

## DEMOGRAPHIC EXPANSION IN DEVELOPING COUNTRIES

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### Abstract

*The paper deals with an assessment of recent demographic development of the world in a breakdown by continents and their regions. It concentrates upon two fundamental measures of natural increase – birth rates and death rates. Using the relationship of the two, the process of demographic revolution is assessed in different parts of the world. The worst results in the speed of demographic revolution are reported from the countries of Africa South of Sahara, where high natality is accompanied by high mortality. These countries with an extreme proportion of HIV-infected population lack food security have unstable political systems and underdeveloped economies. Demographic prognoses assume that, the Earth population number in 2050 will be more than 9 thousand million (9 billion) higher. The most rapid growth is expected in Africa (by 116%) and in Asia (by 34%). The most badly threatened area of the world from demographic standpoint is Africa South of Sahara. Without external assistance it is unable to finish demographic revolution.*

**Key words:** Demographic revolution, Africa South of Sahara, developing countries, natality, mortality, population prognosis

### INTRODUCTION

Demographic development is one of the global problems of socio-natural character. Growth of the Earth population numbers began by the beginning of the Neolithic period, some 9 000 to 10 000 years ago. Knowledge of agriculture expanded rapidly from the original focal point in the Old World (the “Fertile Crescent” in the Near East and neighbouring regions). Other likely focal points of agriculture formation were the Chinese and Indian rivers and the Latin American centre which was slightly “younger”. Countryside could have been populated more densely thanks to the knowledge of agriculture. At the same time, civilization is in progress (handicrafts, trade, commerce, transport, urbanization, gradually also handwriting, arts and fundamentals of the branches of later science).

After the rapid increase of World population numbers, particularly in the Near and Middle East at the beginning and in the Mediterranean, during the millennia B. C., only a slow growth follows, accompanied by numerous fluctuations. Within the conditions of the so-called natural reproductive model marked by high levels of natality and mortality, favourable periods alternated with periods during which the number of population stagnated or even dropped. The basic regulators of population growth were wars, epidemics and starvation.

A significant divide in the population development came in the second half of 18th century, limited to Northeast Europe at the beginning. Thanks to medical care, education, improved nutrition and hygiene, new medicines and other factors mortality, particularly infant mortality, rapidly decreases and life expectancy increases at the same time. The decrease of natality usually follows with a delay hence, there is a big growth of population numbers. The demographic revolution i.e.,

transition from an approximate balance between high levels of both natality and mortality towards a new balance at low levels of the both, took about 200 years in Europe. At the same time in the period of emigration, mostly to America, and this migration reaches its top between 1880–1920. Industrial revolution developed in Europe on the background of demographic revolution.

Roughly until half of the 20th century a gap formed between the industrial countries and the developing countries as concerns the character of population development. In the so-called Third World countries the demographic revolution starts in the 20th century only, most often during the Forties and Fifties.

Over the 1900–2000 periods the number of world population increased from 1.6 thousand millions to 6 thousand millions. Current demographic prognoses assume reaching roughly 9 thousand millions (middle level) by 2050.

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### MATERIALS AND METHODS

The fundamental demographic events are birth and death. Based on the records of these measures of natality (birth rate) and of mortality (death rate) are obtained all over the world, expressing the population reproduction within the given area. In spite of a similar population development in all countries of the world, there are certain time lags in the demographic tendencies observed in some parts of the world. Such lags are caused by different levels of economic and social development. According to the

relationship of birth rates and death rates, three groups of populations are distinguished:

- A. The population after demographic revolution finished or before the end of it.
- B. The population within which the demographic revolution is in progress.
- C. The population before demographic revolution.

Table 1 shows the criteria for population classification by Pavlik (1964).

The paper analyzes recent development of natality and mortality in the world by separate geographic areas. It concentrates on areas with extreme values of demographic measures. Description of the natural increase development tendencies is part of the exercise as well as the assumed development of the world population numbers until 2050. Data sources are based on the UN statistics and the analysis has been performed using the STATISTICA programme package.

### Demographic Revolution in the World

Based on recent experience on population development in Europe and other developed countries it can be assumed that, a similar demographic process, though a lagged one, is going on in the developing countries. Since the 70ies a decline of natality can be observed in some regions, sometimes a rather significant one. An exception is represented by countries from the Middle, West and East Africa, where natality reaches up to 55‰ (Niger, 2005). Birth rate development is shown in the Annex 1, by five-year intervals since the middle of 20th century, including a forecast to 2050. It is obvious from there that, according to the UN prognosis, the developing countries as a whole will not quite reach the levels of today's developed countries over the period, but they should approximate those gradually. As concerns the death rates (Annex 1), the world as a whole approaches the period of its minimum. While the process of death rate reduction in the developed countries was finished in the 70ies, the developing

**Tab. 1:** Criteria for grouping of populations in homogeneous groups

Type	Birth per 1 000 population	Death per 1 000 population
A	not decided	< 15
B	> 30	(15; 20)
C	< 50 or > 50	> 20

countries expect the lowest death rate values by more than two generations later, i.e., in the first quarter of

the 21st century. Table 2 shows the speed of natality and mortality changes over two five-year intervals.

Although the natality suppression programmes cannot be neglected, the main role among the natality limitation motives in the developing countries is played by economic progress and real emancipation of women. It is confirmed by the results of newly industrialized countries of Asia, where the economic rise caused a rapid drop of natality.

The expected future development of the death rate reflects the population age structure since in all parts of the world the average age of population and expectation of life are rising. Globalization positively affects the growth of levels of living, improved availability of health care, growth of education levels and removal of illiteracy. In spite of that, there are numerous factors that decimate population, besides war conflicts. The HIV virus is one of the most dangerous. Table 3 shows 10 countries of the world with the highest HIV/AIDS prevalence in 2005.

The AIDS disease is a principal social and economic problem of the developing world, and the Africa South of Sahara region is its most badly affected part. From the list of 10 countries in Table 3, the first nine ones come from this region and the tenth one (C.A.R.) from Middle Africa. This is a tragedy of immense dimension, since, e.g., in Zambia today live more than a million children without both parents due to AIDS. As if a whole generation got lost. AIDS became a catastrophe going to change the African continent and going to determine development of national economies and

**Tab. 3:** The Top 10 HIV/AIDS Prevalence Countries

Country	Percent of population
Swaziland	33.4
Botswana	24.1
Lesotho	23.2
Zimbabwe	20.1
Namibia	19.6
South Africa	18.8
Zambia	17.0
Mozambique	16.1
Malawi	11.8
Central African Republic	10.7

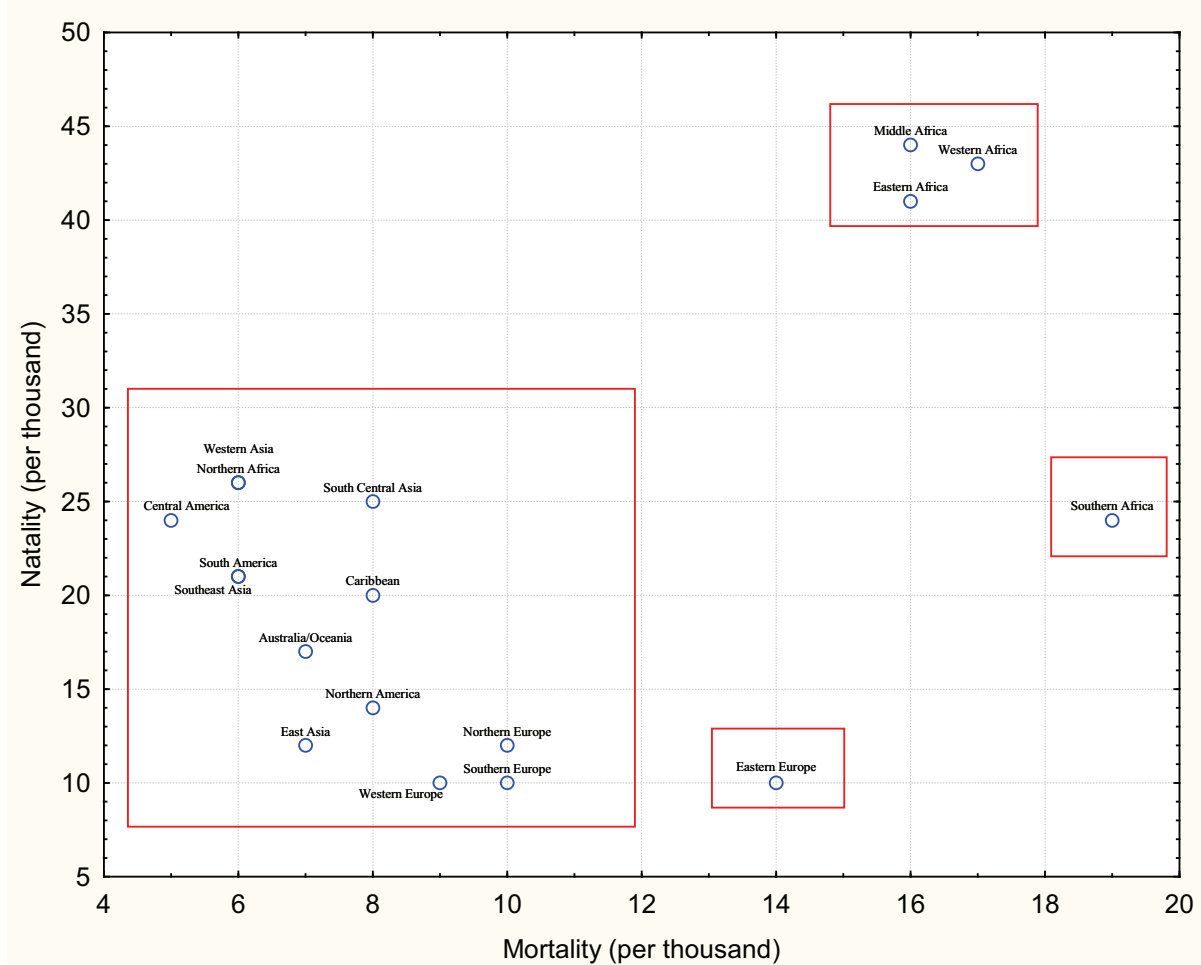
Source: World Population Prospects: The 2006 Revision. UN

**Tab. 2:** Index of natality and mortality changes over a five-year interval

Period	World		More developed countries		Less developed countries	
	natality	mortality	natality	mortality	natality	mortality
1950–2005	0.9444	0.9230	0.9322	0.9990	0.9386	0.9007
2005–2050	0.9512	1.0190	0.9870	1.0263	0.9446	1.0170

Source: World Population Prospects: The 2007 Revision (2007); our calculations

**Fig. 1:** Relationship of birth rates and death rates in world populations, 2006



Source: World Population Prospects: The 2007 Revision (2007); our calculations

whole societies, inclusive of demographic situation for whole decades to go.

In 2006 the highest birth rate values were recorded (Figure 1) in Middle Africa countries (44‰), West Africa countries (43‰) and East Africa countries (41‰). The distances of the remaining regions of the world are rather considerable but this does not exclude high values in separate countries (East Timor, Yemen, Afghanistan, Haiti etc.). This way, the high natality problem is concentrated in a greater part of Africa South of Sahara. With an exception of the Mediterranean countries the highest death rate (Figure 1) is recorded in African regions, too, where the worst situation, also under the AIDS impact, is in the countries of South Africa. On the other hand, low birth rate and death rate values, at the levels of developed countries, already, are seen in East Asia.

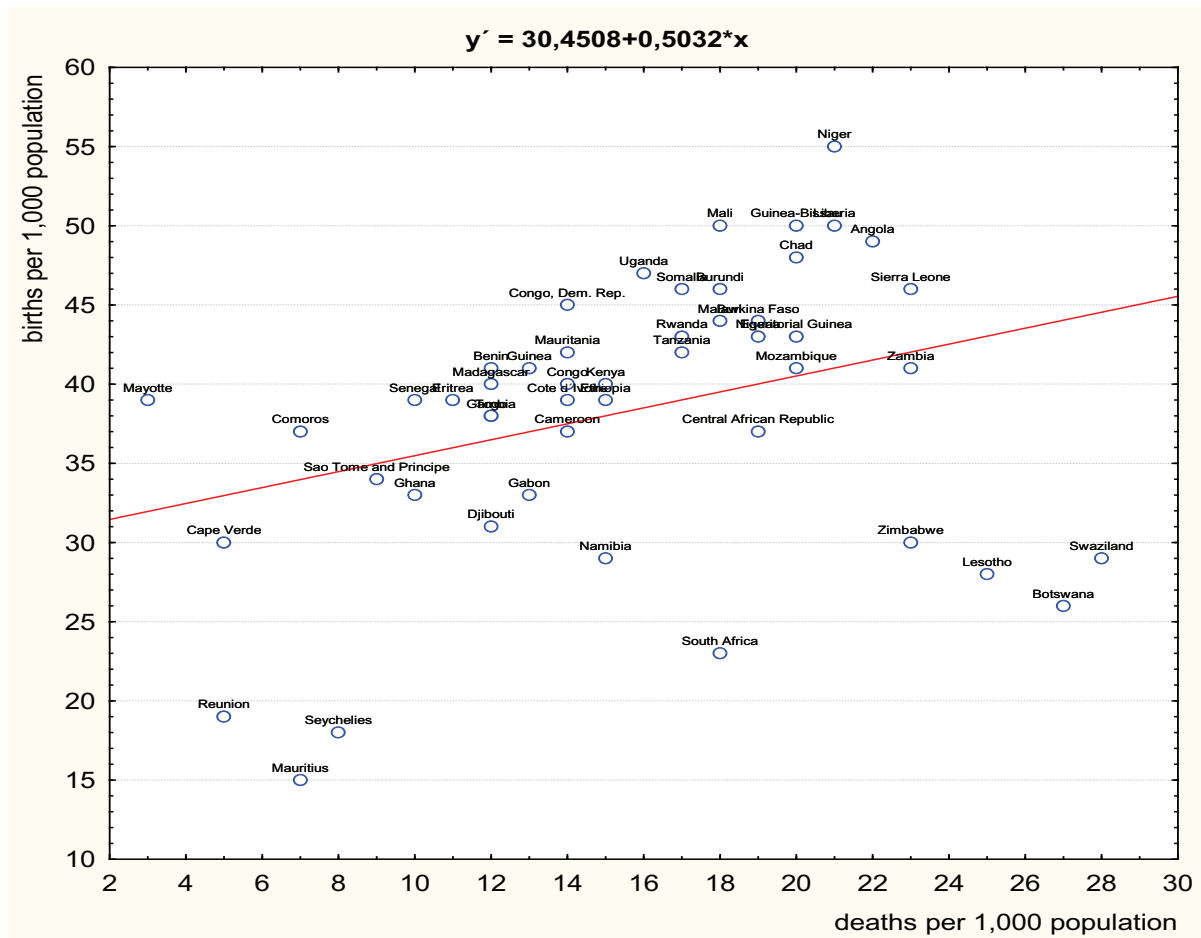
#### Natality and mortality in Africa South of Sahara

The demographic revolution starts in Africa at its latest, in the second half of 20th century only. It's not been finished yet and thanks to the big difference between birth rates and death rates, this region remains still entangled in the population explosion. As compared

with Europe, where the population size development went parallel with the industrial revolution, in Africa it was mainly an external impact. Import of comparatively cheap medicines efficient in the fight against infections and parasites increased the expectation of life in the poor countries, too. At that time the factors having decisively supported the subsequent decline of birth rates in European conditions, have a much more difficult position in the African conditions (education, equal rights of women, social support and pension systems, ban of children's work, low levels of living etc.). Regarding the low age structure (in 2006 there were 55% Africans aged up to 20), hence the lower share of people in productive age, means are missing for demographic investment (health care, school system) and the number of the illiterate grows. Africa South of Sahara together with South Asia countries (India, Pakistan, Bangladesh) where the growth starts from a high basis, represent the most acute population problem of the today's world.

A more detailed look as concerns the birth rates and death rates in separate countries of Africa South of

**Fig. 2:** Relationship of birth rates and death rates in South of Sahara countries, 2006



Source: World Population Prospects: The 2007 Revision (2007); our calculations

Sahara in 2006 (Figure 2) offers a finding that, high parallel values of birth rates and death rates come up mainly in Niger, Liberia, Angola, Guinea-Bissau, Chad, Sierra Leone and Mali. These are heterogeneous geographically countries with undeveloped economies, some of which (Mali, Niger) are fighting the expanding deserts, others (Liberia, Sierra Leone, Angola) suffer from recent civil wars having limited the development ambitions of the countries.

The lowest birth rate and death rate values are recorded by the island regions of Indian Ocean: Mauritius, Reunion (French dependency) and Seychelles. These are countries with above average GDP per head levels in African conditions and oriented significantly on tourist services.

The high natality levels are characteristic for most countries of the region. The different levels of death rates in the countries of Africa South of Sahara correspond to a high degree to age structure of the population but they are affected at the same time by wars and ethnic conflicts, by drought, economic collapse (Zimbabwe) or epidemics. Among the seven countries with highest death rate levels stand six countries of South Africa where the AIDS disease problem is at its most acute.

### Earth Population Number Forecast

The UN demographic prognoses to 2050 assume that, Earth will have 7.8 to 10.8 thousand millions inhabitants and in 2100 (Vallin, 1992) there should live about 9 to 12 thousand million inhabitants. At that, it is assumed that, in the 2nd half of the current century should the world population numbers become stabilized already. Table 4 brings three variants of the world population development to 2050 by the UN.

The most rapid population growth, more than double in 2050 against 2005, is expected in Africa. Especially, Africa South of Sahara is educationally unprepared for the so-called knowledge economics of the 21st century. This is a considerable handicap reducing chances of economic growth and the end of demographic revolution at the same time. A big problem having materialized with the high increment of population size is the internal migration at the same time, causing growth of slum townships at city borders. With an exception of the Republic of South Africa, the countries of this part of the world are unable to master the technologically demanding industries and besides mining of raw materials and monoculture farming there

**Tab. 4:** Population development variants (World total, 1950–2050) – Population in thousands)

Year	Middle variant (x)	High variant	Low variant
1950	2 535 093	x	x
1955	2 770 753	x	x
1960	3 031 931	x	x
1965	3 342 771	x	x
1970	3 698 676	x	x
1975	4 076 080	x	x
1980	4 451 470	x	x
1985	4 855 264	x	x
1990	5 294 879	x	x
1995	5 719 045	x	x
2000	6 124 123	x	x
2005	6 514 751	x	x
Mean growth rate	1.0896	–	–
2010	6 906 558	6 967 407	6 843 645
2015	7 295 135	7 459 289	7 127 009
2020	7 667 090	7 966 382	7 363 824
2025	8 010 509	8 450 822	7 568 539
2030	8 317 707	8 913 727	7 727 192
2035	8 587 050	9 368 004	7 828 666
2040	8 823 546	9 829 962	7 871 770
2045	9 025 982	10 297 036	7 857 864
2050	9 191 287	10 756 366	7 791 945
Mean growth rate	1.0364	1.0558	1.0164

Note: (x) Until 2005 actual numbers

Source: World Population Prospects: The 2006 Revision, UN.

are a ssembly lines f or m achinery a nd ot her produce only left, with imports of most components. Neither the potential chances f or t ourism d evelopment ar e exploited, ( non-existent i nfrastructure, c lime p roblems, infectious diseases), t hat i s co ncentrated i n several countries o nly, wi thin A frica S outh o f S ahara (R .S.A, Kenya, G ambia, M auritius, Seychelles). C onsiderable problems are in waiting if the African continent remains aidless.

Figure 3 a nd T able 5 s how t he a ssumed p opulation growth d evelopment by g e ographic a reas until 2 050. Most of the Earth population will live in Asia (57.29%). In Europe reduction of population numbers is expected hence, t he s hare of E uropean p opulation i n t he t otal world population will make 7.23% only in 2050. Within the African continent, wi th m any poorest c ountries of the w orld t oday, w ith c ountries o f unstable p olitical systems, a g rowth by m ore t han o ne t housand m illion people i s e xpected a nd t he p opulation n umber s hould represent 21.74% of world population.

In Table 5 the current population structure is given, and the assumed population size in separate world regions in 2050. T he U N middle va riant i s e mployed i n computations.

## CONCLUSION

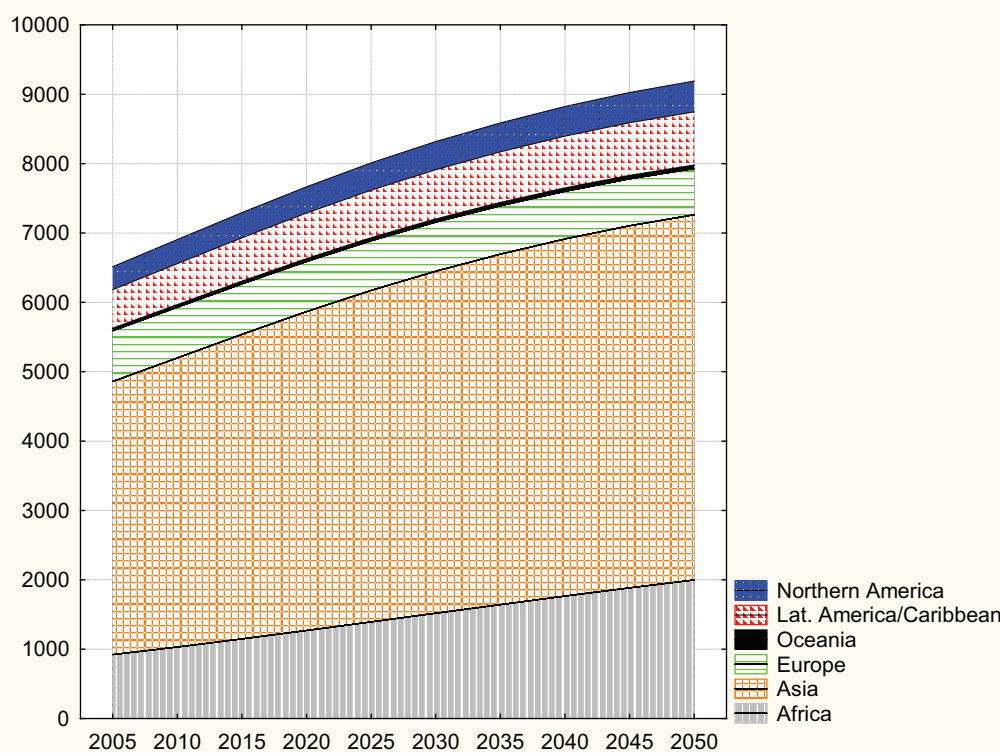
Population n umbers pr ognosticating i s a c omplex business, t he current de velopment t rends c annot be mechanically t ransposed. World p opulation i s not homogeneous one and various effects can be seen here. Population explosion in developing regions has stressed the problem of food security for countries unable so far, to feed themselves on their own. Population growth in the poor countries brings about uncontrolled growth of cities in these regions and economic poverty p rovokes illegal foreign migration. Many ot her a spects, some o f them often mutually linked, will affect considerably the world population development p roblems. T aken f rom

**Tab. 5:** Population structure by geographic regions in 2005 and 2050 (middle variant)

Year	Units	Africa	Asia	Europe	Oceania	Latin America and Caribbean	Northern America
2005	%	14.15	60.45	11.22	0.51	8.56	5.10
	Number of popul. (thous.)	922 011	3 938 020	731 087	33 410	557 979	332 245
2050	%	21.74	57.29	7.23	0.53	8.37	4.84
	Number of popul. (thous.)	1 997 935	5 265 895	664 183	48 742	769 229	445 303

Source: World Population Prospect: The 2006 Revision (2006); our calculations

**Fig. 3:** Expected world population numbers development by geographical regions over 2005–2050 (middle variant), million head.



Source: World Population Prospects, The 2006 Revision, UN, our calculations

the a ll-world viewpoint, those are the environment he protection, energy sources security after the fossil fuels being finished, health care development et c. As the fundamental condition for survival of our civilization peaceful co-existence remains to be maintained. In spite of the expected reduction of world population growth rates until 2050, serious problems remain to be considered within the regions where developing countries are prevailing. The most threatened parts of the world are Middle East and West Africa where demographic revolution is retarded and the birth rates remain high. The current young age structure of three quarters of humanity does not offer chances to the world to reach a stable level of population numbers within a short term. Therefore, as prospects are concerned, inertia will affect the process what is also seen in the demographic projections given above. In the developed countries the problem is mostly inverse since the stable low birth rate levels confirm that, the current population numbers will not, most likely, be reproduced.

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**Annex 1:** Natality and mortality (per thousand) in the period 1950–2005 and a forecast to 2050

Period	World		More developed countries		Less developed countries	
	natality	mortality	natality	mortality	natality	mortality
1950–1955	37.4	19.6	22.4	10.3	44.3	23.9
1955–1960	35.5	17.5	21.3	9.7	41.7	20.9
1960–1965	35.1	15.6	19.6	9.4	41.6	18.2
1965–1970	33.4	13.2	17.1	9.3	39.8	14.7
1970–1975	30.8	11.3	16.2	9.5	36.0	12.0
1975–1980	28.3	10.6	14.9	9.5	32.7	11.0
1980–1985	27.6	10.3	14.5	9.7	31.7	10.5
1985–1990	27.0	9.6	13.9	9.6	30.7	9.6
1990–1995	24.7	9.3	12.4	10.0	28.0	9.1
1995–2000	22.6	8.9	11.2	10.1	25.4	8.6
2000–2005	21.1	8.8	11.1	10.2	23.5	8.4
2005–2010	20.3	8.6	11.1	10.4	22.4	8.3
2010–2015	19.5	8.5	10.8	10.6	21.3	8.1
2015–2020	18.4	8.4	10.4	10.8	20.0	8.0
2020–2025	17.2	8.5	10.0	11.0	18.6	8.0
2025–2030	16.1	8.6	9.8	11.3	17.3	8.1
2030–2035	15.3	8.9	9.9	11.8	16.2	8.4
2035–2040	14.7	9.3	9.9	12.2	15.5	8.7
2040–2045	14.2	9.6	10.0	12.6	14.9	9.1
2045–2050	13.6	10.0	10.0	12.8	14.2	9.5

Source: World Population Prospects: The 2006 Revision (2006)

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