Note:

The attached paper is an unedited version of a contribution to the book 'Population Ageing': Towards an improvement for the Quality of Life?' The book is in fact the proceedings of the International Conference (of the same title), organised by the Belgian Platform on Population and Development, and held in Brussels on 1 March 2007 (in view of the 40th session of the Commission on Population and Development, 9-13 April 2007).

The paper is not the analysis to be presented at the PAA2008; it does include, however, the key element of the analysis, i.e., the simulation exercises used to assess the relative impact of fertility and mortality on the increase in the proportion of older people (here defined as those people aged 60 and over).

The analysis will focus on some European countries. One part of the analysis (not the subject of the attached paper) will be to estimate the fertility level needed to keep the proportion of older people constant at the level attained at, say, the turn of the century.

Part of the conclusions will state that (a) an increase in fertility cannot be an 'instrument' against 'population ageing'; and (b) any policy regarding fertility will need to focus on the well-being of couples, including improved conditions for the combination between work and family.

Chapter One

Population ageing. A global phenomenon with several faces

Ronald C. SCHOENMAECKERS

Contents:

- *Evolution in the dependency ratio and the 'window of opportunity'*
- *'Population ageing' and the ICPD Programme of Action*

1. Introduction

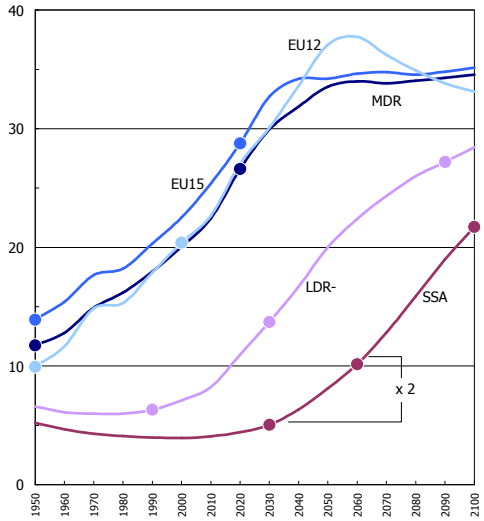
The world population is ageing. At around 2000, the share of the people aged 60 and over had reached the 10 percent mark [1]; by 2050, 20 percent of them will be elderly [2].

With the exception of countries in sub-Saharan Africa, as of 2020, all major world regions will have a population with 10 percent older persons (see figure 1.1). However, until the end of the 21st century, there will be important differences. Until around 2030-2040 the share of elderly in the more developed regions will still be twice as great as the share in the less developed regions (31% against 15%).

Figure 1.1 — Evolution of the proportion of elderly, with indication of doubling time, 1950-2100, selected regions

SOURCE: Results simulation exercises (see text and table 1.2 below)

NOTE: MDR =More developed regions; LDR- = Less developed regions minus Least developed regions); EU15 = 'old' members current EU; EU12 = 'new' members current EU; SSA = sub-Saharan Africa



More important perhaps are the differences that exist between more developed and less developed regions in the increase of the proportion of older people. In the more developed regions it will take about 70 years to double the proportion from 11.7 percent (in 1950) to 26.6 percent (in 2020) [3]. In the less developed regions, the time it takes to double the proportion will only be about 40 years, from 6.3 percent (in 1990) to 13.7 percent (in 2030). For the sub-Saharan region [4] the doubling time will be even shorter, only 30 years. In addition, before the end of the century, the less developed regions (and the countries of sub-Saharan Africa) will experience another doubling of the share of elderly in their population. This will not be the case for the more developed regions. Indeed, as may be observed in figure 1.1, their increase in the proportion of older people will level off and stabilize at around 35 percent.

Clearly, the increase in the proportion of older people starts later in the less developed than in the more developed regions, but once under way the pace of increase is far more rapid.

A population age structure is determined by its levels in mortality and fertility (we deliberately ignore the possible effect of migration). The increases in the proportion of elderly, generally known as 'population ageing', as shown in figure 1.1 are therefore the result of changes in mortality and fertility. Obviously, these changes are not occurring simultaneously in all regions. Our purpose with the present chapter is to describe the differences and their effects on the evolution of elderly (paragraph 3). They will eventually also be explained in the context of the 'demographic transition' (paragraph 4). To conclude, we advance some arguments for the need for greater international co-operation in the field of 'population ageing'.

First, let us look at the evolution in the numbers of elderly in the world.

2. Observed and future evolutions of the proportions of older people

Table 1.1 and figure 1.2 below show that the increase of the number of elderly in the world is more rapid than total population growth and that the great majority of older people live in the less developed regions.

- ***The rapid growth of elderly***

From 1950 to 2000, world population increased by a factor of nearly two-and-a-half (from 2.5 billion to 6.1 billion). From 2000 to 2050 there will be an additional increase by 50 percent (to 9.1 billion). Over the same periods, the number of persons aged 60 and more triples twice (from 205 million in 1950 to 609 million in 2000, and to close to 2 billion in 2050). The increase in the number of persons aged 80 and over — the 'oldest old' — occurs at an even faster pace, and sees its numbers grow by no less than five times in each 50-year period (in fact, close to six times between 2000 and 2050).

The number of elderly is clearly growing at a much faster pace than the population overall. Moreover, the difference is widening. One and the other are related to the fact that the 'population explosion' as the rapid population growth became known in the sixties (Ehrlich, 1968), is gradually disappearing. The growth rate of the 1950s of close to 2 percent annually— corresponding to a doubling of the population size after 35 years — has come down to around 1 percent and in the coming decades will continue to decline to 0.6 percent. Mind, however, that although the 'population explosion' might be over, world population will still continue to grow for a long time. According

to recent long-range population projections prepared by the Population Division of the Department of Economic and Social Affairs (DESA) of the United Nations Secretariat (UN Pop. Division, 1999, 2003b, 2004), world population could stabilize between 9 and 10 billion individuals somewhere between 2200 and 2300, depending on the future evolution of fertility levels [5]. At any rate, world population is likely to grow by at least another 38 percent — and possibly even 54% — compared to its current size of 6.5 billion. Demographers call the process where population continues to grow despite falling fertility rates the 'population growth momentum', or simply the 'population momentum' (see, for example, Keyfitz, 1971) [6].

Table 1.1. — Size of the world population and number of older people, by sex, for selected years.

	1950			1975			2000			2025			2050		
Sex	All ages	60+	80+	All ages	60+	80+	All ages	60+	80+	All ages	60+	80+	All ages	60+	80+
							Absolute numbers (in millions)								
Male	1,257.1	91.3	5.2	2,046.9	153.4	11.6	3,060.3	273.5	24.8	3,960.7	545.2	59.6	4,523.5	901.7	150.0
Female	1,262.4	114.1	8.5	2,026.9	196.4	19.9	3,025.2	335.8	45.5	3,944.5	647.4	100.6	4,552.4	1,066.4	244.2
Both sexes	2,519.5	205.4	13.8	4,073.7	349.7	31.5	6,085.6	609.2	70.3	7,905.2	1,192.6	160.2	9,075.9	1,968.2	394.2
							Relative values by sex (%)								
Male	49.90	44.44	38.00	50.25	43.85	36.73	50.29	44.89	35.24	50.10	45.72	37.21	49.84	45.82	38.05
Female	50.10	55.56	62.00	49.75	56.15	63.27	49.71	55.11	64.76	49.90	54.28	62.79	50.16	54.18	61.95
Both sexes	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
							Annual rate of increase in 25 preceding years (%)								
Male	---	---	---	1.95	2.08	3.16	1.61	2.31	3.05	1.03	2.76	3.52	0.53	2.01	3.69
Female	---	---	---	1.89	2.17	3.38	1.60	2.15	3.31	1.06	2.63	3.17	0.57	2.00	3.55
Both sexes	---	---	---	1.92	2.13	3.30	1.61	2.22	3.21	1.05	2.69	3.30	0.55	2.00	3.60

SOURCE: UN (2005), *World Population Prospects. The 2004 Revision* (own calculations)

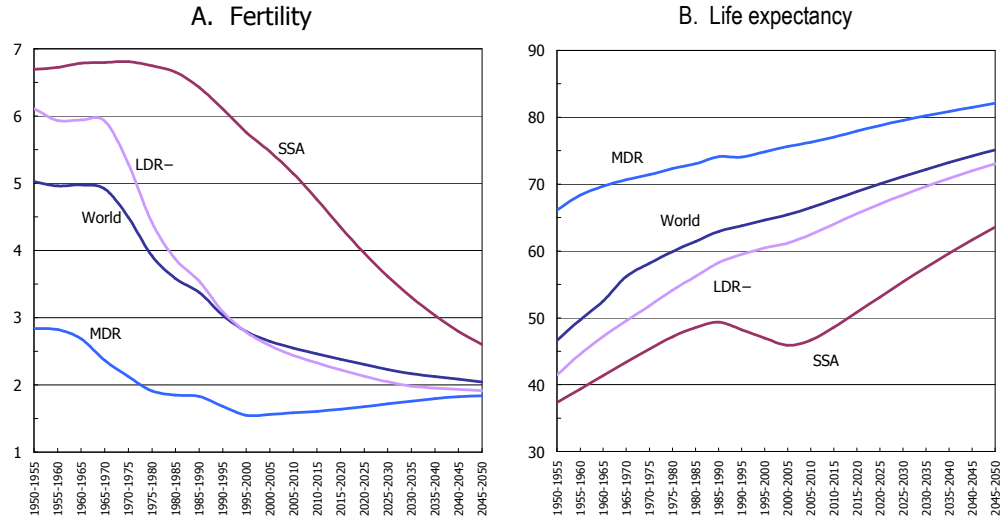
- ***Different evolutions in mortality and fertility***

Let us return for a moment to the observation that the way in which proportions of elderly increase differs between regions (figure 1.1). As said, the age structure of a population (and as such also its proportion of older people) is determined by fertility and mortality. Figure 1.2 shows their evolution from 1950 to 2050; total fertility rate is shown for fertility and life expectancy for mortality.

Both total fertility rate and life expectancy indicate a convergence of their levels. By 2050, TFR-levels will be close to 2 children (only SSA will still show a higher number). Likewise, life expectancies seem to converge to the level of the more developed regions. The simultaneous convergence — coinciding with patterns of declining fertility

rates and increasing levels of life expectancy — explains the increase in the proportions of elderly observed in all regions. At the same time however, despite the convergence, fertility and levels of life expectancy continue to show important differences; this is especially true in the case of life expectancy. The differences that continue to exist in the levels of fertility and mortality are the cause (or explanation?) for the differences in the increase in the proportions of older people between regions.

Figure 1.2 — Evolution of fertility (TFR, total fertility rate or average no. of children per woman) and of life expectancy at birth, both sexes (in years), 1950-2050, world and selected regions



SOURCE: UN (2005), *World Population Prospects. The 2004 Revision* (own adaptation)

Moreover, changes in mortality and fertility do not occur simultaneously. As a result, the way they may affect the proportion of elderly in the population is likely to be different. A specific objective of paragraph 3.2 will be to assess the relative impact of each. It can already be hypothesized now that the important regional differences in fertility at the 'starting point' must be largely responsible for the differences in the changes in the proportions of older people thereafter. A drop from a TFR of 6.69 to 2.60 (SSA) is bound to have a different effect on the population age structure than a drop from 2.84 to 1.84 (MDR).

- ***Some cautionary remarks with respect to future trends***

Before continuing our exploration it must be noted that part of the data shown in figure 1.2 are based on assumptions; only the data for the years 1950-2005 are based on observed estimates. In other words, there is no guarantee that, for example, sub-Saharan countries will by 2050 experience a fertility level of only 2.60 children. Assumptions concerning future developments are therefore regularly adjusted taking into account the most recent trends. This is the precise reason for reproducing the *World Population Prospects* biannually.

The assumptions regarding the evolution of mortality, fertility (and at individual country level migration) that are eventually used in the population projections will be highly responsible for the future size and structure of the world population. The data of figure 1.2 indicate three critical areas in this respect. Any slower decline in fertility rates will eventually imply that world population growth will last longer than what is currently believed; it would imply that world population eventually stabilizes at more than 9 or even 10 billion individuals (as estimated on the basis of long-range projections: see above). Many demographers are also quite pessimistic whether the low fertility rates for the more developed regions will increase as assumed. These low rates are mainly the result of exceptionally low rates (below replacement level) in many European countries. They are associated with what has become known as the 'second demographic transition' (Lesthaeghe and Van de Kaa, 1986; van de Kaa, 1987). At around 2005, 12 of the 27 EU members (44%) still experienced a TFR of less than 1.3; only 6 had a TFR of more than 1.7 (UN Pop. Division, 2005). In the light of these observations it is rather doubtful whether, by 2050, the EU countries will attain, on average, a TFR of 1.85 children [7].

The third assumption that can be a subject of criticism is the increase in the life expectancy for the countries of sub-Saharan Africa. The curve in figure 1.2 shows a clear regression for the years 1985-2010. This pattern stems of course from effects of the AIDS pandemic. Precise and reliable estimates are unavailable. However, in some eastern and southern African countries the HIV prevalence rate among women aged 15-49 would be no less than 20 to 40 percent (UNFPA, 2007) [8].

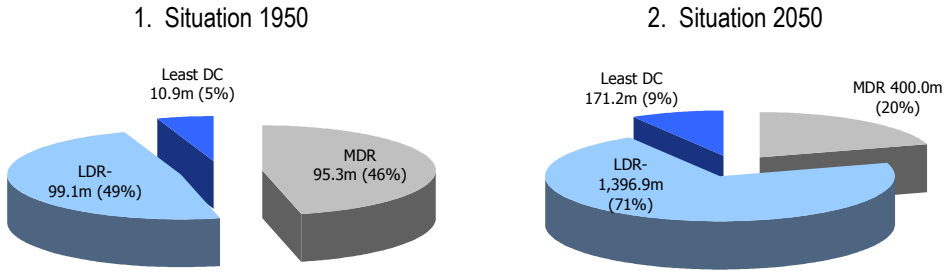
A key question here is to what extent it is realistic to assume that the AIDS pandemic could be 'under control' by 2010. A reason for optimism is that some breakthroughs have occurred in recent years in treatment for HIV patients (WHO, 2007). However, there can be no guarantee that the increase in life expectancy will resume after 2010 at a pace similar to the one that was observed in the 20th century i.e., an improvement of about 4 months every year.

The high levels of life expectancy that have been reached in many western European countries and Japan during the 20th century have been the subject of much research and have given rise to speculation about the theoretical limit of longevity. By and large, researchers accept the possibility of further increases, and indeed life expectancies of 90, 95 years or even higher by the year 2050 are considered to be quite plausible (Vaupel and Lundström, 1994). We will return to this issue in paragraph 5.1xx.

- ***A majority of elderly in the less developed regions***

Because of the high proportions of elderly in more developed regions, there is a popular belief that 'population ageing' is fairly limited to the industrialised countries. That this is a mistake is already obvious from the data in figure 1.1. However, even less known is the fact that the majority of older people live in the less developed regions. This is not a new development and was already the case in fact in the 1950s (figure 1.3).

Figure 1.3 — Distribution of elderly in the world, by major region, as observed in 1950 and projected in 2050 (sizes given in millions)



SOURCE: UN (2005), *World Population Prospects. The 2004 Revision* (own adaptation)

In 1950 already, of the 205 million elderly in the world, a majority (54%) lived in the less developed regions (of which slightly over one tenth lived in the least developed regions). By 2050 no less than 80 percent of all persons aged 60 and more in the world will reside in the less developed regions (by that time its share in the least developed regions will have increased to 12%).

In other words, in a couple of more decades, the great majority of older persons in the

world will live in the poorer countries in the 'South' i.e., in those countries in which social protection systems are usually restricted to very few members of the society, very often inadequate, or simply nonexistent [9].

3. More about the regional differences

It is already clear that the changes in mortality and fertility must play an important part in the increase of elderly. The next sub-paragraph investigates what the relative impact is of each and how this impact may differ between regions.

Other aspects of 'population ageing' that will be treated in this paragraph are the observation that population age structures (or age pyramids) are gradually becoming uniform and the fact that high percentages of 'oldest old' remain thus far a singular characteristic of the more developed regions. In other words, not only in economic or social terms, through, among others, the internet, the world is becoming a 'global village', but also from a demographic perspective.

4. The relative impact of changes in fertility on the proportions of elderly

The reason for assessing the relative impact of fertility on the increase of the proportion of older persons stems from the observation that, especially in the European context, policy makers as well as the media often associate 'population ageing' with low fertility. See, for example, in the 'green paper' entitled "Confronting demographic change: a new solidarity between the generations", issued by the Commission of the European Communities in 2005 [10]. As will be seen below, for most countries (although not for the European countries) a fertility decline is indeed the main 'motor' for the increase in the proportion of older people in their population. But this is the short view. For countries with high levels of life expectancy (such as the European countries) mortality is the main cause of 'population ageing'. This finding is not new: it has already been demonstrated by Calot and Sardon (1999) using theoretical models. The simulation exercise applied here is a more intuitive approach.

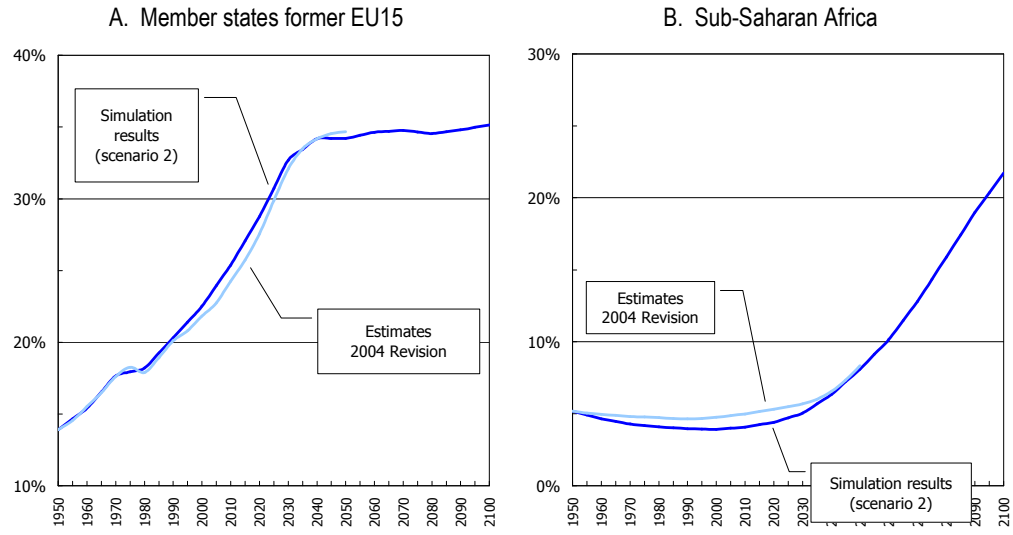
As it turned out, the results provide some indices which are useful in identifying the stage that has been reached in the 'demographic transition'. The importance of the 'demographic transition' within the context of 'population ageing' will be discussed further in paragraph 6xx.

The simulation exercises consist of (a) projecting a population from 1950 to the year 2100 while assuming changing life expectancies but keeping fertility constant at its initial level (scenario 1); and (b) repeating this projection but this time with changing

levels in mortality *and* fertility (scenario 2). The 'base-line' population corresponds to the age population structure as observed in 1950.

The projections are 'simplified' projections in the sense that, where applicable, the changes in life expectancy and fertility follow a linear trend. The 'pivotal' years are given in table 1.2. In spite of this simplified approach, the proportions of elderly resulting from scenario 2 closely follow the proportions available in the *2004 Revision* for the years 1950-2050 (figure 1.4).

Figure 1.4 — Evolution of the proportion of older people: comparison between estimates of the *2004 Revision* and results of scenario 2 of the simulation exercises. Two examples: members of the former EU15 and countries of sub-Saharan Africa.



NOTE: Use of different scale between panels.

All projections have been carried out with the use of the application 'PROJCT' of the demographic software MORTPAK developed by the UN Population Division [11].

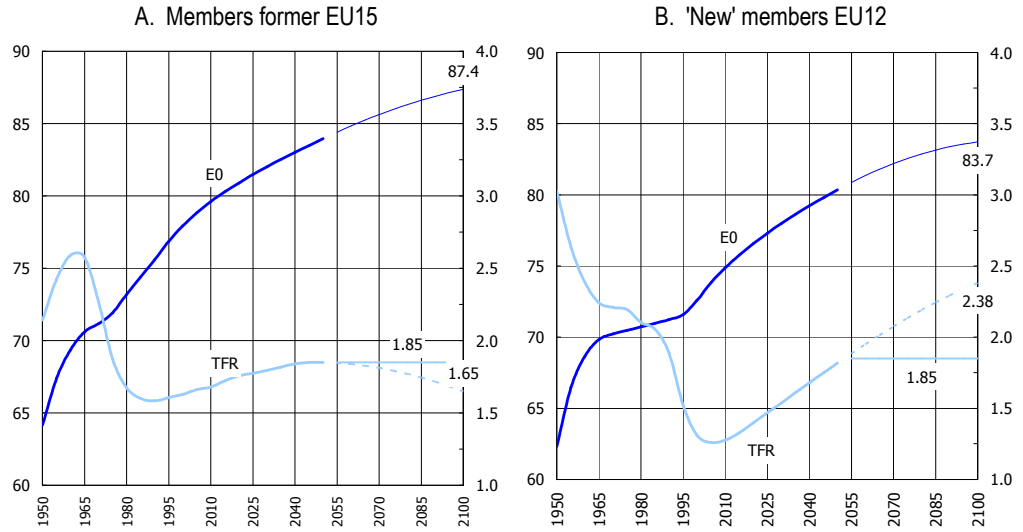
Making the projections until the year 2100 demanded an extrapolation of the levels of life expectancy and fertility (the World Population Prospects provide only data until 2050). This was basically done on the basis of a graphical extrapolation. Examples for the extrapolation are given in figure 1.5, which includes the data for the two groups of EU member states. There were however some constraints. The first constraint was a deceleration in the increases in life expectancy for the years 2050-2100. The second constraint was to impose a limit on the level of fertility. For the low-fertility countries

(such as the European countries), the limit was a TFR of 1.85 children. For the high-fertility countries (such as the African countries) the limit was 2.1 children.

The numerical results of the simulation exercises are given in table 1.2. Table 2.1 does not include the results for all countries; for some, the results are used in figure 1.7 further below [12].

In addition to the assumptions regarding mortality and fertility and the proportions of elderly as estimated with scenarios 1 and 2, table 1.2 includes two rows of 'indices'.

Figure 1.5 — Assumptions re the evolution of mortality (life expectancy, both sexes, in years, left axis) and fertility (TFR, right axis) as used in the simulation exercises. Two examples: members former EU15, and 'new' members EU12.



SOURCE (data years years 1950-2050): UN (2005), *World Population Prospects. The 2004 Revision*

The first index corresponds to the ratio of the proportions obtained with scenario 2 over those obtained with scenario 1, and as such, can be interpreted as the 'extra' impact of fertility over mortality. The second index indicates the relative change (in %) in the proportions (obtained with scenario 2) with 10 years earlier. Both are displayed in figure 1.7. But before turning to figure 1.7, let us comment the results in figure 1.6.

Figure 1.6 presents the proportions of persons aged 60 and more as obtained with scenarios 1 and 2. The figure includes the results for the members of the former EU15 (panel A) and the countries that make up sub-Saharan Africa (panel B). Both groups of countries may be viewed representing the two most extreme situations with regard to

Table 1.2. — Scenarios and results simulation exercises for several groups of countries and some individual countries

More Developed Regions (MDR)	1950	1960	1970	1980	1990	2000	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100
A. Scenarios (changes in mortality and fertility)																
Mortality E0 - Male	61.48	66.10		68.96		71.50					79.13					83.26
E0 - Female	66.11	71.75		76.26		78.93					85.03					90.61
Fertility TFR	2.85	2.75		1.88		1.56					1.85					1.85
B. Results: percentage of persons aged 60 and more																
(a) Changes in mortality alone	11.73	12.48	14.00	14.21	14.96	15.35	15.38	16.23	16.63	17.11	17.93	18.54	18.98	19.56	19.88	20.04
(b) Changes in both mortality *and* fertility	11.73	12.79	14.91	16.19	17.96	20.04	22.45	26.61	29.93	31.87	33.54	34.00	33.83	34.05	34.28	34.56
(c) With TFR = 2.1 by 2100												33.95	33.65	33.63	33.47	33.18
C. Indices																
Impact of change in fertility (or b/a)	---	1.03	1.06	1.14	1.20	1.31	1.46	1.64	1.80	1.86	1.87	1.83	1.78	1.74	1.72	1.73
Tempo (% change with 10 years earlier)	---	9.06	16.51	8.63	10.90	11.60	12.00	18.56	12.48	6.48	5.24	1.35	-0.49	0.65	0.68	0.83

Less Developed Regions (LDR)- (without Least Dev. Countries)	1950	1960	1970	1980	1990	2000	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100
A. Scenarios (changes in mortality and fertility)																
Mortality E0 - Male	37.89	45.32				59.16		64.52			70.94					77.51
E0 - Female	38.78	46.49				62.54		68.11			75.22					81.92
Fertility TFR	6.28	5.94				2.68		2.18			1.92					1.92
B. Results: percentage of persons aged 60 and more																
(a) Changes in mortality alone	6.58	6.06	5.75	5.37	5.06	4.81	4.52	4.78	4.79	4.83	4.97	5.08	5.16	5.27	5.38	5.50
(b) Changes in both mortality *and* fertility	6.58	6.10	5.98	5.99	6.31	7.11	8.23	10.96	13.70	16.69	20.02	22.40	24.34	26.00	27.20	28.43
(c) With TFR = 2.1 by 2100												22.38	24.23	25.74	26.68	27.51
C. Indices																
Impact of change in fertility (or b/a)	---	1.01	1.04	1.11	1.25	1.48	1.82	2.30	2.86	3.46	4.03	4.41	4.71	4.94	5.06	5.17
Tempo (% change with 10 years earlier)	---	-7.25	-2.00	0.09	5.38	12.67	15.77	33.18	25.00	21.83	19.93	11.89	8.64	6.83	4.63	4.52

Sub-Saharan Africa	1950	1960	1970	1980	1990	2000	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100
A. Scenarios (changes in mortality and fertility)																
Mortality E0 - Male	34.09		42.83	46.25		45.42	47.16				62.23		69.88	72.20		74.79
E0 - Female	36.67		45.92	49.52		47.46	48.08				64.94		72.06	74.46		77.13
Fertility TFR	6.66		6.80	6.70		5.61	4.95				2.55		2.12	2.10		2.10
B. Results: percentage of persons aged 60 and more																
(a) Changes in mortality alone	5.19	4.68	4.36	4.20	4.03	3.87	3.81	3.80	3.88	4.05	4.21	4.32	4.44	4.45	4.62	4.73
(b) Changes in both mortality *and* fertility	5.19	4.66	4.28	4.09	3.97	3.92	4.08	4.41	5.04	6.33	8.11	10.16	12.81	15.88	18.98	21.72
(c) With TFR = 2.1 by 2100												---	---	---	---	---
C. Indices																
Impact of change in fertility (or b/a)	---	0.99	0.98	0.97	0.98	1.01	1.07	1.16	1.30	1.56	1.93	2.35	2.88	3.57	4.11	4.59
Tempo (% change with 10 years earlier)	---	-10.29	-8.09	-4.39	-2.99	-1.30	4.02	8.22	14.25	25.64	28.01	25.26	26.14	23.96	19.51	14.43

Table 1.2. — *Continued*

Member States former EU15		1950	1960	1970	1980	1990	2000	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100
		A. Scenarios (changes in mortality and fertility)															
Mortality	E0 - Male	61.10	66.85	68.02	69.79			76.71				81.30					84.46
	E0 - Female	66.70	71.85	74.15	76.51			82.58				86.48					90.37
Fertility	TFR	2.14	2.59	2.27	1.67			1.68				1.85					1.85
		B. Results: percentage of persons aged 60 and more															
(a) Changes in mortality alone		13.91	15.65	18.27	18.65	20.33	21.97	23.86	24.68	25.51	26.43	27.16	27.82	28.45	28.95	29.44	29.93
(b) Changes in both mortality *and* fertility		13.91	15.41	17.66	18.21	20.31	22.52	25.39	28.76	32.69	34.19	34.22	34.64	34.76	34.55	34.81	35.14
(c) With TFR = 2.1 by 2100													34.60	34.58	34.13	34.00	33.77
		C. Indices															
Impact of change in fertility (or b/a)		---	0.98	0.97	0.98	1.00	1.02	1.06	1.17	1.28	1.29	1.26	1.25	1.22	1.19	1.18	1.17
Tempo (% change with 10 years earlier)		---	10.80	14.60	3.10	11.54	10.85	12.76	13.30	13.66	4.60	0.07	1.24	0.35	-0.60	0.73	0.97

12 'new' EU Member States		1950	1960	1970	1980	1990	2000	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100
		A. Scenarios (changes in mortality and fertility)															
Mortality	E0 - Male	59.65	65.88			67.40	68.77	71.01				76.82	77.62				80.04
	E0 - Female	65.20	71.17			75.41	77.27	79.01				83.57	84.91				87.55
Fertility	TFR	3.03	2.39			1.89	1.31	1.28				1.82	1.85				1.85
		B. Results: percentage of persons aged 60 and more															
(a) Changes in mortality alone (scenario 1)		9.93	11.39	13.89	13.55	14.48	14.65	13.88	14.73	15.01	15.13	15.77	16.13	16.53	16.97	17.23	17.55
(b) Changes in both mortality *and* fertility (scenario 2)		9.93	11.66	14.85	15.31	17.87	20.39	22.67	27.06	30.08	33.61	37.07	37.74	36.22	34.90	33.82	33.13
(c) With TFR = 2.1 by 2100														36.17	34.67	33.29	32.13
		C. Indices															
Impact of change in fertility (or b/a)		---	1.02	1.07	1.13	1.23	1.39	1.63	1.84	2.00	2.22	2.35	2.34	2.19	2.06	1.96	1.89
Tempo (% change with 10 years earlier)		---	17.36	27.38	3.10	16.73	14.11	11.18	19.35	11.17	11.74	10.30	1.81	-4.03	-3.66	-3.08	-2.04

'population ageing' (cf. figure 1.1).

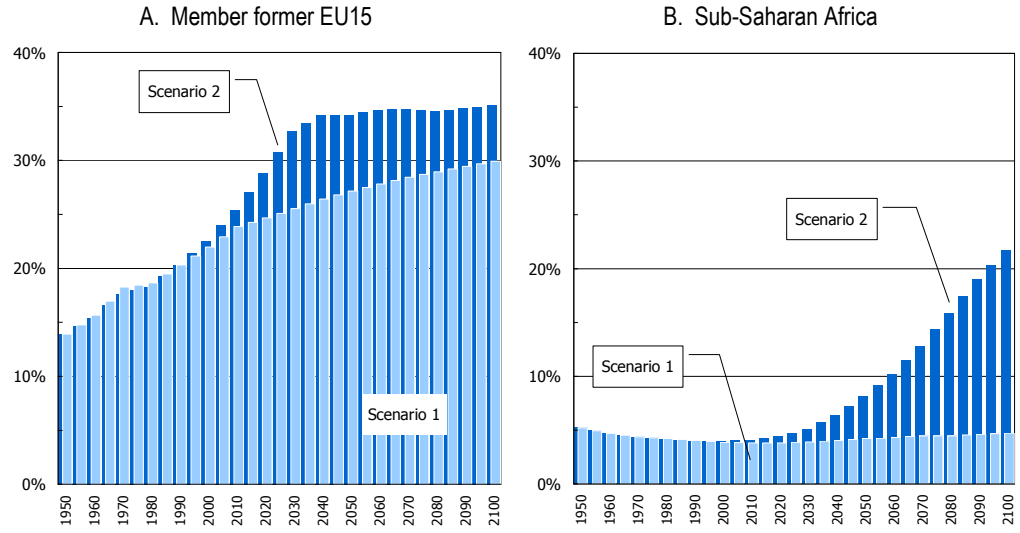
The two groups of countries show striking differences. For the countries of sub-Saharan Africa, the proportions of elderly corresponding to scenario 1 hardly show an increase.

In fact, the highest proportion (5.2%) is observed in 1950. One can only observe a (very) slight increase for the years 2020 to 2100 (from 3.8% to 4.7%). By contrast, changes in mortality alone produce a substantial increase for the European countries, from 13.9 percent in 1950 to 29.9 percent in 2100.

Scenario 2 shows higher proportions of elderly for both groups of countries. There is however a remarkable difference. Whereas the increase may be considered relatively

small for the EU countries (the greatest increase, 29 percent, is observed for 2040), for the sub-Saharan countries the increase attains no less than 306 percent by 2100. The observed trend suggests even higher values after 2100. Such a continued increase is not likely to happen in the European countries. Rather, here one observes a levelling off: by 2010, the increase that results from scenario 2 has declined to no more than 17 percent. (Note that although at a somewhat slower pace than in the first years, the proportions continue to increase in scenario 1)

Figure 1.6 — Results of the simulation exercises: comparison of the proportion of older persons between results from scenarios 1 and 2. Two examples: member states of the former EU15 and countries of sub-Saharan Africa.



NOTE: Changes in mortality and fertility corresponding to scenarios 1 and 2 are described in text above (cf. also figure 1.5). xx

How should one interpret these differences? The sustained increase in the proportion of elderly that is observed for the European countries with scenario 1 is directly related to those countries having reached high levels of life expectancy (cf. figure 1.2). At such levels, any additional gain in life expectancy is greatly the result of increased survival after age 60 (and not a reduction in child mortality which is indeed the most important factor at lower levels of life expectancy such as those still experienced by, for example, the sub-Saharan countries); we will return to this issue in paragraph 5.1xx. The decline in fertility of the 1960s, directly after the 'baby-boom' years of the 1950s (see figure 1.5), has, as is shown with the results of scenario 2, only a limited effect. For the

European countries, the 'motor' of 'population ageing' is clearly the continued increases in life expectancy.

Also note that a fertility rate of 2.1 children would lower the proportion of elderly only slightly; in 2100 the difference would be no more than 1.4 percentage points.

The situation is entirely different in the countries of sub-Saharan Africa. In spite of a rapid increase, even by 2100 SSA countries will experience levels of life expectancy that will still be lower than those of the European countries (the simulation exercise is based on a life expectancy of 76 years for both sexes, by 2100; a whole 11 years less than the life expectancy for the EU15). At such levels, an increase in life expectancy is not immediately 'translated' into higher proportions of older people. Here, as is shown with the results of scenario 2, the real 'motor' of 'population ageing' is fertility decline. The smaller number of children produces a shift in the age structure. The high numbers of population in the older age groups, which are the result of high fertility rates, are no longer replaced because of lower fertility rates. As result the number of older people (those aged 60 and more) is progressively gaining more 'weight' in the age structure.

Let us now turn to the two series of indices. Each series is presented in figure 1.7. Less developed and more developed regions show specific patterns.

The pattern of change in the first series — the relative impact of fertility over mortality — is best understood by re-ordering the values into three periods: 1950/60-2000, 2000-2050, 2050-2100.

For less developed regions, the first period shows a slow start i.e., the impact of fertility is growing slowly; the second period is a period of acceleration; in the third and last period the impact of fertility is weakening. The sub-Saharan countries would follow a similar pattern, but with a time lag of about 50 years (which would be consistent with the late onset of fertility decline as shown in figure 1.2).

The more developed regions show a somewhat similar pattern, of slow growth in the first period and acceleration in the second period. However, in the third period there is a clear deceleration, suggesting that, eventually, the impact of fertility could disappear altogether. The other major difference is that the effect of fertility is by all means much smaller for the more developed than the less developed regions (to such an extent that is was judged appropriate to use different scales).

The important differences between the groups EU15 and EU12 would stem from the differences in fertility decline (cf. figure 1.5). Only for the EU15 is there a clear 'baby-boom' pattern and the decline afterwards is much less pronounced than the one observed for the EU12, not just in relative terms (54% vs 42% [13]), but also in absolute

terms: the lowest levels (TFR values of below 1.3) have been observed for the EU12 countries.

Another explanation for the differences between the EU15 and EU12 is that the latter show lower life expectancies. Already in the years following the Second World War eastern European countries experienced lower levels of life expectancy than the countries in Western Europe [14]. However, a major cause for the differences throughout the 21st century would be related to the collapse of the health care systems that many 'countries with economies in transition' have experienced in the aftermath of the ending of their communist regimes. The collapse of the health care systems would indeed be the cause for the stagnation (and in some countries even the regression) in the improvement in life expectancy (cf. figure 1.5). These events are well-known and have been described elsewhere (for a summary, see Schoenmaeckers, 2004). A remarkable observation is that the failure of the health care system would have had a more serious impact on men than on women. The explanation would be that men suffered more from social isolation than women (Bobak, 1999).

5. Specific issues relating to 'ageing' in less developed regions

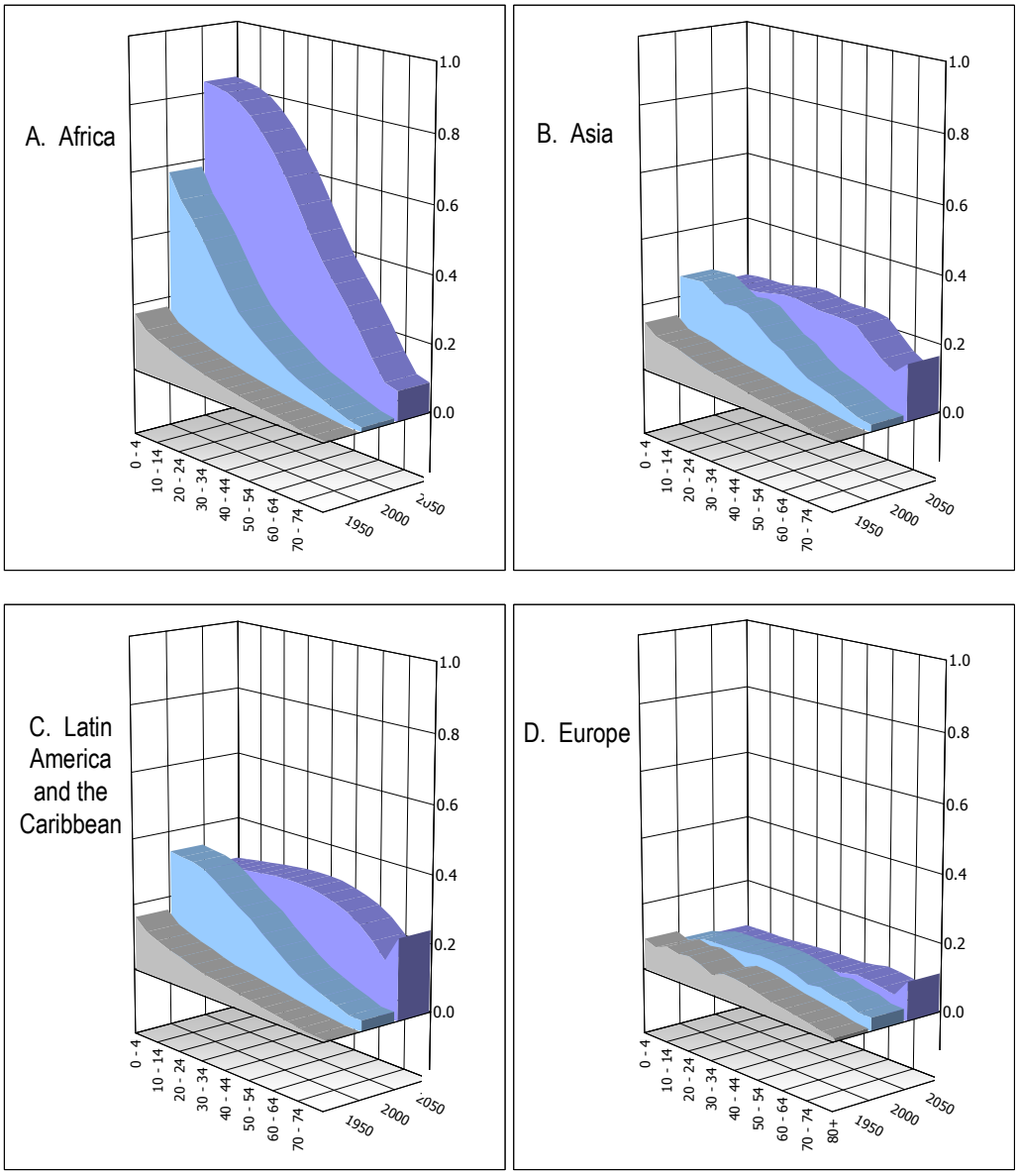
In more developed regions the increase in the proportion of older people is primarily the result of increased life expectancy. In less developed regions its principal cause is fertility decline. Other developments, one demographic and two social, warrant attention in discussion on 'population ageing' in less developed countries.

The first (demographic) development is that less developed regions will continue to be confronted with the problem of rapid population growth. This pattern is consistent with the observation made in paragraph 1 that, in spite of fertility decline, the size of the world population will continue to grow for the next 150-200 years. As may be expected, most of this growth is confined to the less developed regions.

5.1. Continued rapid population growth

Figure 1.9 gives an overview of the changes in the age structure for Africa, Asia, Latin American and the Caribbean, and Europe between 1950 and 2050. A particularity of figure 1.9 is that the 'planes' which represent the age structure [15] are scaled to the population size in 1950. The use of planes allows to fully grasp the changes in age structure and in population size at the same time.

Figure 1.9 —Population age structure in 1950, 2000, and 2050, with relative values scaled to total population size (ref =1950 =1), selected continents



SOURCE: UN (2005), *UN Population Prospects. The 2004 Revision* (own adaptation)

A look at figure 1.9 shows that Africa will experience the highest population increase. Indeed, between 1950 and 2050 its population will multiply by no less than 9, leading

to a total population size of 1.9bn (more precise values are given in table 1.3, which also includes data for Northern America and Oceania). Most of this increase (66%) occurs between 2000 and 2050.

Although the rates of increase are more modest, between 2000 and 2050, the populations of Asia and Latin America and the Caribbean will increase by about 50 percent. For Asia this represents a numerical increase of 1.4bn people (242m for Latin America and the Caribbean).

Europe is the only continent where the population increase appears negligible. Indeed, between 2000 and 2050 Europe's population will decrease by about 10 percent (note that 70% of the decrease will happen after 2025). This decrease is of course a consequence of the fact that fertility rates will remain below replacement (cf. figure 1.5).

Figure 1.9 also shows the differences in the changing age structures between the continents. By 2050 Africa is the only continent to still have a broad base in its age structure, a clear remnant of high levels of fertility. By 2050, both Asia and Latin America and the Caribbean will have a more 'flat' age structure — the classical age 'pyramid', still fairly present in 2000, will by that time have disappeared. Both in Asia and in Latin America and the Caribbean, fertility decline will have lead to a decrease in the numbers of younger people, by 177m in Asia and by 30m in Latin America and the Caribbean. However, in spite of this decline, in both continents the age group 0–19 year still represents one quarter of the population and for Asia it corresponds to no less than 1.3bn people.

In Africa, between 2000 and 2050 the number of young people will increase by 298m, bringing it to a total of 734m, still representing 38 percent of the population. Note, however, that, because of a decrease in fertility the increase is smaller than between 1950 and 2000.

In all three continents, the numbers of older people are rising rapidly and the increases are accelerating. Even in Africa, where by 2050 older people will represent not more than 10 percent of the population, their *number* will nearly quintuple. Both in Asia and in Latin America, by 2050 older people will represent about 25 percent of the population; in Asia this percentage includes 1.2bn individuals. As seen in figure 1.3, by 2050, the majority of older people will reside in the less developed regions.

The changes in the age structure and the increases in the numbers that accompany the changes represent enormous challenges. These challenges span various domains since they include looking for solutions to specific needs for each age group. There will be the need for more schooling facilities and better medical care; for more job

opportunities (with the exception of Europe, in all continents the numbers of people at working age will increase); for older people, there will be the need for more social security and the development of specific health care services.

Finally, the data in table 1.3 reveal that the numbers of 'oldest old' — those aged 80 and more — are increasing more rapidly that the group aged 60 and more. The process is referred to as 'double ageing'. Although, as can be derived from table 1.3, the process is universal (being part of 'population ageing'), so far only in more developed regions it resulted in a significant rise in the proportions of 'oldest old'. The reason is that the proportion is especially sensitive to the level of life expectancy.

- ***Important proportions of 'oldest old': thus far a characteristic limited to the more developed regions***

Table 1.3 shows that by 2050 the proportion of 'oldest old' in Europe will have risen to 10.1 percent of the population and in North America to 7.9 percent. In all other continents the proportions will remain below 5.3 percent (in Africa it will be 1%).

As said before (paragraph 5.1xx) when life expectancies are already high, the main cause for further improvements is an increase in survival at higher ages. The pattern is evident from recent observations for the members of the former EU15 (which together with Japan enjoy the highest levels of life expectancy). Statistics from the Council of Europe (CoE, 2003) show increases for the period 1980–1995 in life expectancy *at birth* by 4.5 percent and *at age 65* by no less than 12.3 percent (median values between 15 member states). The *2004 Revision* assumes an even more optimistic evolution for the next 50 years. Between 2005 and 2050 life expectancy at birth would, on 'average', increase by 6 percent while life expectancy at age 65 by 17 percent, giving an E0 of 84 years and an E65 of 21 years for 2050 (implying that about one quarter of one's life time occurs after age 65). These prospects are quite optimistic; however, they are in line with long-term observations (see, for example, Caselli and Lopez, 1996; Schofield et al., 1991; Vallin, 1989;); they also correspond to the insight and conclusions of specific research on the subject of longevity (see, for example, Coale, 1996; Horiuchi and Wilmoth, 1998; Vaupel and Lundström, 1994) [16].

The 'oldest old' constitute a particular group of older people with specific needs and social-demographic characteristics (Schoenmaeckers, 2004). Many 'oldest old' (far much more than 60- to 70-year olds) have a frail constitution; a majority are women (who live alone); and after age 80 many persons may decide to live in a nursing home (Lodewijckx and Jacobs, 2002). As may be expected, the situation of the 'oldest old' is receiving special attention from policy makers and the research community.

Table 1.3. — Total population size and numbers by broad age groups, by continent, years 1950, 2000, and 2050

Continent	All ages	0-19	20-59	60+	80+	All ages	0-19	20-59	60+	80+	All ages	0-19	20-59	60+	80+
	A. Absolute numbers (in millions) on top row and relative values (italics, in %) on bottom row														
	1950					2000					2050				
Africa	224.1	116.7	95.6	11.8	0.6	811.7	436.2	334.7	41.6	2.9	1,929.4	734.4	1,009.7	192.9	20.1
	100.0	*52.1*	*42.6*	*5.3*	*0.3*	*100.0*	*53.7*	*41.2*	*5.1*	*0.4*	*100.0*	*38.1*	*52.3*	*10.0*	*1.0*
Asia	1,396.3	649.8	651.9	94.5	4.4	3,665.4	1,453.6	1,899.7	322.4	30.0	5,112.3	1,276.2	2,709.8	1,231.2	234.9
	100.0	*46.5*	*46.7*	*6.8*	*0.3*	*100.0*	*39.7*	*51.8*	*8.8*	*0.8*	*100.0*	*25.0*	*53.0*	*24.1*	*4.6*
Europe	547.4	189.3	291.8	66.3	6.1	717.9	178.4	402.3	147.7	21.4	618.8	131.2	296.7	225.4	62.8
	100.0	*34.6*	*53.3*	*12.1*	*1.1*	*100.0*	*24.9*	*56.0*	*20.6*	*3.0*	*100.0*	*21.2*	*48.0*	*36.4*	*10.1*
Lat. America/ Caribbean	167.3	83.3	74.1	10.0	0.7	520.8	220.0	260.6	42.3	5.2	762.5	190.5	403.8	188.7	40.3
	100.0	*49.8*	*44.3*	*6.0*	*0.4*	*100.0*	*42.2*	*50.0*	*8.1*	*1.0*	*100.0*	*25.0*	*53.0*	*24.7*	*5.3*
N. America	171.6	59.0	91.3	21.3	2.0	310.4	89.3	174.6	51.1	10.1	418.8	100.9	219.0	118.1	33.0
	100.0	*34.4*	*53.2*	*12.4*	*1.1*	*100.0*	*28.8*	*56.2*	*16.5*	*3.2*	*100.0*	*24.1*	*52.3*	*28.2*	*7.9*
Oceania	13.0	4.9	6.8	1.4	0.1	30.7	10.9	16.2	3.7	0.5	46.2	11.8	24.7	11.0	2.4
	100.0	*37.7*	*51.9*	*10.5*	*0.8*	*100.0*	*35.5*	*52.9*	*12.2*	*1.6*	*100.0*	*25.5*	*53.5*	*23.7*	*5.2*
	B. Increases in absolute number on top row, and multiplier (in italics) on bottom row														
	1950-2000					2000-2050					1950-2050				
Africa	587.6	319.5	239.2	29.7	2.3	1,117.7	298.2	674.9	151.3	17.2	1,705.3	617.7	914.1	181.1	19.5
	3.62	*3.74*	*3.50*	*3.51*	*4.88*	*2.38*	*1.68*	*3.02*	*4.64*	*6.90*	*8.61*	*6.29*	*10.57*	*16.30*	*33.64*
Asia	2,269.1	803.8	1,247.8	227.9	25.6	1,446.9	-177.4	810.0	908.8	204.9	3,716.1	626.4	2,057.8	1,136.7	230.5
	2.63	*2.24*	*2.91*	*3.41*	*6.85*	*1.39*	*0.88*	*1.43*	*3.82*	*7.84*	*3.66*	*1.96*	*4.16*	*13.03*	*53.69*
Europe	170.5	-10.8	110.5	81.4	15.3	-99.1	-47.2	-105.6	77.6	41.4	71.4	-58.1	4.9	159.0	56.7
	1.31	*0.94*	*1.38*	*2.23*	*3.52*	*0.86*	*0.74*	*0.74*	*1.53*	*2.93*	*1.13*	*0.69*	*1.02*	*3.40*	*10.33*
Lat. America/ Caribbean	353.5	136.7	186.5	32.4	4.6	241.7	-29.6	143.2	146.3	35.1	595.2	107.1	329.7	178.7	39.7
	3.11	*2.64*	*3.52*	*4.25*	*7.98*	*1.46*	*0.87*	*1.55*	*4.46*	*7.70*	*4.56*	*2.29*	*5.45*	*18.94*	*61.50*
N. America	138.8	30.3	83.2	29.8	8.1	108.4	11.6	44.4	67.0	23.0	247.2	41.9	127.6	96.8	31.1
	1.81	*1.51*	*1.91*	*2.40*	*5.16*	*1.35*	*1.13*	*1.25*	*2.31*	*3.28*	*2.44*	*1.71*	*2.40*	*5.55*	*16.93*
Oceania	17.6	6.0	9.5	2.4	0.4	15.5	0.9	8.5	7.2	1.9	33.2	6.9	18.0	9.6	2.3
	2.35	*2.21*	*2.40*	*2.75*	*4.42*	*1.51*	*1.08*	*1.52*	*2.93*	*5.00*	*3.54*	*2.40*	*3.66*	*8.04*	*22.12*

SOURCE: UN (2005), *UN Population Prospects. The 2004 Revision* (own adaptation)

At present the 'oldest old' already represent 17 percent of all old people in Europe. By 2050 they will represent 28 percent. As of 2050, more and more countries in less developed regions will start facing similar situations.

5.2. 'Population ageing' and poverty

The population numbers and simulation exercises presented above should not let us forget that 'population ageing' entails many social and economic issues. Some have already been touched upon in pointing at the special needs of the 'oldest old'.

Most population ageing issues are included as special themes in the United Nation's International Plan of Action on Ageing (see further paragraph 7xx and chapter xx). They differ widely between areas and regions and many of the issues have been the subject of much research [17]. In the more developed countries the issues are generally related to increases in the dependency ratio (see further, figure 1.11) and to its

corollary i.e., the unsustainability of existing social security systems (Schoenmaeckers, 2005; see also CoEC, 2005. In the less developed countries the issues rather emphasize the vulnerability of older persons; in many instances, poverty and a lack of social security provision are key issues. Some of the issues are discussed in other contributions in this publication (chapters xx). Some population ageing issues which are particularly relevant for less developed countries are listed in the following paragraph, although the list is limited to those with a social-demographic component.

- ***The effect of rural-urban migration***

In many less developed countries, rural populations have a tendency to age faster than urban populations (Kinsella, 2001; Marcoux, 1990; Martin and Kinsella, 1994; Skeldon, 1999; Stloukal, 2001) [18]. Based on data in the UN Demographic Yearbook, Stloukal has calculated the ratio between the percentage of persons aged 60 and more in rural over urban areas. (Stloukal, 2001: table 1). For sub-Saharan Africa, the results show a percentage about twice as high for the rural areas (median value between countries). The reason is of course that a large part of the migratory flows is undertaken by younger people looking for better job opportunities in the cities.

One specifically worrisome consequence of rural to urban migration is that older people who are left behind in their ancestral village become socially isolated.

- ***The extra burden of the HIV/AIDS epidemic***

The HIV/AIDS epidemics particularly impact that part in the population that is sexually active [19]. UNFPA's latest *State of the World Reports* give data on the HIV prevalence rate for 15-49-year olds (see, for example, UNFPA, 2007). The impact on the most economically active in the population is of course a threat to economic development. The epidemics also have has also serious social consequences. The effects on family structures are devastating. Persons living with HIV/AIDS are unable to take care of their spouse and children; when they die they leave behind widows, widowers and orphans. Most less developed countries lack the financial reserves and/or the infrastructure to take care of the orphans, which would enable them to continue school attendance and to provide them shelter and food… These gaps often leave the grandparents as the primary care providers to orphaned and vulnerable grandchildren.

As already mentioned in paragraph 2, the AIDS epidemics and the excess mortality of adults cause a severe drop in life expectancy. The countries with the highest estimates for HIV prevalence rate, Botswana, Lesotho and Swaziland (UNFPA, 2007) [20], would, according to the *2004 Revision*, experience life expectancies in the coming 20-25 years that are 14-20 years below the (already low) African average (cf. figure 1.2). This

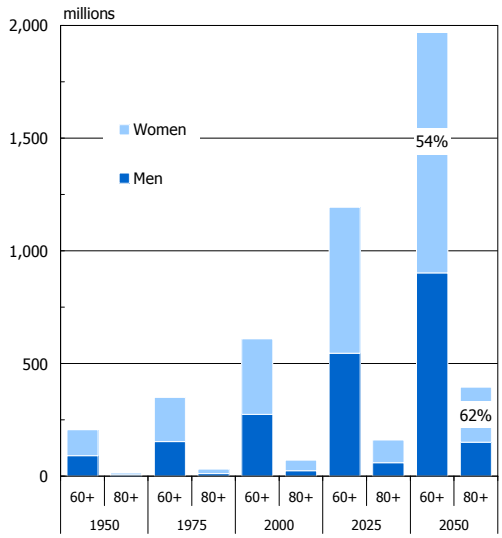
prospect is fairly disturbing, especially when taking into account that until 1995-2000 all three countries enjoyed above average life expectancy.

- ***The old poor: a predominantly women's world***

It is well known that women outlive men. According to the *2004 Revision*, at around the turn of the century, the difference in life expectancy was about 7.4 years in the more developed regions (79.31 v 71.91) and 3.5 years in the less developed regions (65.19 v 61.71). It is therefore no surprise to observe that the majority of older people are women [21]. This difference is especially the case in the 'oldest old': in 2050 no less than 62 percent in the 'oldest old' will be women (figure 1.10).

Figure 1.10 — Observed and prospected evolution of the number of older people in the world, by age group and sex

SOURCE: UN (2005), *UN Population Prospects. The 2004 Revision* (own adaptation



Women 'age' differently from men and their social position in later life varies greatly between regions and countries. Women's position as an 'older' person depends to a large extent on their position in society in general. In the more developed countries, although gender discrimination is still prevalent (e.g., on average, salaries of women are less than those of men, women are underrepresented in legislature, ...) it must be recognized that the social position of women has improved greatly compared to the start of the 20th century when they were still claiming for the right to vote. At present, older women's position largely depends on individual characteristics, rather than on being female (see, for example, Vanderleyden and Dooghe, 1993). It has already been mentioned before that many people may decide to move to a nursing home after age

80. This pattern is true for both men and women. The decision to relocate or not would depend largely on whether one is living alone (single, widowed) or (still) living with one's partner or other relatives (persons living alone decide to move to a nursing home earlier in life). The pattern can be observed in recent Belgian data (Lodewijckx, 2006) and may be general [22].

The situation is far different in many less developed countries, where women, especially older women, are very often still second rank citizens. In communities where traditions still prevail, the social life of a woman may end with the death of her husband. In some societies tradition will prohibit her from remarrying; in others she will remarry automatically — with or without her consent — become the (second) wife of her late husband's brother (see, for example, Maitse and Majake, 2005).

It would be wrong, however, to view this situation as typical of 'women's situation' in less developed countries. Rather, the situation is common in poor and underdeveloped communities, where older people, not only older women, are especially vulnerable. Moreover, a real cause of the problem may not always be traditional lifestyles. Indeed, as the following excerpt suggests, it may often be 'modernisation' rather than 'traditionalism' that contributes to elder abuse:

> "The reasons proposed by older people for the level and extent of abuse perpetrated against them is strongly aligned to the traditional nature of South Africa society. Poverty, unemployment and the subsequent use of alcohol and drugs are viewed as root cause of abuse. The increasing westernisation of society, the loss of traditional values, and the breakdown of family structures that brings with it disrespect and disregard for older persons are also blamed for the increasing levels of abuse."
>
> (Priscilla Reddy, 2002, on the situation of older people in South Africa, Box 2.7)

It should be clear that improving the position of elderly people cannot be achieved without major changes in all layers of society — economic, political, cultural and social. Any solution will be closely linked to the realisation of the *UN Millennium Development Goals*, especially the first objective which is to eradicate extreme poverty [23]. In a world where in the foreseeable future close to one third of the population will be aged 60 and more (cf. figure 1.1), one concrete pillar would be to establish adequate social protection schemes for elderly. An apparent fairly difficult task, considering that in many less developed countries pension schemes are simply non-existent or are limited to only a minority of the population (usually civil servants); and that in more developed countries existing schemes are viewed as becoming unsustainable.

6. 'Population ageing': the last leg of the 'demographic transition'?

The 'demographic transition' refers to the transition of a demographic regime characterised by high mortality and high fertility to a regime characterised by low mortality and low fertility (see, for example, the classic work by Chenais, 1986, on the subject).

The high population growth that the world has witnessed in the second half of the 20th century (corresponding to a doubling of the population size after 35 years) is an unprecedented phenomenon in history. For centuries, the world population increased at a (very) slow rate. Some 2000 years ago [24], world population is estimated to have been at around 300 million. At around 1000 A.D. it would have increased to no more than 310 million. This very slow growth was the result of a 'natural' balance between high fertility and high mortality. Things started to change thereafter. By 1800, world population size had increased to about 1 billion; and after another 120 years, at the beginning of the 20th century, it had increased to 2 billion…

However, the high population growth — the 'population explosion' — that the world experienced in the 20th century was mainly confined to the less developed countries. During the same period, more developed countries experienced moderate growth rates of their population. To understand the moderate growth rates of the developed countries one needs to go back about two centuries. At around the same time of the Industrial Revolution, towards the end of the 18th century and the beginning of the 19th century, the demographic regimes of European countries underwent serious changes. As a result of the Industrial Revolution mortality rates had started to decline and eventually fertility had also started to decline. The changes from demographic regimes characterised by high levels of mortality and fertility to low levels of mortality and fertility have become known as the 'demographic transition'. The term refers to the start of a new demographic balance.

Warren S. Thompson (1929) was the first to elaborate a 'demographic transition' theory. In this early version much attention was given to the fact that the 'new balance' would lead to slower growth rates. In general, however, Frank Notestein (1945, 1953) is considered to be the 'father' of the 'demographic transition' (he was the first to formulate the concept). From Notestein is the now 'famous' statement (1954: 13):

> "*Viewed as a whole the problem of aging is no problem at all. It is only the pessimistic way of looking at a great triumph of civilization.*"

The theory of the 'demographic transition' emphasizes the importance of the Industrial Revolution for the demographic evolution. It is undeniable that the improvements in food supply and sanitation that are related to the Industrial revolution have resulted in

the reduction of disease, which, eventually, has increased life expectancy. The Industrial Revolution would have been the starting point for the second epidemiological transition, the transition from infectious to degenerative diseases, which lasted from ca. 1750 to mid-twentieth century (Horiuchi, 1999). However, the theory fails to explain the subsequent declines in fertility. Apparently, shifts in technological and socio-economic conditions do not automatically incur changes in fertility behaviour. Ron Lesthaeghe (1977), in his pioneering work "The Decline of Belgian Fertility", was the first to point out the importance of values and of cultural change in this regard. According to his findings, the 'secularisation' of society was a key factor in explaining fertility decline. This is how it can be explained why the first signs of fertility decline were observed for France, in the early 19th century, more than 60 years earlier than in England and Wales, the birthplace of the Industrial Revolution (Belgium was the second country to show signs of a sustained fertility decline).

One and the other also explain why — contrary to the general expectations that existed in the 1950s and 1960s — during the greatest part of the 20th century most less developed countries continued to experience high levels of fertility (cf. figure 1.2). Clearly, the theory of the 'demographic transition', mainly derived from the demographic developments of Western European countries, was not entirely applicable in other countries [25]. Again, the main reason is likely to be an underestimation of the importance of values (Caldwell, 1976, xx). Through colonization, people had become exposed to 'modern' ideas; many men became wage labourers and many families left their ancestral villages to live in the cities. This trend resulted in the breakdown of traditional practices such as child-spacing and post-partum taboos (Page and Lesthaeghe, 1981), which eventually limited the number of children a woman would have. However, the trend did not immediately change the position of women in society and for a long time high fertility remained the general norm.

In Western European countries it seems that the key factor that would have triggered fertility decline would have been a more secular outlook; in less developed countries the key factor appears to be schooling [26]. Education appears to be the single most important determinant explaining why women (and men) would be in a position to choose freely the number of children they want. Since the International Conference on Population and Development (ICPD) held in Cairo in 1994, the process is identified as 'empowerment' (see next paragraph).

Since the turn of the century, all countries, including the countries of sub-Saharan Africa, have fully embraced the process of 'demographic transition'. In the long term, the new equilibrium between mortality and fertility will lead to zero population growth; but first, countries will be facing the prospect of 'population ageing'.

- ***The 'second demographic transition'***

The 'second demographic transition' refers to the rather sudden (and unexpected) fertility decline that more developed countries, more particularly the Western European countries (and Japan [27]), experienced in the 1960s and 1970s (cf. figures 1.2 and 1.5). As seen in paragraph 2, in many countries the decline resulted in fertility levels far below replacement level.

Similar to the changes in the 19th century, the fertility decline this time could also be explained by a shift in values. According to Lesthaeghe and van de Kaa (1986) the old 'bourgeois family model' (associated with the 'first' demographic transition) was being replaced by a more 'individualistic family model'. The shift in family model has not only affected childbirth but the whole process of family formation and dissolution. The changes in fertility levels have been accompanied by fewer and later marriages and more divorces; there is also the emergence of alternative forms of family formation (see, for example, Corijn and Klijzing, 2001). Equally important is the observation that fertility rates have not just dropped, but that in all countries have been accompanied by a postponement of childbearing. Between 1960 and 2000, on 'average', the mean age at birth of the first child has increased by 11.4%, from 25.0 to 27.9 years (CoE, 2003) [28]. Changes would be the expression of more 'individualistic' life-styles and self-fulfilment (Lesthaeghe and Surkyn, 2002).

In the last 20 years European social demographers have investigated the 'second demographic transition' fairly extensively. This interest is not surprising since a sustained level of fertility below replacement must lead to the prospect of population decrease (cf. figure 1.9). Much research has investigated the chances that fertility would again attain the more acceptable level of 2.1 children [29].

Some researchers (Cliquet, 1991, Hoffman-Nowotny, 1988) have criticized the 'second demographic transition'. Their main argument is that, contrary to the (first) demographic transition, the fertility decline of the 1960s-1970s did not follow (or was the consequence of) falling mortality rates [30].

A more important argument perhaps is the observation that fertility decline that is associated with the 'second demographic transition' can be interpreted as the 'natural' extrapolation of a trend that started some 100 years earlier. This view is what may be derived from data collected by Festy (1979) in his historical reconstitution on fertility trends for Western European countries. These statistics show a gradual decline in the number of children from about 5 around 1870 to slightly more than 2 at the beginning of the Second World War [31]. This reasoning is consistent with findings from our own research (for example, Cliquet and Schoenmaeckers, 1976) based on Belgian fertility data of the 1960s and 1970s [32]. The findings based on these data show that many

women at the end of their reproductive age span faced the problem of 'excess' fertility i.e., they had more children than the number they initially hoped for. Twenty years later, data again show a mismatch between the numbers of wanted children and realized fertility, only this time the difference is in the opposite direction: many women seem to have fewer children than the number they ideally would liked to have (Van Peer, 2000). The explanation would be the changing position of women in society after the Second World War, more particularly their increased labour force participation and the availability of the contraceptive pill since the 1960s. The consequence of an increased labour force is that more and more women (couples) are being confronted with an incompatibility between work and family life; a consequence of the availability of the contraceptive pill is that for the first time, women fully control their fertility, with a postponement of childbearing as a result (cf. above). The incompatibility between work and family life has become a key area for research relating to the 'second demographic transition'; on the other hand, the importance of the effect of the postponement of childbearing on the final level of fertility appears to be overlooked. There are indeed serious reasons to contend that the postponement of childbearing must have the unwanted effect of lowering the number of children (Lodewijckx and Schoenmaeckers, 1994); moreover, the phenomenon would constitute to a social problem insofar as it affects especially women with a lower educational degree (Schoenmaeckers et al., 2001). In other words, appropriate social policies — in both the areas of work and medical assistance — could lead to higher fertility levels. Such optimism seems to be warranted by the situation in some countries. France and Sweden are two countries with a state-subsidised system of crèches. This provision, together with the fact that in both countries there is no longer the social stigma from illegitimate births may be an explanation for their relatively high levels of fertility (Schoenmaeckers and Lodewijckx, 1997) [33]. The situation in France and Sweden illustrates the importance of social values in determining the level of fertility once again.

Bearing these arguments in mind, there is no reason to assume that low fertility is 'here to stay'. From this perspective, the 'second demographic transition' would be an overstressed term (it has however the merit of identifying the occurrence of major social changes, with a lasting effect indeed). At any rate, from the simulation results it is clear that its effect on the proportion of older people is only limited. If fertility again rises to 1.85 (as is assumed in the simulation), or even to 2.1, its increase on the proportion of older people would be less a result of extreme low fertility and more one of fertility increase after the Second World War known as the 'baby-boom'.

To conclude this paragraph, the theory of the 'demographic transition' (and of the 'second demographic transition') is inappropriate to fully explain the changes in

fertility. Both theories are important in providing a metaphor in identifying long-term demographic developments. The important conclusion is to realize that at the beginning of the 21st century nearly all countries (there are a few exceptions) are on the path to low fertility, and that, although levels and tempo differ, all countries will experience changes in their age structure. 'Population ageing' has become a global development and is unavoidable.

7. Changing structures and the need for more international collaboration

The UN has thus far convened two international conferences on 'ageing'. The First World Assembly on Ageing was held in Vienna in 1982; the Second Assembly took place twenty years later in Madrid. In both cases, the outcome was an *International Plan of Action on Ageing* (the latter is known as the *Madrid International Plan of Action on Ageing* or MIPAA [34]). The MIPAA includes recommendations for realizing the specific contributions and concerns of older persons within — in accordance with the general principles of the UN — the context of improving the economic and social conditions of everyone (cf. paragraph 12). Some of these will be discussed in more detail in the last chapter of this publication.

In this paragraph, we advocate a need for more attention to be given to the issue of 'population ageing' within the context of the follow-up of the ICPD Programme of Action. The ICPD took place in September 1994 in Cairo. The ICPD was the third international conference on population convened by the UN. The first two international conferences were held in Bucharest (1974) and in Mexico City (1984) [35]. The population conferences are organised as part of the activities of the Commission on Population, one of the UN's oldest 'technical' commissions (established in 1946), and in the 'aftermath' of the ICPD renamed Commission on Population and Development or CPD [36].

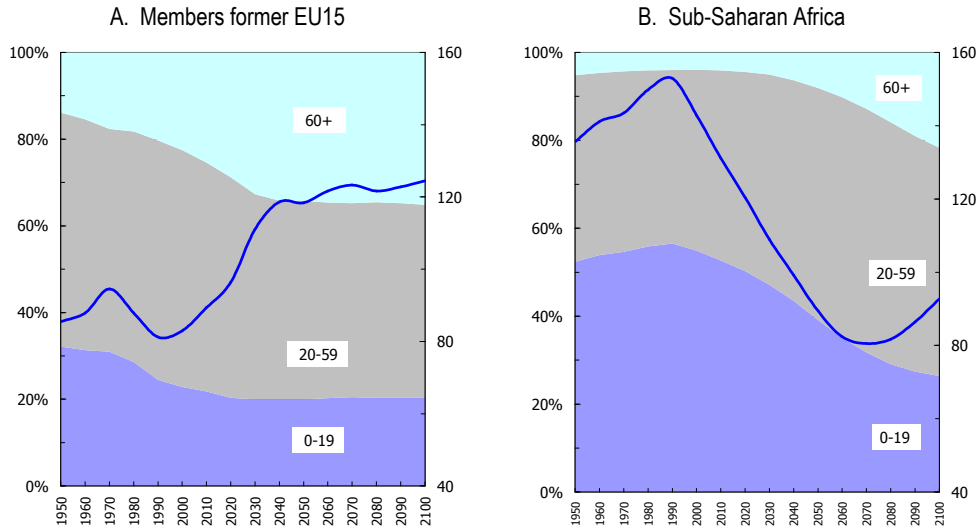
The mandate of the CPD is the follow-up of the implementation of the ICPD-Programme of Action. Within this context more attention to 'population ageing' — or, in more general terms, to 'changing age structures' — seems justified since, as we have seen in the previous paragraphs, the whole process must be interpreted as the 'last leg' of the 'demographic transition' and, as such, is the precursor to a 'new demographic world order' (with a population size of around 10 billion as a main characteristic).

- ***Evolution of the dependency ratio and the 'window of opportunity'***

The key issue of 'population ageing' is captured in the evolution of the dependency

ratio i.e., the ratio of the number of persons of 'inactive' age over the number of persons of (economically) 'active' age [37]. The higher its number (generally calculated per 100 'inactive') the easier it would be to meet the needs of the 'young' and 'old'. Figure 1.11 shows the evolution from 1950 to 2100 for the member countries of the former EU15 and the countries of sub-Saharan Africa.

Figure 1.11 — Changes in the age structure by broad age groups (0-19, 20-59, and 60 and more; in %, left axis), evolution in the 'dependency ratio' (per 100 population, right axis; see formula at bottom), and the 'window of opportunity' (not shown), for member states of the former EU15 and countries of sub-Saharan Africa, 1950-2100.



NOTE: Dependency ratio = 100 x [(nb. persons aged 0-19 + nb. persons aged 65+) / (nb. persons aged 20-59)]

SOURCE: Results simulation exercises.

For the EU countries, after a short decline between 1970 and 1990, the dependency ratio increases steeply from 81 to about 118 in 2040 after which the increase more or less levels off, reaching 125 by 2100. The dependency ratio is clearly a summary measure for the changes in fertility and mortality. The short decline is the result of the fertility decrease that started in the 1960s and the increase captures the increasing number of older people as the result of increasing levels of life expectancy. The end of the steep increase after 2040 coincides with the fact that by that time the presence of the children of the baby-boom in the population starts fading out (the smaller increases thereafter are the result of the continued increase of the proportion of older

people). The key message is the prospect of an ever growing number of 'inactive' people in the population per 100 people of working age (with however the specific characteristic that the greatest change is occurring within the next 30-35 years).

From a purely economic point a view this is a worrisome development. It is a cause of fear for the unsustainability of existing social security systems: pensions will no longer be guaranteed and because of the assumed poorer health of older persons health expenditures could reach unacceptably high levels. A popular solution among policy makers is to postpone retirement age. Needless to say that one and the other are the subject of much research of the last decades. For example, we have ourselves argued (Schoenmaeckers, 2005) that the negative demographic developments can largely be compensated by increased employment rates (especially by women) and increased productivity. Others (Lutz and Scherbov, 2003; Kieffer, 2004) have questioned the hypothesis that the health status of older people would directly lead to higher health expenditures. Their findings show that the majority of added years of life expectancy are years in good health. And according to the results of attitude surveys, the proposed policy measure of increasing the legal age of retirement would be quite controversial among European citizens (Schoenmaeckers et al., 2006a, 2006b).

In sum, the exact socio-economic implications of an older population structure are not known. However, there can be no doubt that Europe is on the eve of profound demographic changes which will have a serious economic and social impact. As of 2040 over one third of Europe's population will be aged 60 and more (compared with only 15% in 1950). This expanded older population will require major adaptations; and, as suggested in the title of the 'green paper' by the European Commission on demographic change (CEC, 2005), it is most likely that solutions will not be workable without intergenerational solidarity.

The evolution of the dependency ratio is quite different in sub-Saharan Africa. Here one observes a rapid *decline* in the dependency ratio between 1990 and 2070: the number of 'inactive' persons per 100 'active' people drops from 153 to 80. This drop would then be followed by a steep increase…

The decline in the dependency ratio is referred to as the 'window of opportunity' (or alternatively as the 'demographic bonus'). When the labour force must support fewer dependants, savings can increase which is expected to stimulate economic growth. One and the other are based on experiences for East Asia, where the rapid decline in the dependency ratio that was observed after 1975 is likely to have contributed to the region's rapid economic growth (Bloom and Williamson, 1998). However, a declining dependency ratio alone would not be sufficient. There would also be a need for an economic and institutional environment that facilitates taking advantage of the

demographic situation (Higgings and Williamson, 1997). Put more simply, the 'window of opportunity' does not translate automatically into improved economic output; it is only, to paraphrase Sinding (2000), an *"opportunity'".*

The implication is that many less developed countries, with poor economic and fragile institutional environments, will not be able to fully seize the opportunity. This is the situation for most countries in sub-Saharan Africa, of which many are part of the group of least developed countries (see note 4). Without international assistance for many the 'window of opportunity' is likely to remain a theoretical concept. This was the point a view of the spokesperson of the group of G77 and China — say, the group of less developed countries [38] — at the 40th session of the Commission on Population and Development, held at the UN Headquarters in New York on 9-13 April 2007, with the annual theme of "The changing age structures of populations and their implications for development" [39].

Note that for the countries of sub-Saharan Africa the task is huge. With the 'window of opportunity' one is supposed to benefit from the relative importance of the number of people of working age in the population. Between 2010 and 2070 (the year in which the 'window of opportunity' will close) the population aged 20-59 would, according to the simulation results, grow by some 800m individuals: to fully benefit from the 'demographic bonus' governments would need to create as many extra jobs during this period.

Some may counter argue that, strictly speaking, any assistance (financial, technical, or otherwise) to benefit from the 'window of opportunity' would not happen within the context of 'population ageing': even by 2070, the proportion of older people in sub-Saharan Africa will not exceed 13 percent of the population. This would be a short-sighted vision. Those constituting the labour force 'today' will supply the numbers of older people of 'tomorrow'. The creation of job opportunities would be a first step to reduce the risk of potential dependence in older age (an objective included in the MIPAA, and repeated in the resolution adopted at the 40th CPD session).

- ***'Population ageing' and the ICPD Programme of Action***

The Population Commission (now Commission on Population and Development or CPD: see above) was established in 1946, at a time when the annual growth of the world population was close to 2 percent (implying a doubling after 35 years). High population growth was regarded as a threat for world peace and development. Curbing the rapid population growth has been a main objective of the three international conferences on population convened since the inception of the CPD (Bucharest, 1974; Mexico City, 1984; Cairo, 1994).

At the time of the first population conference, most less developed countries opposed the idea that rapid population growth was an obstacle for economic development. The idea was viewed as a 'conspiracy' theory from the industrialised countries; to them, the real issue was not population growth, but the fact that wealth was unevenly distributed between the Northern and Southern countries (Cliquet and Veys, 1974). Attitudes started changing with the second conference (Cliquet and Van De Velde, 1985), but a real turning point occurred only 10 years later with the ICPD-conference in Cairo in 1994 (Cliquet and Thienpont, 1994, 1995; Singh, 1998; for a critical note on the ICPD-Conference, see Van de Kaa, 1996) [40].

Unlike the first two conferences, the accent of the ICPD was not on *numbers* (and the need to reduce population growth through the implementation of family planning programmes); the focus of the ICPD Programme of Action lies rather on the *well-being* of the individual (and of couples). A key issue of the ICPD-Programme of Action is 'reproductive health'. In paragraphs 7.2 and 7.3 reproductive health is defined as follows (UN, 1995; own italics) [41]:

> 7.2. Reproductive health is *a state of complete physical, mental and social well-being* […], in all matters relating to the reproductive system […]. Reproductive health therefore implies that people are able to have a satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so. Implicit in this last condition are the *right* of men and women to be *informed and to have access* to safe, effective, affordable and acceptable methods of *family planning* of their choice […], and the right of access to appropriate health-care services that will enable women to go safely through pregnancy and childbirth and provide couples with the best chance of having a *healthy infant*. […]. [Reproductive health] also includes sexual health, the purpose of which is the enhancement of life and personal relations […].
>
> 7.3. Bearing in mind the above definition, reproductive rights embrace certain *human rights* that are already recognized in national laws, international human rights documents and other consensus documents. *These rights rest on the recognition of the basic right of all couples and individuals to decide freely and responsibly the number, spacing and timing of their children and to have the information and means to do so* […].

Based on a first reading one may conclude that reproductive health is essentially a matter of *human rights* and *free choice*, and that the main objective is to enhance the chances of having a healthy child. However, by including the right of couples to decide on the number and spacing of their children — to be realised through the use of acceptable family planning methods — it is also clear that an ultimate objective is to lower the number of children — and, as such, curb population growth. In fact, reproductive health as defined in the ICPD Programme of Action is nothing but a modern version of the traditional postpartum taboos. Anthropological evidence teaches us that the underlying reason for these taboos — including prolonged breast-feeding and sexual abstinence — was to enhance the survival of the already born infant

(Schoenmaeckers et al., 1981).

What, one may ask, is the connection with 'population ageing'?

Gradually, family planning programmes — whether related to 'reproductive health' or not — have become successful and birth rates have declined, first in Asia, and some 30 years later also in Africa (cf. figure 1.2) [42]. As shown by the results of the simulation exercises, with the exception of Europe (and North America), it is precisely fertility decline that acts as the main 'motor' for the increases in the proportion of older people. In other words, it is family planning programmes — or, to use the 'agreed language' of the CPD, reproductive health programmes, *including family planning* —, that are largely responsible for the increase in the proportion of older people [43].

Unfortunately, this aspect has been overlooked. Only one of the 16 chapters (chapter VI) of the ICPD Programme of Action is on 'Population Growth and Structure', and the part in the chapter on the issue of 'Elderly People' has to, our knowledge [44] never been given much attention. The reason for not paying more attention to 'population ageing' could be because at the time of the ICPD the proportions of older people were still relatively low, less than 10 percent at world level and below 7 percent for the less developed regions (cf. also figure 1.1). However, a more profound explanation would be that, as already mentioned, the key objective of the ICPD Programme of Action is the *well-being of the individual* (rather than dealing with 'numbers', as was the case with the previous conferences); with the consequence that throughout the Programme the importance of general principles such as (the respect of) 'human rights', 'empowerment' (of women), and also, in the aftermath of the Rio Conference of 1992 on sustainable development, the 'interrelationships between population, sustained economic growth and sustainable development' are underlined.

These are laudable and respectful principles in their own right. But by emphasizing them — in both the Programme of Action and in the discussions during the CPD sessions — the ICPD has become known as the conference of 'reproductive *and sexual* health' (own italics), with the result that the more demographic aspects — for which the Commission and the international conferences were initiated in the first place — have gradually become overlooked. As I have written elsewhere [45], to some extent "the ICPD Has become victim of its own success".

So far, international programmes on 'population ageing' do not exist. This situation is quite regretful, as such programmes would be most welcome in poorer countries where social security programmes are virtually non-existent or are inefficient (cf. paragraph 2 and note 9); moreover, programmes that foster the 'exchange of best practices' could be an example for true international collaboration.

However, international programmes on 'population ageing' do not exist thus far mainly on the grounds that, with the exception of the wealthy industrialised countries, the relatively low proportion of older persons does not justify the implementation of such programmes. Policy makers and donors are apparently unable (or unwilling) to realize that the number of 'older people' in a population is a direct function of the number of births of some 60 years earlier (diminished by mortality [46]); its proportion will depend on the evolution of fertility (and mortality) over the same period. In addition, demographers may need to draw attention to the fact that programmes on 'population ageing' would contribute to more general objectives included in the MDGs, such as the eradication of extreme poverty and hunger and the promotion of gender equality. In short, international programmes on 'population ageing' would be a direct contribution to more socio-economic development — one of the basic principles, together with respect for human rights, of the UN.

References:

Adamchack, D.J. (1999), Meeting the needs of the poor elderly in Zimbabwe and Namibia. In: Cliquet, R. and M. Nizamuddin (eds.) (1999), *Population Ageing. Challenges for Policies and Programmes in Developed and Developing Countries*. Proceedings of the UNFPA/CBGS technical Meeting, 6-9 October 1997 in Brussels. UNFPA (New York) and CBGS (Brussels).

Billari, F., T. Frejka, J. Hobcraft, M. Macura, and D.J. van de Kaa (2004), Discussion of paper 'Explanations of the fertility crisis in modern societies: A search for commonalities', by John Caldwell and Thomas Schindlmayr. *Population Studies*, Vol.58 (1), pp. 77-92.

Bobak, M. (1999), Health and Mortality Trens in Countries with Economies in Transition. In: J. Chamie and R. Cliquet (eds.), *Health and Mortality. Issues of Global Concern*. Proceedings of the symposiumon Health and Mortality, Brussels, 19-22 November 1997. Brussels, CBGS and UN Population Division (DESA).

Bongard, M and C. Sauvain-Dugerdil (2002), *Socio-Economic Status and Living Arrangements of Older persons in Switzerland*. UNECE (Geneva) and Swiss Federal Statistical Office (Neuchâtel).

Bloom, D.E. and J.C. Williamson (1998), Demographic transitions and economic miracles in emerging Asia. *World Bank Economic Review* 12: pp.419-455.

Caldwell, J. (1976), Toward a restatement of demographic transition theory. *Population and Development Review,* Vol. 2 (3/4): pp.321-366.

Caldwell, J. (xxxx),

Caldwell, J. and T. Schindlmayr (2003), Explanations of the fertility crisis in modern societies: A search for commonalities. *Population Studies*, Vol. 57 (3): pp.241-263.

Calot, G. and J.-P. Sardon (1999), Les facteurs du vieillissement démographique. *Population*, Vol. 54(3): pp.509-552.

Caselli, G. and A.D. Lopez (eds.) (1996), *Health and Mortality Among Elderly Populations*. IUSSP: International Studies in Demography. Oxford: Clarendon Press.

Chesnais, J.-C. (1986), *La Transition Démographique. Etapes, formes, implications économiques*. Travaux et documents, Cahier no. 113. Institut National d'Etudes Démographiques. Paris: Presses Universitaires de France.

Cleland, J. (2005), *Untitled*. Unpublished keynote speech at the XXVth IUSSP International Population Conference, Tours (France), 18-23 July 2005 [copy available upon request].

Cliquet, R.L. (1991), The second demographic transition: fact or fiction? *Population Studies* No. 23. Strasbourg: Council of Europe Publishing.

——— and D. Veys (1974), *Naar een wereldbevolkingspolitiek? De Wereldbevolkings-conferentie in Boekarest, 19-30 augustus 1974* [transl.: "Towards a World Policy on Population? The World Population Conference in Bucharest, 19-30 August 1974"]. Ministerie van Volksgezondheid en van het Gezin, CBGS, Studies en Documenten 4. Kapellen: De Sikkel.

——— and R. Schoenmaeckers (1976), *From Incidental to Planned Parenthood - Results of the Second National fertility Survey in Belgium*. NIDI/CBGS Publications, Vol. 2, Martinus Nijhoff, Social Sciences Division: Leiden [original Dutch edition: "Van toevallig naar gepland ouderschap". Studies en Documenten 1975/ 6, CBGS, Ministerie van Volksgezondheid en van het Gezin. Kapellen: De Sikkel.]

——— and L. Van De Velde (1985), *De Wereldbevolking op een keerpunt? Resultaten van de Internationale Bevolkingsconferentie, Mexico, 6-14 augustus 1984* [transl.: "The World Population at a Turning Point? The International Population Conference, Mexico, 6-14 August 1984"]. Ministerie van de Vlaamse Gemeenschap, Administratie voor Gezin en Maatschappelijk Welzijn, CBGS-Monografie 1985/3. Brussels.

——— and K. Thienpont (1994), *Bevolking en duurzaamheid. Een uitdaging voor de 21ste eeuw* [transl.: 'Population and sustainability. A challenge for the 21st century']. Ministerie van de Vlaamse Gemeenschap, Administratie voor Gezin en Maatschappelijk Welzijn, CBGS Monografie 1994/2. Brussels

———— and K. Thienpont (1995), *Population and Development: A message from the Cairo Conference*. Dordrecht: Kluwer Academic Publishers. [Revised and translated version of the 1994-publication].

Coale, A.J. (1996), 'Age patterns and time sequence of mortality in national populations with the highest expectation of life at birth'. In *Population and Development Review*, Vol.22 (1): pp.127-135.

———— and S.C. Watkins (eds.) (1986), *The Decline of Fertility in Europe. The Revised Proceedings of a Conference on the Princeton European Fertility Project*. Princeton, New Jersey: Princeton University Press.

Commission of the European Communities (2005), Green paper "Confronting demographic change: a new solidarity between the generations". Communication from the Commission (Brussels).

Corijn, M. and E. Klijzing (eds.) (2001), *Transitions to Adulthood in Europe*. EAPS: European Studies of Population Vol.10. Dordrecht: Kluwer Academic Publishers.

Council of Europe (2003), *Recent demographic developments in Europe*. Strasbourg: Council of Europe Publishing.

Ehrlich, P. (1968), *The Population Bomb*. New York: Ballantine Books.

Festy, P. (1979), *La fécondité des pays occidentaux de 1870 à 1970*. Travaux et documents, Cahier no. 85. Institut National d'Etudes Démographiques. Paris : Presses Universitaires de France.

Festy, P. and F. Prioux (2002), *An evaluation of the Fertility and Family Surveys project*. United Nations Economic Commission for Europe (Geneva) and the United Nations Population Fund (New York), with the collaboration of l'Institut National d'Etudes Démographiques (Paris).

Grundy, E., (1996), 'Population Ageing in Europe'. In: D. Coleman (ed.), *Europe's Population in the 1990s*. New York and London: Oxford University Press.

Haub, C. (1995), How Many People Have Ever Lived on Earth? *Population Today* (February 1995): pp. 4-6.

Higgings, M. and J.C. Williamson (1997), Age structure dynamics in Asia and dependence on foreign capital. *Population and Development Review* 23(2): pp.261-293.

Hoffmann-Nowotny, H.J. (1988), Structural and cultural determinants of Europe's Second Demographic Transition. *Bevolking en Gezin*, 1988, 1: pp.73-89. Brussels.

Horiuchi, S. (1999), Epidemiological transitions in human history. In: J. Chamie and R.L. Cliquet (eds.), *Health and Mortality. Issues of Global Concern*. Proceedings of the symposium on Health and Mortality, Brussels, 19-22 November 1997. Brussels, CBGS and UN Population Division (DESA)

——— and John R. Wilmoth (1998), Deceleration in the age pattern of mortality at older ages. *Demography*, 35(4): pp. 391-412.

Keyfitz, N. (1971), On the momentum of population growth. *Demography*, 8(1): pp.71-80.

Kieffer, R. (2004), L'impact du vieillissement démographique sur les dépenses de santé [trans.: 'The impact of population ageing on health expenditures']. Paper presented at the Colloquium Les changements démographiques et leurs repercussions sur les différentes parties de la Grande Région, Luxembourg, 21-22 October 2004 (www.demographie.forum-europa.lu).

Kinsella, K. (2001), Urban and Rural Dimensions of Global Population Ageing; An Overview. *The Journal of Rural Health*, Vol. 17 (4).

Légaré, J., L. Martel, L. O. Stone, and H. Denis (1998), *Living arrangements of Older persons in Canada: Effects on their socio-economic conditions*. UNECE (Geneva) and Statistics Canada (Ottowa).

Lesthaeghe, R.J. (1977), *The Decline of Belgian Fertility*. Princeton. New Jersey: Princeton University Press.

——— and D.J. van de Kaa, (1986), 'Twee demografische transities?' (Two demographic transitions?). In: D.J. van de Kaa and R.L. Lesthaeghe (eds.), *Bevolking: Groei en Krimp*. Deventer: van Loghem Slaterus.

——— and Surkyn, J. (2002), *New Forms of Household Formation in Central and Eastern Europe: Are they related to newly emerging Value Orientations?* IPD-Working Paper 2002-2, Brussels.

Lindgren, J., A. Miettinen, and M. Nieminen (1999), *Socio-Economic Status and Living Arrangements of Older Persons in Finland*. UNECE/PAU (Geneva) and The Population Research Institute (Väestöliito).

Locoh, T. and G. Adaba (1984), Child-spacing in Togo: the Southeast Togo Survey (EFSE). In: Page, H. and R. Lesthaeghe (eds.) (1981), *Child-spacing in Tropical Africa: Traditions and Change*.

Lodewijckx, E. (2006), 'Veranderingen in de huishoudelijke samenstelling (1991-2004): implicaties voor de interne mantelzorg' [transl.: "Changes in household

composition (1991-2004): Implications for informal care"]. In: T. Jacobs and E. Lodewijckx (eds.) (2006), *Grenzen aan mantelzorg* [transl.: "Limits to informal care"]. CBGS-Publicaties, Flemish Government. Leuven: Garant.

———— and R. Schoenmaeckers (1994), Changes in fertility as a result of prior pregnancy-related experiences: an exploratory analysis. "Population and Family in the Low Countries", 30 (1994), NIDI/CBGS. Lisse: Swets & Zeitlinger B.V.

———— and T. Jacobs (2002), 'Burgerlijke staat en samenstelling van het huishouden van ouderen. Veranderingen in het Vlaams Gewest tijdens 1990-2000' [transl.: *Marital status and household composition of elderly. Changes in the Flemish Region, 1990-2000*]. CBGS Working Document, 3, 87 pp. + 113 pp. of tables.

Lutz W. and S. Scherbov (2003), Will population ageing necessarily lead to an increase in the number of persons with disabilities? Alternative scenarios for the European Union. European Demographic Research Papers, 2003, no. 3, Vienna Institute of Demography.

Marcoux, A. 1990. Ageing rural populations in the developing countries: patterns, causes and implications. United Nations International Conference on Aging Populations in the Context of the Family, Kitakyushu, October 1990. In: *Ageing and the Family*, United Nations: New York, 1994, pp. 144-148.

Martin, L.G. (1989), The greying of Japan. *Population Bulletin*, Vol. 44 (2).

Martin, L.G. and Kinsella, K. (1994), Research on the demography of aging in developing countries. In: L.G. Martin and S.H. Preston (eds.) (1994), *Demography of Aging*. National Research Council. Washington DC: National Academy Press.

Maitse, T. & Majake, C. (Eds) (2005), Enquiry into the gendered lived experience of older persons living in conditions of poverty.Johannesburg: Commission on Gender Equality.

Mirkin, B., and M. B. Weinberger, (2001), 'The demography of population ageing'. In: 'Population ageing and living arrangements of older people: critical issues and policy responses', *United Nations Population Bulletin*, Special Issue Nos. 42/43, United Nations: New York, 2001.

Notestein, F.W. (1945), Population — The long view. In T.W. Schultz (ed.), *Food for the World*. Chicago: University of Chicago Press.

———— (1953), Economic Problems of Population Change. In: *Proceedings of the Eighth International Conference of Agricultural Economists*, pp. 13-31. London, Oxford: University Press.

———— (1954), Some demographic aspects of aging. *Proceedings of the American*

Philosophical Society, 98(1), pp.38-45.

Page, H. and R. Lesthaeghe (eds.) (1981), *Child-spacing in Tropical Africa: Traditions and Change*. Interuniversity Programme in Demography, Vrije Universiteit Brussel, Belgium. London & New York: Academic Press.

Pison, G. (2006), La population de la France en 2005. *Population et Sociétés*, No.421 (March 2006).

Reddy, P. (2002), The plight of older persons in South Africa. In: UNFPA (2002a), Situation and Voices. The older poor and excluded in South Africa and India. *Population and Development Strategies Series No.2*. United Nations Population Fund: New York. In collaboration with the CBGS (Brussels).

Ryder, N. and C. Westoff (1971), *Reproduction in the United States 1965.* Princeton, New Jersey: Princeton University Press.

Schofield, R., D. Reher, and A. Bideau (eds.) (1991), *The Decline of Mortality in Europe*. IUSSP: International Studies in Demography. Oxford: Clarendon Press.

Schoenmaeckers, R. (1984), The Onset of Changes in fertility Behaviour in Kenya. A Birth Interval Analysis with the Use of a Relational Hazards Model. Unpublished Ph.D. thesis, Interuniversity Programme in Demography, VUB, Brussels.

———— (2004), The demographic characteristics of the oldest old. *Population Studies*, No. 47. Strasbourg: Council of Europe Publishing.

———— (2005), Population ageing and its economic and financial implications. In Schoenmaeckers, R. and I. Kotowska (2005), Population ageing and its challenges to social policy. Study prepared for the European Population Conference 2005. *Population Studies*, No. 50. Strasbourg: Council of Europe Publishing.

--------, I. Shah, R. Lesthaeghe, and O. Tambashe (1981), 'The Child-spacing Tradition and the Post-partum taboo in Tropical Africa: Anthropological evidence'. In: Page, H. and R. Lesthaeghe (eds.) (1981), *Child-spacing in Tropical Africa: Traditions and Change*. Interuniversity Programme in Demography, Vrije Universiteit Brussel, Belgium. London & New York: Academic Press.

-------- and E. Lodewijckx (1997), Changes in Demographic Behaviour in Europe: Some Results from FFS-Country Reports and Suggestions for Further Research. "The European Journal of Population", Vol 15, No.3 (September 1999), pp.207-240 [Original paper presented at the XXIIIrd IUSSP General Population Conference, Beijing, 11-17 October 1997].

--------, E. Lodewijckx, and C. Van Peer (2001), Social differentials and policy

implications with respect to the start of childbearing and the total number of children. Paper presented at the European Population Conference 2001, Helsinki, 7-9 June 2001.

--------, L. Vanderleyden, and Lucie Vidovicova (2006a), Intergenerational Solidarity, the Elderly and Ageing, DIALOG Paper Series No.8. (D22/D23). Federal Institute for Population Research, Wiesbaden.

--------, M. Callens, L. Vanderleyden, Lucie Vidovicova (2006b), Attitudes towards population ageing and older people, in: Höhn, C. D. Avramov, I. Kotowska (Eds.), *People, Population Change and Policies: Lessons from the Population Policy Acceptance Study*, Volume 2, chapter 5.1. Federal Institute for Population Research, Wiesbaden

--------, M. Callens, and Lieve Vanderleyden (*forthcoming*), Espérance de vie accrue et désir de retraite anticipée. Un paradoxe ? In: S. Feld (ed.), *Changements de la structure des populations et vieillissement de la population active* (provisional title) Paper presented at the 14th AIDELF Colloquium, Aveiro, 18-23 September 2006.

Sinding, S. (2000), The tumultuous demography of the 20th century an dits implications for the 21st. Paper delivered to the Nederlandse Genootschap voor Internationale Zaken [Netherlands Association for International Affairs], The Hague, 13 December 2000.

Singh, J.S. (1998), *Creating a New Consensus on Population*. London: Earthscan Publications Ltd.

Skeldon, R. 1999. *Ageing of Rural Populations in South-East and East Asia*. Sustainable Development Department, FAO: Rome.

Stloukal, L. (2001), Rural population ageing in poorer countries: possible implications for rural development. Sustainable Development Department, FAO: Rome.

Szreter, S. (1993), The idea of demographic transition and the study of fertility change: A critical intellectual history. *Population and Development Review*, 19(4): pp.659-701.

Thompson, W.S. (1929), Population. *American Journal of Sociology*, 34(6): pp.959-975.

Tukey, J.W. (1977), *Exploratory data Analysis*. Reading, Massachusetts: Addison-Wesley.

United Nations (1995), *Population and Development. Volume 1: Programme of Action adopted at the International Conference on Population and Development, Cairo, 5-13 September 1994*. Department for Economic and Social Information and Policy Analysis, ST/ESA/SER.A/149. United Nations: New York. (The ICPD Programme is also available on UNFPA's website at www.unfpa.org/icpd/icpd_poa.htm)

———— (1999), *Long-range World Population Projections: Based on the 1998 Revision*. Population Division, Department of Economic and Social affairs, United Nations Secretariat. United Nations: New York.

———— (2003a), *World Population Prospects. The 2002 Revision* (3 volumes). Population Division, Department of Economic and Social affairs, United Nations Secretariat. United Nations: New York.

———— (2003b), *Long-Range Population Projections*. Proceedings of the UN Technical Working Group on Long-Range Population Projections, UN Headquarters, NY, 30 June 2003. Population Division, Department of Economic and Social affairs, United Nations Secretariat. United Nations: New York.

———— (2004), *World Population in 2300*. Proceedings of the UN Expert Meeting on World population in 2300, UN Headquarters, NY, 9 December 2003. Population Division, Department of Economic and Social affairs, United Nations Secretariat. United Nations: New York.

———— (2005), *World Population Prospects. The 2004 Revision* (3 volumes). Population Division, Department of Economic and Social affairs, United Nations Secretariat. United Nations: New York.

UNECE & UNFPA, fertility and family Surveys in Countries of the ECE Region. Standard Country Reports. Economic Studies No. 10. United Nations Economic Commission for Europe (Geneva) and the United Nations Population Fund (New York),

UNFPA (2002a), Situation and Voices. The older poor and excluded in South Africa and India. *Population and Development Strategies Series No.2*. United Nations Population Fund: New York. In collaboration with the CBGS (Population and Family Study Centre): Brussels.

———— (2002b), Population Ageing and Development. Social, Health and Gender Issues. *Population and Development Strategies Series No.3*. United Nations Population Fund: New York. In collaboration with the CBGS (Population and Family Study Centre): Brussels.

———— (2007), *State of the World Population Report 2007*. United Nations Population Fund: New York.

Vallin, J. (1989), L'avenir de l'espérance de vie vu à travers les projections de l'INSEE. *Population*, 44(4-5): pp. 930-936.

Van de Kaa, D.J. (1987), Europe's Second Demographic Transition'. *Population Bulletin*, 42(1). Washington DC: Population Reference Bureau.

———— (1996), The Cairo Conference: a demographer's view. In H. Van den Brekel and F. Deven (eds.), Population and Family in the Low Countries 1995: Selected Issues. Amsterdam: Kluwer Academic Publishers.

————, and R.L. Lesthaeghe (eds.) (1986), *Bevolking: Groei en Krimp*. Deventer: van Loghem Slaterus.

Vanderleyden, L. and G. Dooghe (eds.) (1993), *De ouder wordende vrouw in de samenleving* [transl.: "The elderly woman in society"]. Ministerie van de Vlaamse Gemeenschap, Administratie voor Gezin en Maatschappelijk Welzijn, CBGS-Monografie 1993/3. Brussels.

Van Peer, C. (2000), Desired and realized fertility in selected FFS-countries. Paper presented at the FFS Flagship Conference, Brussels, 29-31 May 2000.

Vaupel, J.W. and H. Lundström (1994), The future of mortality at older ages in developed countries. In: W. Lutz (ed.), *The Future Population of the World. What Can We Assume Today?* IIASA. Earthscan Publications: London.

WFS (1981), *World Fertility Survey Conference 1980*. Record of Proceedings (3 volumes). London, 7-11 July 1980.

WHO/ UNAIDS/ UNICEF (2007), *Toward Universal Access. Scaling up propriety HIV/AIDS interventions in the health sector*. Progress Report, April 2007. World Health Organisation: Geneva.

Endnotes Chapter One:

1 The United Nations Population Division defines a population as being 'old' when the percentage of its members aged 65 and over has reached 7 percent or more (see, for example, Mirkin and Weinberger, 2001). By and large, this percentage corresponds with 10 percent of people aged 60 and over.

2 Throughout this chapter 'elderly' or 'older people' are defined as those aged 60 and over.

3 Note that in reality it took even longer than 70 years as the increase started before 1950. The year 1950 is the 'base line' of the simulation exercises and is the earliest year available in the *Population Prospects* that are prepared biannually by the Population Division. All data in this chapter are based on the medium variant of the *2004 Revision of the World Population Prospects* (UN, 2005). The medium variant corresponds with the 'most likely' scenario regarding the future evolution of mortality and fertility. The chosen fertility scenario largely determines the size of the future population. See also note 5 xx below.

[4] The sub-Saharan African region corresponds closely with the group of least developed countries. The least developed countries include a total of 50 countries, of which a majority (60%) is African. The categorisation (used in the *Population Prospects*) corresponds with a definition of the UN General Assembly in 2003.

[5] The 10 billion estimate is consistent with the *1998 Revision* (showing a stabilisation of the world population at around 2200); the 9 billion estimate is consistent with the *2002 Revision*. The differences are largely due to the adoption of different scenarios regarding the future evolution of fertility. "Beginning with the *1998 Revision*, countries with fertility below replacement were no longer constraint to rise to replacement level by 2050. […] In the *2002 Revision*, in light of increasing evidence that many less developed countries are experiencing below-replacement fertility, it was no longer assumed that countries with intermediate levels of fertility would see their fertility declines stop at 2.1 children per woman." (UN Pop. Division, 2004: 1).

[6] The process can be explained in a fairly simple way. Countries that experienced high fertility levels before the onset of the fertility decline have vast numbers of women of reproductive age. Even when these women have fewer children than their mothers the number of children they will bear will far exceed the number of their own parents. It will take several generations for this mechanism to fade out and population size will stabilize (the precise number of years before stabilisation is reached depends on the initial level of fertility and on the pace of the decline).

[7] A rise in fertility to 1.85 children by 2050 may look doubtful but is, however, not entirely unrealistic. According recent statistics (for 2005 and 2006), Finland, France, Denmark, and the UK experience a total fertility rate of 1.85 children per women or more (see websites national statistical Institutes). In France, the level of 1.92 children in 2005 followed a period of about 10 years of growth (Pison, 2006). On the basis of these examples, an increase of up to 1.85 children by 2050 is therefore not to be ruled out.
The very low levels of fertility in Europe have been the subject of extensive research (see note 29 further below). Some optimism in believing that fertility levels may increase seems warranted given that surveys of the 1990s indicated that a mismatch existed between desired and actual number of children (Van Peer, 2000). It is not unreasonable to contend achieving a life/work balance and the availability of crèches could produce an upward shift. Another important factor could be the non-stigmatisation of illegitimate fertility, which would explain the relatively high levels that have been observed in France and Sweden (Schoenmaeckers and Lodewijckx, 1997).

[8] Clearly a much higher rate that those recorded for European countries: 0.1 to 0.6 percent (UNFPA, 2007).

[9] For example, in Namibia, one of a handful of SSA countries to operate a social pension programme, only 30 percent of all households receive pension benefits (Adamchak, 1999).
The need for more social protection at old age could be one of the most important and urgent policy issues in the discussion regarding 'population ageing'. According to the research institute for Development Policy and Management (IDPM) of the University of Manchester and HelpAge International, an NGO, an universal pension system could be a key for meeting the Millennium Development Goals (MDGs, see further below, note 23xx). Part of the argument would be based on the work of Prof. Amartya. Sen, who received in 1998 the Nobel Prize in Economics. For more detail, visit www.sed.manchester.ac.uk/idpm/ or http://www.helpage.org/.

[10] Another example is an article in *The Economist* (June 16, 2007) on "Europe's population", which states that because of higher fertility rates, France and Britain will by 2050 have a far more favourable age pyramid (than, for example, Italy), with more than two workers per pensioner. As such, the article refers indirectly to the (in-)dependency ratio. Changes in the dependency ratio are treated in more detail in the last paragraph.

[11] Required input data of PROJCT are the base year population by age and sex; the start - and end levels of life expectancy by sex; and the start - and end levels of fertility for the projection period. In addition, the program requires the indication of the model life table pattern and the fertility pattern. For mortality, the 'general' model of the UN life table models was used (in some cases, for high levels of life expectancy, the 'West' model of the Coale and Demeny models was used). Fertility patterns were derived from the regional patterns given in the *2002 Revision* (UN Pop. Division, 2003a). For sub-Saharan Africa, estimates were derived from data readily available for Kenya (Schoenmaeckers, 1984) and Togo (Locoh and Adaba, 1981).

[12] Note that it was not a purpose of this contribution to provide an exhaustive set of simulation exercises. These exercises have been limited to a set of countries (or group of countries) that may be viewed as illustrating the heterogeneity regarding the process known as the 'demographic transition' sufficiently (see paragraph 6xx).

[13] The percentage difference between the highest and lowest levels. As is the case for the graphs in figure 1.5 these figures are based on the median values of each group of countries.

[14] The EU15 or 'old' EU members are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, Portugal, Netherlands, Spain, Sweden, and the UK ; the 'new' members are : Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovenia, Slovakia, and Romania.

[15] 'Planes' are actually similar to the more classical age pyramid, with the difference that no distinction is being made between the numbers of men and women.

[16] Note, however, that all researchers are careful in their predictions. In view of recent developments one can no longer agree on a maximum life span. In fact, researchers now question the existence of a biological maximum. There is agreement, however, based on analysis of data on mortality for populations with high levels of life expectancy (such as Sweden and Japan), that mortality at old age is slowing down; and that there is a deceleration of the increase in life expectancy (cf. the assumptions made in the simulation exercises for the evolution of life expectancy after 2050).

[17] For an overview of population ageing issues, see, for example, UNFPA (2002b).

[18] According to Martin and Kinsella (1994: pp. xx-xx), the difference could be decreasing because of lower mortality rates in the cities.

[19] However, HIV transmission from mother to child has become an equally major concern in the fight against HIV/AIDS, see, the latest UNAIDS Report (2007).

[20] The UNFPA statistics are based on a UNAIDS Report from 2006 and refer to the situation in 2005.

[21] Note that with rising life expectancies, the difference between men and women could be narrowing. The observation was first made for England and Wales and is so far limited to some European

countries (Grundy, 1996). There is no clear explanation. A plausible explanation would be that women have adopted and risky life styles usually associated with men (Schoenmaeckers, 2004).

[22] The pattern can also be derived from results in the country reports for, for example, Canada (Légaré, et al. 1998), Finland (Lindgren et al., 1999), and Switzerland (Bongard and Sauvain-Dugerdil, 2002) in the UNECE/PAU series on the *Socio-Economic Status and Living Arrangements of Older Persons*.

[23] The eight MDGs are: eradicate extreme poverty and hunger; achieve universal primary education; promote gender equality and empower women; reduce child mortality; improve maternal health; combat HIV/AIDS, malaria and other diseases; ensure environmental sustainability; develop a global partnership for development . MDGs targets are to be achieved by 2015; for more detail, see: www.un.org/millenniumgoals.

[24] The following estimates are derived from a table 'Historical Estimates of World Population' available on the website of the US Census Bureau (www.census.gov/ipc/www/worldhis.html), which itself refers to several sources. For a critical essay on the way in which historical estimates are obtained, see Haub (1995).
An overview of historical estimates is also given in Box 2 'World Population Growth' and in table 1, in UN (1999), available at www.un.org/esa/population/publications/sixbillion/sixbilpart1.pdf.

[25] For a critical analysis of the 'demographic transition' theory, see Szreter (1993).

[26] There is a vast literature explaining changes in fertility behaviour. We have only referred to publications in which we have collaborated personally (or we have been able to discuss with the author personally).
The majority of articles (incl. our own Ph.D. dissertation) on fertility behaviour in less developed countries has been based on data of the WFS (World Fertility Survey) of the 1960s and 1970s and the DHS (Demographic and Health Survey) initiated in the 1980s.
Studies regarding the early changes in European countries were undertaken under the *Princeton European Fertility Project*, undertaken in the 1970s by the Office of Population Research of Princeton University, in collaboration with numerous European researchers (of which Lesthaeghe's work on the Belgian fertility decline was part of); an overview of the results is available in Coale and Watkins (1986).

[27] Note that Japan's demographic history is unique. "During the first quarter of the 20th century, Japan experienced the high mortality and fertility levels characteristic of present-day developing countries. In 1925, life expectancy at birth was about 45 years and women gave birth to a total of 5.1 children […]. By 1950, life expectancy had increased to 60years and the total fertility rate […] had fallen to 3.7 children" (Martin, 1989: 7). After the Second World War, Japan's mortality and fertility continued to lose all characteristics of those of a less developed country. By the turn of the century it showed the highest life expectancy in the world (81.9 years, both sexes combined, a full 1.5 years more than Switzerland or Sweden, which ranked second and third respectively) and one of the lowest fertility levels (of 1.4 children, just above Italy or Spain with 1.2 children).

[28] Values based on the median for the former 15 EU Member States. In 2000, the highest value (28.6 years) observed was for the Netherlands.

[29] The literature relating to the 'second demographic transition', its causes and especially the question whether (very- low fertility would be a temporary phenomenon or not, is so vast that, once again, it would be inappropriate to try to present a summary of the literature within the scope of this

contribution. However, by way of summary (or introduction), we would commend reading the discussion paper by Francesco Billari et al. (2004) on the paper by John Caldwell and Thomas Schindlmayr (2004) regarding a 'common explanation' for the low levels of fertility in European countries.

One may also wish to note that much of the research (to explain the 'second demographic transition') has been achieved on the basis of FFS data (Fertility and Family Survey) that were collected during the 1990s in many European countries. Annotated tabulations are presented in a series of 'standard country reports published in 1996-2001 (UNECE). An evaluation of the project is given in Festy and Prioux (2002).

30 The assumption of a time lag is part of the demographic transition theory, as presented in textbooks (and these days also on the internet: http://en.wikipedia.org/wiki/Demographic_transition); such time lag may be observed in the 'classic' graphical presentation of the demographic transition theory, as in, for example, figure 1.1xx in the afore-mentioned work by Chenais (1986).
However, this assumption is rarely supported by the available statistics (which are scarce). We came rather to the conclusion that mortality and fertility declined more or less simultaneously. After all, the consequences of the Industrial Revolution were not limited to the improvement of hygiene and better medical treatment; it has also lead to sociological change (including a change from 'petty' industry to wage labour) and cultural change.

31 The described trend is consistent with the evolution of the median value for 7 West European countries that are currently Member States of the EU: Denmark, Finland, France, Germany, Netherlands, Sweden, and the UK.
Note that the *2004 Revision* indicates for the fertility level in 1950 of all 15 'old' Member States a median value of 2.33 children.

32 The data stem from the so-called 'NEGO' surveys (National Surveys on Family Formation). These surveys were derived from the National Fertility Study that had been conducted by Norman B. Ryder and Charles F. Westoff (1965) in the US in the mid-1960s. The Belgian NEGO-surveys may be regarded to be the predecessor of the international FFS surveys of the 1990s (cf. note 30xx).

33 According to the *2004 Revision*, France and Sweden had a TFR-value in 2000-2005 of 1.89 and 1.65, respectively, in both cases significantly higher than the median of 1.28 for the southern EU15 members (Greece, Italy, Portugal, Spain).

34 A full report on the Second World Assembly on Ageing, including the MIPAA, is available at www.un.org/esa/socdev/ageing.

35 These were preceded by two more 'technical' conferences (i.e. implying that no international programme of action was adopted by participating countries): the first organised in Rome in 1954 and the second organised in Beograd in 1965.

36 More information is available at www.un.org/esa/population/cpd/aboutcom.htm (the website of the UN Population Division).

37 An alternative for the dependency ratio is to measure the ratio of the number of 'older persons' over the number of persons of working age. We prefer to include the number of younger people in the equation.

[38] The denomination 'G77' dates from 1964 when the group was established at the end of the first UNCTAD-meeting (UN Conference on Trade and Development). Today, the group includes over 130 member countries.

[39] The full text of preparatory paragraph 11 of the resolution that was eventually adopted at the CPD-40 is as follows:

> "Recognizing further that the second stage of the demographic transition [referring to the decline in fertility, the first stage being the decline in mortality according to the classic theory: see note 31xx above] presents a window of opportunity for development and that the translation of this window of opportunity into benefits for development requires national policies and an international economic environment conducive to investment, employment, sustained economic development and further integration and full participation of developing countries in the global economy."

[40] For an overview of the three international UN conferences, their differences and significance for the international community see Sinding (2000).

[41] The complete version of the ICPD Programme of Action is available on the website of UNFPA: www.unfpa.org/icpd.

[42] The first signs of fertility decline in Asia were observed in 1955-1960; Latin America and the Caribbean followed in 1965-1970; it was not before 1985-1990 that all the Africa regions showed signs of a fertility decline.
A vast literature exists on the causes of the success of family planning programmes and fertility decline. A key research question is to what extent family planning programmes can be successful independent of economic development. Much of the early literature is based on WFS-data (for an overview, see WFS, 1981). Current research is based on DHS-data (more info available at: www.measuredhs.com/start.cfm).

[43] We will not discuss whether FP programmes alone have led to fertility decline or in conjunction with socio-economic development. We tend to agree with Cleland (2005), as stated in his keynote address at the XXVth IUSSP International Population Conference in Tours, 18-23 July 2005, that FP programmes (and the availability of contraceptives) alone are unlikely sufficient for women to have fewer children. This conclusion is in line with the historical fertility decline as observed in Europe and the role of values (cf. Lesthaeghe, 1977).

[44] The author has attended, as a member of the Belgian delegation, the ICPD Conference and nearly all subsequent CPD sessions (which are organised annually at the UN Headquarters in NY).

[45] In mission reports and unpublished 'essays', most available only in Dutch.

[46] We deliberately ignore here the possible impact of migration.