

Even during the 20th century last decade, the Czech Republic population evolution was first and foremost set by natural reproduction. The unparalleled fertility intensity decrease brought about a sharp fertility level decline despite a significant increase of potential mothers thus reacting against population number growth reverse orientation; in contrast mortality intensity positive development supported population growth hence partially compensating fertility low level. If mortality had remained at a level corresponding to the first half of the 80's in the nineties, then the resulting population number would have counted 150 000 people less. This mere figure testifies to mortality situation very significant shift bearing in mind that, at present, fewer than 110 000 inhabitants yearly die in the Czech Republic. Even more meaningful than population total number change, natural reproduction elements reverse development has modified population age structure composition.

However, the mortality rate decrease we have witnessed for the past fifteen years does not translate into a mere increase of living beings. Mortality rate significantly structural differences were due to a diverse transformation range of mortality intensity indicators according to age. In the past few years the elderly mortality intensity has been primarily decreasing thus population demographic ageing is accelerating.

The Czech Republic postwar mortality evolution was characterised by a few specific features. The first postwar life expectancy relatively swift increase was replaced by a long term stagnation at the turn of the sixties which lasted almost three decades. Concerning male population, the late sixties brought about a two-year life expectancy decrease as compared to the early sixties. The analysed development was in sharp contradiction with changes going on in most advanced countries, among which Czechoslovakia definitely belonged in the late fifties, concerning its mortality situation. That is still the reason why we still significantly lag behind these countries up until today. The beginning of mortality rate evolution third stage, characterised by a long term life expectancy rise and by its closing up on advanced countries group, is most often dated 1987. From the point of view of mortality total intensity shifts, this year is specifically considered as a turning point.

Mortality shifts subsequent to 1987 can be characterised as rather smooth, though not entirely balanced. This new trend setup was initially limited and its actual existence was merely confirmed as of the early 90's. Mortality rate and structure decisive shifts are thus connected to particularly significant socioeconomic changes following 1990 which have affected population health state as well. Mortality level overall improvement at this period in time is the outcome of numerous factors combined effect. A tentative list of a few major ones would definitely include the following:

- End of healthcare monopolization and liberalization, free selection of doctors, significant widening of range of means directed to healthcare sector translating into specialised care increased offer, implementation and improvement of accessible, state of the art technology and medicine quality as well as provided health services marked rise and general availability.
- More efficient health education adopting some advertising methods.
- Rising awareness of individual healthcare, partially due to the apprehension of a possible income downsizing or even loss, thus leading to an increased active concern about a healthy lifestyle.
- Substantial changes in population lifestyle leading to healthy life habits.
- Large offer and current availability of quality food products.
- Significant improvement of environment quality basic parameters.
- Shifts in population economic activity (industry workers decrease, service industry workers increase) and to related health hazardous work environments narrowing.

Improving mortality conditions during the last analysed period are further documented e.g. by total deceased number indicators value decrease of approximately 127 000 persons in 1987 to less than 108 000 persons in 2001, not taking into account concurrently ongoing demographic ageing. However deceased total number as well as crude mortality rate are influenced by age structure evolution that is why they do not reflect mortality process ongoing shifts real intensity. Their accurate extent is defined on the age structure by independent indicators – standardized mortality rates and life expectancy at diverse age levels. If in 1987, there were 12.3 deaths per 1 000 living persons then in 2001, it was a mere 10.5 deaths. However if an increased representation of the elderly had not occurred within the population and the 1987 age structure had remained identical, in 2000 95 000 persons would have died due to present mortality intensity which de facto is close to 13 000, less than in reality (age structure ageing outcome) and 32 000 less than in 1987 (mortality level decline outcome). On the

**Healthcare More Propitious Conditions Triggered Mortality Rate Decrease**

contrary, if the 1987 mortality level had been maintained and only age structure would have changed, deceased total number in 2000 would have almost reached 145 000 persons. It means that subsequent to mortality intensity decrease from its 1987 level to its 2000 one, only in 2000 an approximate increase of 37 000 human lives occurred. Thus the latter divergence is more than an eloquent proof of the extent of changes within the Czech Republic population mortality after 1987.

**Table 6.1: 1987–2001 Mortality**

Indicator	1987	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001p	
Number of Deaths	127 244	129 166	124 290	120 337	118 185	117 373	117 913	112 782	112 744	109 527	109 768	109 001	107 755	
Mortality Crude Rate	12.3	12.5	12.1	11.7	11.4	11.4	11.4	10.9	10.9	10.6	10.7	10.6	10.5	
Standardized Crude Mortality Rate <sup>1</sup>	12.3	12.2	11.7	11.3	11.0	10.8	10.7	10.1	10.0	9.6	9.5	9.2	.	
Life Expectancy at Birth	Men	67.86	67.58	68.25	68.44	69.20	69.54	69.72	70.37	70.50	71.13	71.40	71.65	72.14
	Women	75.12	75.36	75.72	76.14	76.41	76.58	76.63	77.27	77.49	78.06	78.13	78.35	78.45
	Difference	7.26	7.78	7.47	7.70	7.21	7.04	6.91	6.90	6.99	6.93	6.73	6.70	6.31
Life Expectancy at 65	Men	11.66	11.61	11.95	12.09	12.40	12.75	12.71	13.09	13.19	13.41	13.60	13.72	14.00
	Women	14.97	15.18	15.54	15.89	15.90	15.99	16.05	16.36	16.63	16.92	16.91	17.09	17.13
	Difference	3.31	3.57	3.59	3.80	3.50	3.24	3.34	3.27	3.44	3.51	3.31	3.37	3.13

<sup>1</sup>Standard – population age structure as of 1.7.1987.

Throughout the analysed period, due to mortality intensity decrease life expectancy at birth concerning men rose from 67.9 to 72.1 and concerning women from 75.1 to 78.5, i.e. men would on average live 4.2 years longer and women 3.4 years longer than in 1987 while maintaining 2000 mortality parameters. Though these life expectancy hopes do not belong to the absolute highest, as to our domestic mortality evolution context, they are yet comparable to interwar and postwar maxima, when within a comparable time sequence 10–12 years, life expectancy at birth reached above 0.5 year on average. In the 90's, this indicator value concerning both men and women in the Czech Republic, rose faster than in other European countries. The only similarly intensive life expectancy at birth increase occurred in Austria where, throughout the 1986–1999 period it reached values of 4.1 years for men and 3.2 years for women, for example comparable to Italy (3.4 and 3.1 years) or France (3.5 and 2.9 years), though with a higher life expectancy. Within post-communist countries, the Czech Republic mortality level evolution has had no comparison for the last ten or fifteen years.

**Higher Life  
Expectancy at Birth  
Implied Significant  
Infant Mortality  
Level Decrease**

Mortality intensity shifts were not identical within each age group. One of the most significant shift occurring after 1987, was mortality rate decrease during the first year. Infant mortality percentage out of total mortality computed according to deaths absolute number decreased from 1.2% in 1987 to a mere 0.3% in 2001. If at the beginning of the analysed period in 1987, 12 infants out of every 1 000 live born ones died before reaching their first birthday, in 2001 infant mortality rate reached the even recently quite unbelievable value of 4‰ on average and for both sexes. This indicator last published value represents 4.6‰ for boys and even 3.4‰ for girls.

From the point of view of time and of changes inner structure, infant mortality rate decrease went on rather smoothly throughout the analysed period. Yet decisive changes occurred in the mid 90's. Between 1992 and 1997, infant mortality rate value decreased from 9.9‰ to 5.9‰, representing half of this indicator total decrease between 1987 and 2001. A significant and from the intensity perspective comparable decrease occurred across infant mortality total structure. However it was somewhat more intensive concerning infant mortality and most acute between the first and sixth full days following birth. Actually until 2001, infant mortality intensity decreased exactly down to a third of its 1987 final value while early neonatal mortality intensity (0 to 6 days) decreased to 22%, including within its frame, mortality at the age of 1 or 2 complete days down to a mere 18% of final rate. Besides one ought to repeat that not even one of the above mentioned cases was due to unexpected fluctuations within the frame of the analysed year but to a long term, regular decrease down to its reached level.

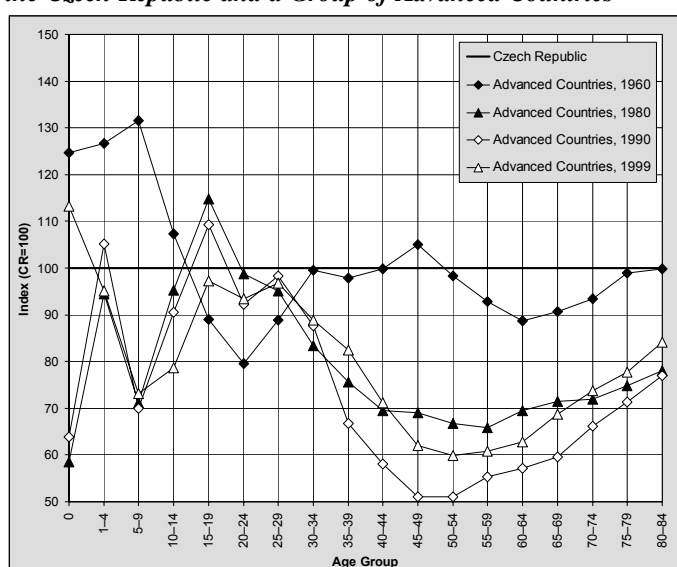
Perinatal mortality, concerning still births and deaths during the first week of life (0–6 days), underwent similar changes as infant mortality did. Perinatal mortality current index of 4.3 children out of 1 000 births represents a mere 40% of this indicator 1987 value (10.7%). In 2001, total number of still born and deceased prior to 7 days infants was not only lower (395 children) than 1987 mere number of deceased prior to 7 days (857 children) but of stillborn as well (548 children) and the mere fact that total births number decreased by 30% during the same period, does not change this reality at all.

**Table 6.2: Infant Mortality Characteristics**

Indicator	1987	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of Stillborn	548	530	496	437	445	336	300	317	273	294	303	259	263
Number of Deaths Prior to:													
– 24 hours (0 day)	263	236	238	181	171	108	92	73	62	66	62	48	47
– 3 days (0–2 days)	639	553	513	431	359	251	230	158	137	128	119	101	95
– 7 days (0–6 days)	857	753	704	585	505	348	309	224	186	175	172	150	132
– 28 days (0–27 days)	1 094	1 003	902	749	692	505	475	347	326	289	261	231	212
– 1 year (0–364 days)	1 577	1 410	1 343	1 204	1 028	847	740	547	531	472	413	373	360
Share of Total Deaths Till 1 Year (%) – Died Prior to:													
– 24 hours (0 day)	16.7	16.7	17.7	15.0	16.6	12.8	12.4	13.3	11.7	14.0	15.0	12.9	13.1
– 3 days (0–2 days)	40.5	39.2	38.2	35.8	34.9	29.6	31.1	28.9	25.6	27.1	28.8	27.1	26.4
– 7 days (0–6 days)	54.3	53.4	52.4	48.6	49.1	41.1	41.8	41.0	35.0	37.1	41.6	40.2	36.7
– 28 days (0–27 days)	69.4	71.1	67.2	62.2	67.3	59.6	64.2	63.4	61.4	61.2	63.2	61.9	58.9
– between 28 days and 1 year (28–364 days)	30.6	28.9	32.8	37.8	32.7	40.4	35.8	36.6	38.6	38.8	36.8	38.1	41.1
Share of Deaths Prior to 1 Year out of Total Deaths (%)	1.2	1.1	1.1	1.0	0.9	0.7	0.6	0.5	0.5	0.4	0.4	0.3	0.3
Rate (per 1 000 live births):													
– first day mortality (0 day)	2.0	1.8	1.8	1.5	1.4	1.0	1.0	0.8	0.7	0.7	0.7	0.5	0.5
– postnatal mortality (0–2 days)	4.9	4.2	4.0	3.5	3.0	2.4	2.4	1.7	1.5	1.4	1.3	1.1	1.0
– early neonatal mortality (0–6 days)	6.5	5.8	5.4	4.8	4.2	3.3	3.2	2.5	2.1	1.9	1.9	1.6	1.5
– neonatal mortality (0–27 days)	8.4	7.7	7.0	6.2	5.7	4.7	4.9	3.8	3.6	3.2	2.9	2.5	2.3
– postneonatal mortality (28–364 days)	3.6	3.1	3.4	3.7	2.8	3.2	2.8	3.2	2.3	2.0	1.7	1.6	1.7
– infant mortality (0–364 days)	12.0	10.8	10.4	9.9	8.5	7.9	7.7	6.0	5.9	5.2	4.6	4.1	4.0
Perinatal mortality:													
Stillborn and Deceased Prior to 7 Days Number	1 405	1 283	1 200	1 022	950	684	609	541	459	469	475	409	395
Perinatal Mortality Index (per 1 000 births)	10.7	9.8	9.2	8.4	7.8	6.4	6.3	6.0	5.0	5.2	5.3	4.5	4.3

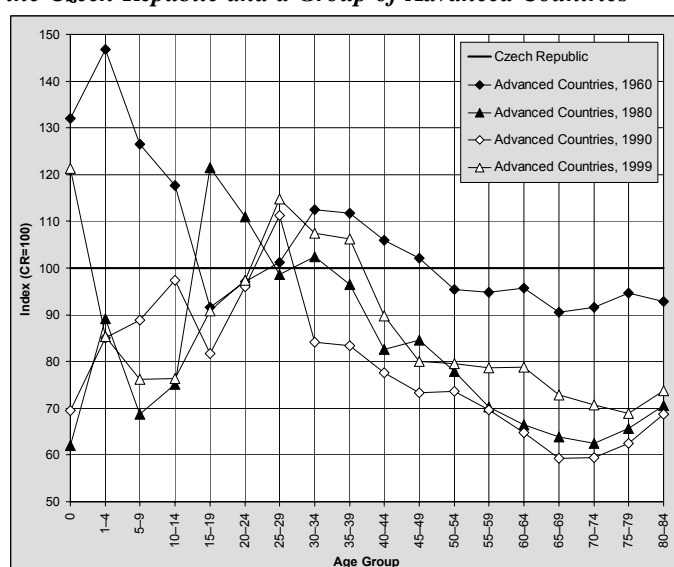
Within the international context, the Czech Republic alongside Japan and Western European countries, ranks among the top ones as to its infant and perinatal mortality rates. All introduced indicators very low values stabilized throughout the last years, bear witness to foremost prenatal and neonatal quality medical healthcare. The prevention of some genetic defects and conditions, classified as mortality endogenous factors still represent the most severe threat to infant life, has been particularly successful. By reaching first year infants very low mortality rate, practically all reserves of this age category concerning life expectancy values increase at birth were used up. That is why, the Czech Republic population mortality current studies primarily focus on highest age groups within the last decade.

**Figure 6.1a: Differences in Male Mortality Intensity between the Czech Republic and a Group of Advanced Countries<sup>1</sup>**



<sup>1</sup>“Advanced Countries”: England, Denmark, Finland, France, Italy, Japan, Canada, Germany, the Netherlands, Norway, Austria, the United States, Sweden and Switzerland..

**Figure 6.1b: Differences in Female Mortality Intensity between the Czech Republic and a Group of Advanced Countries**



The Czech Republic mortality structure according to sex and age has, apart from general regularities such as a higher male mortality intensity in all age groups, a few significant specificities. First of all there is a markedly higher middle-aged (45–64 years of age) male mortality indicating up until now an approximately double intensity as compared to mortality in advanced countries. Our population shows one half higher mortality values in wide age segments 15–44 and 65–74 concerning men and 50–79 concerning women than these countries.

Changes in mortality total level that we have been witnessing during the last fifteen years, occurred in all age groups. Aside from the first year, the greatest relative decrease concerned men and women at 30–44 years of age, of more than a quarter. An identical evolution was detected concerning males aged up to 70. A mere slightly less intensive decrease took place within all other age groups. Still, the change was of up to tenths per cent as compared to the starting year. Concerning men, changes were generally always somewhat greater than concerning women corresponding to a significant developmental lag of their mortality level prior to 1987.

**Table 6.3: Mortality Probabilities according to Sex and Age (x 1 000)**

Age	Men				Women				Index 2001p/1987		Index Men/Women	
	1987	1995	2000	2001p	1987	1995	2000	2001p	Men	Women	1987	2001p
0	13.6	7.3	4.6	4.6	10.2	5.3	3.5	3.4	34	33	133	137
1–4	1.9	2.3	1.2	1.0	1.4	1.9	1.0	0.9	52	64	136	110
5–9	1.7	1.2	1.0	0.9	1.1	1.0	0.7	0.7	51	60	155	132
10–14	1.5	1.2	1.1	0.9	0.8	1.0	0.9	0.7	59	81	188	136
15–19	4.1	3.5	3.4	3.3	1.8	1.7	1.6	1.4	80	77	228	237
20–24	5.5	5.9	5.2	5.3	1.7	1.8	1.7	1.6	96	94	324	331
25–29	5.9	6.0	5.0	4.8	2.1	2.0	1.6	1.8	82	86	281	268
30–34	7.5	7.3	6.1	5.7	3.1	2.8	2.3	2.3	77	74	242	252
35–39	11.9	10.8	9.0	8.6	4.8	4.5	3.7	3.8	72	78	248	229
40–44	21.2	17.5	15.8	15.1	8.4	7.7	6.9	7.2	71	85	252	212
45–49	34.9	29.6	27.5	25.8	14.7	12.6	12.2	11.5	74	78	237	224
50–54	56.9	49.6	44.6	42.2	23.5	21.2	19.1	18.9	74	81	242	223
55–59	90.2	76.0	68.8	67.7	39.5	33.3	29.2	29.6	75	75	228	228
60–64	142.9	115.3	105.3	99.3	62.2	52.4	45.1	44.2	69	71	230	224
65–69	210.0	175.7	156.6	149.2	111.3	88.3	77.4	75.2	71	68	189	199
70–74	290.7	272.2	228.8	222.3	178.4	154.5	132.4	130.0	76	73	163	171
75–79	425.2	389.5	336.8	326.8	296.4	264.7	230.3	229.7	77	78	143	142
80–84	576.7	511.8	472.5	462.0	469.9	409.1	373.8	374.6	80	80	123	123
85–89	752.2	649.3	634.9	622.7	685.0	602.0	579.2	584.8	83	85	110	106

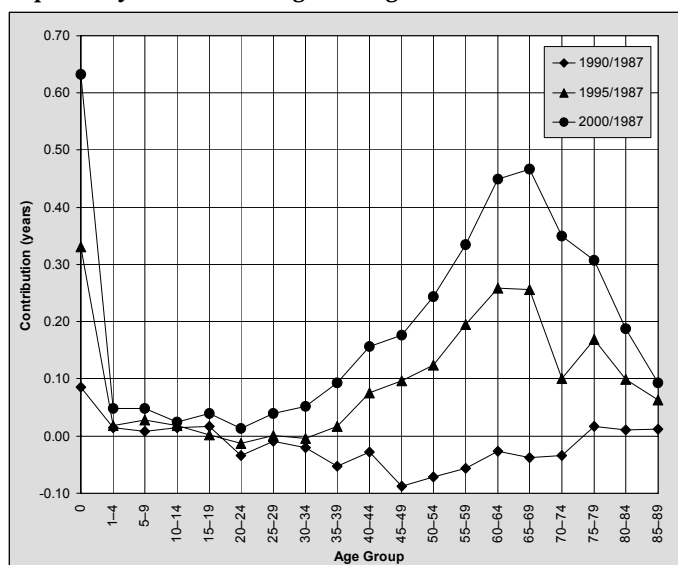
2001p – probability from CSO 2001 mortality tables; computation based on 2001 population census preliminary results.

Male unfavourable mortality structure according to age does not stem from international comparisons but from male versus female mortality level differences. Three times higher male mortality intensity compared to the female one within the 20–29 age group, and more than twice higher in all other age groups within the 15–69 segment, is more than meaningful. High excess male mortality thus creates to a certain extent, a logical frame meant for monitoring mortality intensity development differentiation according to sex and age since 1987. Furthermore, the fact that in a decisive manner, these differences still survive, points to a certain potential of mortality future changes.

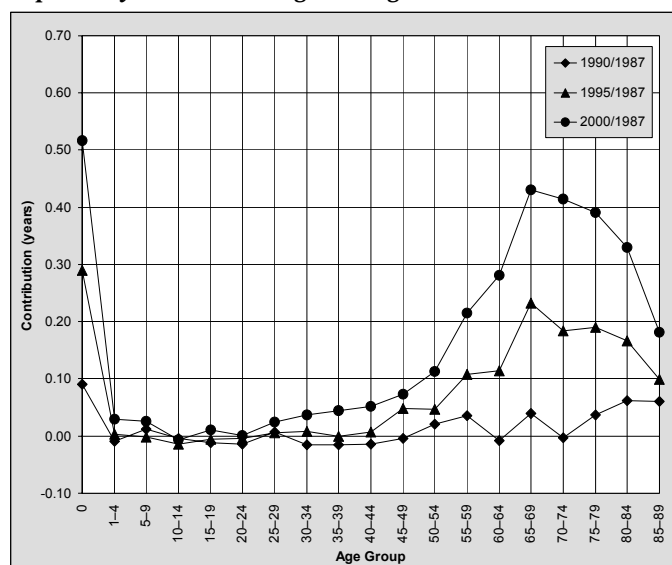
### **Excess Male Mortality Remains High**

Since within individual age groups, a usually different number of persons dies depending on living beings total number and corresponding mortality intensity, and due to living potential (life expectancy) fluctuation according to age, mortality intensity identical relative changes according to age can have a different meaning from the point of view of general mortality development. Thus mortality level significant improvement within the 30–39 age group has had practically no repercussion on male general mortality, since the one third decrease in mortality intensity meant an overall contribution of less than two tenths in life expectancy at birth. In contrast a comparable relative change within the 60–69 age group meant a contribution superior to 0.9 year. From this point of view, the most significant changes in mortality intensity during the past approximately fifteen years, occurred concerning men aged 50–85 and women aged 55–85, obviously not taking into account mortality decrease during the first year of life. The latter represented the utmost contribution to life expectancy increase, reaching approximately two thirds for men and half a year for women. However in conversion to a comparable time segment, infant mortality level decrease significance was even a few times greater.

**Figure 6.2a: Age Groups Contribution to Male Life Expectancy at Birth Change during 1987–2000 Period**

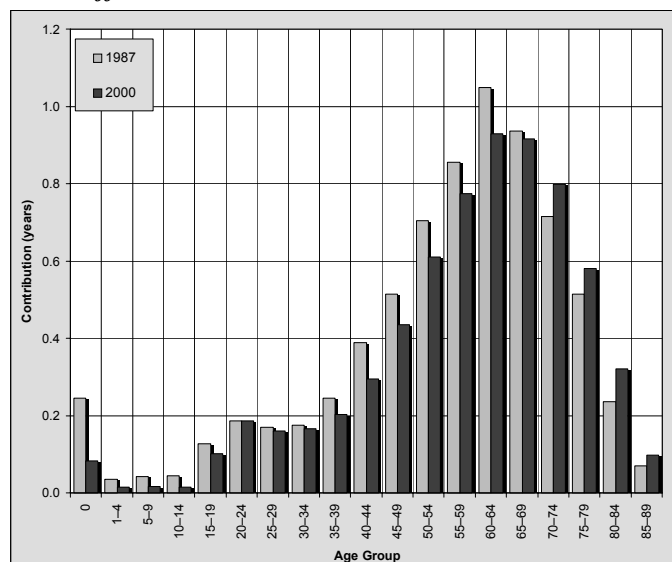


**Figure 6.2b: Age Groups Contribution to Female Life Expectancy at Birth Change during 1987–2000 Period**



Men’s more intensive mortality level decrease as compared to women’s contributed to a relatively significant reduction of their life expectancy difference from 7.3 years (1987), respectively 7.8 years (1990) to 6.3 years (2001). Age groups percentage of established differences is relatively stable timewise and due to identical reasons as in life expectancy at birth does not correlate to mortality intensity relative differences according to sex within individual age groups. The 20–29 age group does not contribute as much to total difference with a three times higher excess mortality, but the 60–69 age group does, since men “only” die twice more frequently than women.

**Figure 6.3: Age Groups Contribution to Life Expectancy at Birth Differences between Women and Men**



Age and sex are basic as well as traditional signs of mortality differences study. Apart from them, there is a relatively wide range of signs, according to which mortality is differentiated according to period, age and sex. That is why a more detailed knowledge of mortality process context requires a more thorough analysis of its additional structural characteristics, such as e.g. differences according to death causes or according to social, educational and professional categories, in a regional cross-section and in relation to environment separate physical or social elements, individually according to distinctive signs as well as in the light of their mutual interaction.

Specific differences in mortality level according to sex and age are connected to mortality particular structures according to causes. The cause of most deaths is the resulting interaction of each individual biological (internal) conditions and external factors long term activity. That is why mortality intensity in relation to a concrete cause often depends on, apart from specific conditions according to which members of a given population lived and live, exposure time to specific external influences as well. Exposure intensity can also depend on age and a few additional features of exposed persons, as well as to their past living experiences. Due to the deceased rising age, there are more frequent cases of several illnesses combination thus impeding death causes identification and codification. Besides, death causes statistics can be influenced by diagnostic practice differences, which can bear a significant, time and regional range consequently hindering data analysis and obtained findings interpretation. However despite these facts, mortality level and structure analysis according to causes produce valuable and interesting information, leading to a better understanding of mortality differences according to sex and an identification of this process further development reserves.

Similarly to global population development, its individual elements development undergoes specific, historical stages or phases, thus changing their intensity and transforming their structure. Within mortality context, one most frequently mentions epidemiologic transition. In the 80’s, the Czech Republic population had already been for a longer while in its third phase since civilisation and degenerative

diseases, mainly cardiovascular system ones, prevailed amid mortality causes. Mortality intensity sharp, past decrease due to infectious diseases control led to mortality structure significant transformation, life expectancy further growth and contributed to population gradual ageing. Linked to the elderly rising percentage, circulatory system diseases and cancers, are logically prevailing among death leading causes.

Circulatory system diseases are the most frequent cause of death of the Czech Republic inhabitants. In 2001 they led to more than 57 000 death cases. More than 28 000 persons died of tumor diseases and other causes led to 22 000 deaths out of a total number of approximately 108 000 deceased. In 2001, more than 53% of all deaths belonged to the group of cardiovascular system diseases, first acute myocardial infarction (10 700 deaths), other forms of heart ischemic diseases (12 300) and brain vascular diseases (16 800). More than one fourth of deaths was caused by newly coined cancers though a mere 0.5% were classified as benign tumors. In 2001, malignant tumors leading to death most frequently attacked bronchial tubes and lungs (5 600 deaths), the colon (2 600), the breast (1 900), lymphatic, blood and related tissues (1 900). Other groups of death causes were mostly due to external causes, concerning a rather high death rate (6 900) at a definitely younger average death age. Former leading groups of respiratory system diseases (4 700 deaths) and digestive system ones (4 400) are at present the last ones. In 2001 other causes, such as the group combining a relatively numerous and diverse diseases range, led to 5 900 death cases.

**Mortality Level  
Decrease Was Mainly  
Due to Total Number  
of Deaths Caused by  
Circulatory Diseases  
Reduction**

**Table 6.4: Mortality Structure according to Main Groups of Death Causes**

Death Causes	1987	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001p
	Number of Deaths												
Neoplasms	27 506	28 434	28 258	28 018	28 102	28 446	28 631	27 879	28 008	28 015	28 185	28 705	28 455
Circulatory System Diseases	72 071	72 396	69 488	67 054	65 986	65 132	65 951	63 145	63 334	60 397	60 286	58 192	57 404
Respiratory System Diseases	5 879	5 423	5 134	5 093	4 808	4 636	5 076	4 667	4 314	4 105	4 659	4 959	4 653
Digestive System Diseases	4 621	5 023	4 674	4 435	4 155	4 470	4 326	4 146	4 024	4 158	4 248	4 239	4 418
External Causes	8 487	9 049	8 786	8 692	8 496	8 556	8 502	7 793	7 847	7 013	6 925	7 070	6 910
including:													
– Traffic Accidents	1 244	1 571	1 583	1 715	1 691	1 827	1 667	1 528	1 584	1 428	1 568	1 572	..
– Other Accidents	5 307	5 481	5 299	4 986	4 888	4 877	5 102	4 697	4 597	3 972	3 747	3 849	..
– Suicides	1 936	1 997	1 904	1 991	1 917	1 852	1 733	1 568	1 666	1 613	1 610	1 649	1 623
Other Causes	8 680	8 841	7 950	7 045	6 638	6 133	5 427	5 142	5 217	5 839	5 465	5 836	5 915
Total	127 244	129 166	124 290	120 337	118 185	117 373	117 913	112 782	112 744	109 527	109 768	109 001	107 755
	Share (%)												
Neoplasms	21.6	22.0	22.7	23.3	23.8	24.2	24.3	24.7	24.8	25.6	25.7	26.3	26.4
Circulatory System Diseases	56.7	56.0	55.9	55.7	55.8	55.5	55.9	56.0	56.2	55.1	54.9	53.4	53.3
Respiratory System Diseases	4.6	4.2	4.1	4.2	4.1	4.0	4.3	4.1	3.8	3.8	4.2	4.5	4.3
Digestive System Diseases	3.6	3.9	3.8	3.7	3.5	3.8	3.7	3.7	3.6	3.8	3.9	3.9	4.1
External Causes	6.7	7.0	7.1	7.2	7.2	7.3	7.2	6.9	7.0	6.4	6.3	6.5	6.4
including:													
– Traffic Accidents	1.0	1.2	1.3	1.4	1.4	1.6	1.4	1.3	1.4	1.3	1.4	1.5	..
– Other Accidents	4.2	4.2	4.3	4.1	4.2	4.1	4.3	4.2	4.1	3.6	3.4	3.5	..
– Suicides	2.5	1.6	1.5	1.7	1.6	1.6	1.5	1.4	1.5	1.5	1.5	1.5	1.5
Other Causes	6.8	6.9	6.4	5.9	5.6	5.2	4.6	4.6	4.6	5.3	5.0	5.4	5.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

From the point of view of 1987–2001 mortality total number development, an important change took place within the circulatory system diseases group, its deaths total number decreasing by 15 000. These 15 000 cases represented three fourths of total deaths number decrease. The change extent was further underlined by the fact that it happened at a period when population was ageing. The number of deaths due to other causes decrease by 2 800 was less significant from an absolute perspective through similar. Within a relative statement this decrease represented the absolute, greatest change down to 32% as to former state. Concerning circulatory system diseases, an analogous change represented “only” 20%, which was the same concerning two additional groups, respiratory system diseases and external causes. During the past six years, suicides sharp decrease was equally significant.

Death high concentration within the first two main groups of death causes, representing almost 80% of all events since the analysed period onset, did not leave sufficient room for further changes. That is why the 1.5 per cent point increase between 1987 and 2001 should be evaluated as significant. This change was reached due to a 3.3 per cent point decrease of circulatory system diseases and an almost five per cent increase of tumor diseases amid death causes. Neoplasms represented the only

group of causes which percentage significantly rose, since it increased by almost 1 000 its total deaths number and at the same time total deaths number within population fell by 15%. Though in 1987, tumor disease was the cause of almost every fifth death, in 2001 it represented approximately every fourth. Considering slower death decrease caused by digestive system diseases, this group of causes percentage also rose by half a per cent point. Other groups percentages, i.e. other causes, external causes and respiratory system diseases, decreased during the analysed period. Together these groups lost almost two per cent points, their common percentage out of total number decreased from 18% to 16%.

During the whole analysed period, the Czech Republic population was undergoing a relatively intensive demographic ageing process. That is why mortality level development according to causes should be cleared of ever-changing age structure influence so as to objectively evaluate its intensities and trends. In our case, the method of direct standardization combined with age structure corresponding to World Health Organization (WHO) European standard was used to compute comparable indicators.

Mortality standardised intensity level and structure according to main groups of death causes correspond in their main outline to male and female mortality structure according to number of deaths. A decisive share of mortality total intensity is due to circulatory system diseases and neoplasms. Cancer deaths mostly concern men; as to circulatory system diseases leading to death excess male mortality is lower. The group of other causes indicates a higher female mortality intensity as compared to the group of external causes. As far as men are concerned, their order is reversed due to a higher accident proneness and specifically a higher suicide rate.

**Table 6.5: Standardised Mortality Rates per 1 000 Inhabitants according to Sex (WHO European standard)**

Deaths Causes	1987	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Index 2000/1987
Men													
Neoplasms	352.9	361.1	356.0	353.4	344.1	348.3	345.1	338.6	332.2	330.0	321.4	326.7	93
Circulatory System Diseases	833.1	834.1	791.4	765.5	729.7	707.3	708.1	666.2	660.8	615.7	602.8	576.9	69
Respiratory System Diseases	85.1	81.3	73.2	71.3	65.1	59.7	62.5	56.6	51.7	52.0	54.6	56.9	67
Digestive System Diseases	58.9	67.6	61.7	56.9	52.1	54.5	53.6	51.3	47.9	50.6	50.5	48.5	82
External Causes	103.4	117.4	112.9	114.6	109.4	106.7	106.2	99.4	102.3	91.8	90.8	93.0	90
including:													
– Traffic Accidents	19.0	23.8	23.5	26.0	24.8	26.7	23.2	21.9	23.0	20.4	22.6	22.2	117
– Other Accidents	55.0	62.9	60.1	57.7	55.4	52.7	57.2	53.4	53.5	46.7	43.2	45.9	83
– Suicides	29.4	30.7	29.3	30.9	29.2	27.3	25.8	24.1	25.8	24.7	25.0	24.9	85
Other Causes	104.0	103.7	92.3	81.6	75.0	69.0	60.0	56.5	56.6	62.8	58.8	59.6	57
Total	1 537.3	1 565.3	1 487.5	1 443.4	1 375.4	1 345.5	1 335.6	1 268.6	1 251.4	1 202.9	1 179.0	1 161.6	76
Women													
Neoplasms	187.8	191.6	191.8	188.1	191.8	188.4	191.4	179.8	180.9	178.5	180.3	178.7	95
Circulatory System Diseases	529.7	512.5	492.1	468.5	468.1	456.8	455.0	430.7	428.2	407.4	401.5	379.0	72
Respiratory System Diseases	34.8	29.7	30.8	30.0	29.0	28.6	31.6	29.1	26.7	23.0	27.9	29.1	84
Digestive System Diseases	30.0	29.7	28.7	27.6	26.3	28.3	26.3	24.9	24.8	24.2	24.6	25.4	85
External Causes	57.6	54.1	53.4	49.7	49.0	50.3	47.9	42.3	40.4	35.2	34.1	34.2	59
including:													
– Traffic Accidents	5.7	6.9	7.1	7.1	7.5	7.9	8.2	6.9	6.7	6.0	6.5	7.0	123
– Other Accidents	42.4	37.6	37.4	34.0	32.9	33.6	32.2	29.5	27.7	23.5	22.3	21.4	50
– Suicides	9.5	9.6	8.9	8.6	8.6	8.8	7.5	5.9	6.0	5.7	5.3	5.8	61
Other Causes	70.3	70.7	63.4	57.4	54.8	51.1	46.8	43.3	43.4	46.0	42.3	44.2	63
Total	910.2	888.3	860.1	821.3	819.0	803.4	798.9	750.1	744.3	714.4	710.5	690.5	76
Index Men/Women													
Neoplasms	188	188	186	188	179	185	180	188	184	185	178	183	97
Circulatory System Diseases	157	163	161	163	156	155	156	155	154	151	150	152	97
Respiratory System Diseases	245	274	238	238	224	209	198	195	194	226	196	196	80
Digestive System Diseases	196	228	215	206	198	193	204	206	193	209	205	191	97
External Causes	180	217	211	231	223	212	222	235	253	261	266	272	151
including:													
– Traffic Accidents	333	345	331	366	331	338	283	317	343	340	348	317	95
– Other Accidents	130	167	161	170	168	157	178	181	193	199	194	214	165
– Suicides	309	320	329	359	340	310	344	408	430	433	472	429	139
Other Causes	148	147	146	142	137	135	128	130	130	137	139	135	91
Total	169	176	173	176	168	167	167	169	168	168	166	168	100

Standardised rates comparison outcome shows that mortality intensity is markedly higher concerning men than women in all main causes groups. Differences are such that for example in 2000, general mortality level concerning men was by two thirds higher than the one concerning women. In 2000, the greatest difference in mortality intensity according to sex appeared in external causes group and within its frame, the greatest difference concerned suicides. Men in a comparable age structure died four times more frequently committing suicide than women, and three times more than women of traffic accidents whereas they died only twice more frequently of other accidents.

**Excess Male Mortality Is Obvious in All Age Groups and in All Death Causes Groups**

Despite the significant discrepancy between men and women mortality corresponding characteristics, any assumption of a satisfactory situation regarding women mortality is erroneous. According to international comparative studies, Czech women mortality level is significantly higher than the European Union 15 countries average in all death causes groups except respiratory system diseases. According to a comparative study with the European Union average covering 1996-1999, women ended up with an even lower evaluation than men since their total mortality was 33% higher than men's at "only" 31%. If we take as an evaluation standard, EU countries with the lowest mortality intensity – Sweden for men and France for women – then the result for our female population is even less favourable. If male general mortality difference between the Czech Republic and Sweden was of 46%, then women living in the Czech Republic had a general mortality intensity 60% higher than women in France. Concerning both sexes, the greatest differences were in circulatory system diseases and external causes mortality rate. The only group of causes, bearing a definitely positive mortality intensity evaluation concerning the Czech Republic, was the respiratory system diseases one due to its low representation.

Mortality rate and structure established differences indicate the Czech Republic future mortality evolution possible direction and intensity. This latter evolution very trends within recent years can tell us even more. Comparing mortality standardised rates, we can infer that tumor illnesses leading to death stagnation or slow growth and their percentage increase out of total mortality did not trigger a mortality intensity increase within this group but were the outcome of a changing age structure. During the 1987–2000 period, mortality distinctive intensities due to tumor illnesses indicated a relatively smooth decrease down to values lower than 7% for men and 5% for women, but in comparison with other causes, this remained a relatively minor change. Indeed circulatory diseases analogous mortality intensity decreased down to 31, respectively 28%. The most significant mortality intensity decrease occurred as to respiratory diseases concerning men (33%) and external causes group concerning women, decreasing down to 41% during the 1987–2000 period. This substantial decrease took place regardless of female mortality intensity 23% increase due to traffic accidents. Male mortality rate due to external causes decreased by a mere 10% whereas in 2000, mortality rate within the frame of traffic accidents subgroup was 17% higher than in 1987. Within the frame of all death causes main groups concerning both sexes, a 5–41% range mortality rate decrease occurred throughout the analysed period while total mortality standardised indicator decreased concerning both men and women down to 24%.

The identical mortality intensity relative decrease concerning men and women led to this indicator somewhat diverse transformations, taking into account life expectancy at birth different resulting values. During the 1987–2000 period, life expectancy at birth increase reached 3.8 years for men and 3.2 years for women while contributions to this change were significantly differentiated according to age. We encounter a similar differentiation as to individual death causes groups. However their contribution to total life expectancy at birth modification implies a real meaning of mortality intensity changes on mentioned causes groups. This significance is given by the deceased specific age structure, given population death order and mortality intensity changes extent on given cause during the analysed period.

**Table 6.6: Death Causes according to Age Groups Contributions to Life Expectancy at Birth Changes during 1987–2000 Period**

Death Causes	Men					Women				
	0–34	35–64	65+	Total	%	0–34	35–64	65+	Total	%
Neoplasms	0.07	0.32	0.03	0.42	11.1	0.03	0.17	0.01	0.21	6.5
Circulatory System Diseases	0.05	1.01	1.05	2.11	55.8	0.03	0.50	1.35	1.88	58.2
Respiratory System Diseases	0.06	0.07	0.11	0.24	6.4	0.03	0.02	0.04	0.09	2.8
Digestive System Diseases	0.03	0.04	0.05	0.11	2.9	0.01	-0.03	0.07	0.05	1.5
External Causes	0.07	-0.07	0.06	0.06	1.6	0.07	0.01	0.21	0.29	9.0
Other Causes	0.63	0.09	0.13	0.84	22.2	0.48	0.11	0.12	0.71	22.0
Total	0.90	1.47	1.42	3.79	100.0	0.64	0.79	1.80	3.23	100.0



During the 1987–2000 period, the Czech Republic mortality significant improvement due to respiratory system diseases subsiding, played a decisive role as to life expectancy growth: concerning men it contributed to a total modification of 2.1 years (56% life expectancy at birth total change) and concerning women, to 1.9 year (58%). Concerning men, this increase was equally divided between middle and elderly ages whereas concerning women 72% of the increase went to the 65 and older age group, thus depending on changes internal structure within the frame of a given group. Concerning men, acute myocardial infarction mortality rate recorded a decisive improvement, since this mere cause contributed to a total change increase of 1.02 year (out of which 0.60 year in 35–64 age group). Concerning women, an identical role was played by brain vascular diseases contribution of 0.88 year. Mortality intensity decrease due to cancers meant a life expectancy substantial increase concerning men (0.42 year) less substantial concerning women (0.21 year), yet for both sexes, this change decisively occurred at middle age. Mortality rate changes in two most significant groups of death causes together secured approximately 90% of life expectancy increase at middle age resulting value and two thirds of increase taking place across all age groups. Apart from age groups and causes which mortality intensity decreased between 1987 and 2000, one can also find groups and individual causes which mortality rose thus their increase is negative. Yet mere traffic accidents are worth mentioning with a loss of 0.11 year concerning men and 0.02 concerning women.

Diverse biological conditions as well as men and women different exposure extent to risks due to diverse gender roles lead to differences in mortality intensity according to causes and consequently to mortality intensity differentiation according to sex. The question why are life expectancy differences between men and women so significant, could be partially answered by these differentiations distribution into individual causes groups contributions. In 2000, life expectancy at birth between men and women was of 6.7 years, more than a third of this difference was attributed to men higher mortality intensity due to circulatory system diseases, over a fourth to cancers and one fifth to external causes. At the same time excess men mortality concerned all death causes except sexual organs malignant cancers, the latter narrowing life expectancy difference between sexes of a mere 0.08 year. Almost half the difference (3.27 year) went to mortality at middle age. The first age group counted the largest contributing part of external causes total difference (0.59 of 0.74 year) while two thirds went to mortality due to traffic accidents deaths and suicides. At middle and elderly ages, it was again mainly circulatory system diseases and cancers and at middle age external causes as well.

**First and Foremost Mortality Intensity Due to Circulatory System Diseases Decrease Led to Life Expectancy Increase**

**Table 6.7: Death Causes Contributions to Life Expectancy at Birth Difference between Men and Women according to Age Groups (years)**

Deaths Causes	1987					2000				
	0–34	35–64	65+	Total	%	0–34	35–64	65+	Total	%
Neoplasms	0.05	0.86	0.74	1.66	22.7	0.01	0.77	0.99	1.77	26.4
Circulatory System Diseases	0.06	1.81	1.32	3.19	43.5	0.03	1.28	1.28	2.60	38.8
Respiratory System Diseases	0.05	0.18	0.23	0.45	6.1	0.02	0.14	0.18	0.34	5.0
Digestive System Diseases	0.03	0.31	0.07	0.42	5.7	0.02	0.29	0.07	0.38	5.6
External Causes	0.57	0.50	0.03	1.10	15.0	0.59	0.65	0.11	1.34	20.0
Other Causes	0.27	0.13	0.11	0.51	7.0	0.08	0.15	0.05	0.28	4.2
Total	1.03	3.79	2.51	7.32	100.0	0.74	3.27	2.68	6.70	100.0

The fundamental feature of life expectancy at birth difference between sexes development throughout 1987–2000 period was due to circulatory and respiratory systems diseases and other causes increase transfer to cancers and external causes, and from younger age levels onto older ones. This development corresponds to mortality intensities development registered tendencies according to age and death causes main groups.

Diverse studies of mortality and its changes during the past ten or fifteen years have confirmed that higher educated people bear a lower mortality intensity as well as married people compared to others. The shaping of a modern lifestyle linked to a growing education level, but with a more frequent single life pattern brings about positive and negative sides to mortality rate changes. Mortality intensity decrease, specifically concerning elderly men also appeared within elderly population structure according to family status, because it led to less female widowhood thus to the elderly current marriages duration extension.

The course of separate demographic processes, including mortality, remains in a rather narrow correlation with population separate structural features and is influenced by its concrete living conditions. If these conditions are different in diverse regions or if population territorial distribution according to

mentioned characteristics and signs is unbalanced, then regional differences appear in demographic processes development. That is why regional differences in population mortality can be a significant indicator of quality of life differentiation and mortality development newest tendencies in centers or regions spreading innovation, and indicate a great deal about this process perspectives in other regions and at the national level. Since the Czech Republic districts population extent is not, from the point of view of representative yearly tables computation, sufficient we had to resort to several years data, concretely to a five-year period.

**Table 6.8: Life Expectancy at Birth Differentiation in 77 Districts**

Indicator	Men			Women		
	1986–1990	1991–1995	1996–2000	1986–1990	1991–1995	1996–2000
Minimum Value	64.9	66.2	68.7	72.3	73.2	75.3
Maximum Value	69.7	70.5	72.9	76.3	77.3	79.2
Range	4.8	4.3	4.2	4.0	4.1	3.9
Coefficient of Variation	1.46	1.44	1.41	1.11	1.08	1.05
Czech Republic	67.8	69.0	71.0	75.2	76.3	77.8

Since 1987, regional differences evolution of mortality process intensity has significantly influenced market relations renewal and its subsequent weakening of subdividing mechanisms, leading to a deepening differentiation between the country's separate regions. However conditions of people's daily lives have not yet significantly impacted to a greater extent on mortality intensity differentiation evolution in the Czech Republic regions. On the contrary regional complexes diversification according to life expectancy at birth has somewhat decreased since the range has narrowed and variation quotient has been brought down too. We can further interpret this fact since differences in medical care availability due to its quality transformation process have rather abated and outweighed the negative effect of other conditions increasing regional differentiation. Nevertheless the issue remains whether it will remain so in the future. Namely, a few living conditions which differentiation has increased, could more substantially affect mortality in the longer term.

**Table 6.9: Districts with the Highest and Lowest Life Expectancy at Birth**

Highest Values							
Men				Women			
1986–1990		1996–2000		1986–1990		1996–2000	
Třebíč	69.7	Hradec Králové	72.9	Vyškov	76.3	Hradec Králové	79.2
Brno–město	69.2	Plzeň–město	72.8	Třebíč	76.1	Jihlava	79.1
Pardubice	69.0	Náchod	72.7	Zlín	76.1	Pardubice	79.1
Vyškov	69.0	Hl.m. Praha	72.7	Tábor	76.0	Brno-venkov	79.0
Hradec Králové	69.0	Brno–město	72.4	Hradec Králové	76.0	Náchod	79.0
Brno-venkov	68.9	Ústí nad Orlicí	72.3	Břeclav	75.9	Vyškov	78.9
Blansko	68.9	Žďár nad Sázavou	72.2	Brno-venkov	75.9	Šumperk	78.7
Hl.m. Praha	68.9	Pardubice	72.2	Žďár nad Sázavou	75.8	Hodonín	78.6
Žďár nad Sázavou	68.9	Tábor	72.1	Blansko	75.7	Třebíč	78.6
Jihlava	68.7	Třebíč	72.1	Hodonín	75.7	Hl.m. Praha	78.6
Lowest Values							
Men				Women			
1986–1990		1996–2000		1986–1990		1996–2000	
Teplice	64.9	Most	68.7	Sokolov	72.3	Teplice	75.3
Most	65.4	Jeseník	68.9	Teplice	72.7	Most	75.8
Chomutov	65.6	Sokolov	69.0	Cheb	73.1	Chomutov	75.9
Český Krumlov	65.9	Chomutov	69.0	Most	73.1	Cheb	76.2
Cheb	65.9	Karviná	69.1	Česká Lípa	73.4	Rakovník	76.4
Sokolov	66.0	Děčín	69.1	Tachov	73.5	Děčín	76.5
Litoměřice	66.0	Teplice	69.2	Chomutov	73.6	Česká Lípa	76.5
Louny	66.1	Česká Lípa	69.3	Děčín	73.7	Litoměřice	76.6
Ostrava–město	66.2	Tachov	69.5	Karviná	73.7	Ústí nad Labem	76.7
Karlovy Vary	66.3	Louny	69.6	Litoměřice	73.7	Tachov	76.8

The fact that substantial internal changes in the Czech Republic mortality geographic structure occurred, even though corresponding statistical collections variability did not significantly change, is supported by exchanges of counties order at both ends of corresponding variability columns for 1986–1990 and 1996–2000 periods. Hradec Králové, Pardubice and Třebíč districts steadily belonged to regions with the highest life expectancy for both sexes as well as Náchod and Prague districts more recently. Concerning men, during mentioned periods, five regions names changed out of the first ten districts and concerning women four, excluding the new Šumperk district. During both periods, first and foremost Teplice, Most and Chomutov districts belonged to the end of the column, among lowest life expectancy total figures, and during 1996–2000 Děčín, Česká Lípa and Tachov districts as well, concerning men – mostly border districts with a specific population composition and deteriorated environment. Women’s life expectancy indicated a somewhat greater territorial structures stability as compared to men’s which primarily points to male population mortality level changes higher potential.

The Czech Republic mortality structure and rate analysis results represent from most perspectives a very optimal further development promise. The transformation process started in mid 80’s and considerably speeded up due to the 90’s political and social development, brought about a whole range of tangible, positive results. At the same time, mortality rate transformations established tendencies use main existing reserves, identified according to international comparative studies and partially research findings as well, concerning differences between male and female mortality intensity. A comparative study shows that, despite the past 10–15 years significant progress, main reserves remain strong. In the Czech Republic or elsewhere in the world, this development is contingent upon external conditions. Mortality level steady decrease will require additional stimuli by means of new financial and ideological investments directed not only to health but health education, senior citizens care, traffic safety, work safety and other lifesaving forms as well, including education and lifestyle.

Throughout the past fifteen years, due to its mortality level positive evolution and its corresponding life expectancy increase within all age groups, the Czech Republic grew more and more apart from other post-communist countries, since some of them even suffered a worsening of their mortality situation. Currently due to its indicator values, life expectancy has started to approach advanced countries, but this approaching process will probably continue for a long time.

**Strong Reserves  
Remain as to State of  
Health Improvement  
Thus to Mortality Rate**