

**PART TWO**  
**CONTRIBUTED PAPERS**



## THE DIVERSITY OF CHANGING POPULATION AGE STRUCTURES IN THE WORLD

*Population Division, Department of Economic and Social Affairs  
United Nations Secretariat*

The world population is in the midst of an unprecedented transformation brought about by the transition from a regime of high mortality and high fertility to one of low mortality and low fertility. This demographic transition is responsible for the rapid and accelerating growth that the world population experienced in the twentieth century as well as for the slowing down of that growth and for the changes in the age distribution associated with those developments. Indeed, the demographic transition starts usually with a reduction of mortality, which results in longer survival, particularly of children who typically benefit the most from the reduction of the very high risks of death that they experience when mortality is high. As a consequence population growth accelerates and the proportion of children in the population increases, leading to a rejuvenation of the population's age structure. Partly in response to these changes, fertility begins to decrease because parents realize that they can have fewer children to ensure the survival of the number they desire. Sustained reductions of fertility slow down population growth and produce eventually reductions of the proportion of children in the population thus triggering the process of population ageing. As time elapses, if the reductions of fertility and mortality continue, they reinforce the ageing process because, over time, sustained fertility decline leads not only to decreasing proportions of children but also of young people and eventually of adults of working age. Furthermore, increases in longevity have generally the effect of accelerating the growth of the proportion of older persons more than those of young people or adults.

Thus, in terms of the effects of the demographic transition on population age structures, one can distinguish three distinct stages. During the first, there is a rejuvenation of the age distribution as the proportion of children increases. During the second, triggered by fertility reductions, the proportion of children begins to decline while the proportion of adults and older persons rise. During the third stage, reached usually after lengthy periods of fertility and mortality decline, the proportions of both children and adults of working age decline and only the proportion of older persons rises.

During the second stage of the transition, adults of working age constitute a significantly larger proportion of the total population than during the first stage of the transition, so that the number of adults of working age per dependent (that is, children and older persons) increases for a certain period until it reaches a maximum. During that period, a population is optimally placed to benefit from economically productive investment because its levels of economic dependency are low and there are relatively more potential workers to support persons in the non-productive ages (children and the older population). The terms "demographic dividend", "demographic bonus" or "demographic window of opportunity" have been coined to describe this stage of the transition and allude to the possibilities that it presents for raising a country's rate of economic growth per capita and its standard of living.

However, the benefits associated with the "demographic window of opportunity" are not automatic. For instance, the second stage of the demographic transition usually entails a rapidly growing population of young people (aged 15 to 24) who need to be educated and provided with gainful employment in order to become assets for society. The demographic bonus may provide an opportunity for speeding development, but realizing those benefits depends on the adoption of macroeconomic policies that promote productive investment, increase employment opportunities and in general ensure a stable social and economic environment propitious for sustained economic growth and sustainable development.

Although the period of the demographic bonus can last several decades, if fertility reductions are sustained it eventually gives way to the third stage of the transition, where the proportion of adults of working age ceases to rise and only the proportion of older persons continues increasing. This period of rapid population ageing poses new challenges for the adaptation of society to an unprecedented situation and requires the development of sound public policy to facilitate the adjustments that will be necessary in a variety of spheres, including the provision of health care and old-age support. The need for such adjustments raises questions of intergenerational equity in meeting the needs of persons at different stages of life and of the roles of the State, the private sector and the family in providing such support. Different approaches to solving those problems are likely to affect the distribution of wealth, opportunities and burdens that cut across age and gender groups within societies.

Today the major areas of the world are at different stages of the demographic transition. Europe is well into the third stage of the transition and its population, which is already the oldest in the world, is expected to age rapidly in the foreseeable future. Northern America and Australia/New Zealand also find themselves in the third stage of the transition but because their fertility levels have not fallen as low as those of Europe, they are expected to experience a somewhat slower ageing process. Asia and Latin America and the Caribbean find themselves in the second stage of the transition and are still in time to benefit from the demographic bonus. However, because these two regions experienced on average fairly rapid fertility reductions, they are expected to age more rapidly than Europe or Northern America did in the past. Lastly, Africa has only recently embarked on the second stage of the transition and still has a very young population with high dependency levels. Furthermore, because Africa is the major area most affected by the HIV/AIDS epidemic, its transition to low mortality has been interrupted and it is not clear whether the incipient fertility reductions experienced by countries in the region will accelerate or not over the short term. Even assuming that fertility reductions proceed at a moderate pace, Africa is expected to continue being the major area with the youngest population well into the twenty-first century.

This paper presents an overview of trends in population ageing, thus providing the demographic basis for the further examination of the social, economic and policy implications of the changes expected. Most of the data presented here are derived from the *2004 Revision of World Population Prospects*, the most recent version of the official United Nations population estimates and projections (United Nations, 2005a). In what follows, trends are generally discussed in terms of the following age groups: children (the population aged 0 to 14 years); young persons or youth (persons aged 15 to 24 years); adults of working age (aged 15 to 59); older persons (persons aged 60 years or over), and the oldest-old (those aged 80 years or over).

#### A. THE CHANGING AGE DISTRIBUTION OF THE WORLD AND THE DEVELOPMENT GROUPS

As described above, the different stages of the demographic transition give rise to various changes of the age distribution over time. At the world level, the population in 1950 was relatively young, having 34 per cent of its members under age 15 and barely 8 per cent aged 60 or over (table 1). Between 1950 and 1975, as mortality decline accelerated, particularly in the less developed regions, both the proportion under age 15 and that aged 60 or over increased, to reach 37 per cent and about 9 per cent respectively. Overall, therefore, the population of the world became slightly younger from 1950 to 1975. But after 1975, as fertility reductions in the developing world accelerated, the proportion of children at the world level began to decrease, so that by 2005 the population under age 15 accounted for just 28 per cent of the total. Given that fertility at the world level started declining in the 1970s, by 2000 there had also been a slight reduction in the proportion of the population aged 15-24, from 19 per cent in 1975 to 18 per cent in 2005. However, as expected, the proportion aged 25-59 had risen markedly, passing from 36 per cent in 1975 to nearly 44 per cent in 2005. These trends suggests that the world population is already well into the period in which the demographic bonus can be reaped. Furthermore, if fertility and mortality trends continue as projected in the medium variant of the official United Nations population projections, the

TABLE 1. POPULATION BY MAJOR AGE GROUP AND PERCENTAGE DISTRIBUTION BY AGE GROUP FOR THE WORLD AND THE DEVELOPMENT GROUPS, 1950, 1975, 2005, 2025 AND 2050

Age group	Population (millions)					Percentage				
	1950	1975	2005	2025	2050	1950	1975	2005	2025	2050
<i>World</i>										
0-14	864	1 498	1 821	1 909	1 833	34.3	36.8	28.2	24.2	20.2
15-24	459	757	1 159	1 211	1 225	18.2	18.6	17.9	15.3	13.5
25-59	991	1 469	2 812	3 593	4 051	39.3	36.1	43.5	45.4	44.6
60-79	192	318	586	1 032	1 574	7.6	7.8	9.1	13.1	17.3
80+	14	31	87	160	394	0.5	0.8	1.3	2.0	4.3
Total	2 519	4 074	6 465	7 905	9 076	100.0	100.0	100.0	100.0	100.0
<i>More developed regions</i>										
0-14	222	254	206	196	193	27.4	24.2	17.0	15.7	15.6
15-24	138	176	165	140	133	17.0	16.8	13.7	11.2	10.8
25-59	357	456	596	570	510	43.9	43.5	49.2	45.7	41.2
60-79	87	143	200	275	284	10.7	13.7	16.5	22.0	23.0
80+	9	18	44	68	116	1.0	1.8	3.7	5.4	9.4
Total	813	1 047	1 211	1 249	1 236	100.0	100.0	100.0	100.0	100.0
<i>Less developed regions</i>										
0-14	642	1 244	1 615	1 713	1 639	37.6	41.1	30.7	25.7	20.9
15-24	321	581	994	1 071	1 091	18.8	19.2	18.9	16.1	13.9
25-59	634	1 014	2 216	3 023	3 541	37.1	33.5	42.2	45.4	45.2
60-79	105	175	386	757	1 290	6.1	5.8	7.3	11.4	16.5
80+	5	13	42	92	278	0.3	0.4	0.8	1.4	3.6
Total	1 707	3 027	5 253	6 656	7 840	100.0	100.0	100.0	100.0	100.0

Source: *World Population Prospects: The 2004 Revision*, Datasets in Excel and PDF Formats, Extended Dataset, United Nations, 2005.

bonus will persist until at least 2025, since still by then it is projected that the proportion of the population aged 25-59 will continue to increase, albeit slightly.

These trends at the world level are mainly the result of the average trends for the less developed regions, where the age distribution also showed an increase in the proportion of children and youth between 1950 and 1975, followed by a decline in both proportions between 1975 and 2005. But just as at the world level, this decline is compensated by a marked increase in the proportion aged 25-59 which is expected to continue rising until at least 2025 and could remain almost unchanged until 2050 (at close to 45 per cent). In addition, the proportion aged 60 or over in the less developed regions has been rising steadily and is expected to pass from 8 per cent in 2005 to 13 per cent in 2025 and might reach nearly 20 per cent by 2050. That is, the ageing of the population of less developed regions is expected to accelerate, particularly after 2025.

In contrast with the less developed regions, whose population is still fairly young, the more developed regions have an older population. Already today, 20 per cent of the population in the more developed regions is aged 60 years or over, a proportion that might be reached by the less developed regions only by 2050. However, because of the very low fertility that the more developed regions have had since the 1980s, their age distribution today is somewhat more advantageous than the one projected for less

developed regions in 2050, in the sense that the proportion of persons aged 25-59 in more developed regions today is 49 per cent or 4 percentage points higher than the proportion projected for less developed regions in 2050.

Another way of assessing the implications of population distribution for economic and social development is to consider the number of persons aged 25-59 per 100 persons in other age groups. This ratio is a rough indicator of the number of persons in the economically productive ages to the number of persons of other ages who are more likely not to be productive, either because they are studying or because they are no longer economically active.<sup>1</sup> Table 2 shows the evolution of this ratio between 1950 and 2050 for the world and the development groups. The ratios indicate that since 1950, the more developed regions have had a considerably more advantageous ratio than the less developed regions. Especially today, there are 97 persons aged 25-59 in more developed regions to every 100 persons in the other age groups, whereas in the less developed regions that ratio, which is at an all time high, is just 73. Over the next 20 years, the situation in the less developed regions continues improving while the ratio for the more developed regions declines, but by 2025 both sets of countries are expected to have similar overall ratios. After 2025, the ratio for the more developed regions declines markedly while that for the less developed regions remains almost unchanged. This measure corroborates therefore that the less developed regions, as a whole, still have the opportunity to reap the benefits of the demographic bonus and some time to adapt to the rapid population ageing that they will experience once the bonus ends.

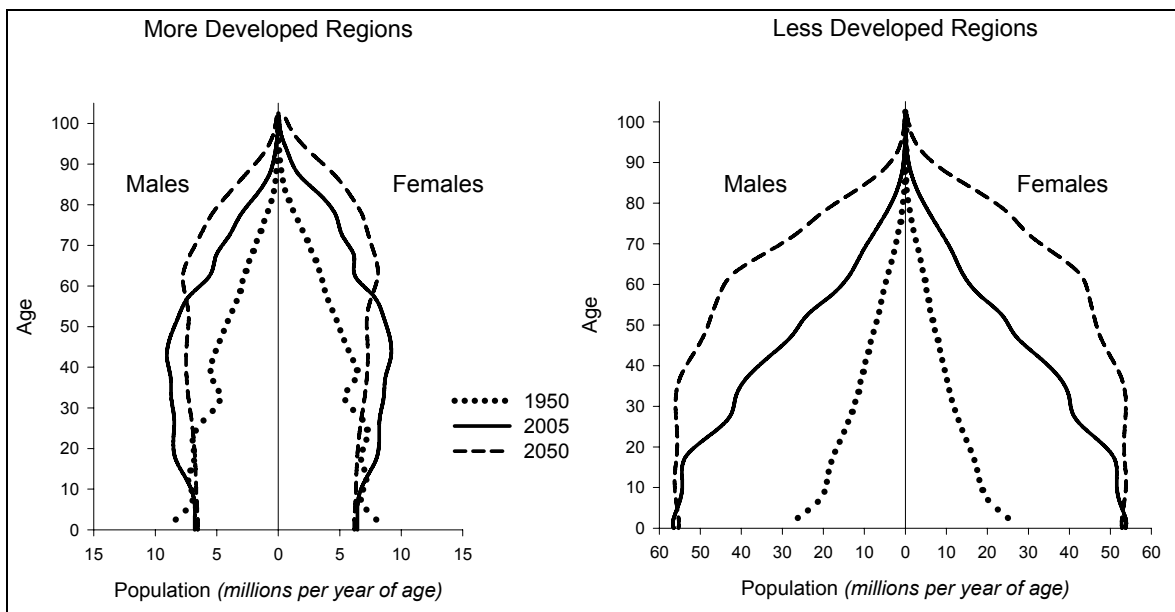
TABLE 2. NUMBER OF PERSONS AGED 25-59 PER 100 PERSONS IN THE OTHER AGE GROUPS FOR THE WORLD AND THE DEVELOPMENT GROUPS, 1950-2050

	1950	1975	2005	2025	2050
World	65	56	77	83	81
More developed regions	78	77	97	84	70
Less developed regions	59	50	73	83	82

*Source: World Population Prospects: The 2004 Revision, Datasets in Excel and PDF Formats, Extended Dataset, United Nations, 2005.*

It should be noted that although the proportion of the population aged 25-59 is expected to remain nearly constant in the less developed regions between 2005 and 2050, the age distribution of those potential workers is also expected to become older, as illustrated in figure 1. Thus, whereas in 1950 the age distribution of the working-age population in the less developed regions resembled a pyramid, with a broad base at the younger working ages and decreasing numbers at higher ages, by 2050 the distribution is expected to become closer to a rectangle, although the younger cohorts in the less developed regions still tend to be somewhat larger than the older cohorts. In the more developed regions, the distribution of the group aged 25-59 today is closer to an inverted pyramid, with the older cohorts being larger than the younger ones, and the expected distribution by 2050 also becomes considerably more rectangular. Furthermore, whereas in the less developed regions the population continues to increase until 2050 for every age group above age 10, the population of the more developed regions is smaller in 2050 than it is expected to be in 2025 for every age group above age 10.

**Figure 1. Age and sex distribution of the population, more developed and less developed regions, 1950, 2005 and 2050**



Source: *World Population Prospects: The 2004 Revision*, Datasets in Excel and PDF Formats, Extended Dataset, United Nations, 2005.

In sum, the world population as a whole is today in a relatively favourable position regarding the size of its population of working age relative to that of children and older persons. Furthermore, although the more developed regions are more advanced in the process of population ageing than the less developed regions, they are still in a relatively advantageous situation because they have a fairly high proportion of persons in the economically active ages and a moderate proportion of older persons (20 per cent). Their main concern, therefore, should be to make provisions for the rapid ageing that lies ahead. For the less developed regions as a whole, the situation is also propitious and the expectation is that it will improve further over the short term as fertility continues to decrease. However, this development will help accelerate the ageing process so that by mid-century the less developed regions are likely to be in a position similar to that of more developed countries today.

#### B. POPULATION AGEING IN MAJOR AREAS

The overall trends described above mask important differences among major areas and countries, resulting from variations in the timing of the demographic transition in each of them. Table 3 displays selected indicators of the changing age distribution in each major area and figures 2 and 3 show trends over time. Clearly Africa has today the youngest age distribution, with 41 per cent of the population under age 15 and just about 5 per cent of the population aged 60 years or over. In sharp contrast, Europe has a much older population, with just 16 per cent under age 15 and 21 per cent aged 60 or over. Therefore, in Europe the number of older persons has already surpassed the number of children.

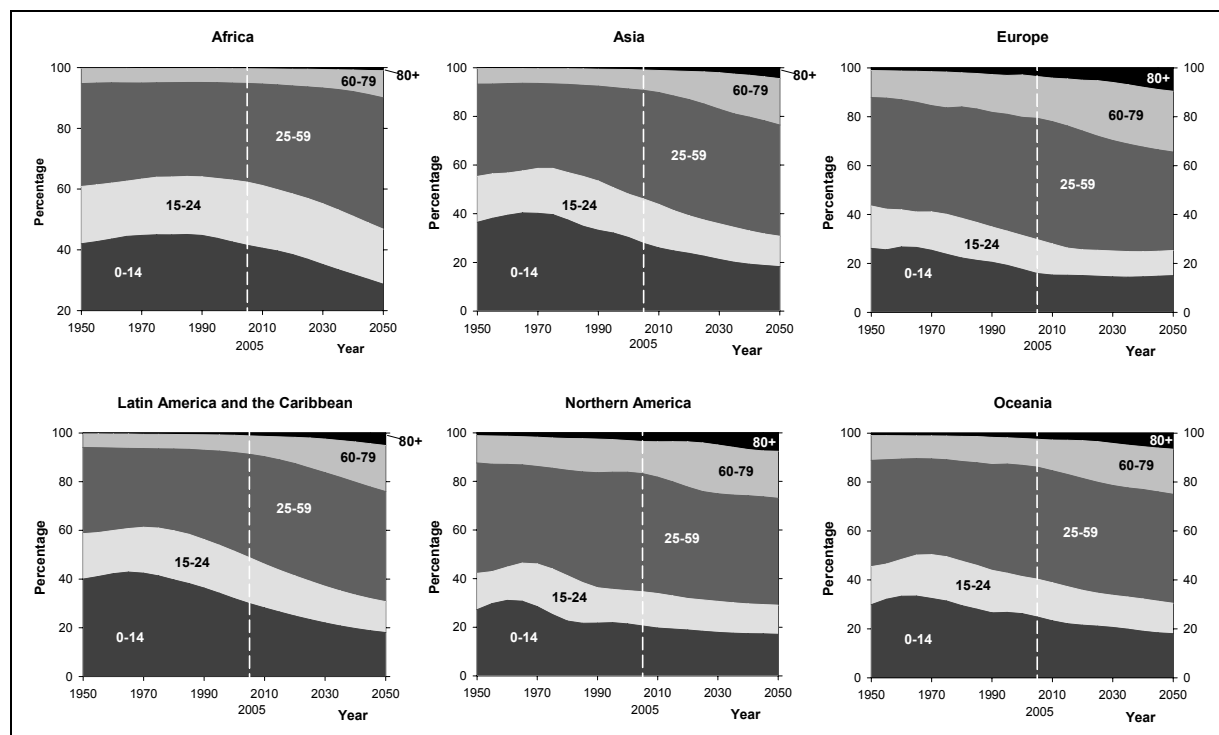
TABLE 3. POPULATION BY MAJOR AGE GROUP AND PERCENTAGE DISTRIBUTION BY AGE GROUP FOR MAJOR AREAS, 1950, 1975, 2005, 2025 AND 2050

Age group	Population (millions)					Proportion by age group (percentage)				
	1950	1975	2005	2025	2050	1950	1975	2005	2025	2050
<i>Africa</i>										
0-14	94	187	376	495	556	42	45	41	37	29
15-24	42	79	189	270	350	19	19	21	20	18
25-59	76	129	294	494	838	34	31	32	37	43
60-79	11	20	44	78	173	5	5	5	6	9
80+	1	1	4	7	20	0	0	0	1	1
Total	224	416	906	1 344	1 937	100	100	100	100	100
<i>Asia</i>										
0-14	509	949	1 086	1 067	954	36	40	28	23	18
15-24	263	455	712	701	650	19	19	18	15	12
25-59	529	832	1 743	2 254	2 382	38	35	45	48	46
60-79	90	148	327	623	996	6	6	8	13	19
80+	4	11	38	83	235	0	0	1	2	5
Total	1 396	2 395	3 905	4 728	5 217	100	100	100	100	100
<i>Latin America and the Caribbean</i>										
0-14	67	133	168	163	141	40	41	30	23	18
15-24	31	63	106	110	99	19	20	19	16	13
25-59	59	105	238	323	354	35	33	42	46	45
60-79	9	19	43	86	148	6	6	8	12	19
80+	1	2	7	15	40	0	1	1	2	5
Total	167	322	561	697	783	100	100	100	100	100
<i>Northern America</i>										
0-14	47	62	68	71	75	27	25	20	18	17
15-24	26	46	47	50	52	15	19	14	13	12
25-59	78	101	161	173	192	45	41	49	45	44
60-79	19	30	44	78	85	11	12	13	20	19
80+	2	5	12	16	33	1	2	4	4	8
Total	172	243	331	388	438	100	100	100	100	100
<i>Europe</i>										
0-14	143	160	115	104	98	26	24	16	15	15
15-24	95	111	101	75	67	17	16	14	11	10
25-59	243	294	361	330	263	44	43	50	47	40
60-79	60	99	125	161	163	11	15	17	23	25
80+	6	12	26	37	63	1	2	4	5	10
Total	547	676	728	707	653	100	100	100	100	100
<i>Oceania</i>										
0-14	4	7	8	9	9	30	31	25	21	18
15-24	2	4	5	5	6	16	18	16	13	12
25-59	6	8	15	19	21	43	40	46	45	45
60-79	1	2	4	7	9	10	10	11	17	18
80+	0	0	1	1	3	1	1	3	3	7
Total	13	21	33	41	48	100	100	100	100	100

Source: World Population Prospects: The 2004 Revision, Datasets in Excel and PDF Formats, Extended Dataset, United Nations, 2005.



**Figure 2. Percentage distribution of the population by broad age group for major areas, 1950-2050**



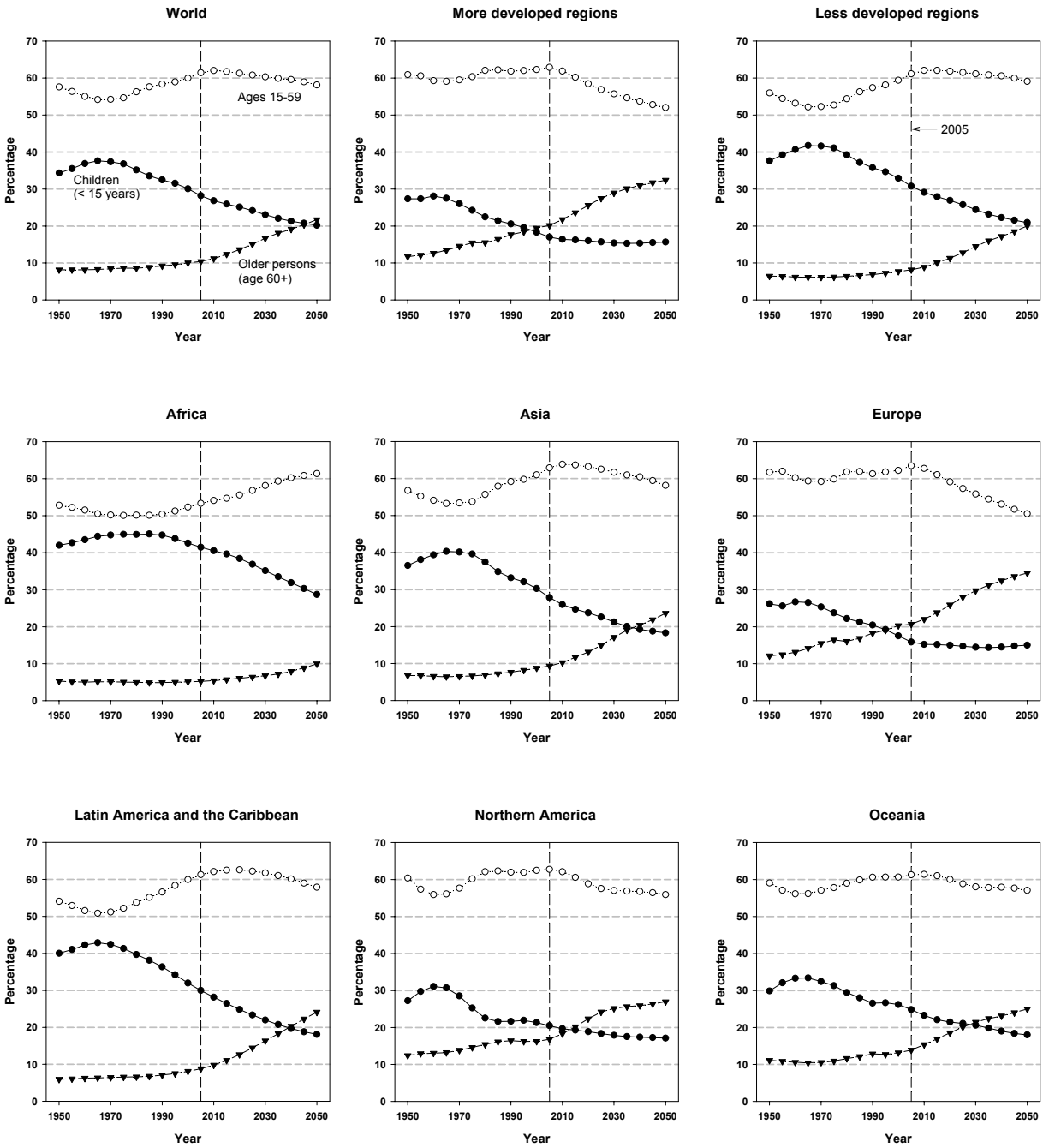
Source: *World Population Prospects: The 2004 Revision*, Datasets in Excel and PDF Formats, Extended Dataset, United Nations, 2005.

Northern America is the second oldest area, with 20 per cent of the population under age 15 and 17 per cent aged 60 years or over. Oceania, where the developed countries of Australia and New Zealand account for most of the population, exhibits the next oldest population, with 25 per cent of children and 14 per cent of older persons. Asia and Latin America and the Caribbean follow. Both have about 9 per cent of the population aged 60 years or over, but Latin America and the Caribbean have a higher proportion of children than Asia (30 per cent vs. 28 per cent).

Although all major areas are expected to experience further ageing of their populations over the next 45 years, large differences in age structure will likely persist until 2050. By then, the proportion aged 60 years or over is likely to range from 10 per cent in Africa to 35 per cent in Europe. In all the other major areas, about a quarter of the population is expected to be 60 or over. Similarly, except for Africa and Europe, where the proportion of children is expected to be 29 per cent and 15 per cent, respectively, that of all other areas is expected to be between 17 and 18 per cent. This implies that in all major areas except Africa and Europe, the proportion of the population aged 15-59 is expected to be similar, ranging from 56 to 58 per cent. Europe would have by 2050 a much lower proportion in those ages (50 per cent), while Africa would have 61 per cent.

One important development expected over the next century is the continued ageing of the older population. That is, the proportion of persons aged 80 or over is expected to grow rapidly. Thus, whereas in 2005 that proportion amounted to just over 1 per cent of the world population, by 2050 it is expected to reach over 4 per cent. In Europe and Northern America, where the oldest old constitute today about 4 per cent of the population, they are expected to account for 10 per cent and 8 per cent of their respective

**Figure 3. Evolution of the proportion of the population in major age groups for the world and major areas, 1950-2050**



Source: *World Population Prospects: The 2004 Revision*, Datasets in Excel and PDF Formats, Extended Dataset, United Nations, 2005.  
 NOTE: Estimates and medium-variant projections.

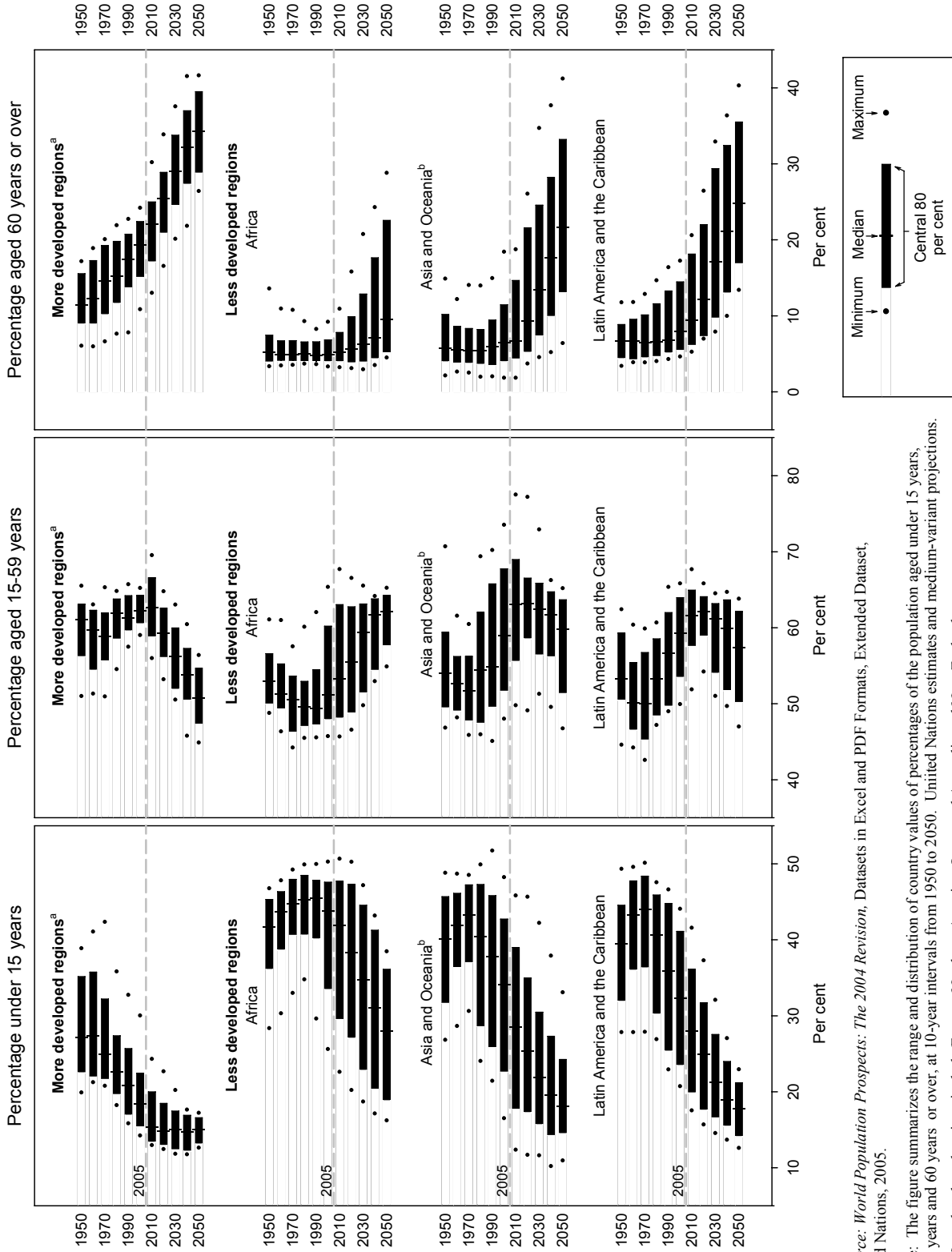
populations in 2050. In Oceania the equivalent increase is expected to be from 3 per cent to 7 per cent. But it is in Asia and Latin America and the Caribbean where the increase is more remarkable: from barely 1 per cent in 2005 to 5 per cent in 2050. In contrast, the oldest old, which account for barely 0.4 per cent of Africa's population today, are expected to account for just 1 per cent in 2050, indicating that Africa's population will still be fairly young by mid-century.

Averages for major areas conceal large differences in the ageing process at the country level. Figure 4 shows the distribution of countries according to the percentages of children, adults of working age, and older persons, by major area in the developing world and for the more developed regions as a whole. The horizontal dark bars for each period indicate the central four-fifths of each distribution, the dot within the bars shows the median value, and the dots outside show the extreme values of each distribution (lowest and highest values observed). Focusing on the distributions relative to the proportion under age 15, a tendency for the bars and the highest value to move to the left is indicative of general reductions of the proportion of children and, therefore, of population ageing. Alternatively, a movement of the bars and lowest value to the right, indicates increases in the proportion of children and hence population rejuvenation. The diagrams thus make clear that many countries in Africa, Asia and Oceania, and Latin America and the Caribbean first experienced some rejuvenation of the population before ageing set in. For Asia and Oceania as well as for Latin America and the Caribbean the distributions begin to move to the left during the 1980s, but for Africa some leftward movement in the distribution occurs only after 2000. In all major areas, the initial movement of the distribution of the proportions of children to the left produces an elongation of the central bar, indicating that heterogeneity within the region increases as different countries embark on the transition to low fertility at different times. But, as time elapses, the length of the bar tends to diminish because more countries follow the path to ageing. Figure 4 shows clearly that there is greater homogeneity already among the more developed countries than in the developing regions. But both in Asia and Oceania and in Latin America and the Caribbean heterogeneity in terms of the proportion of children in the population is expected to decrease substantially by mid-century. The same is not expected for Africa, where even by mid-century there is likely to be considerable heterogeneity among countries in terms of their proportions of children.

The distributions of the proportion of persons aged 60 years or over contrast with those relative to the proportion of children because they tend to move in the opposite direction, as the proportions of older persons rise. In addition the diversity or variability among countries tends to increase as time elapses, so that, at least in the less developed regions, the dark bar is longer around 2050 than in earlier periods. It is noteworthy that the movement to the right of the distributions begins earlier in Latin America and the Caribbean than in Asia and Oceania, and that it is hardly noticeable in Africa before 2010. For the more developed regions, the movement to the right of the full distribution is steady and was already under way by the late 1960s. This pattern together with the relatively narrow central bars suggests that the ageing process is pervasive and relatively homogeneous in the more developed countries.

Lastly, the distributions of the proportion of persons aged 15-59 illustrate the movement of the population wave that eventually leads to rapid ageing. In the less developed regions, the proportions 15-59 tend to decline at first (moving the distribution to the left) as the population becomes younger when mortality decreases; then, as fertility declines, they increase and the distribution moves to the right. Later, at the third stage of the transition, the distribution moves again to the left as the proportions 15-59 decline in favour of the increasing proportions of older persons. In the less developed regions the distributions are still moving to the right as the proportions 15-59 generally increase. The movement to the left is not expected to occur before 2030 in Asia and Oceania nor in Latin American and the Caribbean. Furthermore, in Africa the movement leftward is not likely to occur before 2050. In sharp contrast, the movement to the left is just about to start in the more developed regions and is expected to be persistent over the coming decades.

**Figure 4. Distribution of the proportion of population aged under 15 years, 15-59 years and 60 years or over for major areas, 1950-2050**



Source: *World Population Prospects: The 2004 Revision*, Datasets in Excel and PDF Formats, Extended Dataset, United Nations, 2005.

Note: The figure summarizes the range and distribution of country values of percentages of the population aged under 15 years, 15-59 years and 60 years or over, at 10-year intervals from 1950 to 2050. United Nations estimates and medium-variant projections.

<sup>a</sup> More-developed regions include Europe, Northern America, Japan and Australia and New Zealand.

<sup>b</sup> Excluding Japan, Australia and New Zealand.

Note that, especially in Asia and Oceania, there are some countries where the proportion aged 15-59 is projected to reach exceptionally high levels (above 70 per cent). The countries with these high proportions are mostly small and tend to be important destinations for migrant workers, such as the member States of the Gulf Cooperation Council. In addition to these countries, there are several others where the proportion aged 15-59 is already or is projected to be above 65 per cent. These include Algeria and Tunisia in Africa; Armenia, China, Iran, Mongolia, the Republic of Korea and Viet Nam in Asia; a number of the successor States of the former USSR including the Russian Federation, and several countries in Eastern and Southern Europe. All of these countries have experienced either sharp drops in fertility or long periods of very low fertility or both.

### C. POPULATION AGEING AT THE COUNTRY LEVEL

One useful indicator of population ageing is the median age of a population, that is, the age that separates the population into two equal halves. Increases in the median age are indicative of population ageing. Between 1950 and 2005, the median age of the world population increased from 24 to 28 years and it is projected to rise to 38 years by 2050 (table 4). More developed countries already have a median age of 39 years and it is projected to rise to over 45 years by mid-century. The less developed countries as a whole have a much younger population, with a median age that is currently 26 years and that is projected to be somewhat below 37 years in 2050. Particularly young populations are found in the group of 50 least developed countries whose overall median age is still under 19 years today and will likely not surpass 28 years over the next 45 years. These countries include most of those where fertility is still high and has shown no decrease or only an incipient decline.

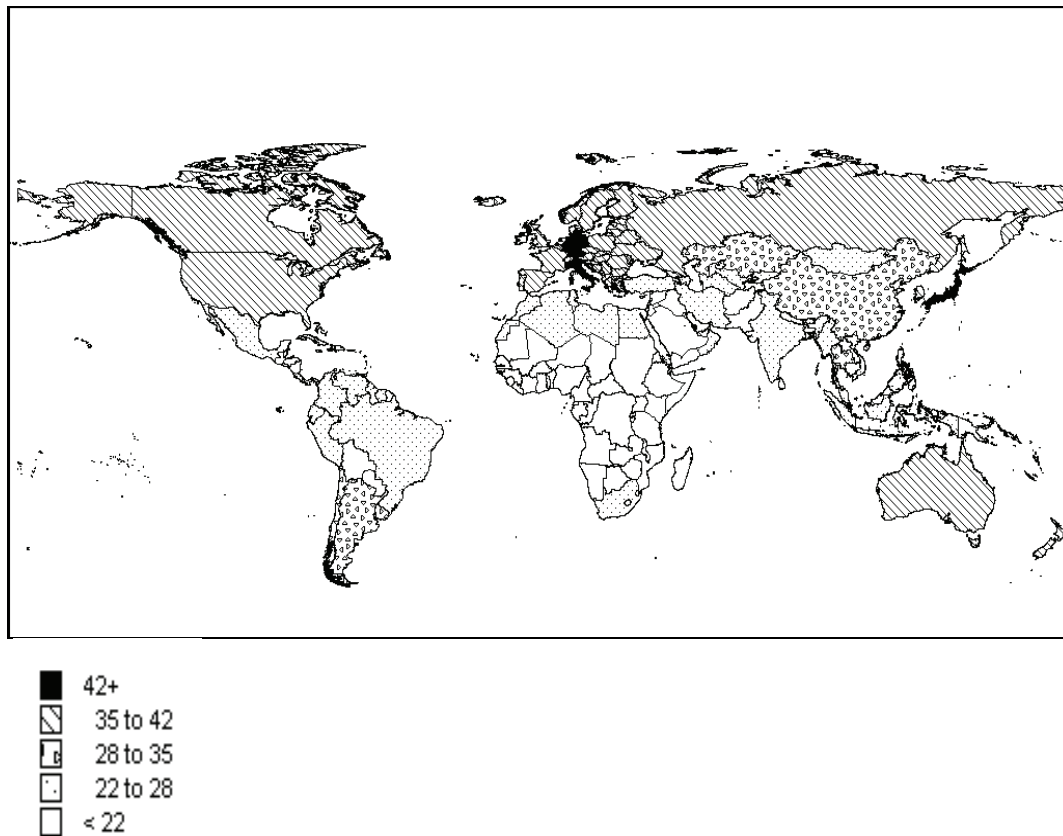
At the level of countries, the youngest populations are those of Mali, Niger and Uganda, whose median ages in 2005 were at most 16 years. Countries with young populations typically have still or had until recently high fertility levels. The map in figure 5 indicates that the youngest populations are mainly concentrated in the countries of sub-Saharan Africa. Young populations also characterize countries in the Arabian Peninsula and a few countries in South-Central and Eastern Asia, including Afghanistan and Pakistan. Most countries in Central America also have young populations as do Bolivia and Paraguay in South America.

TABLE 4. MEDIAN AGE FOR THE WORLD, THE DEVELOPMENT GROUPS AND THE MAJOR AREAS, 1950, 2005 AND 2050

<i>Regions and major areas</i>	<i>Median age (years)</i>		
	<i>1950</i>	<i>2005</i>	<i>2050</i>
World	23.9	28.1	37.8
More developed regions	29.0	38.6	45.5
Less developed regions	21.4	25.6	36.6
Least developed countries	19.6	18.9	27.3
Africa	19.0	18.9	27.4
Asia	22.0	27.7	39.9
Latin America and the Caribbean	20.2	25.9	39.9
Northern America	29.8	36.3	41.5
Europe	29.7	39.0	47.1
Oceania	28.0	32.3	40.5

*Source: World Population Prospects: The 2004 Revision, Datasets in Excel and PDF Formats, Extended Dataset, United Nations, 2005.*

**Figure 5. Median age by country, 2005**

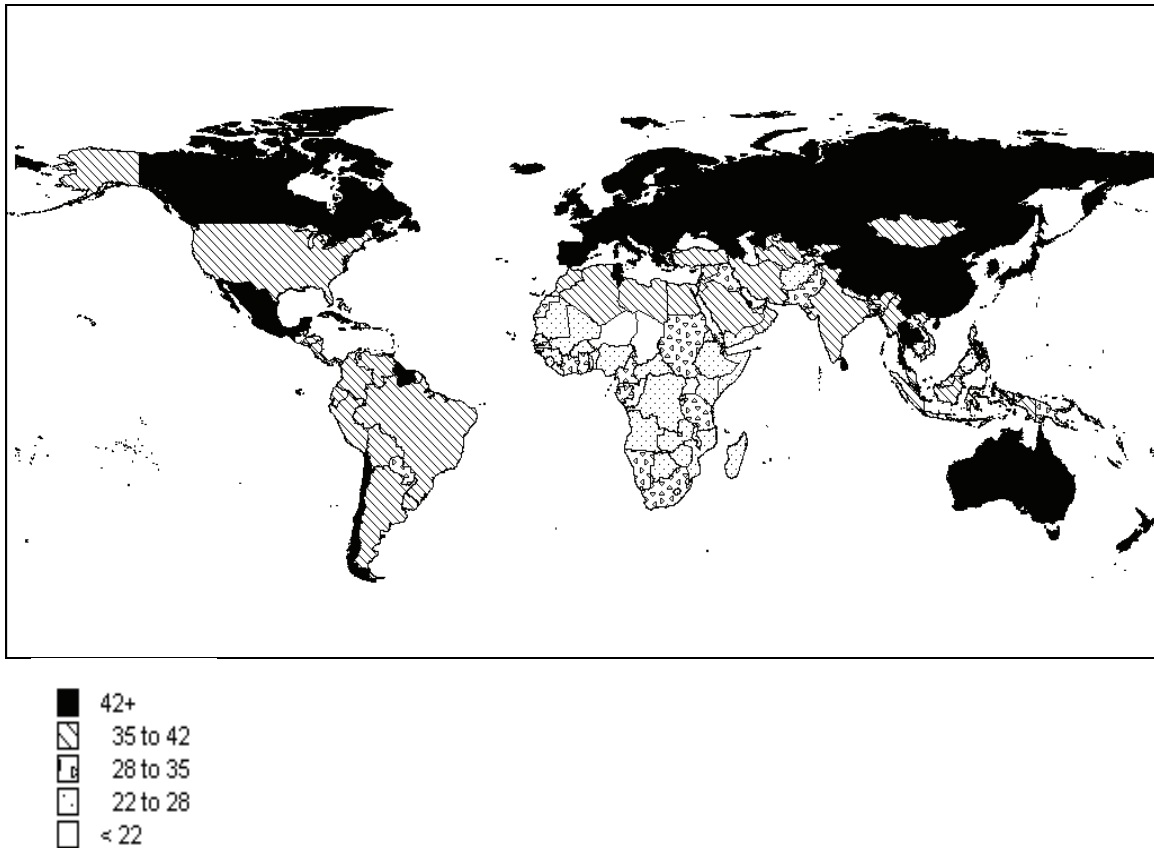


Source: *World Population Prospects: The 2004 Revision*, Datasets in Excel and PDF Formats, Extended Dataset, United Nations, 2005.

At the other end of the spectrum, countries such as Germany, Italy and Japan already have median ages surpassing 42 years. Indeed, as figure 5 shows, all developed countries have median ages at or above 35 years. Among the developing countries, those with the oldest populations include Argentina, Chile, Cuba and Uruguay in Latin America and the Caribbean as well as China, Kazakhstan and Thailand in Asia but most of them still have median ages below 35 years.

Over the next 45 years, most countries will see their median ages rise markedly. As the map in figure 6 shows, by 2050 very few countries are expected to have median ages below 22 years. Burundi, Chad, Congo, Guinea-Bissau, Guinea, Liberia, Niger and Uganda are projected to have the youngest populations at that time. In sharp contrast, 17 countries are expected to have median ages higher than 50 years, the majority located in Europe (e.g., Bulgaria, the Czech Republic, Italy, Lithuania, Poland, Romania, Slovakia, Slovenia and Ukraine) or in Asia (Hong Kong SAR China, Georgia, Japan, and the Republic of Korea). As the map in figure 6 shows, by 2050 the median ages of all developed countries except the United States are expected to be equal or greater than 42 years, and a number of developing countries are also projected to have median ages in that range, including China, Chile, Cuba, Kazakhstan, Mexico, Thailand and Tunisia. Furthermore, with the exception of countries in sub-Saharan Africa, most of which continue to have relatively young populations in 2050, virtually all other developing countries are projected to have median ages at or above 35 years by mid-century. Among developed countries, the United States maintains a relatively younger population because of international migration: without migration its median age in 2050 would be projected at 43.6 years instead of the 41.1 years projected with migration.

Figure 6. Median age by country, 2050



Source: *World Population Prospects: The 2004 Revision*, Datasets in Excel and PDF Formats, Extended Dataset, United Nations, 2005.

#### D. IS POPULATION AGEING INEVITABLE?

So far, the discussion of future prospects has been based on the results of the medium variant of the official United Nations population projections (United Nations, 2005a). However, the projections include other projection variants aimed to illustrate the effects of different future paths of fertility change. In particular, the high and low variants differ from the medium variant in that their future fertility remains half a child above and half a child below that of the medium variant over the projection period (2005-2050). These differences imply that, whereas in the medium variant the fertility of most countries reaches 1.85 children per woman by the end of the projection period in 2045-2050, in the high variant it reaches 2.35 children per woman and in the low variant 1.35 children per woman. That is, both the low and medium variants project eventual fertility levels that do not ensure the replacement of populations and would therefore lead to declining populations, whereas the high variant projects fertility levels that, if sustained, would produce a continually growing population. These assumptions lead to vastly different populations in 2050: the low variant produces a population of 7.7 billion persons that is already declining; the high variant produces a population of 10.6 billion that continues to increase and the medium variant produces a population of 9.1 billion that is still increasing but very slowly. It is expected that future population trends will be within the range projected, particularly because if fertility at the world level would differ markedly from the trends projected the population would grow faster or decline earlier and more rapidly than projected, outcomes that would more likely be unsustainable.

What effects do the fertility levels projected in the high and low variants have on the age distribution expected by mid-century? As table 5 indicates, at the world level the low variant projects a population where the proportion of children is 15 per cent and that of older persons is 26 per cent, while in the high variant the proportion under 15 is 25 per cent and the proportion aged 60 or over is 18 per cent. In comparison with today's figures of 28 per cent under age 15 and 10 per cent aged 60 or over, the low variant produces a population that is ageing very rapidly. But even in the high variant, where fertility remains above replacement level and the population continues to increase, producing therefore only a small reduction in the proportion of children, the proportion of older persons nearly doubles, partly because of the expected continuation of mortality reductions, especially at older ages. Higher fertility as projected in the high variant is also insufficient to stop the ageing of the population of more developed regions, although it does increase somewhat the proportion under age 15 (it rises from 17 per cent in 2005 to 20 per cent in 2050). But the high variant still produces fairly marked ageing in the less developed regions. Thus, even under the assumption of continued population growth, population ageing seems inevitable.

TABLE 5. PERCENTAGE DISTRIBUTION OF THE ESTIMATED AND PROJECTED POPULATION OF THE WORLD AND THE DEVELOPMENT GROUPS ACCORDING TO DIFFERENT PROJECTION VARIANTS, 2005 AND 2050

<i>Age group</i>	2005	2050		
	<i>Estimates</i>	<i>Low</i>	<i>Medium</i>	<i>High</i>
		<i>World</i>		
0-14	28	15	20	25
15-59	61	59	58	57
60+	10	26	22	18
Total	100	100	100	100
<i>Number (billions)</i>	6.5	7.7	9.1	10.6
		<i>More developed regions</i>		
0-14	17	11	16	20
15-59	63	51	52	52
60+	20	38	32	28
Total	100	100	100	100
<i>Number (billions)</i>	1.2	1.1	1.2	1.4
		<i>Less developed regions</i>		
0-14	31	16	21	25
15-59	61	60	59	57
60+	8	24	20	17
Total	100	100	100	100
<i>Number (billions)</i>	5.3	6.6	7.8	9.2

Source: *World Population Prospects: The 2004 Revision*, Datasets in Excel and PDF Formats, Extended Dataset, United Nations, 2005.



How about the effect of international migration? In today's world, the more developed regions are net receivers of international migrants while the less developed regions are net senders. The medium variant assumes that the direction of those flows will be the same in the future. Therefore, the medium variant already reflects the possible rejuvenating effect that migration may have on the population of the more developed regions. To gauge the size of that effect, projections assuming that there is no migration have been calculated. They show that, without migration, the population of the more developed regions would be expected to have 15 per cent of the population under age 15, 50 per cent aged 15-59 and 35 per cent aged 60 or over. That is, a net migration gain averaging 2.2 million persons per year during 2010-2050 would reduce the proportion aged 60 or over by 3 percentage points and increase the proportion of children by one percentage point, a fairly small contribution to the slowing down of the ageing process.

This finding is consistent with those of other studies that have examined international migration's effect on population age structures and have concluded that the effect is usually small, though not always negligible (see United Nations, 1998; 2001). Although migrants tend to be concentrated in the young adult ages and are often accompanied by young children, thus adding to the younger age groups, in order for migration to have a lasting effect on the age structure of a population, a sustained inflow of migrants over time is required. Simulations to calculate the level of international migration necessary to offset the reduction of population numbers in countries with below-replacement fertility, such as Italy, Japan or the Republic of Korea, have shown that the levels of immigration required would have to be much higher than those experienced by those countries in the 1990s (United Nations, 2001). To offset projected population decline in Europe, for instance, the net number of immigrants would need to be twice as high annually during 2000-2050 as it was during 1995-2000. The levels of immigration needed to offset projected declines in the working-age population would be larger still. Furthermore, even those levels of net immigration would not halt the process of population ageing. Indeed, enormous migration flows would be required in countries with below-replacement fertility to keep constant the ratio of persons over age 65 to the population of working-age. Such inflows would also result in very rapid population growth driven mainly by the new immigrants and their descendants. Such a scenario underscores the fact that the ongoing process of population ageing has a powerful in-built momentum that can only be halted by major population increases which would in all likelihood be unsustainable.

#### E. THE COMPONENTS OF CHANGE OF THE AGE STRUCTURE

It is of interest to ascertain to what extent the changes in fertility, mortality and international migration expected in the future have an impact on the eventual age structure of the population. Following a procedure used in United Nations (1988) whereby different projections are made keeping all components of change constant, except one, so as to assess its effect, the estimates presented in table 6 were obtained. In general, the age distribution of a closed population is determined by the fertility and mortality to which the population has been subject. The initial age structure of the population also has an effect on the eventual age distribution, but this effect diminishes as the projection period increases. In addition, if the population experiences non-zero migration, the latter also affects the resulting age distribution.

As table 6 indicates, in the more developed regions the proportion of children aged 0-14 declined by 9.1 percentage points between 1950 and 2000 and is projected to decline further by 2.7 percentage points from 2000 to 2050. During 1950-2000, fertility decline was responsible for most of the change observed. In the future, however, because fertility is expected to recover somewhat from the very low levels it has reached in most developed countries, its contribution to the proportion of children in more developed regions is expected to be positive. However, such contribution is more than counterbalanced by the negative contributions of mortality and of the initial age distribution. The contribution of mortality is negative during 2000-2050 because mortality levels are expected to decline faster among older persons than among children.

TABLE 6. COMPONENTS OF CHANGE IN THE PROPORTIONS OF POPULATION UNDER AGE 15, AGED 15-59 AND 60 OR OVER FOR THE DEVELOPMENT GROUPS, 1950-2000 AND 2000-2050

	<i>More developed regions</i>		<i>Less developed regions</i>	
	<i>1950-2000</i>	<i>2000-2050</i>	<i>1950-2000</i>	<i>2000-2050</i>
<i>0-14 years</i>				
Initial proportion (percentage)	27.4	18.3	37.6	32.9
Proportion at the end (percentage)	18.3	15.6	32.9	20.9
Absolute change	-9.1	-2.7	-4.7	-12.0
Fertility effect	-9.3	2.1	-11.9	-5.8
Mortality effect	-0.1	-1.0	2.8	0.2
Migration effect	0.3	0.6	0.1	-0.1
Effect of the initial age distribution	0.0	-4.4	4.3	-6.3
<i>15-59 years</i>				
Initial proportion (percentage)	60.9	62.3	55.9	59.4
Proportion at the end (percentage)	62.3	52.0	59.4	59.1
Absolute change	1.4	-10.3	3.5	-0.3
Fertility effect	5.2	-0.4	9.9	3
Mortality effect	-2.1	-2.9	-3.5	-2.1
Migration effect	0.3	1.5	-0.2	-0.1
Effect of the initial age distribution	-2.0	-8.5	-2.7	-1.1
<i>60 years or over</i>				
Initial proportion (percentage)	11.7	19.5	6.4	7.7
Proportion at the end (percentage)	19.5	32.4	7.7	20.0
Absolute change	7.8	12.9	1.3	12.3
Fertility effect	4.1	-1.7	2.0	2.9
Mortality effect	2.2	4.0	0.7	2.0
Migration effect	-0.4	-2.2	0.2	0.0
Effect of the initial age distribution	1.9	12.8	-1.6	7.4

In the more developed regions, fertility made a positive contribution to the growth the proportions 15-59 and 60 or over during 1950-2000, precisely because it had a negative effect on the growth of the proportion of children over the same period. Mortality made a negative contribution to the proportion 15-59 while it contributed positively to that 60 or over because it declined faster at older ages. Similarly, the initial age distribution contributed to reduce the share of the population aged 15-59 but it raised that of the older population. By contrast, migration had a small positive effect on the share of those aged 15-59 but a negative one on the share of the older population. During 2000-2050, the 2000 age distribution in more developed regions has by far the major effect on the changes expected in the proportions aged 15-59 and 60 or over. In addition, mortality has an important role, raising the proportion 60 or over while reducing that 15-59, and migration has a moderate effect in the opposite direction in both instances. Fertility, which has a positive effect on the proportion of children during 2000-2050, has consistently negative effects at ages above 15.

In the less developed regions changes in fertility are the dominant factor determining the change in the age distribution, followed by the effects of the initial age distribution, particularly with respect to changes in the proportion under 15 during 1950-2000 and in the proportion 60 or over during 2000-2050. The effect of mortality on the changing proportions under 15 and 15-59 is significant during 1950-2000 and it is expected to make a moderate contribution to the proportion of older persons in the future. In the less developed regions, international migration had a very small effect during 1950-2000 at its effect becomes virtually nil during 2000-2050.

In sum, fertility change was an important contributor to the change in the age distribution of both more developed and less developed regions in the past and is expected to continue having an important role in the less developed regions in the future. In addition, the effects of the 2000 age distribution on future development are substantial in both groups of countries but especially in the more developed regions. That is, much of the expected future ageing of today's population is already inscribed in its age distribution which itself is the result of the unprecedented and historical unique transition from high mortality and fertility to low levels of both.

#### F. DEPENDANTS AND WORKERS

Indicators of the potential effects of ageing for social and economic development are the so-called dependency ratios which relate the group of the population that is considered to be economically dependent to the group that is economically active. Since exact measures of the number of persons who are producers and those who are exclusively consumers are generally not available, proxies are used based solely on age ranges. Thus, it is generally assumed that children under 15 fall in the dependent category. It is also assumed that older persons are more likely to be at a stage of life where they are mainly consumers. In this paper, the older population has been defined as that aged 60 years or over. For consistency, that age group will be used here to calculate dependency ratios. Three types of ratios will be considered: (a) the child dependency ratio which relates the number of persons aged 0-14 to the number aged 15-59; (b) the old-age dependency ratio which relates the number of persons aged 60 or over to those aged 15-59, and (c) the overall dependency ratio which is the sum of the other two. All dependency ratios are expressed in terms of number of children or older persons or both per 100 persons aged 15-59.

Before proceeding to an analysis of trends in these dependency ratios, some caveats are in order. Clearly, in most populations people do not stop being economically active at age 60, nor is it true that all persons aged 15-59 are economically active. Furthermore, although old persons often require economic support from others, older persons in many societies are also providers of support to their adult children (Morgan, Schuster and Butler, 1991; Saad, 2001). In addition, not all persons aged 15-59 provide direct or indirect support to children or older persons (Taeuber, 1992). In particular, as the period of training for a productive life increases, most adolescents and young adults remain in school and out of the labour force, effectively extending the period of young-age dependency well beyond age 15. These observations suggest that, at best, trends in the dependency ratios considered here are indicative of the constraints that society may face as the population ages and unprecedented imbalances arise in the sizes of key age groups. However, estimation of the likely economic impact of such imbalances would require more appropriate measures of the number of workers and consumers in a population by age.

Table 7 shows the values of the three dependency ratios for selected years from 1950 to 2050 for the world, the more developed regions and the less developed regions. As expected, the overall dependency ratio for the world increases from 74 dependents per 100 persons aged 15-59 in 1950 to 83 in 1975, mainly as a result of the increase in the number of children relative to the working age population, as reflected in the rise of the child dependency ratio. Between 1975 and 2005, the overall dependency ratio declines from 83 to 63 dependents per 100 persons of working age, mainly because of the continued and major reductions in child dependency. However, this decline is expected to come to a halt in the coming

decade so that, by 2025, the overall dependency ratio is projected to be 65, slightly higher than in 2005, and by 2050 it would reach 72. This projected increase in the overall dependency ratio is entirely due to the rise of old-age dependence since the ratio relative to children is expected to maintain its decreasing path (figure 7). It should be noted that these trends would be similar if the ratios considered used the population aged 15-64 as denominator and defined older persons as those aged 65 or over.

In the more developed regions, the overall dependency ratio increased slightly between 1950 and 1975 (from 64 to 66 dependants per 100 persons aged 15-59), and then declined to 59 in 2005, thus reaching a very low level and the minimum that it is expected to reach since a steadily increasing path is projected for the overall dependency ratio in the future. Such an increase results from the ever rising old-age dependency ratio. Indeed, by 2050 the old-age dependency ratio for the more developed regions is expected to reach 62, a value higher than today's overall dependency ratio and close to the overall ratio estimated for 1950. Adding the dependent children produces an overall dependency ratio of 92 in 2050, a level 45 per cent higher than the average dependency ratio prevailing in the more developed regions between 1950 and 2005. These trends confirm the earlier finding that the window of opportunity is essentially over for the more developed regions and that rapid ageing lies ahead.

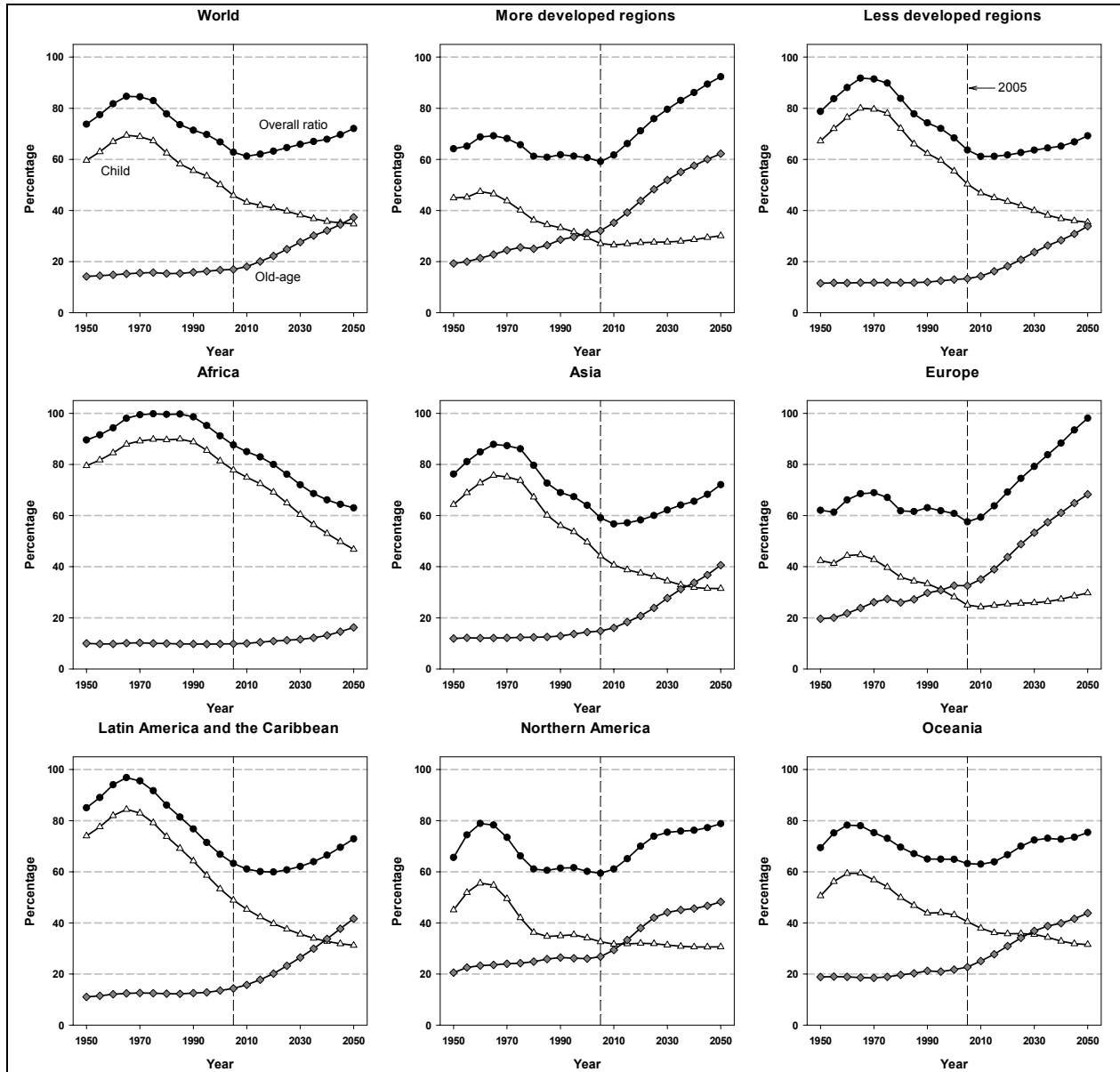
The experience of the less developed regions and their prospects are quite different. First, their overall dependency ratio in 1950, at 79 dependents per 100 persons aged 15-59, was high compared to that of the more developed regions at the time and it was mostly due to the high level of child dependency (67 per 100). Between 1950 and 1975, as the proportion of children increased because of reduced mortality, both the child and the overall dependency ratios soared to 78 and 90 respectively. But the reduction in the proportions of children coupled with the rising proportions of persons aged 15-59 that occurred after 1975 led to a major reduction of the child and overall dependency ratios. By 2005, the overall dependency ratio in the less developed regions stood at 64 and is expected to keep on declining until it reaches 61 in 2015 before a slowly increasing trend sets in. Increases after 2015 are slow because the rapid rise expected in the old-age dependency ratio are counterbalanced by continued reductions in child dependency. By 2050 the less developed regions as a whole are expected to have an overall dependency ratio of 69, lower than it was in 1950, but with a very different composition than in earlier times since older persons are expected to account for about half of the dependency burden, up from 15 per cent in 1950 and 21 per cent today.

TABLE 7. THREE TYPES OF DEPENDENCY RATIOS RELATING THE POPULATION OF CHILDREN AND THE OLDER POPULATION TO THE POPULATION AGED 15-59 FOR THE WORLD AND THE DEVELOPMENT GROUPS, 1950-2050

	<i>Type of ratio</i>	<i>1950</i>	<i>1975</i>	<i>2005</i>	<i>2025</i>	<i>2050</i>
World	Overall	74	83	63	65	72
	Child	60	67	46	40	35
	Old-age	14	16	17	25	37
More developed regions	Overall	64	66	59	76	92
	Child	45	40	27	28	30
	Old-age	19	26	32	48	62
Less developed regions	Overall	79	90	64	63	69
	Child	67	78	50	42	35
	Old-age	12	12	13	21	34

*Source: World Population Prospects: The 2004 Revision, Datasets in Excel and PDF Formats, Extended Dataset, United Nations, 2005.*

Figure 7. Trends in the three types of dependency ratios for the world, the development groups and the major areas, 1950-2050



Source: *World Population Prospects: The 2004 Revision*, Datasets in Excel and PDF Formats, Extended Dataset, United Nations, 2005.  
NOTE: Estimates and medium-variant projections.

Figure 7 also illustrates the paths followed over time by the overall dependency ratio and its child and old-age components for each of the world's major areas. Between 1950 and 1975, Africa and Latin America and the Caribbean both had very high overall dependency ratios, hovering in the upper 90s but, whereas the overall dependency ratio for Latin America and the Caribbean had dropped markedly by 2005 (to 63), that of Africa remained very high (at 88). With respect to the future, the period of steady decline of the overall dependency ratio still lies ahead for Africa where it is expected to reach 63 by 2050. For Latin America and the Caribbean, in contrast, the expectation is for the ratio to stop declining around 2020 and then initiate a steady increase to reach a level of 73 by 2050. Furthermore, as figure 7 illustrates,

after 2040 much of the increase of the dependency ratio will come from the rising weight of the older population.

Asia's overall dependency ratio follows a path similar to that of Latin America and the Caribbean but at a lower level, so that it reaches a low value of 59 in 2005. The prospects for Asia are also mainly a steady though slow increase in the overall dependency ratio that sets in at around 2010. In Asia the old-age burden becomes higher than the child burden slightly earlier than in Latin America and the Caribbean but by 2050 both regions are expected to have similar overall dependency ratios (72 for Asia).

The other three regions, being part of the developed world, exhibit lower overall dependency ratios before 2005 than the major areas of the developing world. Europe in particular maintains very low overall dependency ratios during that period, especially because of its lower levels of child dependency. In addition Europe is the first region to exhibit a crossover of the child and old-age dependency ratios so that by 2005 the older population accounts for 57 per cent of its overall dependency burden which itself stands at 58 dependants per 100 persons aged 15-59. It is this early crossover that leads to a sharp rise in the overall dependency ratio of Europe, which largely parallels that of its old-age ratio. As a result, by 2050 Europe's overall dependency ratio is expected to be a high 98, similar to that of Africa in the 1960s but determined mainly by a high proportions of older persons instead of high proportions of children.

For Northern America and Oceania, the overall dependency ratios follow similar trends, having peaked at around 1960 at a level of 78-79 and then declined to 59 and 63, respectively, by 2005. In both regions the dependency ratios are expected to start increasing within the next decade to reach by 2050 a level of 79 in Northern America and 75 in Oceania. It is noteworthy, however, that the share of older persons in the overall dependency ratio is expected to surpass that of children earlier in Northern America (in 2015) than in Oceania (2030). In both major areas, as in Europe, the expected increase in the overall dependency ratio is mainly driven by the rising weight of the older population.

#### G. THE SIZE AND GROWTH OF MAJOR AGE GROUPS

So far the discussion has focused on the distribution of population by age group or the relative size of one group to another but one important consequence of the demographic transition is the veritable explosion of population growth and its eventual decline, processes that have affected differently the growth of the major age groups in the population. Overall, world population increased from 2.5 billion in 1950 to 6.5 billion in 2005, a gain of 4 billion, nearly 2.6 times as many people as were alive in 1950. But, as table 8 indicates, about 1.6 billion of this increase occurred between 1950 and 1975 and 2.4 billion during 1975-2005. During the first period, 60 per cent of the population increase was concentrated in the age groups 0-14 and 15-24. In contrast, between 1975 and 2005, 56 per cent of the increase occurred in the form of growth of the population aged 25-59 and during 2005-2025 that age group will also account for the largest share of the population increase expected (54 per cent). After 2025, however, 66 per cent or two-thirds of the expected growth will be concentrated in ages 60 or over.

TABLE 8. ABSOLUTE INCREASE AND AVERAGE ANNUAL GROWTH RATE BY AGE GROUP FOR THE WORLD AND THE DEVELOPMENT GROUPS, 1950, 1975, 2005, 2025 AND 2050

Age group	Increase (millions)				Average annual growth rate (percentage)				Percentage distribution of the population increase by age group			
	1950-1975	1975-2005	2005-2025	2025-2050	1950-1975	1975-2005	2005-2025	2025-2050	1950-1975	1975-2005	2005-2025	2025-2050
<i>World</i>												
0-14	633	323	88	-77	2.2	0.7	0.2	-0.2	41	14	6	-7
15-24	298	402	52	14	2.0	1.4	0.2	0.0	19	17	4	1
25-59	479	1 343	780	458	1.6	2.2	1.2	0.5	31	56	54	39
60-79	127	267	447	542	2.0	2.0	2.8	1.7	8	11	31	46
80+	18	55	74	234	3.3	3.4	3.1	3.6	1	2	5	20
Total	1 554	2 391	1 440	1 171	1.9	1.5	1.0	0.6	100	100	100	100
<i>More developed regions</i>												
0-14	31	-48	-10	-2	0.5	-0.7	-0.2	-0.1	13	-	-	-
15-24	38	-11	-25	-7	1.0	-0.2	-0.8	-0.2	16	-	-	-
25-59	99	140	-26	-61	1.0	0.9	-0.2	-0.4	42	-	-	-
60-79	56	56	75	9	2.0	1.1	1.6	0.1	24	-	-	-
80+	10	26	23	48	3.1	2.9	2.1	2.1	4	-	-	-
Total	234	164	38	-13	1.0	0.5	0.2	0.0	100	-	-	-
<i>Less developed regions</i>												
0-14	602	371	98	-74	2.6	0.9	0.3	-0.2	46	17	7	-6
15-24	260	413	77	21	2.4	1.8	0.4	0.1	20	19	6	2
25-59	380	1 203	806	518	1.9	2.6	1.6	0.6	29	54	57	44
60-79	70	211	371	532	2.1	2.6	3.4	2.1	5	9	26	45
80+	8	29	50	186	3.6	3.9	3.9	4.4	1	1	4	16
Total	1 320	2 227	1 403	1 183	2.3	1.8	1.2	0.7	100	100	100	100

Source: *World Population Prospects: The 2004 Revision*, Datasets in Excel and PDF Formats, Extended Dataset, United Nations, 2005.

Trends at the world level are determined mainly by those of the less developed regions so that the two resemble each other. Hence, population growth in the less developed regions during 1950-1975 was concentrated in ages 0-24, but during 1975-2025 its concentration shifted to age group 25-59. After 2025, 61 per cent of the expected population growth in the less developed regions is concentrated in age group 60 or over.

More developed regions display a different pattern of growth by age group. During 1950-1975, age group 25-59 absorbed the largest share of overall population growth, 45 per cent, whereas groups 0-24 and 60 or over accounted for almost equal shares of overall growth (28 per cent). During 1975-2005, however, the population under age 25 declined and population growth was concentrated in both age groups 25-59 and 60 or over, with the former accounting for the largest share. But in future even the population aged 25-29 is expected to decrease so that any population increase will be concentrated at ages 60 or over. That is expected to happen between 2005 and 2025 and, remarkably, also between 2025 and 2050 when overall population growth is projected to be negative even as the population aged 60 or over still increases substantially.

The trends described above result from the movement over the life cycle of the large cohorts born when fertility was high. In the developed world, they are related to the ageing of the “baby boom” generation, that is, the cohorts born from the late 1940s to the 1960s, when fertility rebounded. In the developing world it is the movement of the large cohorts born before fertility declined significantly in the late 1970s or early 1980s. The fact that fertility remains still high in an important part of the developing world, including most notably sub-Saharan Africa, produces a longer period of expected increases in the size of age groups 0-24 and 25-59. However, according to current projections, the child population in the developing world may start declining after 2025.

With regard to the speed of growth of different age groups, figure 8 displays the growth rates by five-year age group for the world and the development groups. The figure shows how, for the world and the less developed regions, rapid growth at the younger ages gives way to rapid growth at the adult ages and then to that at the older ages as time elapses. It is noteworthy that population growth at the oldest ages (above age 75 or 80) remains high throughout the 1950-2050 period.

For the more developed regions, figure 8 makes plain the pervasive trend toward the eventual reduction of the population which first makes its appearance after 1975 when the younger age groups (under 25) show negative growth. By 2005-2025 negative growth is expected for all age groups below age 55 and by 2025-2050 all groups below age 70 are expected to be decreasing in size.

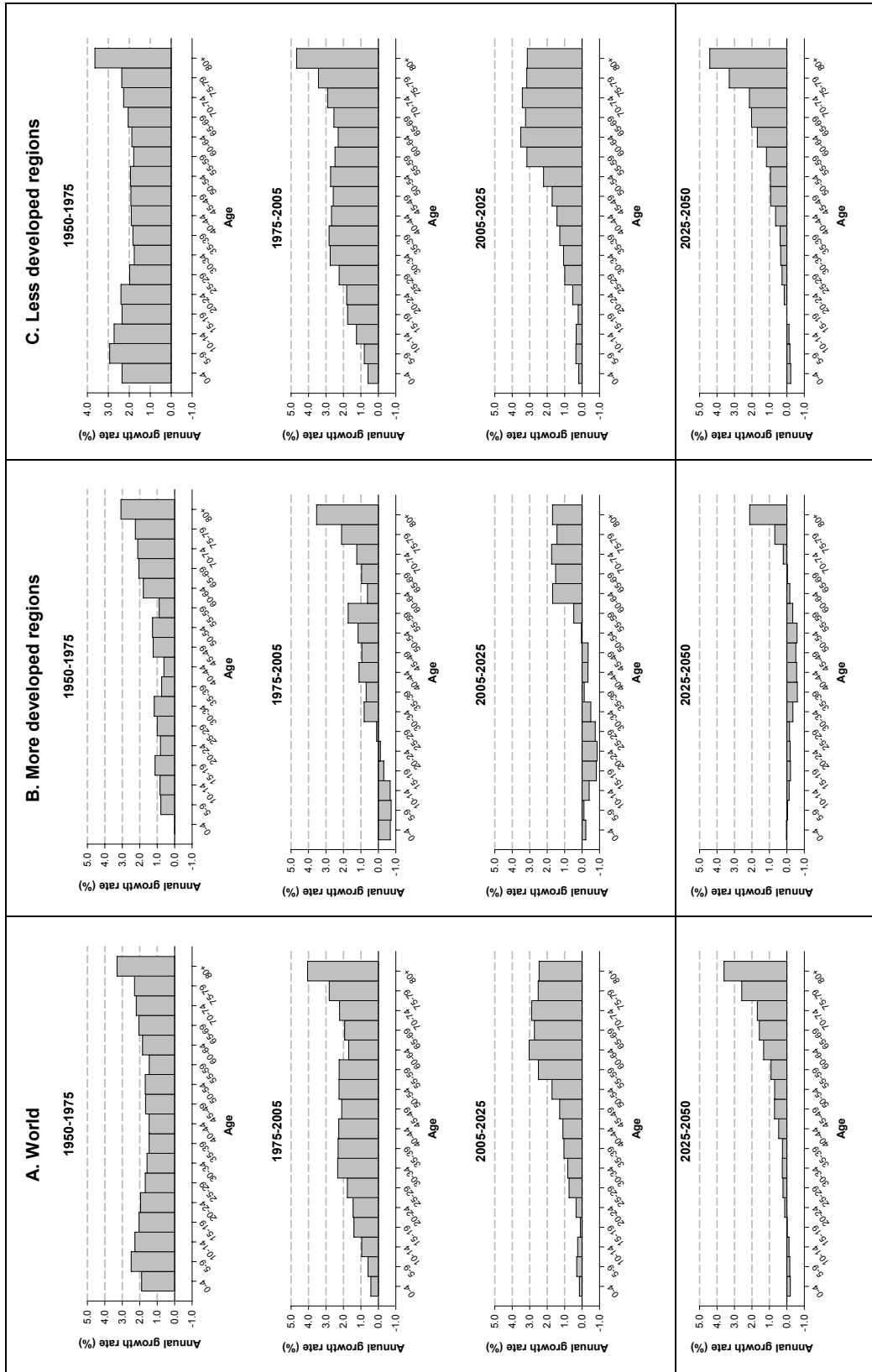
Today the world has 1.8 billion children and just under 1.2 billion young persons aged 15-24, 88 per cent of whom live in the developing world. These numbers are not expected to change much during the coming decades (table 1). But their distribution among the major regions will experience important shifts. Thus, whereas today 60 per cent of the population under age 25 lives in Asia, 19 per cent in Africa 9 per cent in Latin America and the Caribbean, and 12 per cent in the more developed regions, by 2050 the share of Africa is projected to rise to 30 per cent, while those of Asia, Latin America and the Caribbean, and the more developed regions will drop to 52, 8 and 10 per cent respectively.

The population aged 15-59 is projected to increase by about one third between 2005 and 2050, passing from 2.8 billion to 4.1 billion (table 1). All of this increase is expected to take place in the less developed regions. In the more developed regions, the population of working age is projected to start declining after 2005, so that by 2050 it will be 15 per cent smaller than in 2005 (510 million compared to 596 million). The decline will take place mainly in Europe, where the population aged 25-59 is expected to be almost 30 per cent lower in 2050 than in 2005, and in Japan, where the decline will amount to one third of the current number. In Africa, by contrast, the population aged 25-59 in 2050 is projected to be almost two and a half times as large in 1950 as it is today: 838 million vs. 294 million (table 3).

The number of persons aged 60 or over is expected nearly to triple, passing from 672 million in 2005 to nearly 2 billion by 2050. The increase in the number of older persons is expected to be more marked in the less developed regions, where it may almost quadruple, passing from 428 million to nearly 1.6 billion during 2005-2050. The number of older persons will also rise in the more developed regions, but more moderately, passing from 244 million in 2005 to 400 million in 2050. As a result, whereas today 64 per cent of the population aged 60 or over lives in developing countries, by 2050 the equivalent proportion is expected to be nearly 80 per cent. Today, 54 per cent of the older population lives in Asia and 22 per cent in Europe. The shares of Africa, Latin America and the Caribbean, and Northern America



Figure 8 Average annual growth rate of population in 5-year age groups, for four time periods during 1950-2050: world and development groups



Source: World Population Prospects: The 2004 Revision, Datasets in Excel and PDF Formats, Extended Dataset, United Nations, 2005.

are about 7 per cent each. By 2050, Asia is expected to have the largest share of the older population (63 per cent), whereas Africa, Europe and Latin America and the Caribbean will have about 10 per cent each and Northern America's share would decline to 6 per cent.

A notable aspect of the global ageing process is the progressive demographic ageing of the older population itself. In most countries, regardless of their geographic location or developmental stage, the population aged 80 or over is growing faster than any younger segment of the older population. At the global level, the average annual growth rate of persons aged 80 years or over in 2000-2005 (4.2 per cent) was more than twice as high as the growth rate of the total population aged 60 or over (2.0 per cent). Although those growth rates are expected to decline over the next 45 years, by 2045-2050 the growth rate of population aged 80 or over (3.0 per cent) will still be almost double that of the group aged 60 or over (1.7 per cent). Such high rates of growth produce in 2050 almost 400 million persons aged 80 or over, nearly five times as many as in 2005 (87 million). Currently, a slight majority of the oldest old live in the more developed regions. By 2050, over 70 per cent are projected to live in the less developed regions.

Although the proportion of the oldest-old is growing, they will remain a minority among older persons. Today, just 12 per cent of the older population is aged 80 or over and in 2050 the projected numbers show that about 20 per cent could be in that age group. Worldwide, in 2050, nearly half (47 per cent) of the older population will be aged 60-69 and one third will be aged 70-79.

#### H. THE DISTRIBUTION BY SEX OF THE OLDER AGE GROUPS

Normally, more boys are born than girls and the average sex ratio at birth is a biological constant that varies little among populations (it usually ranges from 103 to 106 boys for every 100 girls). Hence, differences in the sex ratio by age are determined by differential mortality by sex. Because women usually have a survival advantage over men, they tend to outnumber men as age advances. Thus, whereas it is estimated that there are today 101 males per 100 females in the world population, the equivalent ratio is 82 men per 100 women among those aged 60 or over (table 9). This means that women aged 60 or over outnumber men in the same ages by about 67 million. Furthermore, the proportion of women in the older population grows substantially with advancing age. In 2005, women outnumber men by almost 4 to 3 at ages 65 or older, and by almost 2 to 1 at ages 80 or over.

Mortality levels have dropped markedly since 1950. Between 1950-1955 and 2000-2005 the world population gained 18 years of life expectancy, but the gains were not equally shared by men and women (table 10). In most countries, reductions in mortality have been greater for females than males, thus reinforcing the female survivorship advantage. At the world level the female advantage in life expectancy at birth has increased from 2.8 to 4.5 years since 1950. Furthermore, in terms of life expectancy at ages 60 and 80, the female advantage has also risen. Consequently, not only are women more likely than men to survive to age 60 but, once they reach that age, they can expect to live considerably longer than men of the same age. These trends have contributed to maintain the low sex ratio of the world population aged 60 or over (82 men per 100 women). Furthermore, among those aged 80 or over, the sex ratio has decreased markedly, passing from 61 in 1950 to 55 in 2005.

Sex ratios at older ages tend to be lower in the more developed regions than in the less developed regions, partly because the sex advantage in female survivorship has been larger in the more developed regions, particularly after age 80. As a result, there are today 72 men per 100 women aged 60 or over in the more developed regions and just 46 men per 100 women aged 80 or over. Furthermore, given that the female advantage in life expectancy in the more developed regions is expected to decline by 2045-2050, the sex ratio of their population aged 60 or over is projected to increase between 2005 and 2050, passing from 72 to 78 males per 100 females. Increases are also expected in the sex ratio of those aged 80 or over.

TABLE 9. SEX RATIO OF THE POPULATION IN SELECTED AGE GROUPS FOR THE WORLD AND THE DEVELOPMENT REGIONS, 1950, 2005 AND 2050

<i>Age group</i>	<i>Sex ratio (males per 100 females)</i>		
	<i>1950</i>	<i>2005</i>	<i>2050</i>
<i>World</i>			
0-14	104	105	105
15-59	100	103	104
60+	80	82	85
80+	61	55	61
Total	100	101	99
<i>More developed regions</i>			
0-14	103	105	105
15-59	90	100	103
60+	74	72	78
80+	58	46	57
Total	91	94	94
<i>Less developed regions</i>			
0-14	105	105	105
15-59	106	103	104
60+	86	88	86
80+	68	66	63
Total	104	103	100

*Source: World Population Prospects: The 2004 Revision, Datasets in Excel and PDF Formats, Extended Dataset, United Nations, 2005.*

In contrast, in the less developed regions, sex ratios in both age groups are expected to decline, indicating that there will be an exacerbation of the imbalance between men and women at older ages in the developing world.

Among the world's major areas, Europe has today the lowest sex ratios at older ages: 69 men per 100 women aged 60 or over, and 42 men per 100 women aged 80 or over. These low ratios result from both large sex differentials in life expectancy and the long-term effects of the massive loss of young men during the Second World War.

TABLE 10. LIFE EXPECTANCY AT BIRTH AND AT AGES 60 AND 80 BY SEX FOR THE WORLD AND THE DEVELOPMENT GROUPS, SELECTED PERIODS

	1950-1955			2000-2005			2045-2050					
	Both sexes	Female	Male	Difference	Both sexes	Female	Male	Difference	Both sexes	Female	Male	Difference
World	46.6	48.0	45.3	2.8	65.4	67.7	63.2	4.5	75.1	77.5	72.8	4.7
More developed regions	66.1	68.5	63.5	5.0	75.6	79.3	71.9	7.4	82.1	85.0	79.1	5.9
Less developed regions	41.1	42.0	40.3	1.7	63.4	65.2	61.7	3.5	74.0	76.2	71.8	4.4
					<i>Life expectancy at birth (years)</i>							
World	14.8	15.5	13.9	1.5	19.2	20.7	17.5	3.2	22.4	24.3	20.5	3.8
More developed regions	18.0	19.6	16.2	3.4	21.0	23.0	18.7	4.3	25.0	27.3	22.6	4.7
Less developed regions	13.0	13.3	12.6	0.6	18.1	19.3	16.8	2.5	21.8	23.5	20.0	3.5
					<i>Life expectancy at age 60 (years)</i>							
World	5.7	5.7	5.4	0.3	7.5	8.1	6.7	1.4	9.0	9.9	7.9	2.0
More developed regions	6.7	7.2	6.1	1.1	8.3	8.9	7.2	1.7	10.4	11.5	9.0	2.6
Less developed regions	4.9	4.8	4.9	0.0	6.8	7.2	6.3	0.9	8.5	9.3	7.5	1.7

Source: *World Population Prospects: The 2004 Revision*, Datasets in Excel and PDF Formats, Extended Dataset, United Nations, 2005.

## I. THE CHANGING AGE STRUCTURES OF URBAN AND RURAL POPULATIONS

As populations around the world are growing older, they are also becoming more urban. The age structures of urban and rural populations usually differ appreciably, mainly because urban populations have generally undergone the transition to low mortality and low fertility earlier than rural populations. Therefore, urban populations are usually further along the path to population ageing than rural populations. However, urban areas are also major attractors of rural-urban migrants, who tend to be concentrated in the younger ages and would therefore help in moderating population ageing.

Using data gathered by population censuses supplemented in a few cases by information collected by nationally representative surveys it was possible to obtain the age distribution of the population classified by urban or rural area of residence for at least two points in time for 119 of the 192 countries or areas of the world that had in 2000 a population of 100,000 or more. For almost all the countries with data, the first data set refers to a date within the period 1960-1980 and the second to the period 1981-2005. Those periods were selected so as to make possible an assessment of changes in the age distributions of urban and rural populations from about 1970 to the 1990s. The countries with data available have a combined population of 5.2 billion in 2000, that is, they account for 85 per cent of the world population at the time. Table 11 presents the distribution of countries with data available by development group and major area. Note that coverage is somewhat better for developed than for developing countries (68 per cent vs. 60 per cent of countries have data, respectively) and that, in terms of major area, coverage ranges from 50 per cent of countries in Oceania to 68 per cent of those in Europe and Northern America.

To obtain the proportions of the population in each age group by rural and urban residence, the data available for countries within each major area were added up without adjustment for reference dates, completeness of coverage or variations in the definition of urban. In reporting the aggregates, the median reference date of the data in each aggregate is reported as an indicator of the reference date of the sum. Despite their deficiencies, the estimates obtained provide an indication of how age structures vary in urban and rural areas.

According to United Nations estimates (United Nations, 2004), the world population will become half urban before 2010. However, the proportion urban varies markedly among major areas. Despite the trend towards rapid urbanization, the populations of Africa and Asia remain mainly rural and the proportion urban in those areas is still a low 40 per cent in 2005. Latin America and the Caribbean, in contrast, is highly urbanized with close to 78 per cent of its population living in cities or towns. Europe, Northern America and Oceania are also highly urban, with Europe and Oceania being 73 per cent urban in 2005 and Northern America having 81 per cent of its population in urban areas. It is in this context that an examination of differences in the age structures of urban and rural populations is to be examined.

Given that urban populations the world over have been the first to benefit from improvements in sanitation, vaccines and new drugs that reduce mortality and that urban dwellers have been more adept at controlling their fertility, the transition to low mortality and low fertility usually starts much earlier in urban than in rural areas. Consequently, it would be expected that the urban population would be older than that in rural areas. However, as mentioned above, the age distribution of urban populations is also influenced by migration and because the net gains from rural-urban migration tend to be high at young adult ages, it is expected that urban populations may be somewhat younger than they would have been in the absence of migration.

TABLE 11. AVAILABILITY OF DATA ON POPULATION BY AGE GROUP  
AND URBAN/RURAL RESIDENCE

<i>Major area</i>	<i>Number of countries</i>		<i>Percentage with data</i>
	<i>Total<sup>a</sup></i>	<i>With data</i>	
World	192	119	62
More developed regions	44	30	68
Less developed regions	148	89	60
Africa	54	31	57
Asia	50	31	62
Latin America and the Caribbean	35	23	66
Europe and Northern America	41	28	68
Oceania	12	6	50

<sup>a</sup> Only countries or areas with more than 150,000 inhabitants in 2000 are included.

Table 12 presents the age distribution of the urban and rural populations of the world and major areas by broad age groups. Two sets of data are presented in each case: one referring to the early 1970s and the second referring to the 1990s or later. Note that, particularly for the most recent estimate, median reference dates vary from 1990 to 2001. In particular, considerably more recent data are available for the more developed regions than for the less developed regions.

Focusing first on change over time, it is clear that the proportion of children has decreased almost universally, whether in urban or rural areas. The sole exception is among the rural population of Africa and this finding is consistent with the delayed transition to low fertility in that major area. It is noteworthy, however, that a small reduction in the proportion of children is noticeable for the urban population of Africa, consistent with an incipient transition to lower fertility.

The proportion of the population aged 15-24 has also decreased in most areas over time. Exceptions arise again in the case of Africa but also for Latin America and the Caribbean where the proportion in age group 15-24 in urban areas remains unchanged and that in rural areas increases slightly. The effect of net rural-urban migration may contribute to the lack of change in the proportion for urban areas and because the data for Latin America and the Caribbean refer to earlier reference dates than those for Asia, the trends observed are consistent with a transition to low fertility that started in the 1970s and has not yet had an effect at ages above 15.

Regarding trends in the proportions aged 25-59 and 60 or over, increases are the rule except in Africa where the estimates show no change in the proportion aged 60 or over whether in rural or in urban areas and an increase in the proportion aged 25-59 in rural areas, indicative of the ongoing rejuvenation of the population as fertility remains high.

Overall therefore, the trend toward population ageing is evident in both the urban and the rural populations of all major areas except Africa. From around 1970 to the most recent reference date, the age distributions of the urban and rural populations of all areas except Africa shifted from the two younger age groups, especially from ages 0-14, to older ages, primarily as a result of declining fertility.

TABLE 12. PERCENTAGE DISTRIBUTION OF THE POPULATION BY AGE GROUP IN URBAN AND RURAL AREAS FOR THE WORLD AND MAJOR AREAS, TWO REFERENCE DATES

<i>Major area</i>	<i>Year</i>	<i>Percentage of the urban population in each age group</i>				<i>Percentage of the rural population in each age group</i>			
		<i>0-14</i>	<i>15-24</i>	<i>25-59</i>	<i>60+</i>	<i>0-14</i>	<i>15-24</i>	<i>25-59</i>	<i>60+</i>
World	1971	31	20	41	9	39	17	36	8
	1996	25	18	46	11	34	17	40	9
More developed regions	1970	24	18	44	13	27	15	41	16
	2001	19	15	49	18	20	14	45	21
Less developed regions	1972	35	21	38	6	41	18	35	7
	1994	28	20	44	8	35	17	39	8
Africa	1974	40	21	34	4	45	18	31	6
	1991	38	21	36	5	46	19	30	6
Asia	1971	32	21	41	7	40	18	36	7
	2000	25	19	47	9	33	17	41	9
Latin America and the Caribbean	1971	39	20	35	7	46	18	30	6
	1993	30	20	42	9	38	19	35	8
Northern America	1970	28	18	40	14	31	16	39	14
	2000	21	14	49	16	21	12	49	18
Europe	1970	22	18	46	14	26	15	42	17
	2001	18	15	49	17	21	14	43	21
Oceania	1972	29	17	41	13	36	16	38	9
	1990	23	17	45	15	29	15	44	11

*Source:* Authors' calculations.

Turning now to the level of urbanization of the population in each age group, the estimates derived from the countries with data available suggest that, at the world level, children 0-14 are less likely to be urban dwellers than persons in other age groups (table 13). This finding is consistent with the conclusions of earlier studies (United Nations, 1980; Hermanova, 1999). The proportions urban for other age groups are remarkably similar indicating that the population aged 25 or over is already 49 per cent urban.

In the more developed regions, the highest levels of urbanization are found among age groups 15-24 and 24-59, which are 75 per cent urban. Children are 72 per cent urban and older persons just 70 per cent. These estimates reflect mostly the pattern in Europe, where children and older persons also appear to be less likely than persons in other age groups to live in urban areas. However, the data for Europe may be biased toward the more rural countries in the continent since the overall level of urbanization for Europe shown table 13 is somewhat lower than the 73 per cent estimated for the whole population of Europe in 2000 (United Nations, 2004).

The estimates for the less developed regions also show that children and older persons are less likely to be urban dwellers than persons aged 15-59. This pattern results mainly from those prevalent in Africa and Asia because in Latin American and the Caribbean there is not a large difference between the proportions living in urban areas for ages 15-59 and 60 or over.

TABLE 13. PERCENTAGE OF THE POPULATION IN EACH AGE GROUP LIVING IN URBAN AREAS FOR THE WORLD AND MAJOR AREAS, TWO REFERENCE DATES

<i>Major area</i>	<i>Year</i>	<i>Percentage in urban areas</i>				<i>Total</i>
		<i>0-14</i>	<i>15-24</i>	<i>25-59</i>	<i>60+</i>	
World	1971	30	38	38	39	35
	1996	39	48	49	49	46
More developed regions	1970	63	70	67	62	66
	2001	72	75	75	70	74
Less developed regions	1972	23	29	27	24	26
	1994	35	43	43	38	40
Africa	1974	21	27	25	19	23
	1991	28	34	36	28	32
Asia	1971	21	27	27	23	24
	2000	32	41	40	37	38
Latin America and the Caribbean	1971	54	61	62	63	59
	1993	71	76	78	76	75
Northern America	1970	72	76	74	73	74
	2000	79	81	79	78	79
Europe	1970	56	64	62	55	60
	2001	66	70	71	64	68
Oceania	1972	77	81	82	85	81
	1990	79	84	83	87	83

*Source:* Authors' calculations.

In sum, aside from showing that the degree of urbanization varies by age group, the estimates available also show that the large majority of the child population in Africa and Asia lives in rural areas, as does the majority of the older population of those major areas (about 70 per cent in Africa and 60 per cent in Asia). It also appears that about a third of the child and the older population of Europe still lives in rural areas, though the countries with data available may be less urbanized than those excluded. Lastly, in Latin America and the Caribbean, Northern America and Oceania, very high percentages of the whole population but also of children and older persons are already urban dwellers. These differences by major areas have important implications for the strategies that society may adopt to adjust to the expected changes in age distribution.

#### J. LIVING ARRANGEMENTS OF OLDER PERSONS

As this paper has documented, populations everywhere are growing older. Furthermore, not only are more people surviving to reach old age, but those who attain old age are living longer than ever before. As a consequence, families comprising three or even four generations have become common, considerably expanding the alternatives for living arrangements of older persons. At the same time, the social and economic transformations that many countries are undergoing are modifying many aspects of



day-to-day family life, including traditions favouring lifelong co-residence of parents and children as a basic means of ensuring support for young and old.

A recent study by the United Nations presents an analysis of the patterns in the living arrangements of older persons based on comparable data for more than 130 countries (United Nations, 2005b). The study finds that about one out of every seven older persons or approximately 90 million people live alone. The large majority of these people, some 60 million, are women. Worldwide, 19 per cent of women aged 60 or over live alone, compared with 8 per cent of men in the same age group (table 14). Older women are more likely than older men to live alone because less of them are currently married. Thus, about 45 per cent of women aged 60 years or over have a living spouse, whereas nearly 80 per cent of men in that age group do. Older women are also more likely to live with grand-children only or with relatives other than their children or grand-children, whereas older men are more likely to live with a spouse.

TABLE 14. PROPORTION OF PERSONS AGED 60 YEARS OR OVER WHO LIVE ALONE: ESTIMATES FOR THE WORLD AND MAJOR AREAS, BY SEX  
(Percentage)

<i>Major area or region</i>	<i>Total</i>	<i>Men</i>	<i>Women</i>
World .....	14	8	19
Africa .....	8	6	11
Asia .....	7	5	9
Europe .....	26	13	35
Latin America and the Caribbean .....	9	7	10
Northern America .....	26	15	34
Oceania <sup>a</sup> .....	25	16	34

*Source:* United Nations (2005). *Living Arrangements of Older Persons Around the World*. (United Nations publication, ST/ESA/SER.A/240).

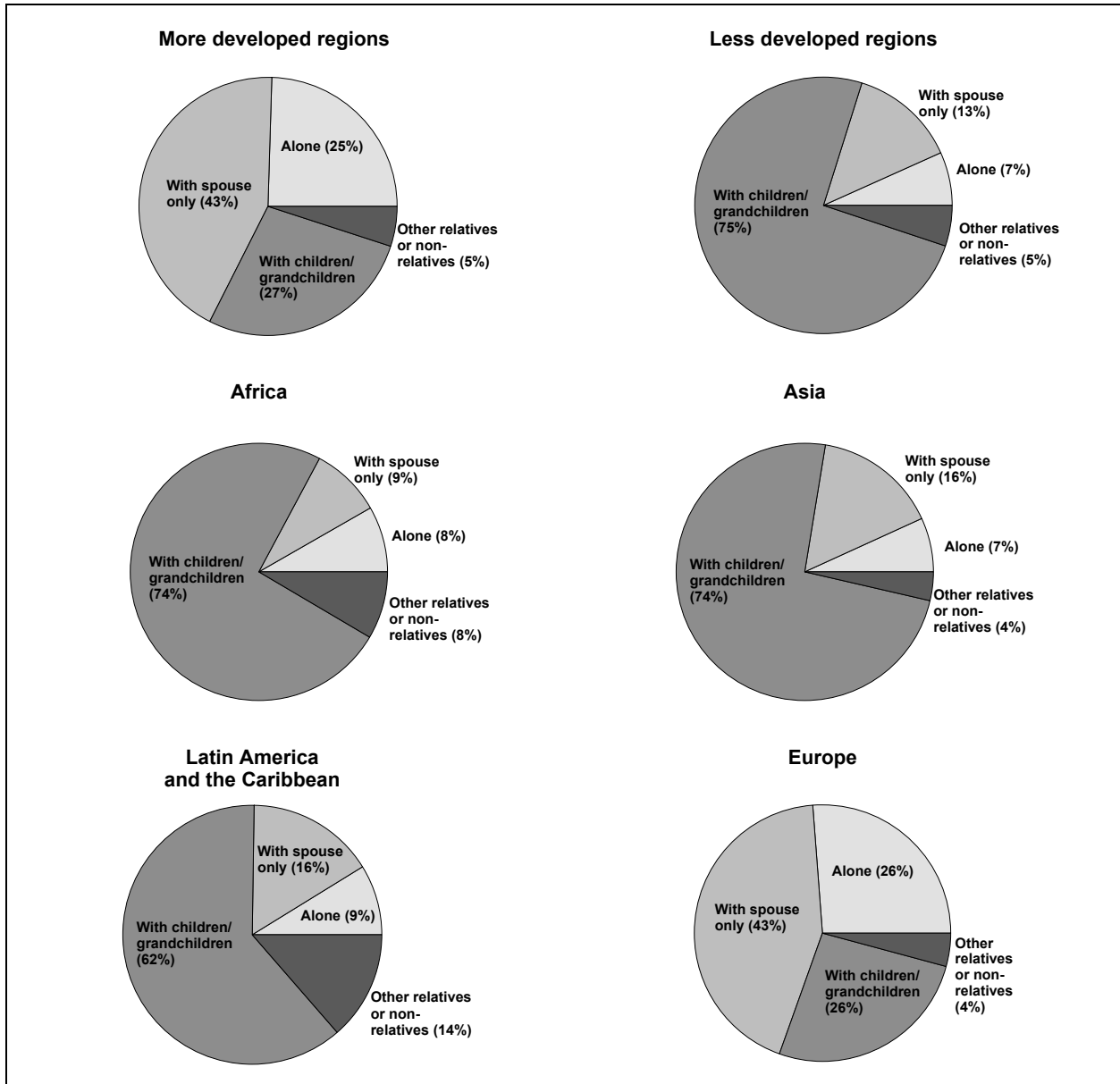
<sup>a</sup> Imputed on the basis of data that covered under half of the region's population.

In the more developed regions, about a quarter of older persons live alone, but in the less developed regions just under 10 per cent do so. The proportions living alone are lowest in South-Eastern and South-Central Asia, where about 5 per cent of older persons live alone, and highest in Northern and Western Europe, where about a third of older persons do so.

Whereas the likelihood of solitary living at older ages had been increasing in many developed countries, in recent years that trend has slowed down or halted in some countries, including Canada, Italy and the United States. The reasons for such slow down involve a combination of longer life, which tends to decrease the prevalence of widowhood, declines in the proportion who never married, and an upward trend in the age at which children leave home.

Older persons the world over are opting for independent living by either living alone or only with a spouse. This preference is pervasive in economically developed countries and it is growing in some developing countries. However, whereas the most common arrangement in developed countries is for older persons to live apart from their children, around 75 per cent of older persons in developing countries live with a child or grandchild (figure 9). In European countries, by contrast, just 25 per cent of older persons live with their children.

**Figure 9. Living arrangements of older persons in more developed and less developed regions and selected major areas**  
(Persons aged 60 years or over)



Source: United Nations (2005). *Living Arrangements of Older Persons Around the World* (United Nations publication, ST/ESA/SER.A/240).

NOTE: Based on the population in households.

At the world level, the proportion of older persons who live with a child has been declining. This is so, even as the percentage of older persons who have living children has been increasing. In developed countries, older persons typically experience an “empty nest” phase of life, so that the percentage of older persons living with children declines substantially as age advances from the sixties to the seventies and the youngest children mature and leave home. By contrast, in many developing countries the percentage of older persons living with a child remains high at older ages, suggesting a predominant pattern of lifelong co-residence with at least one child.

Countries with higher levels of social and economic development have lower levels of co-residence with children. National levels of development explain much of the variation in living arrangements of older persons around the world. This suggests that, as levels of income and education rise, and as fertility decline leads to a smaller number of offspring, living arrangements in the developing countries might come to resemble those of the more developed regions. However, cultural factors may have long-enduring effects on living arrangements. For example, even after taking development levels into account, older Europeans are less likely to live with children than are older persons in the less developed regions.

Within developing countries, higher socio-economic status is often associated with higher, not lower, levels of co-residence with children. More specifically, in countries with low levels of development, co-residence with children tends to be associated with higher social and economic status. Among countries at moderate levels of development, these differentials tend to disappear or even reverse direction, and in economically advanced countries, older persons living as a separate couple tend to have a higher socio-economic status than those living with children.

Co-residence with children is an important element of the flow of support between family members. This is particularly so with respect to informal support that depends on physical proximity, such as providing assistance with basic activities of daily living. For older persons living with a spouse, support in performing activities of daily living is primarily provided by the spouse. Furthermore, it is wives rather than husbands who usually provide such support.

In many developed countries, institutional living has become an option for older persons who have difficulty managing on their own or who need specialized medical services. The issue of how to provide long-term care for older persons who need assistance and the escalating costs of providing such care have become pressing policy concerns in developed countries. In some countries, policies promoting community support so that it is possible to “age in place” appear to have halted or reversed earlier trends towards higher rates of institutionalization. The main factor accounting for differences in levels of institutionalization among countries appears to be a society’s ability to support the costs of institutional care. Recent trends in a number of developed countries seem to indicate that institutional care is increasingly reserved for those with the greatest need for more intensive care, who tend to be the oldest and the frailest. In most countries, the level of institutionalization is higher for women than for men. Women’s greater likelihood of being widowed is the main reason for their greater likelihood of institutionalization. Indeed, unmarried older men are usually more likely to live in an institution than unmarried women.

In countries with high rates of HIV infection, the proportion of older persons living with grandchildren, but not with children (skipped-generation households), has increased. In the countries where at least 10 per cent of adults have been infected with HIV, the proportion of older persons in skipped-generation households grew by 2.7 percentage points over a period averaging only seven years. Older women are more likely than older men to live in these skipped-generation households.

In developing countries, older persons living either alone or in skipped-generation households tend to be an especially disadvantaged group and older women are more likely than older men to live in those situations. Over 10 per cent of older women live in skipped-generation households in most countries of sub-Saharan Africa and in some of Latin America and the Caribbean. In Malawi, Rwanda, Zambia and Zimbabwe, between 21 per cent and 34 per cent of older persons live in skipped-generation households.

Overall, there is great variability in living arrangements involving older persons. For instance, the proportion of older persons living with a child or grandchild ranges from 4 per cent in Denmark to almost 90 per cent in Bangladesh, while the proportion living alone varies from less than 1 per cent in Bahrain to almost 40 per cent in Denmark. Living arrangements are both determined by and determine the well-

being of older persons. As populations continue to age, societies will have to develop novel ways of improving and promoting the self-reliance of older adults, perhaps by providing innovative services to permit older persons to remain living independently for as long as possible and by encouraging family cohesiveness and the continued involvement of family members in the care and well-being of the older generations.

## K. CONCLUSION

In 2005, most countries of the world are far advanced in the demographic transition. Developed countries have already reached the threshold of the third stage of the transition, when population ageing is pervasive and rapid. The majority of developing countries are in the second stage, when a favourable age distribution gives rise to a demographic bonus. There remain, however, some countries that are only at the start of the transition to low fertility and fewer still where fertility decline has not yet started. Those countries, most of which are located in Africa, are expected to continue having a youthful population for some time and may not enter the period of the demographic bonus until later in this century.

The changes set in motion by the demographic transition lead to an ongoing transformation of populations which entails both opportunities and challenges for development. In order to benefit from the demographic bonus countries need to adopt sound macroeconomic policies to foster investment and job creation. Already the cases of the “East Asian Tigers” prove that the demographic bonus can contribute to accelerate economic growth (Bloom and Williamson, 1998). The issue is whether other countries undergoing the transition can reap similar benefits.

In developing countries, the demographic bonus appears after a period of rapid population growth where the population becomes younger. Consequently, both the number and the proportion of children and young adults rises. Countries that are just entering the second stage of the transition also have to face the need to educate the large number of children and young adults in their population. At the world level, the number of persons aged 15-24 is at an all time high of nearly 1.2 billion and this number is not expected to decline before 2050. Nearly 9 out of every 10 persons aged 15-24 live in the developing world. Providing them and the 1.8 million children of the world with adequate education and health services to enhance their productive role in society remains a major challenge.

Equally important is the need to start planning for the time when the demographic bonus ends and population ageing accelerates. Already today, when developing countries have a relatively youthful population, 64 per cent of the population aged 60 years or over lives in developing countries. In 20 years time, developing countries will be the home of 71 per cent of the world’s older persons. Although older persons will constitute just about 13 per cent of the population of the less developed regions in 2025, their numbers will soar to 850 million. Ensuring that these growing numbers of older persons have adequate support in old age, access to decent employment for those who need or want to remain economically active, and appropriate health care is also likely to prove challenging.

In the more developed regions, the rapid population ageing expected demands societal and economic adaptations to a new reality. Older people in developed countries remain in good health for longer than ever before and therefore have the potential to continue being productive. Increases in retirement age are already being instituted and will have to continue if mortality across the developed world keeps on falling as expected.

Future changes in age structure can be anticipated with considerable accuracy, partly because the older persons of mid-century have already been born. Policy makers and planners have therefore ample

warning of what lies ahead. Although population ageing is inevitable, its consequences will depend on the measures developed to address the challenges it poses.

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NOTE

<sup>1</sup> The ratio presented here differs from that normally used which considers age group 15-59 (or 15-64) to represent those ages where economic activity is most prevalent and ages 0-14 together with 60+ (or 65+) as the age groups where people are more likely to be economically dependent. The findings using these groups would not be fundamentally different. Other types of dependency ratios are considered later in this paper.

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