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**Retirement**

# Demographic Turning Point

World population has quadrupled to 7 billion people within just 100 years.





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## Imprint

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# Demographic Turning-Point

World population has quadrupled to 7 billion people within just 100 years.

## Guest article

This analysis is a guest article by Dr. Michaela Grimm. Dr. Grimm is a member of the Group Economic Research & Corporate Development team at Allianz SE.

hygiene. This trend is all the more remarkable if one considers that, previously, there was an interval of more than 300 years between the year 1500, around which the 500-million mark was exceeded, and the doubling to one billion people in the first half of the 19th century.

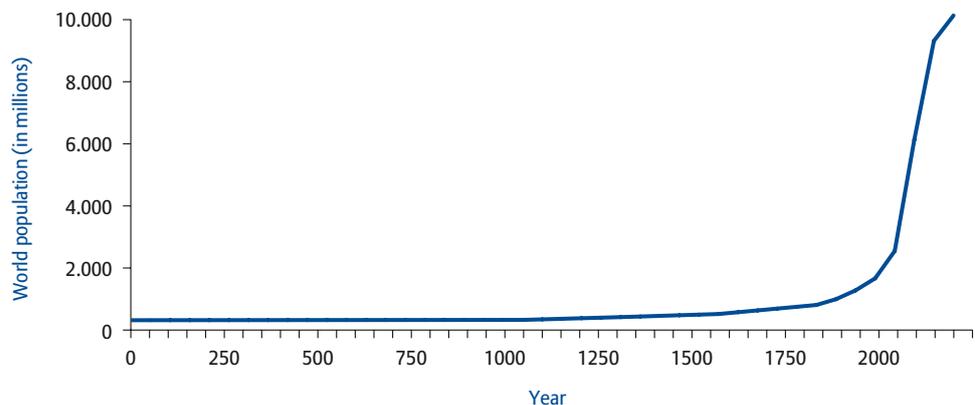
## The majority of the world's population lives in economically emerging markets

Most of the people in the world live in Asia. According to UN figures for this year, the continent has a population of about 4.2 billion; of these, more than half live in China (1.3 billion) and in India (1.2 billion). Second and third place are taken by Africa, with a current population of around one billion people, and Latin America with some 600 million inhabitants. As a result, three quarters of humanity live in so-called developing countries and emerging markets. In contrast, Europe's importance from a demographic viewpoint has declined

## World population exceeds 7 billion

The 7-billionth citizen of Earth will be born in autumn this year. Never before have so many people lived on our planet at the same time. This means that it has taken just 100 years for the world's population to quadruple from 1.65 billion to now 7 billion, not least due to improvements in nutrition and in standards of

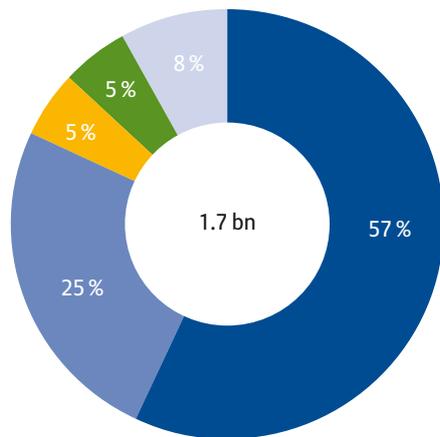
The world's population has quadrupled in the past 100 years



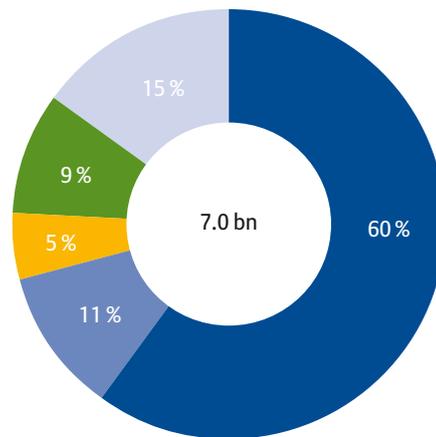
Source: UN Population Division.  
as of: 08/19/2011

## Asia remains the most populous continent

Distribution of the world's population, ca. 1900



Distribution of the world's population, 2011



Source: UN Population Division.  
as of: 08/19/2011

substantially in the past 100 years; only every tenth inhabitant of Earth now lives on the old continent, compared to every fourth person about 100 years ago.<sup>1</sup> For this reason there is a relatively high probability that the 7-billionth citizen of Earth will be born in one of the emerging markets. UN estimates put the number of children born this year in India alone at around 26.5 million and in China at 18.6 million; in the European Union on the other hand, the total is only 4.4 million.<sup>2</sup>

The world's population is therefore likely to continue to grow in the foreseeable future.

Although, according to UN forecasts, we would welcome the 8-billionth citizen of Earth as early as the middle of the next decade it could then be 18 years before the next billion threshold is reached. Towards the end of the century, around 2082, more than 10 billion people will in all likelihood live on our planet, double the figure of 1986. The increasing length of these intervals illustrates a trend that has been apparent for some years, namely that the rate of growth in the world population is declining. Since the peak of 2.1% in 1968, it has fallen to 1.1% last year.<sup>3</sup>

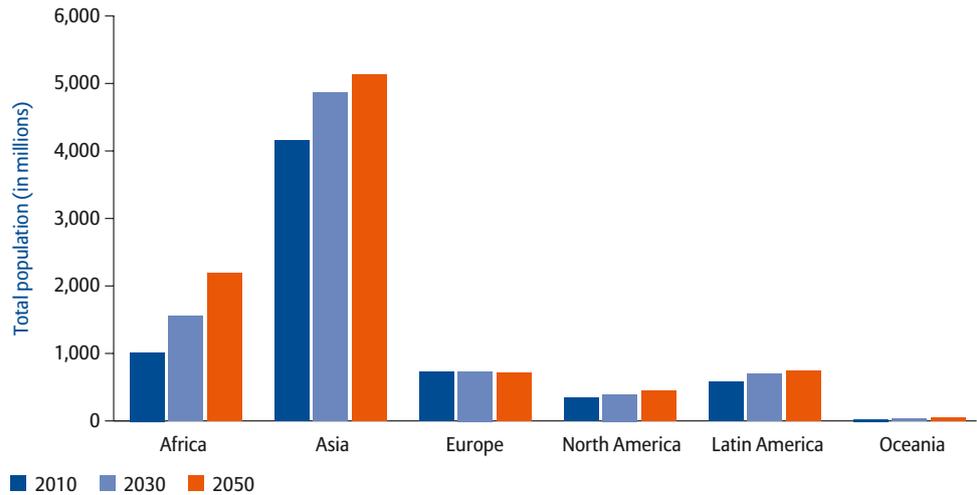
<sup>1</sup> Cf. UN Population Division: The World at Six Billion, p. 4.

<sup>2</sup> Cf. UN Population Division, World Population Prospects, 2008 Revision.

<sup>3</sup> Cf. UN Population Division, World Population Prospects, 2010 Revision.



### Asia will remain the most populous continent



Source: UN Population Division, World Population Prospects, 2010 Revision.

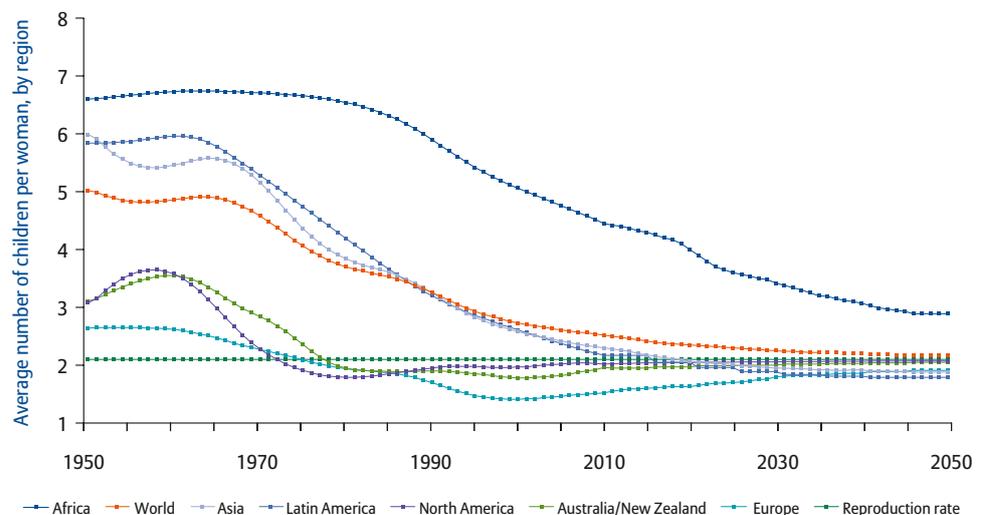
Looking at individual regions, however, there are significant differences in terms of population momentum. While the population in Africa is expected to more than double by the middle of the century and Asia should have a billion more people around 2050, it is likely to decline in Europe over the long term. In the USA on the other hand, the population should continue to climb to a good 403 million by that time.<sup>4</sup>

### Falling birth rates are resulting in a decline in population growth

The trend in birth rates is the principal cause of this. As a worldwide average, the birth rate has halved from 5.0 children per woman to 2.5 in the past 60 years. The fact that there are considerable regional differences is well known. The highest birth rates are still recorded in Africa, where a woman brings an average of

<sup>4</sup> Cf. UN Population Division, World Population Prospects, 2010 Revision.

### Birth rates are declining in all regions of the world



Source: UN Population Division, World Population Prospects, 2010 Revision.

4.4 children into the world. In Europe, the continent with the lowest birth rates worldwide at present, the average birth rate has fallen to only 1.6 children per woman and, since 1975, has even been below the rate of 2.1 that is required to maintain a population. Asia and Latin America have seen the sharpest falls, not least due to the one-child policy in China, where birth rates over the same period have decreased from 6.0 and 5.8 to 2.2 and 2.3 children per woman, respectively.<sup>5</sup>

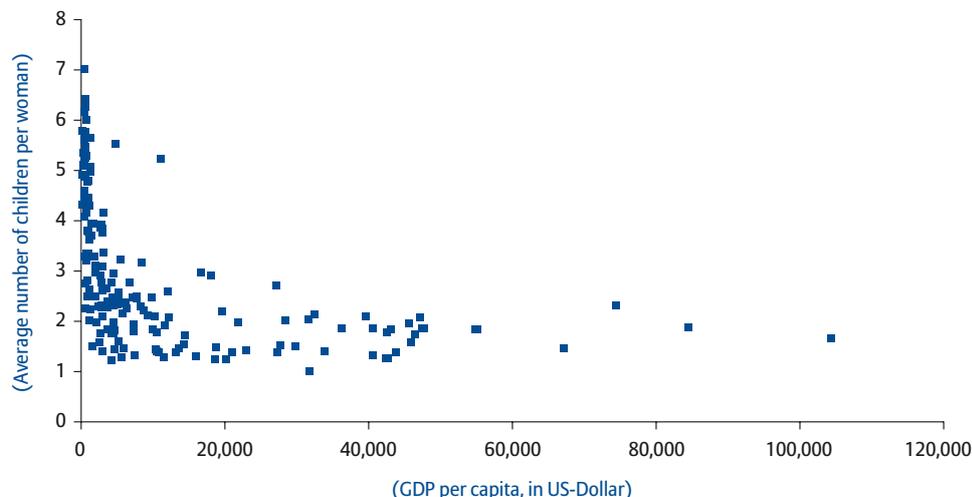
A number of studies have looked at the particular factors influencing behaviour in relation to births within a population. There are many different explanations and reversing the trend is difficult, as illustrated by the German federal government's attempts to increase the birth rate, which only met with moderate success. It has been found that the aver-

since the average birth rate per woman in Germany was 4.2 children around 1900 and 2.2 in 1935. After the end of the Second World War it rose again to 2.6 children until the mid-1960s. However, it has been declining ever since and, since 1970, it has been below the reproduction rate of 2.1. A look at Africa today indicates the role that improved educational opportunities for women may have played. Even though the initial situations are by no means comparable, it is clear that the higher the level of education and consequently the job opportunities of women, the lower the average number of children tends to be. Consequently, the average birth rate in Chad, for example, where only a good 20% of women can read and write, is 6.3 children, while a woman in South Africa, where the literacy rate for women is just under 90%, has only 2.5 children on average.<sup>6</sup>

<sup>5</sup> Cf. UN Population Division, World Population Prospects, 2010 Revision.

### Birth rates and living standards are negatively correlated

Birth rates and GDP per capita, 2010



Sources: UN Population Division, World Population Prospects, 2008 Revision, IMF.

age number of children falls as the general standard of living and the level of education of women rises. This becomes evident when looking at history and comparing birth rates in various African countries. Many in Germany will still remember that their grandmother and grandfather were from large families,

This corresponds to the fact that there is a negative correlation between the general standard of living and the average birth rate. It is clearly the case that the higher the living standard of a society, the lower the number of children. According to the UN, for example, Niger has the highest birth rate in the world:

<sup>6</sup> Cf. UNESCO and UN Population Division. In what was formerly known as West Germany, for example, 26% of women in the 40 to 75 age-group with high educational qualifications were childless, while this only applied to 16% of women with a medium level of education, and 11% of those with a low level of education. Cf. German Federal Statistical Office, Micro-census 2008. New data on childlessness in Germany, Wiesbaden 2009, p. 27.

a woman gives birth to an average of 7.0 children. Niger is one of the 10 poorest countries in the world, with average gross domestic product (GDP) amounting to the equivalent of EUR 287 per head in 2010. In Luxembourg on the other hand, the average birth rate in 2010 was only 1.7 children. According to International Monetary Fund (IMF) statistics, this country has the highest GDP per head in the world, at EUR 82,020. Against this background it can be expected that birth rates will in future also decline in emerging markets as economies develop and the standard of living rises.

The higher the living standard of a society, the lower the number of children.

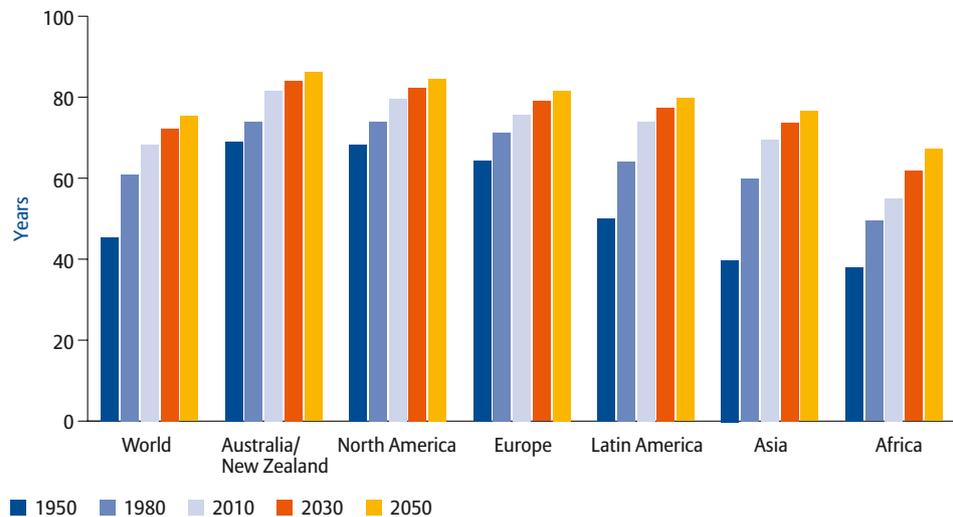
**The world's population is ageing in two respects**

The impact of the decline in birth rates on the overall population trend is nevertheless cushioned by the rise in life expectancy. Since 1950, the worldwide average life expectancy at birth has increased by 4.6 months per year, from 45.4 to 68.2 years. Higher standards of living, improvements in hygiene and medical progress have made key contributions. The rise in life expectancy has been strongest in Asia, where it has increased by almost 30 years in the past 60 years, from 39.9 to 69.6 years.

With an additional 11 years, the rise over the same period was much smaller in Europe and North America. In this case, however, the starting point for this slower increase was considerably higher, since in 1950 the average European already had a life expectancy of 64.5 years at birth. This is because, in the decades prior to 1950, Europeans had already made a similarly great leap in relation to life expectancy as that made by Asians. In Germany, for example, the average life expectancy of a boy born around 1900 was 44.8 years, while that of a girl was 48.3 years. By 1950, life expectancy had already reached 64.6 and 68.5 years, respectively.<sup>7</sup> A boy

**Significant rise in life expectancy**

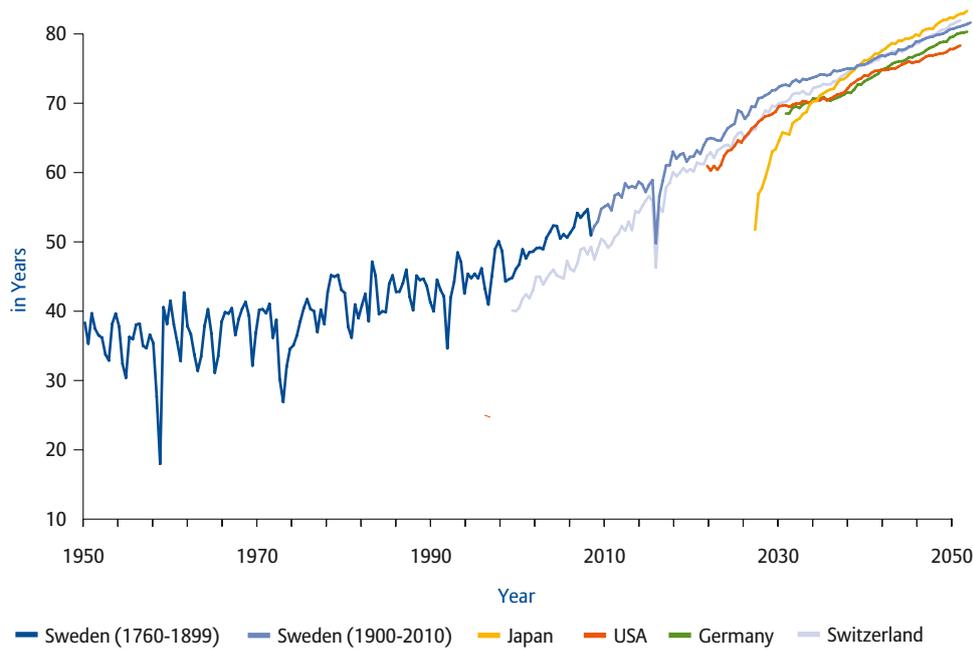
Average life expectancy at birth



Source: UN Population Division, World Population Prospects, 2010 Revision.

## The increase in life expectancy has accelerated in the past 100 years

Life expectancy at birth, 1760-2010



Source: Human Mortality Database (HMD).  
as of: 08/19/2011

born today has an average life expectancy of 77.3 years and that of a girl is 82.5 years.<sup>8</sup>

Even though there are divergent opinions on the effect of a changing lifestyle on life expectancy and the question of whether there is an absolute upper limit for human life expectancy remains unresolved, demographers agree that average life expectancy is likely to rise further. In 30 years, the average life expectancy of a new-born child anywhere in the world should be 75 years, while there will still

be significant differences due to the differing levels of development in different countries. A new-born child in Germany, for instance, would have a life expectancy of more than 84 years, in Japan it could be 87 years, in Brazil 79 years and in Nigeria 64 years. While this rise in life expectancy in developing countries is attributed primarily to the fall in infant mortality, the increase in life expectancy in industrial countries and in most emerging markets will seemingly be driven by an increase of further life expectancy in higher ages.

<sup>7</sup> Cf. Federal Statistical Office: Mortality tables 1901/1910 and mortality tables 1949/1951.

<sup>8</sup> Cf. Federal Statistical Office: Mortality tables 2007/2009.



<sup>9</sup> Cf. Human Mortality Database.

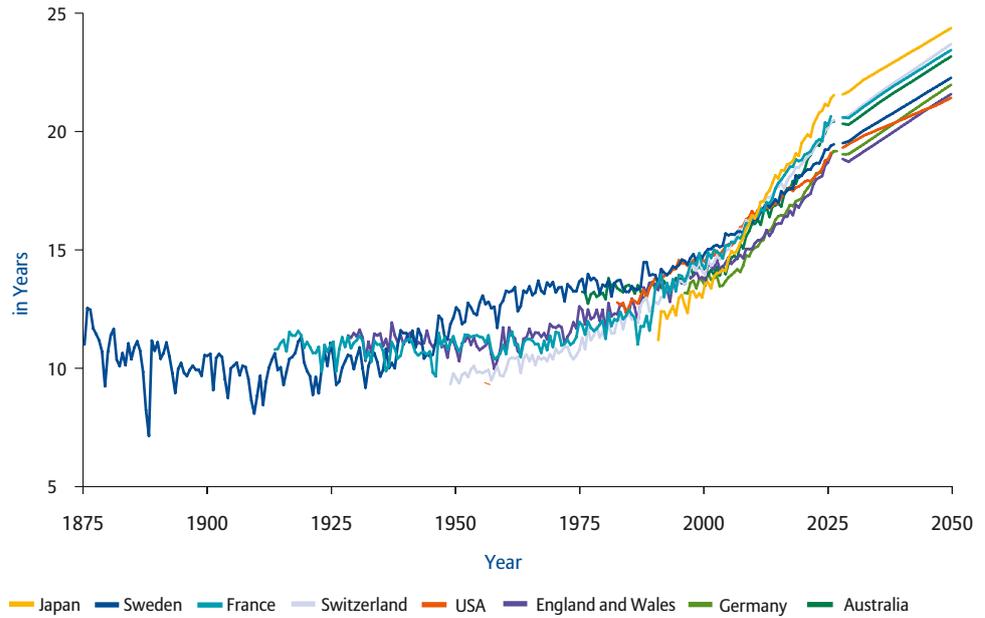
<sup>10</sup> Cf. UN Population Division, World Population Prospects, 2008 Revision.

In Japan, for example, the average life expectancy on retirement at the age of 65 was 11 years in 1950, while it is almost 22 years today.<sup>9</sup> It is expected to rise to 24 years by the middle of the century. In Switzerland it would then be 23.7 and in Germany approximately 22 years. The third stage of life should

to live another 21.6 years around 2050, while in China this figure should amount to 18.7 years.<sup>10</sup>

As a result, the number of over-65s worldwide should almost triple by 2050, rising from the current level of about 530 million to 1.5 bil-

**Increase in life expectancy at higher ages**  
Further life expectancy at age 65



Sources: UN Population Division, HMD.  
as of: 08/19/2011

<sup>11</sup> Cf. UN Population Division, World Population Prospects, 2010 Revision.

also become longer in current emerging markets such as South Korea and China. In South Korea, a person aged 65 can expect

to live another 21.6 years around 2050, while in China this figure should amount to 18.7 years.<sup>10</sup> Of these, 330 million will probably live in China alone. The country could have more inhabitants at retirement-age than the whole of Europe together, which is then expected to have 193 million people over 65 years of age. In addition, 402 million of these over-65s worldwide will likely be 80+.<sup>11</sup> This means that the world's population is ageing in two respects. On the one hand, birth rates are falling, leading to fewer new-born children and an ageing of society as a whole. On the other, individual life-spans are becoming longer.

The average life expectancy on retirement is expected to rise to over 20 years.

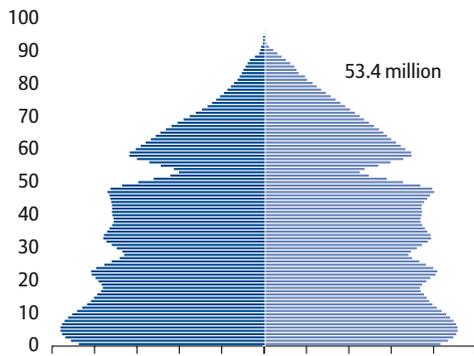
**Population pyramids are beginning to turn upside down**

Figuratively speaking, the age pyramid of the world's population is increasingly adopting a bell shape, representing a society that is still growing but, at the same time, ageing. Over the next few decades it should increasingly develop into an urn shape in many industrial countries, where birth rates have been

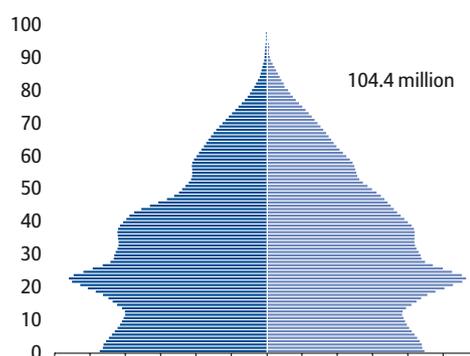
below the reproduction rate of 2.1 children per woman for a number of decades. This is because, in these cases, the population is not only ageing but also shrinking. Japan is an example of this. It already has the oldest population in the world and for some years now has had a declining population. Another example is Italy, which has one of the lowest birth rates in Europe.

**Old-age dependency ratios are rising worldwide**

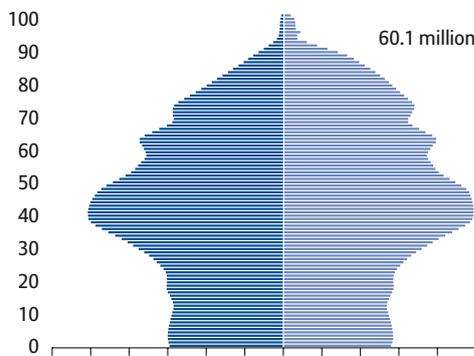
**Italy, 1970**



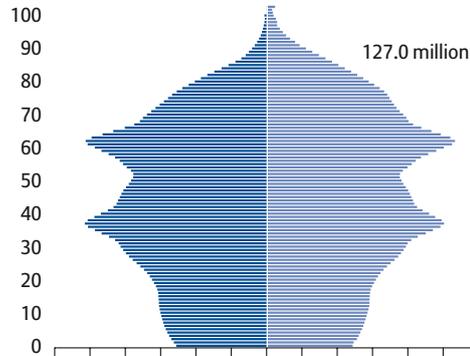
**Japan, 1970**



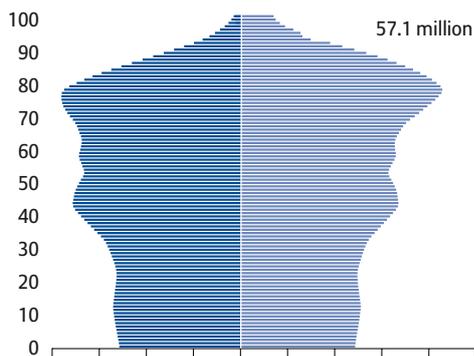
**Italy, 2010**



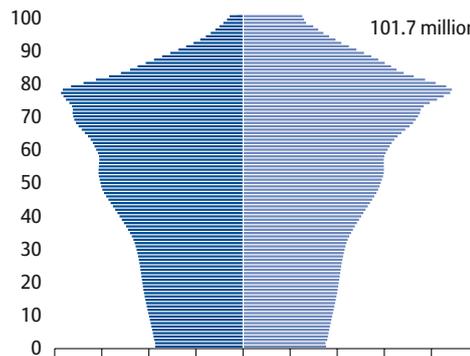
**Japan, 2010**



**Italy, 2050**



**Japan, 2050**



■ Men ■ Women

■ Men ■ Women

\* Population aged 65 and older as percentage of working age population between 15 and 64.  
Source: UN Population Division, World Population Prospects, 2010 Revision.

This raises the question of how we will cope in an increasingly ageing society. Right at the top is the quite mundane question of how the third stage of life will be financed in future. This applies particularly to countries with social security systems financed on a pay-as-you-go basis, in which the younger generations at working age between 15 and 64 years finance the pensions and healthcare of the older generation through ongoing contributions. Even though it can be shown that the number of years that a person is in good health has also increased in the past, very few people in industrial countries above the age of 65 or 68 are now gainfully employed. However, the further the ratio of pensioners to working-age persons deteriorates, the more difficult financing will become through an implicit intergenerational contract. Incidentally, this applies not only to state systems, but also to informal support through family members. Against this background, the ageing of the population in emerging markets such as China also poses a challenge. On the one hand, traditional family structures are increasingly breaking up - in China, as a consequence of the one-child policy, we are already seeing the 1-2-4 problem, i. e. for every (only) child there are two parents and four grandparents.

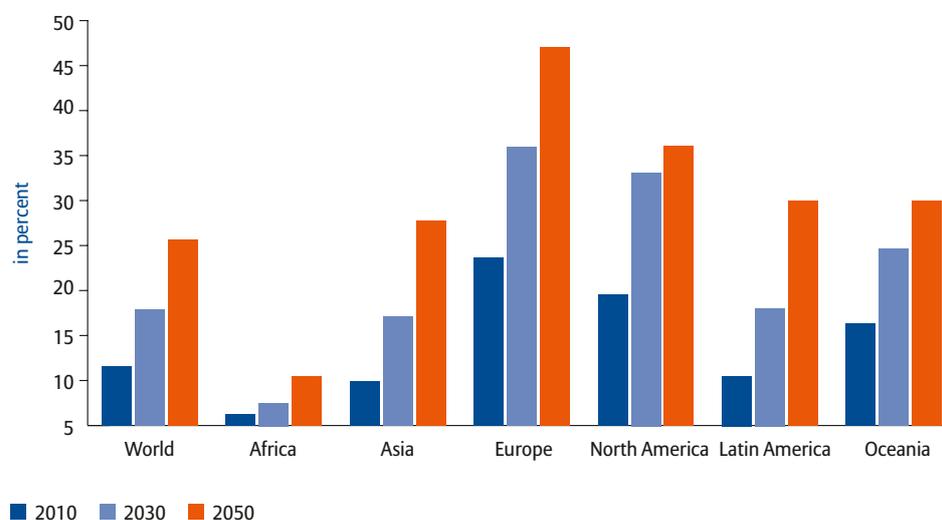
On the other hand, state systems are still inadequate, while individuals do not have the financial means to make private provisions.

The trend in old-age dependency ratios in various regions of the world illustrates that demographic change is not only a phenomenon and a challenge in industrial countries. Due to the sharp decline in birth rates in Asia and Latin America in recent decades, the population in those regions is likely to age much more rapidly than in Europe or North America. By the middle of the century, the ageing quotient in these regions would have almost tripled, i. e. in Asia and Latin America, there could be almost 30 over-65s for every 100 persons of working age. Bearing this in mind, policymakers in many emerging markets are now faced with the task of developing a viable social security system within a few years to cope with an ageing population in the foreseeable future. Governments in most EU states have already responded to the demographic challenges in recent years and introduced pension reforms. At their core is a reduction in the level of state benefits financed on a pay-as-you-go basis combined with expansion of privately funded pension provisions.

Dr. Michaela Grimm

### Old-age dependency ratios are rising worldwide

Old-age dependency ratios\*, 2010-2050



\* Population aged 65 and older as percentage of working age population between 15 and 64.

Source: UN Population Division, World Population Prospects, 2010 Revision.

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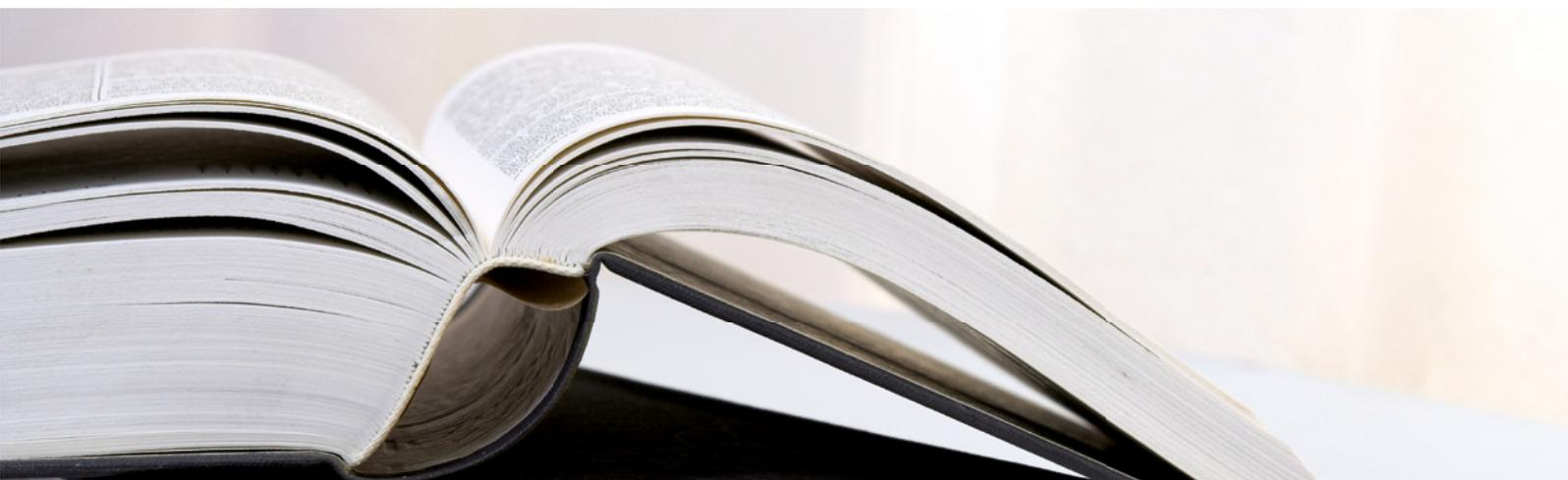
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