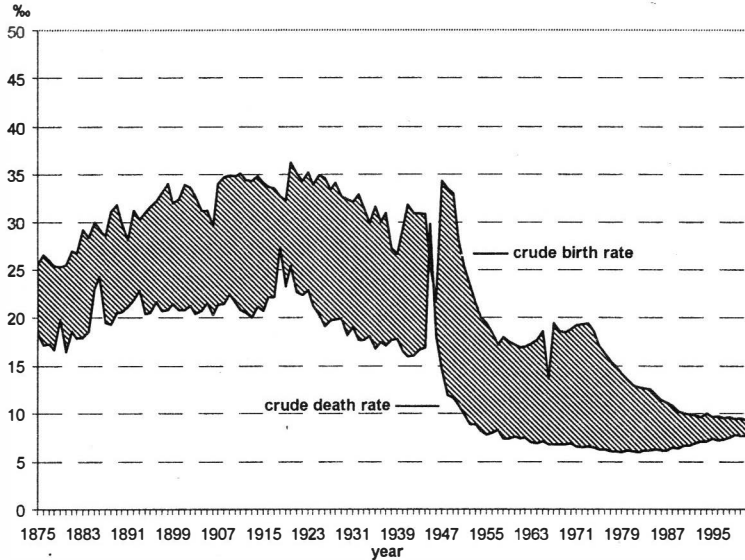


Figure 1 Development of the natural movement in Japan (1875 – 2002)

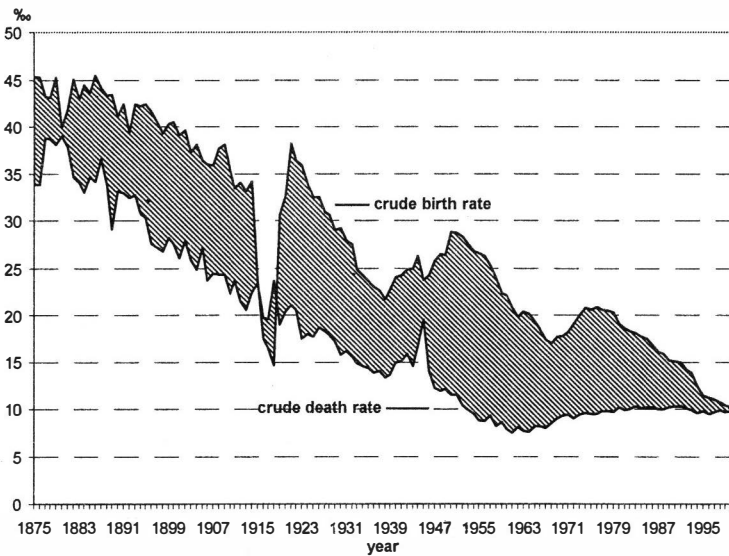


Figure 2 Development of the natural movement in Slovakia (1875 – 2001)

## 2.2 Development of total fertility rate

The total fertility rate in Japan decreased after 1925 when it reached the value of 5.11. This trend was only interrupted by the after-war compensation increase. The total fertility rate decreased from the approximate 4.5 to less than 2 in the course of the 1950s. Causes of such abrupt decrease lied in social changes such as the reform of the Empire, growing economy, and transition to market economy, new life style, promotion of planned motherhood, and the new educational programme. In the period 1963 – 1974 it maintained at the simple reproduction level (2.1) and in the mid-1970s it definitely dropped below 2.1. At the beginning of the 1980s, the beginning of the 1990s and in 2001 it reached the values around 1.7, 1.5, and 1.33 respectively. The Year of Fire Horse (1966) is also distinctly identifiable in the development of the total fertility rate when it decreased from 2.14 to 1.58.

The onset of compensation phase after the Second World War in Slovakia was slower which might have been connected with the unstable political situation in the country while the total fertility rate culminated in 1950 with the value of 3.47. The slow decrease of total fertility followed after this year. It dropped below the value 3 for the first time in 1961 and below 2.5 in 1967. The increase of total fertility rate in the mid-1970s to the level around 2.5 depended above all on the entry of the strong after-war years in fertile age and on the pro-natal policy. Total fertility decreased to 2.08 (for the first time below the limit of population decrease) before 1989. In the 1990s the total fertility dramatically decreased to 1.198 (in 2001) – the level lower than in Japan – in the consequence of demographic changes.

## 2.3 Development of specific fertility rate by age

Decrease of total fertility rate is connected with decrease of specific fertility of women at all age categories; however, the rate of this decrease was different in the individual categories. The difference between the SR and Japan is above all in the level and intensity of the decrease of the specific fertility rate and in the age of maximum fertility.

In the 1950s distinct decrease of fertility in all age categories, but above all in 30 – 40 and 35 – 39 year old was observable in Japan when the fertility in the two last mentioned age categories decreased by more than two thirds in the course of the 10-year period. The smallest changes took place in the marginal age categories (15 – 19 and 45 – 49) where, however, the fertility reached negligible values (below 10%) in contrast to the SR. Another period of dramatic changes in the specific fertility came after 1980 when in turn the fertility in lower age categories (25 – 29 and 20 – 24) decreased most distinctly. On the contrary, fertility of 30 – 34 and 35 – 39 year old women recorded slight increase which testifies to transfer of births into higher ages as early as the beginning of the 1980s (Marenčáková, J., 2003).

In Slovakia, like in Japan, since the end of the Second World War until the end of the 1980s the categories of 30 – 34 and 35 – 39 year old women are characterised by the largest fertility decrease by more than two thirds. However, this decrease did not take one but three decades in Slovakia. The smallest changes were recorded in the 15 – 19 year old category. In the 1990s, fertility of women at the age below 29 years (above all in the group of 20 – 24 year old) most distinctly decreased, what suggests postponing of child birth into higher age. The lowest fertility decrease was identified in case of women in higher fertile age (beyond 30) with low fertility level.

The highest fertility of 25 – 29 year old women and the second to highest fertility in 30 – 34 year old women was identified in Japan, while the difference in fertility in these two age categories continuously decreased. In the SR, since the end of the 1950s until the end of the 1980s the highest fertility was identified in the category of 20 – 24 year old women. It was connected above all with the low marriage age. The second to highest fertility was determined in the 25 – 29 age category. The difference of the fertility level in these two categories diminished in the 1990s and in 2000 fertility in the 25 – 29 age category reached a higher level (Marenčáková, J., 2003).

#### **2.4 Development of the average age of woman at the birth of the first child**

Before the Second World War in Japan, the average age of woman at the birth of the first child was low (20 – 24 year). During transformation of the Empire this age increased under the impact of population policy oriented to planned motherhood and the governmental educational programme. After 1980s this indicator exceeded 26 years and later in connection with the increased economic activity, educational level and emancipation of women it grew further. In 1990 it exceeded 27 years and in 2001 it reached 28.03 years.

From the long-term point of view, the average age of woman at the birth of the first child in the SR changes relatively slowly. It decreased by about a year from 23.5 years since the beginning of the 1950s until the end of the 1960s. It grew slowly since the end of the 1980s and reached the distinct increase by two years in the 1990s. The average age of woman at birth of the first child was 24.1 years in 2001 (in 1990 it was 21.9 years). The average age of woman at birth of the first child in the SR is lower from the long-term point of view than in Japan. This difference has been diminishing lately, but it is still 4 years (Marenčáková, J., 2003).

#### **2.5 Development of the extra-marital natality**

Up to the end of 1980s the share of children born out of wedlock in the total number of children born in the SR did not exceed 8% in spite of the fact that sole mothers were privileged in certain aspects (special social allowances, preference in location of children in nurseries and kindergartens). All these relative advantages were abolished after 1989, but the share of children born out of wedlock increased as connected with increasing cohabitations but above all under the effect of the distinct decrease of the total number of born children. Already in 1991 it reached about 9% and increased to almost 20% until 2001.

Increase of cohabitations and extra-marital births in Japan was negligible in the last quarter of the 20<sup>th</sup> century. Currently, the share of children born out of wedlock does not exceed 1.5%. Causes may lie in poor distribution of the modern anti-conception methods connected with legal limitations, conservative stance to sexuality, and the preference of traditional family behaviour (Atoh, M. 2001). It is also connected with the surviving traditional division of roles between the sexes – man, the breadwinner and woman, the housewife.

### 3. DEVELOPMENT OF MORTALITY INDICATORS

Mortality, like natality, is determined by numerous demographic, economic, and social factors. Mortality rate depends on age structure of population which is the result of long- and short-term changes, above all those concerning the level of birth rate, but also population migration which reflects economic and social level of the individual regions. Mortality level also depends on sex structure of population in connection with uneven mortality rate of sexes.

Differences in total economic level and that of health care are identifiable between Slovakia and Japan. These differences also appear in the mortality indicators – lower life expectancy at birth and that of higher age categories in Slovakia also higher neonatal and infant mortality, and higher mortality in the category of 45 – 55 year old (above all men) in the consequence of heart diseases.

#### 3.1 Development of crude mortality rate

The long-year decreasing trend of the crude mortality rate in both countries was replaced by stagnation or moderate increase of its level in connection with population ageing in recent three decades. The level of crude mortality rate in Japan has been lower during the whole long term development with the exception of the war and interwar periods. The crude mortality rate lowered in both countries to about a third of the original level from the mid-19<sup>th</sup> century to end of the 20<sup>th</sup> century, but while it dropped from the 30 – 35‰ level in the SR to 9 – 11‰, in Japan it dropped from only 20 – 25‰ to 6 – 8‰ (Fig. 1, 2). This indicator fell definitely below 30‰ in Slovakia by the end of the 19<sup>th</sup> century.

Until the beginning of the 20<sup>th</sup> century the development of mortality was subject to fluctuations especially under the effect of epidemics. The crude mortality rate increased in both countries, more distinctly in Japan, in the war period. The mortality rate of the SR was lower than that of Japan during the whole war and interwar periods. Increase of mortality during the First World War to 23.6‰ in the SR and to 27.3‰ in Japan was replaced by its decrease connected with improved health care and medical progress. The crude mortality rate definitely dropped below 20‰ in the SR and in Japan in 1923 and 1929 respectively (except for the year 1945). The Second World War caused extreme increase of mortality in both countries. In 1945 mortality in the SR was 19.5‰ and in Japan it was 29.8‰ (in the consequence of nuclear raids).

Mortality of Japan decreased below that of the SR in the after-war period although the difference was not large until the mid-1960s. After the Second World War the crude mortality rate in the SR decreased until the 1960s when it stabilised at the level of 7‰. In case of Japan, it decreased until the 1980s when it stopped at 6‰. This low mortality rate was the result of prolongation of the life expectancy through improved health care and also in the consequence of favourable population age structure. The last stage of the development of the crude mortality rate is represented by its increase observed in Japan since 1985 to as much as 7.7‰ in 2001. Mortality in Slovakia started to increase at the beginning of the 1970s and in 1978 reached the level 9.8‰ – around which it oscillates at present (9.7‰ in 2001).

### 3.2 Development of specific mortality rate

The shape of the curve of the mortality rate by age is similar in all parts of the world, but the differences are in the reached level of specific rates. Mortality in all age categories of both sexes decreased since 1950. Differences between the SR and Japan are above all in the intensity of this decrease and in the reached level of mortality by age in the individual time intervals (Fig. 3 – 6).

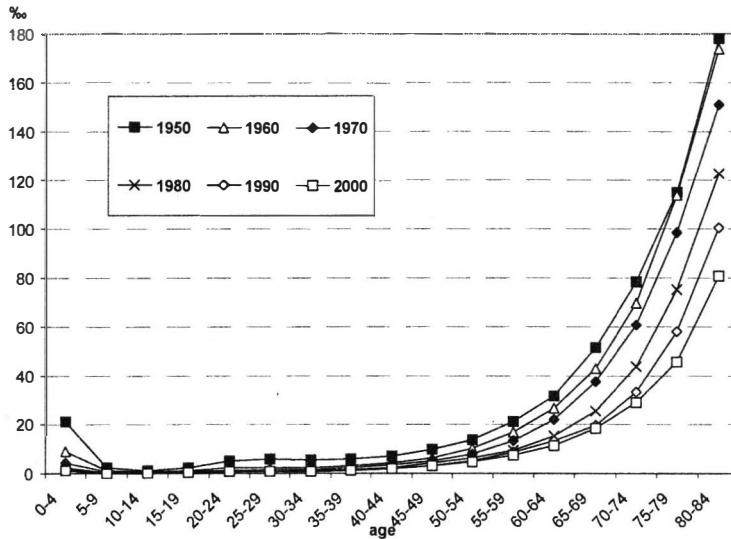


Figure 3 Development of the men specific mortality rate by age in Japan (1950 – 2000)

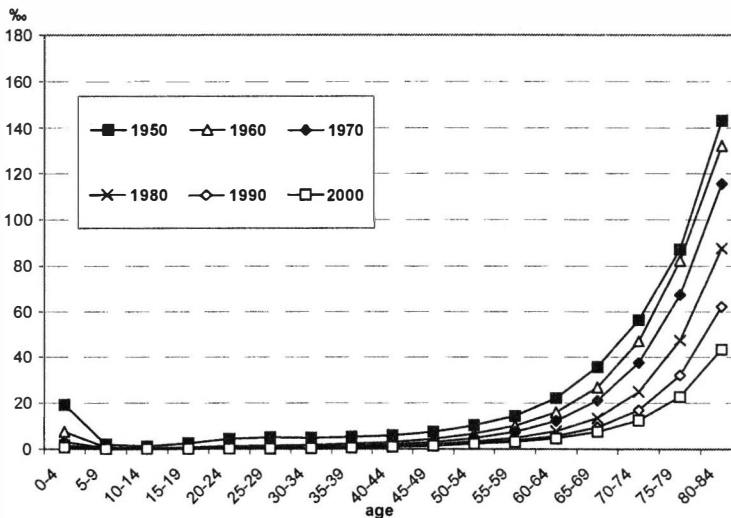
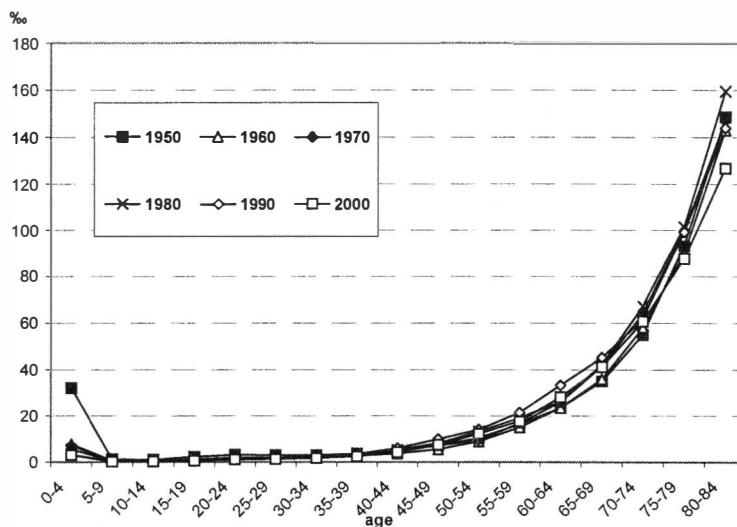
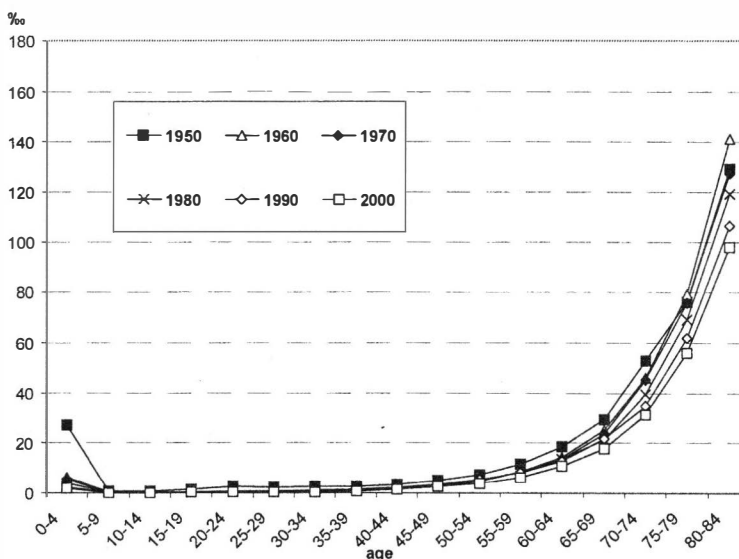


Figure 4 Development of the women specific mortality rate by age in Japan (1950 – 2000)



**Figure 5** Development of the men specific mortality rate by age in Slovakia (1950 – 2000)



**Figure 6** Development of the women specific mortality rate by age in Slovakia (1950 – 2000)

In 1950 the specific mortality rate in the SR was lower in low age categories as the result of higher infant mortality than in Japan. But the child mortality was higher in Japan. Specific mortality age below 50 years of age in the SR slowly increased, while its increase was quicker in Japan, above all that of men, already from the age of 20. Specific mortality rate of Japanese women in 1950 drew close to the specific mortality rate of men in the SR. The lowest specific mortality rate was that of Slovak women.

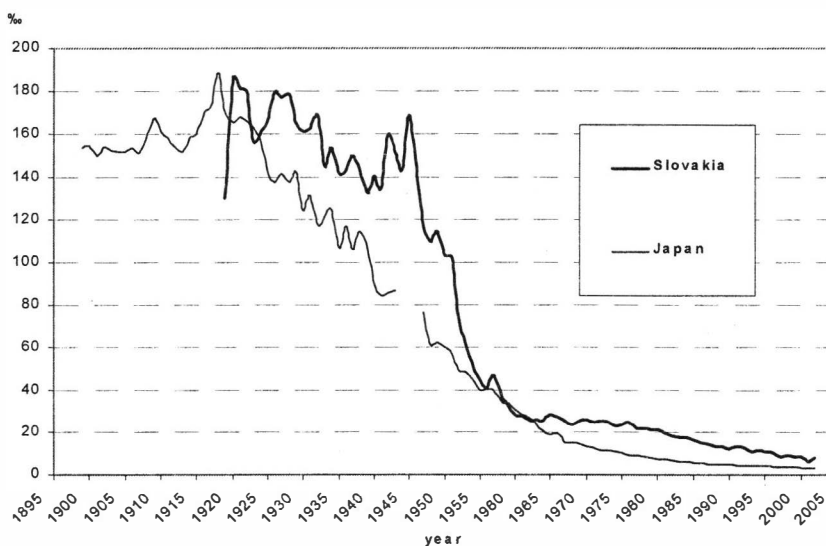


At present the distribution of mortality by age and sex in the SR and Japan is very similar – higher mortality rate below 1 year of age, minimum mortality rate at child age and abrupt increase at higher age. The phenomenon of male over-mortality in both countries appears as confirmed by higher mortality rate of men than that of women in all age categories. However, at present two basic differences in specific mortality by age or sex can be identified between the two study countries.

The first difference is in the mortality level in the individual age categories. This difference is striking at the level of infant mortality which is higher in the SR than in Japan in both sexes in during a prolonged interval (Chapter 3.3). Higher mortality rate values in the SR than in Japan are also observable at a higher age of women (above 60) and men from 45 years of age. The second difference is in the age until which the specific mortality curve maintains at the minimum level and then it starts to increase abruptly. The mortality rate in Slovakia started to increase much earlier; from the age of 60 in women and from the age 50 years in men, meanwhile in Japan it maintained longer on the minimum level and started to increase from the age of 60 in men and from the age of 70 in women.

### 3.3 Development of infant mortality

The coefficient of infant mortality points to the health care level and an overall life standard in the particular country. In long-term development it is possible to talk about its decreasing trend in both countries. In the course of the 20<sup>th</sup> century it decreased in Japan from 140 – 160‰ to 3 – 5‰; in the SR from 160 – 180 to 8 – 10‰ (Fig. 7). In the whole development this coefficient reached lower values in Japan than in the SR (with exception of some years when the differences were negligible), just like in 2002 when it was 7.6‰ and only 3‰ in the SR and Japan respectively.



**Figure 7** Development of the infant mortality coefficient in Slovakia (1919 – 2002) and in Japan (1900 – 2002)

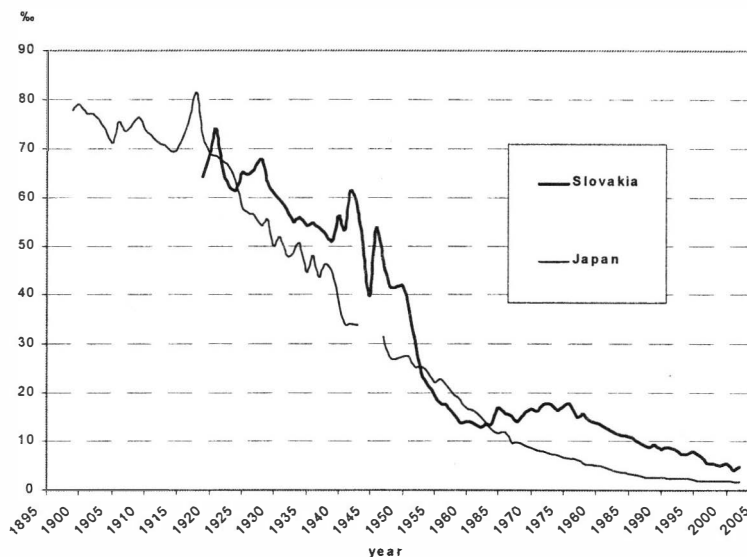
By the end of the 19<sup>th</sup> century and the beginning of the 20<sup>th</sup> century infant mortality in both countries was subject to considerable fluctuations and the coefficient was over 150%. Its increase came during the First World War when its value exceeded 180%. In the interwar period, the coefficient of infant mortality decreased in both countries, quicker in Japan. While its values decreased to 83‰ in Japan in 1940, in the SR it was only to 135‰. The decrease of infant mortality in interwar period is connected with improved health care level in both countries and new medical discoveries which made possible better care after birth-giving women accompanied by early diagnostics and efficient therapy of infant diseases.

Striking increase of infant mortality in the SR (as much as 170‰) took place during the Second World War (no data are available for Japan). In the after-war years medical progress was the cause of the abrupt decrease of infant mortality which was more distinct in the SR than in Japan, as in this later mentioned country it started to drop already after the First World War. Although the decrease in the SR started from a much higher level, Japan and the SR in 1955 reached the same level of infant mortality – 40‰. Since the 1960s, the decrease of the infant mortality coefficient slowed down in both countries. The decrease in the SR in the 1990s was more abrupt (7.6‰ in 2002). The infant mortality steadily decreases in Japan since the 1960s – the present low level moves around 3‰.

### **3.4 Development of neonatal mortality**

The development of neonatal mortality is analogous with the development of infant mortality in both countries. The decrease of overall infant mortality depends to a great extent on the decrease of neonatal mortality. The neonatal mortality of all infants represented until the end of the Second World War in Japan and in the SR until the end of the 1950s only about 40%. In the following period the share of neonatal mortality in mortality of all infants increased rapidly to as much as 70% in the mid-1970 in both countries. During the following period this share oscillated between 60 – 70% (62% in 2002) in the SR, but it decreased in Japan and from the end of the 1980s it moved between 55 – 60% (57% in 2002).

From the point of view of long-term development, the agreeing descending trend of the neonatal mortality coefficient in both countries is observable, while there were differences in its level, speed and intensity of decrease. Between the years 1920 and 2002 it dropped from approximately the same level of 70‰ in both countries to 4.7 ‰ in Slovakia and only 1.7‰ in Japan (Fig. 8). During almost its whole development it was lower in Japan than in the SR with the exception of some short intervals, when there was a negligible difference. Like in total infant mortality rate, also the increase of neonatal mortality in the war period is observable, which was followed by an abrupt decrease after the Second World War. This decrease was more distinct in the SR, because the neonatal mortality started to descend in Japan already after the First World War (it dropped below 50‰ already at the beginning of the 1930s), while it maintained at a high level above 50‰ until the end of the Second World War in Slovakia.



**Figure 8** Development of the neonatal mortality coefficient in Slovakia (1919 – 2002) and in Japan (1900 – 2002)

### 3.5 Development of mortality according to causes of death

At present, the five most frequent death causes according to the International Disease, Accident and Death Cause Classification (9<sup>th</sup> revision) are in accord in both compared countries. However, there is a difference in shares of these causes in total mortality, as well as at the level of mortality rates by causes (number of deaths following the given cause per 100 000 inhabitants). The most frequent death cause is the diseases of the circulatory system; it is the death cause of one third of inhabitants in Japan, and that of 55% of inhabitants in the SR. The second to largest share in total mortality is that of neoplasms – the cause of death of 30% and 20% of Japan and the SR respectively. These two main causes represent about 65% and as much 75% of total number of dead in Japan and Slovakia respectively. At the following three positions in the rank of death causes are injuries, poisoning and suicides, diseases of the respiratory system and diseases of digestive system. However, none of these classes participates by more than 8% in the total mortality of inhabitants in either of the two countries. While approximately 550 die from diseases of the circulatory system per 100 000 inhabitants in the SR, it is only about 250 in Japan. In turn, speaking of neoplasms as death causes, in Japan there are 230 dead per 100 000 inhabitants and approximately 200 in the SR. In case of the remaining three death causes, the number of dead does not exceed 50 per 100 000 inhabitants (Fig. 9a, 9b, 10a, 10b).

Differences between Japan and the SR are also observable in the development of mortality structure by death causes. In the 1930s and 1940s in Slovakia and in Japan also in the 1950s and 1960s such death causes like infectious and parasitic diseases, diseases of the respiratory system, endocrine, metabolic and immunologic diseases and those of perinatal period dominated. Medical progress has gradually led to elimination of these causes; their share in total mortality considerably decreased in both countries. The dominant death cause in the following development is represented by diseases of the

circulatory system, share of which in total mortality and the rate of mortality in the SR increases in time in contrast to Japan where this share and rate decreases. Diseases of the circulatory system as death cause are followed by neoplasms, incidence of which increases in both countries. Within the set of the five most frequent death causes are injuries, poisoning and suicides, diseases of the respiratory system and from the beginning of the 1990s in Japan also the category of symptoms and manifestation of diseases without satisfactory characterization which was replaced by already mentioned diseases of the digestive system.

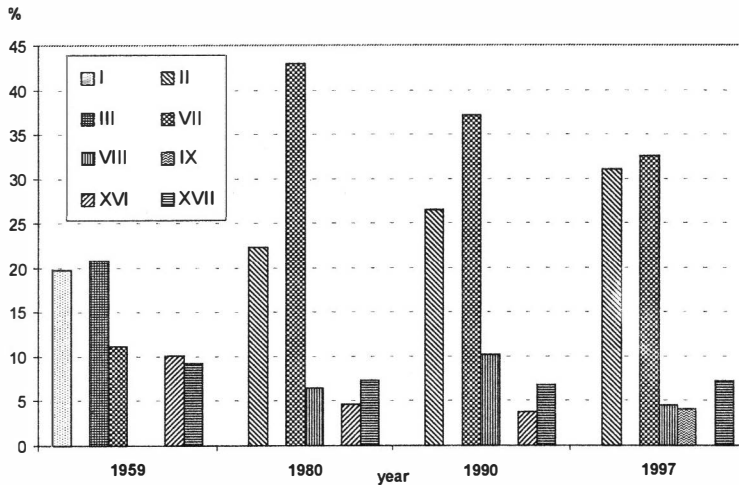


Figure 9a Development of the mortality by 5 the most frequented causes in Japan (share of the all deaths)

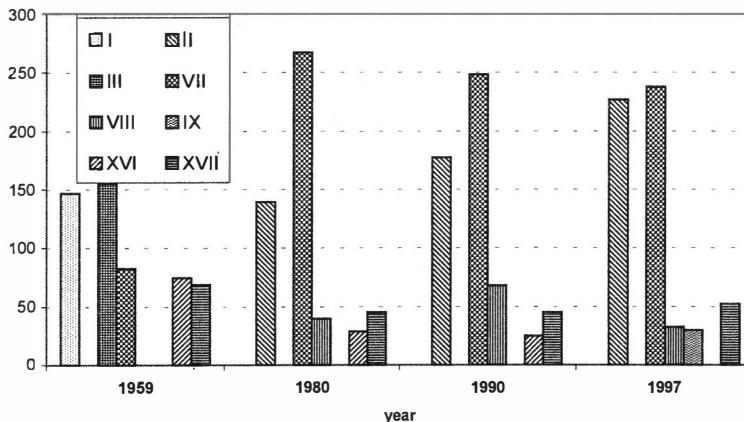
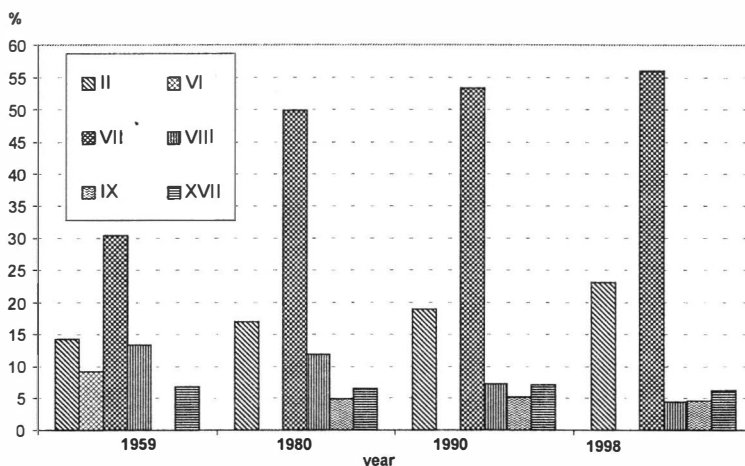
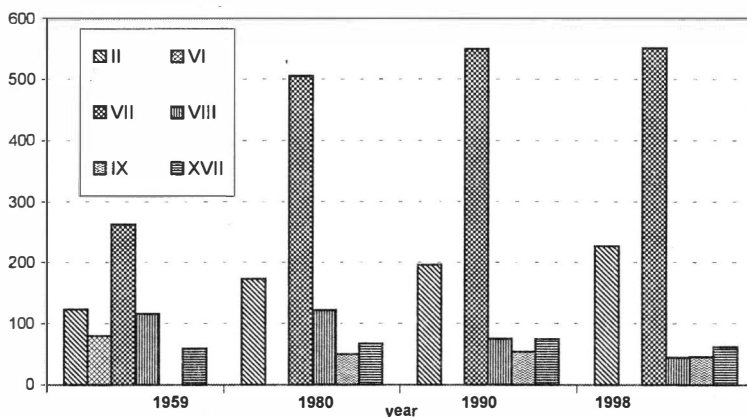


Figure 9b Development of the mortality by 5 the most frequented causes in Japan (per 100 000 inhabitants)

Notes: I. Infectious and parasitic diseases, II. Neoplasms, III. Endocrine, metabolic and immunologic diseases, VII. Diseases of the circulatory system, VIII. Diseases of the respiratory system, IX. Diseases of the digestive system, XVI. Symptoms and manifestation of diseases without satisfactory characterization, XVII. Injuries, poisoning and suicides



**Figure 10a** Development of the mortality by 5 the most frequented causes in Slovakia (share of the all deaths)



**Figure 10b** Development of the mortality by 5 the most frequented causes in Slovakia (per 100 000 inhabitants)

Notes: II. Neoplasms, VI. Disease of the nervous system, VII. Diseases of the circulatory system, VIII. Diseases of the respiratory system, IX. Diseases of the digestive system, XVII. Injuries, poisoning and suicides

### 3.6 Development of the life expectancy

Japan boasts considerably higher life expectancy at birth values, as well as life expectancy in selected age categories of 65 and 80 years (but also 50, 60 years) compared with Slovakia (Tab. 1) and appears among the world countries with the highest values of these indicators.

The common feature of these indicators in both sexes both in the SR and Japan is the increasing trend in the period which followed after the Second World War, but the speed, intensity and distribution in time of this increase are different. Since the 1950s until the mid-1960s minimum differences existed between the study countries in life

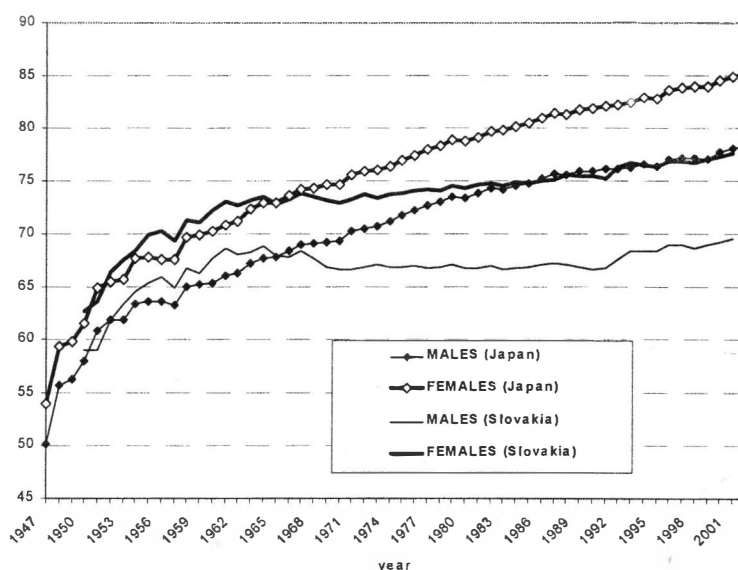
expectancy at birth levels, 65 and 80 year old men and women (these differences did not exceed 2 years in case of the newborn). In the SR even higher values of life expectancy at birth in both sexes during the whole stage in question and also of life expectancy at ages 65 and 80 during several intervals were observable (Fig. 11 – 13).

**Table 1** Life expectancy in selected age categories in Japan and in Slovakia in 2001

	Age 0 years			Age 65 years*			Age 80 years*		
	Males	Females	diff.	Males	Females	diff.	Males	Females	diff.
Slovakia	69.54	77.60	8.06	12.91	16.38	3.47	6.18	6.60	0.42
Japan	78.07	84.93	6.86	17.54	22.42	4.88	7.96	10.6	2.64
Difference	8.53	7.33	–	4.63	6.04	–	1.78	4.00	–

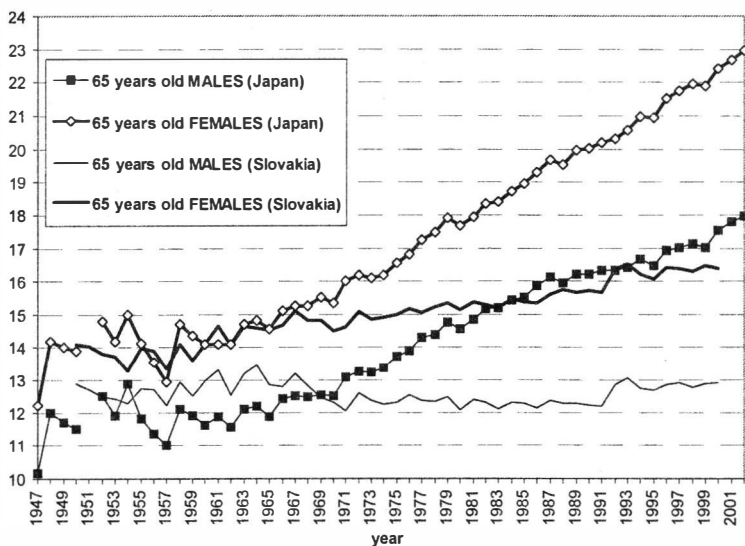
Source: Vaňo, B. (2003) ed. [www.mhlw.go.jp/english/database/db-hw/lifetb02/1.html](http://www.mhlw.go.jp/english/database/db-hw/lifetb02/1.html)

Notes: \* in year 2000

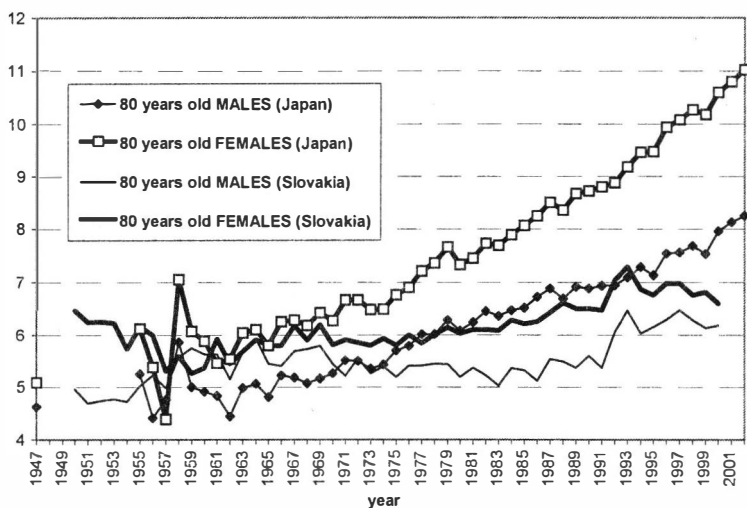


**Figure 11** Development of the life expectancy at birth for males and females in Slovakia (1950 – 2001) and in Japan (1947 – 2002)

The increase of the monitored life expectancy after 1965 was more distinct in Japan than in the SR. Consequently, Japan enjoyed better values of these indicators not only than the SR but also advanced European countries. In Slovakia, a long period of stagnation followed and lasted from the mid-1960s until the late 1980s which was then replaced by the period of moderate increase. The quoted difference in the intensity of increase can be demonstrated by the life expectancy at birth. It increased from 1955 to 2001 in case of Slovak men by 4.15 years (from 65.39 to 69.54 years) in contrast to 17.47 years in case of Japanese men (from 63.60 to 78.07 years). Likewise, increase of this indicator in case of women can be observed in the SR by 7.77 years (from 69.83 to 77.60 years) and in Japan by as much as 17.18 years (from 67.75 to 84.93 years).



**Figure 12** Development of the life expectancy at 65 years old males and females in Slovakia (1950 – 2000) and in Japan (1947 – 2002)



**Figure 13** Development of the life expectancy at 80 years old males and females in Slovakia (1950 – 2000) and in Japan (1947 – 2002)

The difference between sexes in life expectancy at birth in both countries increases from the 1950s until the present from approximately equal level of this difference of 4.0 – 4.5 years to 8.0 – 8.5 in the SR and to 6.5 – 7.0 in Japan. The differences in this indicator in study countries were small until the mid-1960; the distinct increase in the SR appeared after 1965. On the contrary, the difference in life expectancy of men and women at the age of 65 and 80 is now smaller in the SR than in Japan (Tab. 1), while it slowly increased in time, in Japan until the present and in the SR until the end of the 1980s followed by stagnation in recent years.

## 4. SYNTHESISED EVALUATION OF THE DEVELOPMENT OF NATURAL MOVEMENT OF POPULATION

### 4.1 Development of natural increase

Similar developmental stages in population increase changes over time are observable in the majority of world countries, differences appear only in the duration of these stages, intensity, and speed of changes of the processes, which influence the population movement balance.

Toward the end of feudalism in both countries, the high level of birth rate was connected with high mortality rate, while both values were characterised by great fluctuations. It means that the natural increase was low (in average 4 – 6‰) and the level of mortality often exceeded that of birth rate (natural decrease) also in the consequence of hunger, wars and epidemics. In the second half of the 19th century quicker mortality decrease connected with stagnation or slight decrease of birth rate appeared in Slovakia, while stagnation of mortality in Japan is connected with slight increase of birth rate. However, the result is the distinct increment of natural increase of population in both countries which reached the average 12 – 14‰ by the end of the 19<sup>th</sup> century and the beginning of the 20<sup>th</sup> century (Fig. 1, 2).

The following stage in the natural population movement ending in the 1960s is characterised in both countries by decrease of mortality. Simultaneously, in the SR the decrease of natality manifests in the SR, consequently the natural increase decreases. Natality in Japan maintains at the relatively high level or it slightly decreases and the result is that the natural increase maintains high (average 12 – 15‰). The two world wars interrupted this apparently simple process in two ways:

- ♦ In the consequence of increased mortality or birth rate decrease the natural increase decreased during the wars. The First World War has intervened more distinctly in the dynamics of the SR when the distinct natality decrease resulted in the natural population decrease (-4‰ to -5‰). In Japan, the natural increase decreased below 10‰. The Second World War has more distinctly affected Japan which reflected in natural decrease (-4.2‰ in 1945) in connection with nuclear raids. Natural increase also decreased in the SR during the Second World War (average 6 – 8‰).
- ♦ During the after-war compensation phase natality increased or the mortality decreased for a short period resulting in increased natural increase. In the SR the natural increase after the First and Second World Wars reached as much as 16 – 18‰ and 14 – 16‰ respectively. In Japan the natural increase after the First World War increased to 12 – 13‰ but the compensation phase after the Second World War was more distinct when the increase reached 20 – 22‰.

In the 1970s the natural increase rose in both countries for a short interval (to 11.4‰ in the SR and to 12.8‰ in Japan) in the consequence of increased natality of the strong after-war generation. Since the later half of the 1970s, the decrease of natural increase was observable in both countries. It was quickest in Japan in the second half of the 1970s and in Slovakia in the 1990s. The development in that period was determined above all by the course of natality because the crude mortality level stabilised at a relatively low level. A distinct decrease of the natural increase in the SR in the 1990s in connection with the change of situation in reproduction caused that in 2001 negative natural increase appeared (-0.2‰) while it was still positive in Japan (1.6‰).



## 4.2 Development of the net reproduction rate (NRR)

Reproduction of population as the steady renovation of population in certain territory covers all population phenomena and processes which affect such renovation. Although expanded reproduction ( $NRR > 1$ ) was typical for Slovakia during long years, it dropped to insufficient level ( $NRR < 1$ ) and even below its level in Japan in the course of the recent decade. Japan, in turn, is characterized by the long-term insufficient reproduction.

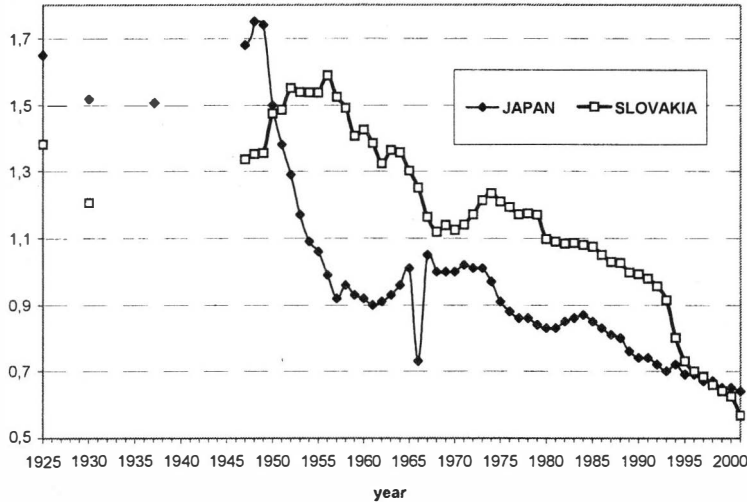


Figure 14 Development of the net reproduction rate in Slovakia and in Japan (1925 – 2001)

The common developmental feature of the NRR in both countries is the decrease of its level. It dropped from 1.65 to 0.64 and from 1.382 to 0.569 in Japan and in the SR from 1925 to 2001 (Fig. 14). While the NRR was higher (1.5 – 1.8) in Japan than in the SR (1.2 – 1.4) until 1950, for the years from 1950 until 1997 the contrary is true. The NRR of Japan was higher than that of SR in recent years. The decreasing developmental trend of the NRR in Slovakia was interrupted by two periods of increased level at the beginning of the 1950s (it exceeded 1.5) and at the beginning of the 1970s (when it exceeded 1.2). In the course of the 1990s the decrease of the NRR accelerated in the SR when it dropped for the first time (except for the time of economic crises in the 1930s) below 1. The NRR in Japan during the compensation phase after the Second World War moved at a higher level (almost 1.8) than in the SR (below 1.4). In the course of the 1950s, it abruptly decreased in the consequence of population policy and already in the mid-1950s it dropped below 1. It maintained at the level of simple reproduction in the course of the 1960s and the first half of the 1970s, with the exception of the Year of Fire Horse, when the NRR abruptly decreased to 0.73. Since the mid-1970s the NRR definitely dropped to the level of insufficient reproduction and maintains so until the present time.

## 5. CONCLUSION

1. In spite of considerable differences of socio-economic, political, cultural, etc. nature between the SR and Japan, there exist some common features of the development of basic population processes.
  - ♦ It is possible to talk about the **agreeing trend of long-term development** in studied countries, whether it is the increasing trend (for instance, the average age of woman at the birth of the first child, age of maximum fertility, life expectancy) or decreasing trend (for instance, crude birth rate, total fertility, specific fertility and mortality by age, coefficient of infant and neonatal mortality, net reproduction rate, and natural increase).
  - ♦ Along with the common trend in the development of natural population movement indicators, at the present time in case of several indicators (for instance, crude birth rate, total fertility, specific fertility in age categories from 40 years, net reproduction rate), **approximately the same level** in Japan and in the SR is observable, albeit the levels at the beginning of the study period were different.
2. However, there also exist considerable differences in the long-term development of natural movement indicators between Slovakia and Japan:
  - ♦ The basic difference is the **speed of development** of the individual natural population movement indicators in time. Numerous indicators were subject to distinct changes in earlier period than in Slovakia.
  - ♦ Along with the speed of development of the individual natural movement indicators in time, also the difference in **intensity of this development** was identified. The development in Japan was slower and more stable in the majority of indicators while in Slovakia numerous indicators underwent abrupt changes in shorter intervals.
  - ♦ Differences were also observed at the **level of numerous indicators in time** which survive until the present time. For instance, average age of women at the birth of the first child, age of maximum fertility, life expectancy are the indicators which reach much higher level in Japan, on the contrary the indicators like coefficient of infant mortality, coefficient of neonatal mortality, and the share of children born out of wedlock are lower in Japan.

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## Podobnosti a rozdiely prirodzeného pohybu obyvateľstva Japonska a Slovenska

### Resume

Vo väčšine rozvinutých populácií sveta pozorujeme podobnosti v dlhodobých tendenciách populačného vývoja, ktoré sú považované za prirodzenú súčasť spoločenského vývoja. Ide o dlhodobé zmeny charakterizované napr. poklesom ukazovateľov ako hrubá miera pôrodnosti, úhrnná plodnosť, čistá miera reprodukcie, prirodzený prírastok a naopak nárastom ukazovateľov ako priemerný vek ženy pri pôrode, vek maximálnej plodnosti, stredná dĺžka života a pod.

Uvedené črty dlhodobého populačného vývoja sledujeme aj v populáciách Slovenska a Japonska, hoci ide o značne odlišné populácie z hľadiska ekonomických, spoločenských, kultúrnych, politických a ďalších charakteristík. Práve s uvedenými rozdielmi sledovaných populácií súvisí aj množstvo rozdielov vo vývoji populačných procesov.

Cieľom príspevku je komparácia vývoja a súčasnej úrovne jednotlivých zložiek prirodzeného pohybu obyvateľstva na Slovensku a v Japonsku. Ide jednak o identifikáciu spoločných a odlišných vývojových črt ako i o odhalenie dominantných faktorov demografického vývoja.

#### A. Podobnosti prirodzeného pohybu obyvateľstva Japonska a Slovenska:

- ♦ U väčšiny ukazovateľov prirodzeného pohybu obyvateľstva možno hovoriť o zhodnom trende dlhodobého vývoja v sledovaných krajinách, či už o rastúcom trende (napr. priemerný vek ženy pri pôrode, vek maximálnej plodnosti, stredná dĺžka života) alebo klesajúcom (napr. hrubá miera pôrodnosti, úhrnná plodnosť, koeficient dojčenskej úmrtnosti, čistá miera reprodukcie, prirodzený prírastok).
- ♦ Popri spoločnom trende vývoja ukazovateľov prirodzeného pohybu obyvateľstva sledujeme v súčasnosti u viacerých ukazovateľov (napr. hrubá miera pôrodnosti, úhrnná plodnosť, čistá miera reprodukcie), približne rovnakú úroveň v Japonsku a v SR.

#### B. Rozdiely prirodzeného pohybu obyvateľstva Japonska a Slovenska:

- ♦ Základnou odlišnosťou je rýchlosť vývoja jednotlivých ukazovateľov prirodzeného pohybu obyvateľstva v čase. Viaceré ukazovatele zaznamenali v Japonsku výraznejšie zmeny už v skoršom období ako na Slovensku.
- ♦ Popri rýchlosti vývoja jednotlivých ukazovateľov prirodzeného pohybu v čase, identifikujeme rozdiel aj v intenzite tohto vývoja. Vývoj v Japonsku bol u väčšiny ukazovateľov plynulejší, pozvoľnejší, no v SR zaznamenali viaceré ukazovatele prudké zmeny v kratšom časovom období.
- ♦ Rozdiely sledujeme aj v úrovni viacerých ukazovateľov v čase. Podstatne vyššiu úroveň dosahujú v Japonsku napr. priemerný vek ženy pri pôrode, vek maximálnej plodnosti, stredná dĺžka života a naopak nižšie sú napr. koeficient dojčenskej a novorodeneckej úmrtnosti, podiel narodených mimo manželstva.

## スロバキアと日本における人口の自然動態の類似点と相違点

### ヤナ・マレンチャーコヴァー

人口変動の長期傾向は、一般に社会変動の基本的要素と考えられており、世界の人口集団の大部分で似た特徴を示す。こうした長期変動を特徴づけるのは、例えば、粗出生率、合計出生率、純再生産率、自然増加といった指標の値の低下、平均出産年齢、出生力の最も高い年齢、平均余命などの上昇である。

長期の人口変動のこうした特徴は、経済、社会、文化、政治その他の特徴という点でかなりの差があるにもかかわらず、スロバキアと日本でも観察される。両国においては、人口変動過程の違いは、先にあげた特徴の違いと、とくに関係がある。本論の目的は、スロバキアと日本について、人口の自然動態の各要素の変化と現在の水準をくらべることだが、これは、変化の特徴の共通点と相違点を見きわめ、人口学的変化の主要な要素を明確にすることとつながる。

#### A. スロバキアと日本の自然動態の類似点：

- ・ 長期変動の傾向に関して、両国には共通する部分があるといえる。例えば、女性の平均出産年齢、出生力の最も高い年齢、平均余命などは上昇傾向、粗出生率、合計出生率、乳児死亡の係数、純再生産率、自然増加などは低下傾向にある。
- ・ 日本とスロバキアでは、自然動態の指標の変化に共通する傾向があるとともに、例えば粗出生率や合計出生率、純再生産率などいくつかの指標で、現在ほぼ同等の水準にあることが観察できる。

#### B. スロバキアと日本の自然動態の相違点：

- ・ 基本的に、人口の自然動態の各指標の変化の早さが異なる。日本では、スロバキアより早い時期に、多くの指標がはっきりとした変化にさらされた。多くの指標にとって、明確な変化がおきることになった時期は、スロバキアより日本のほうが早かった。
- ・ 人口動態の各指標の変化の早さとならび、変化の強度でも違いが見られる。日本では、大部分の指標で、変化はより緩やかで安定的であったが、スロバキアでは、多くの指標の値は、より短期間に急激に変化した。
- ・ さらに、多くの指標で、数値の水準に差がみられる。例えば、女性の平均出産年齢、出生力の最も高い年齢、平均余命は、日本ではずっと高い水準に達している。反対に、乳児死亡および新生児死亡の係数や、婚外出生の割合は、日本のほうが低い。