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GERMANY'S POPULATION BY 2050

Results of the 11th coordinated population
projection



Federal Statistical Office

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projection**

Impressum

Published by: Statistisches Bundesamt, Federal Statistical Office, Wiesbaden

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This publication is based on data published by the Federal Statistical Office on the occasion of a press conference held in Berlin on 7 November 2006.



A free download of the report in PDF format as well as further information and data related to the subject of this publication are available on the internet website of the Federal Statistical Office (<http://www.destatis.de>) under the heading "Presse -> Presseveranstaltungen".

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Purchase order number: 0010007-06900-1

© Photo copyright front page: Bildunion / – bu 10004734 (links)

Printed on recycling paper.

Published in November 2006.

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Germany's population by 2050

The 11th coordinated population projection

1. Executive summary

The 11th population projection for Germany, a coordinated undertaking of the statistical offices of the Federation and the federal states of Germany, shows population trends until 2050. It quantifies future changes in the size and – above all – the age structure of Germany's population and reveals the effects of demographic trends which are identifiable from today's perspective. One thing that has become clear is the steadiness with which the processes of population dynamics evolve. The projection is based upon assumptions on birth rates, life expectancy and Germany's balance of immigration and emigration, providing the framework for a total of twelve variants of future development scenarios.

The projection covers a period until 2050

Results of the 11th coordinated population projection:

The results described here are based on two variants of development scenarios, assuming that birth rates will remain nearly constant, life expectancy will increase by seven years or so and the migration balance will amount to 100 000 or 200 000 people per year. These variants define the limits of a corridor, within which population size and age structure will evolve, if the currently observed demographic trends continue to be effective. They are referred to as the "medium" population's lower and upper limits.

Birth numbers will continue to fall in future. A low birth rate causes the number of potential mothers to become smaller and smaller. Even today the cohorts of new-born girls are numerically smaller than those of their mothers. In future, when these girls will be grown up and when they, too, will have on average less than 2.1 children, the future number of children will continue to drop, as fewer mothers will potentially be alive at that time.

Fewer births in future

In spite of a rise in life expectancy the number of deaths will increase, because the numerically strong cohorts will grow to old age.

More deaths

The number of deaths will more and more exceed the number of births. This will lead to a rapidly growing birth deficit, which cannot be compensated any longer by net immigration. As a consequence, Germany's population number, which has decreased ever since 2003, will further decrease. If the demographic situation continues to develop along current lines, the number of inhabitants will drop from almost 82.5 million in 2005 to nearly 69 million in 2050.

Growing birth deficit leads to a decrease in population

The relations between old and young people will strongly change. In late 2005, 20% of the population were younger than 20 years, the share of those being 65 years old or older was 19%. The remaining 61% were so-called working-age people (20 to under 65 years). In 2050, however, just about half of the population will be at working age, more than 30% will be 65 years old or older and circa 15% will be younger than 20 years.

In 2050 twice as many older people than younger ones

As early as in 2010 the number of children, juveniles and adolescents aged under 20 years will be by 10% lower than it is today and it will continue to decrease rapidly. The number of children or juveniles at day care and school age will decrease in the same way as the number of young people at apprentice age does. Today there are nearly 4 million young people at apprentice age, ranging from 16 to under 20 years. By 2012 that number will have fallen to as few as about 3 million.

Rapid decrease at school and apprentice age

Ageing and decrease of working-age population

In the long run, the working age population will also undergo a process of further ageing and shrinking. Until about 2015 the number of the 20 to under 65-year-olds will remain stable at about 50 million. That is so, because the older group of the 50 to under 65-year-olds will grow rapidly enough to offset the strong reduction in the number of those aged under 50 years and to keep the total working age population constant for some time. Later on, the number of these older people will decrease as well. As far as younger working age people are concerned, the age group of the 30 to under 50-year-olds will decrease rapidly, whilst that of the 20 to under 30-year-olds (the age group from which most university graduates are recruited) will remain stable for some time and shrink only after 2015. Total working age population will count between 42 and 44 million in 2030 and between 35 and 39 million in 2050.

Working-age population will be dominated by older people

As a result, there will be a clear shift in the age structure of working-age people. At present, 50% of working-age people belong to the medium-age group, which includes people of 30 to 49 years, nearly 20% belong to the young age group of 20 to 29 years and 30% to the older age group of 50 to 64 years. In 2020, the medium-age group will account for as little as 42%, the older one, however, will remain almost unchanged at about 40%; the situation will be similar in 2050 (medium group: 43%, older group: nearly 40%). The percentage of the 20 to under 30-year-olds will not change very strongly. As a result, older people will clearly prevail among working-age population.

Population aged 80 and older will grow from 4 to 10 million

The number of people aged 65 and older will increase by about half until the end of the 2030s: from currently nearly 16 million to circa 24 million. Afterwards it will slightly fall. The 80+ population will continuously grow: from nearly 4 million in 2005 to 10 million in 2050. Then more than 40% of those aged 65 and older will be at least 80 years old.

Youth dependency rate slightly decreases

Today 33 out of 100 working-age people (20 to 65 years) are less than 20 years old. This so-called youth dependency ratio will drop just slightly, amounting to 29 in 2050.

By 2050 the old-age dependency rate will double for the 65 year-olds ...

In future, the old-age to working-age dependency ratio will shift in favour of an increasing number of people at old age. In 2005, that ratio was 32 people at old age (65 and more years) per 100 people at working age (20 to under 65 years). The old-age dependency ratio will rise to 50 or 52 by 2030 and to 60 or 64 by 2050.

... and rise strongly for the 67-year-olds

Notwithstanding a raise in the retirement age, the old-age dependency ratio for people aged 67 or older in 2050 would clearly exceed today's old-age dependency ratio for people aged 65 and older.

The dependency total rate will also rise clearly

The ratio of people, who are either below or beyond working age, to working-age people (total dependency ratio) will be determined by the old-age dependency ratio. In 2005, that ratio was 65 people aged either under 20 or 65 years and older to 100 people aged between 20 and 65 years. The old-age dependency ratio will rise to more than 80 by 2030 and to 89 or 94 by 2050.

Assumptions:

All three assumptions on birth rates remaining low

The **total level of birth rates** remains to be low. Three options are assumed on this background. They are derived from the interaction of long-term trends and present-day developments, occurring in the former territory of the Federal Republic of Germany, in the New Länder and among foreign women.

The first option assumes that current age-specific trends will not change over the next 20 years: the total fertility rate remaining at its present level of nearly 1.4 children per

woman and the average age at birth rising by circa 1.6 years. Afterwards birth ratios are assumed to remain constant during 2026-2050.

The second option assumes an increase in birth rates to 1.6 children per woman until 2025, the average age at birth rising by one year. Birth rates remain constant during 2026-2050.

The third option, in its turn, assumes that birth rates will gradually decrease to 1.2 children per woman until 2050 and that a woman's average age at birth will rise by circa two years.

Life expectancy will further increase. Two assumptions were made with regard to life expectancy. They were derived from two different combinations of the short-term (since 1970) and the long-term (since 1871) trends in the development of mortality.

Two assumptions on an increase in life expectancy

Proceeding from the base assumption, we find that men's average life expectancy at birth will be 83.5 years in 2050 and that of women 88.0 years. That is a rise by 7.6 and 6.5 years, respectively, on the 2002/2004 life expectancy in Germany. The gap between men's and women's life expectancy will narrow from 5.6 to 4.5 years by 2050. 60 year-old men or women can still be supposed to stay alive for another 25.3 and 29.1 years, respectively, which is about five years more than in 2002/2004.

According to the second assumption, life expectancy at birth is supposed to achieve on average 85.4 years for men and 89.8 years for women by 2050. That is an increase of 9.5 years for men and 8.3 years for women as compared with 2002/2004. The gap between men's and women's life expectancy will narrow from 5.6 to 4.4 years. 60 year-old men or women can be expected to stay alive for another 27.2 and 30.9 years, respectively.

Two assumptions were made regarding the future **migration balance**. They assume an annual migration surplus of 100 000 or 200 000 people, imputing exemplary evolution in both cases. As far as real migration is concerned, it will – as in the past – clearly be subject to variation, so that the imputed values should only be interpreted as long-term averages for several years. The margin between the two assumptions was chosen taking into account average long-term external migration, with a view of defining a corridor, along which migration processes could be supposed to evolve in the future.

*Net migration gain
100 000 and 200 000
persons per year*

2. Introduction

Population projections provide basic future-related information for political and socio-economic decision-making processes. They reveal the effects that presently existing structures and identifiable changes will have on a future population. Population projections, which were coordinated between the Federal Statistical Office and the Statistical Offices of the Federal States, are now submitted regularly. This publication describes the assumptions and results of the 11th coordinated population projection for Germany until 2050. The 11th coordinated population projection consists of several variants, which show the future developments that are foreseeable from today's point of view, on the one hand, and which make it possible to judge the impact that different demographic components – birth rate, mortality and migration – will have on population trends, on the other hand.

Processes, which are of relevance to the population, evolve very slowly and continuously. That is the reason why the new population projection does not show a completely new picture of Germany's demographic future as compared with that of the 10th coordinated population projection. Rather, using extended and updated assumptions, we tried to add new facets to the picture and show possible implications of the more recent developments.

A broad public discussion has started on population and birth trends. In addition to assuming that the birth rate will remain constant, we now present the implications of a slight growth or a slight reduction in birth rates as well. Furthermore, the results presented here consider two variants of what is called external migration – that is the balance of migrants moving into and those leaving Germany, which has shown a clear reduction since the latest projection, as well as two variants of a clearly prolonged life expectancy. The details of the assumptions are described and substantiated in chapter 4.

The 11th coordinated population projection is not a forecast that forebodes the future until 2050. Rather, it shows how the size and the structure of population are supposed to evolve on certain assumptions. When the length of a projection period increases, it becomes more and more difficult to predict the evolution of major determinants, so that long-term forecasts of that kind have a model character.

There are other, additional uncertainties which are interrelated with the data base: Basic figures on the current state of the population are gained by updating the results of the latest population census, so that they become the more imprecise the longer the distance from that census is. The most recent population censuses took place on the area of the former Federal Republic in 1987 and in the ex-GDR in 1981. Since that time population figures have been updated on a yearly basis using notifications on births, deaths and arrivals or departures of migrants, and they cannot be readjusted until the census planned for 2010/2011 will be evaluated. Estimates assume that the updated figures exceed the real population size by more than a million. Consequently, for the first few years it may turn out that the birth rate has been under- and life expectancy overestimated. Considering, however, that a population projection is not a prediction of the future, but aims to show long-term changes in a population's age structure and size, the quality of the results will not essentially be affected by these uncertainties.

The current 11th population projection, a coordinated effort of the Statistical Offices of the Federation and the federal states, provides results both for total Germany and by federal state. They are based on harmonised assumptions and identical methods of computation. This report presents selected results for Germany. More detailed

results are available on the internet and can be downloaded free of charge (www.destatis.de/shop keyword "Population2050"). There you will also see changes in the age structure of the population visualised by animated population pyramids (<http://www.destatis.de/bevoelkerung2050>). Results by federal state will be available at a later time.

Expression of gratitude to the experts on "Population Projection"

The Federal Statistical Office invited a team of experts to attend to its population projections as scientists. The team consists of scientists, of experts conducting projections of their own and of particularly interested users. In this context they also present and discuss their own work results.

The assumptions of the 11th coordinated population projection were discussed by the expert team on "Population Projections". The Federal Statistical Office expresses its gratitude for the valuable support they gave in compiling the 11th coordinated population projection:

- Dr. Holger Bartel
Gesamtverband der Deutschen
Versicherungswirtschaft e.V.
- Dr. Wolfgang Bick
Statistisches Amt für Hamburg und Schleswig-Holstein
- Professor Dr. Eckart Bomsdorf
Universität zu Köln
- Dr. Hansjörg Bucher
Bundesamt für Bauwesen und Raumordnung
- Ivar Cornelius
Statistisches Landesamt Baden-Württemberg
- Harri Cruijsen
democast
- Professor Dr. Reiner H. Dinkel
Universität Rostock
- Professorin Dr. Gabriele Doblhammer-Reiter
Universität Rostock und Rostocker Zentrum zur Erforschung des
Demografischen Wandels
- Dr. Jürgen Flöthmann
Universität Bielefeld
- Professor Dr. Heinz Grohmann

- Dr. Roland Rau
Max Planck Institut für
Demografische Forschung Rostock
- Dr. Erika Schulz
Deutsches Institut für Wirtschaftsforschung, Berlin

3. Results of the 11th coordinated population projection

The assumptions made in the population projection on birth rates, life expectancy and Germany's migration balance – if mutually combined – yield twelve variants in total. The results presented below relate to four variants which depict the upper and lower limits of the “medium-aged” population, on the one hand, and a “relatively young” and a “relatively old” population, on the other hand: The two first variants mark the extension of a corridor, within which the population will evolve in terms of size and age structure, provided that current demographic trends will continue. By the “relatively young” and the “relatively old” population we understand the span of ageing covered by the population projection.

**Results are presented
on the basis of four
scenarios**

Variant	Assumptions on:		
	Birth rate (children per woman)	Life expectancy at birth in 2050	Migration balance (persons/year)
“Medium- aged” population, lower limit	Nearly constant at 1,4	Base assumption: Increase by 7.6 years for boys and 6.5 years for girls	100 000
“Medium- aged” population, upper limit			200 000
“Relatively young” population	Rising slightly to 1.6	Base assumption	200 000
“Relatively old” population	Falling slightly to 1.2	Steep increase: 9.5 years for boys and 8.3 years for girls	100 000

A complete synoptic presentation of all variants including additional model computations and other selected results can be found in the appendix. All details of the results can be obtained via the Internet website of the Federal Statistical Office under <http://www.destatis.de>.

3.1 Growing birth deficit

Since 1972 the number of deaths has exceeded the number of births in Germany. This birth deficit has, however, been offset by a positive migration balance, except for some years. As a result, the population has grown.

**Since 1972 Germany has
recorded a birth deficit**

All variants of the 11th coordinated population projection show that the birth deficit will grow rapidly in future. On the one hand, this will happen because of a rise in mortality: The cohorts reaching old age will be numerically much stronger than today's cohorts of people at old age. This will lead to a rise in the number of deaths.

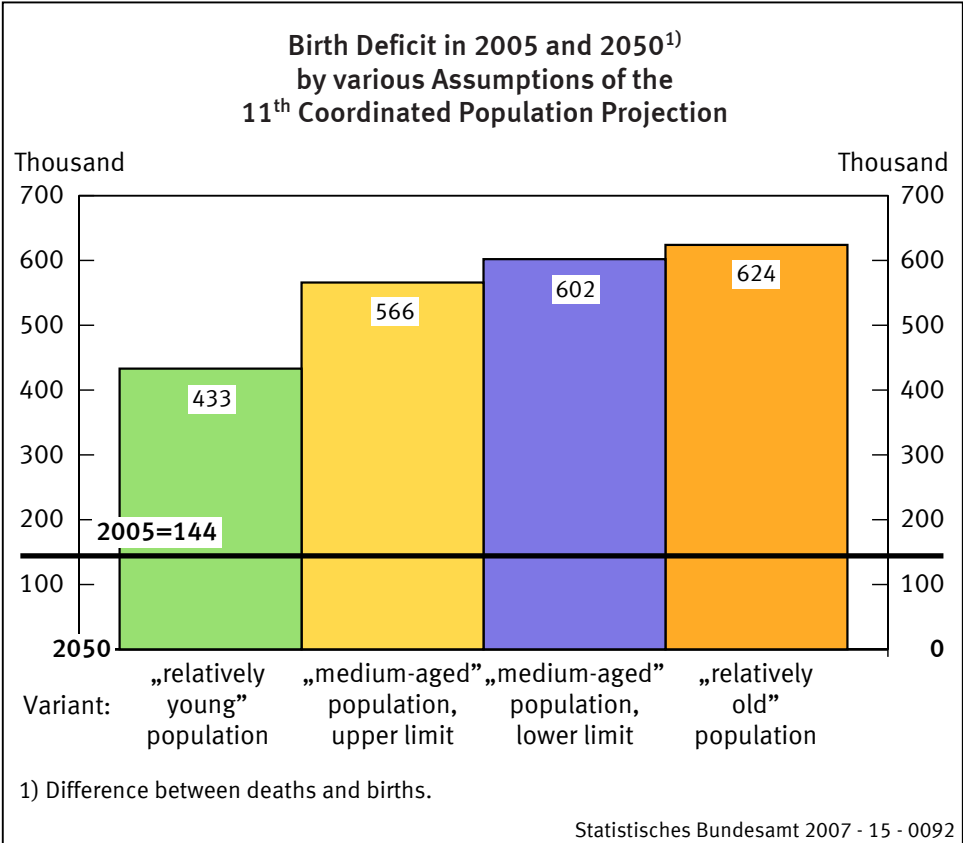
**More deaths in future as
the number of old-age
people increases**

On the other hand, the number of births will decrease further. As long as the birth rate will remain below 2.1 children per woman, every subsequent generation of mothers will be smaller than the preceding one. Women, who are some 30 years old today, will throughout their fertile lives give birth to many less children than actually needed to numerically replace their own generation. When their daughters will be grown up and

**Birth numbers will defi-
nitely fall as cohorts of
mothers shrink**

will on average also have 1.4 or even 1.6 children, the future number of children will decrease further owing to the smaller number of potential mothers, who will be alive at that time.

Figure 1



Birth deficit in 2050 four times as high as in 2005

If demographic trends go on at the current level (“medium-aged” population), there will be a rapid rise in the birth deficit, which will be boosted from 144 000 in 2005 to already 300 00 by the end of the next decade. Then the deficit will continue to rise to approximately 570 000 to 600 000 by 2050.

Birth deficit will triple by 2050 even in a “relatively young” population

Even a slight increase in the birth rate would not change the situation fundamentally. As fig. 1 shows, a rise in the birth rate to 1.6 children per woman would actually lead to a somewhat lower birth deficit, which nevertheless would still be three times as high as it was in 2005.

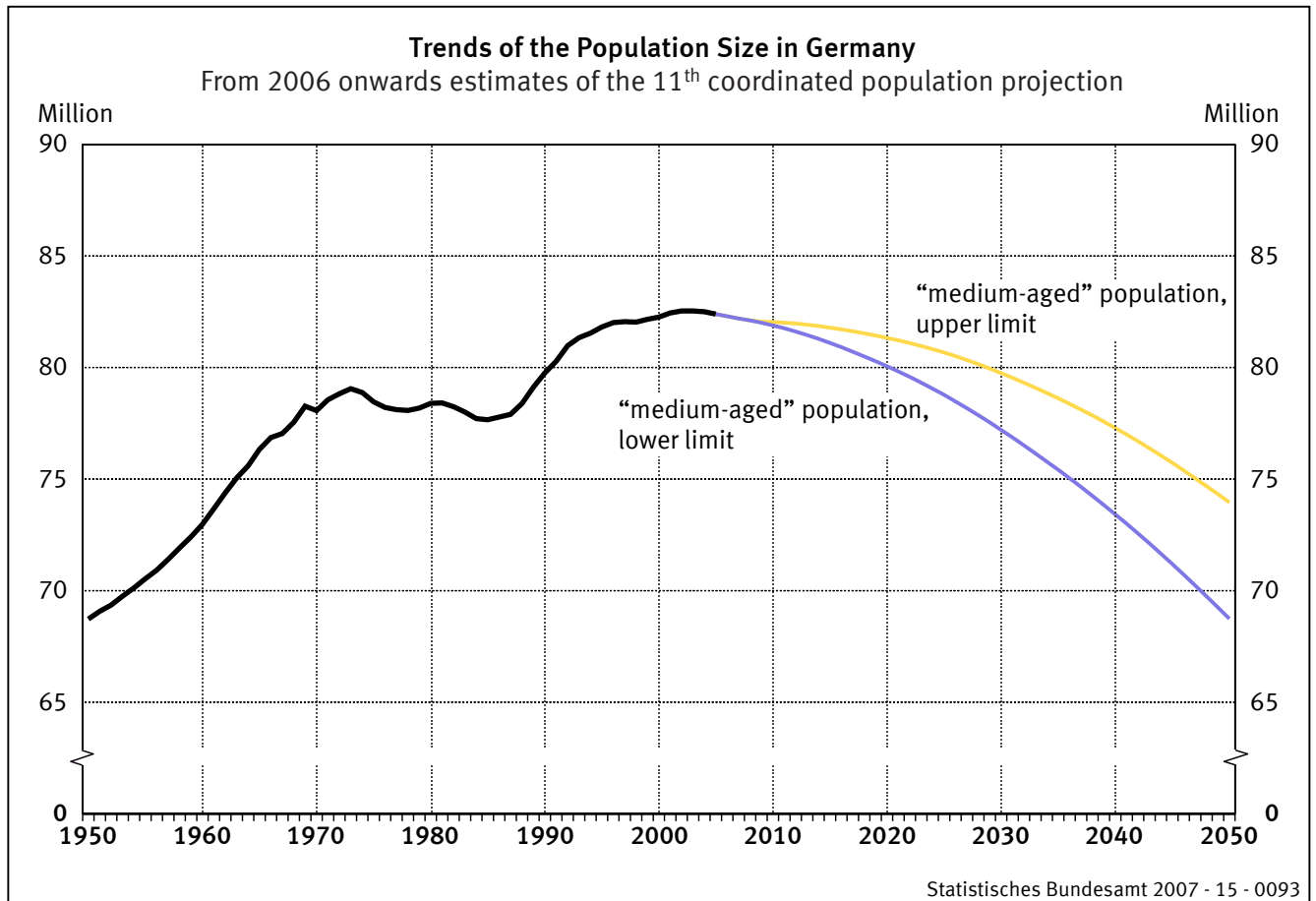
3.2 A shrinking population

Germany's population has decreased since 2003

In 2003, the size of Germany's population began to decrease, because the birth deficit could no longer be offset by the falling migration balance in recent years. This trend will continue due to a further increase in the birth deficit in Germany. Although that does not rule out a possible growth of the population in some years, in the long run it will not be possible to compensate so high a death surplus by any migration balance of an imaginable size from today's point of view.

Fig. 2 shows the population paths for the upper and lower limits of the “medium-aged” population.

Figure 2

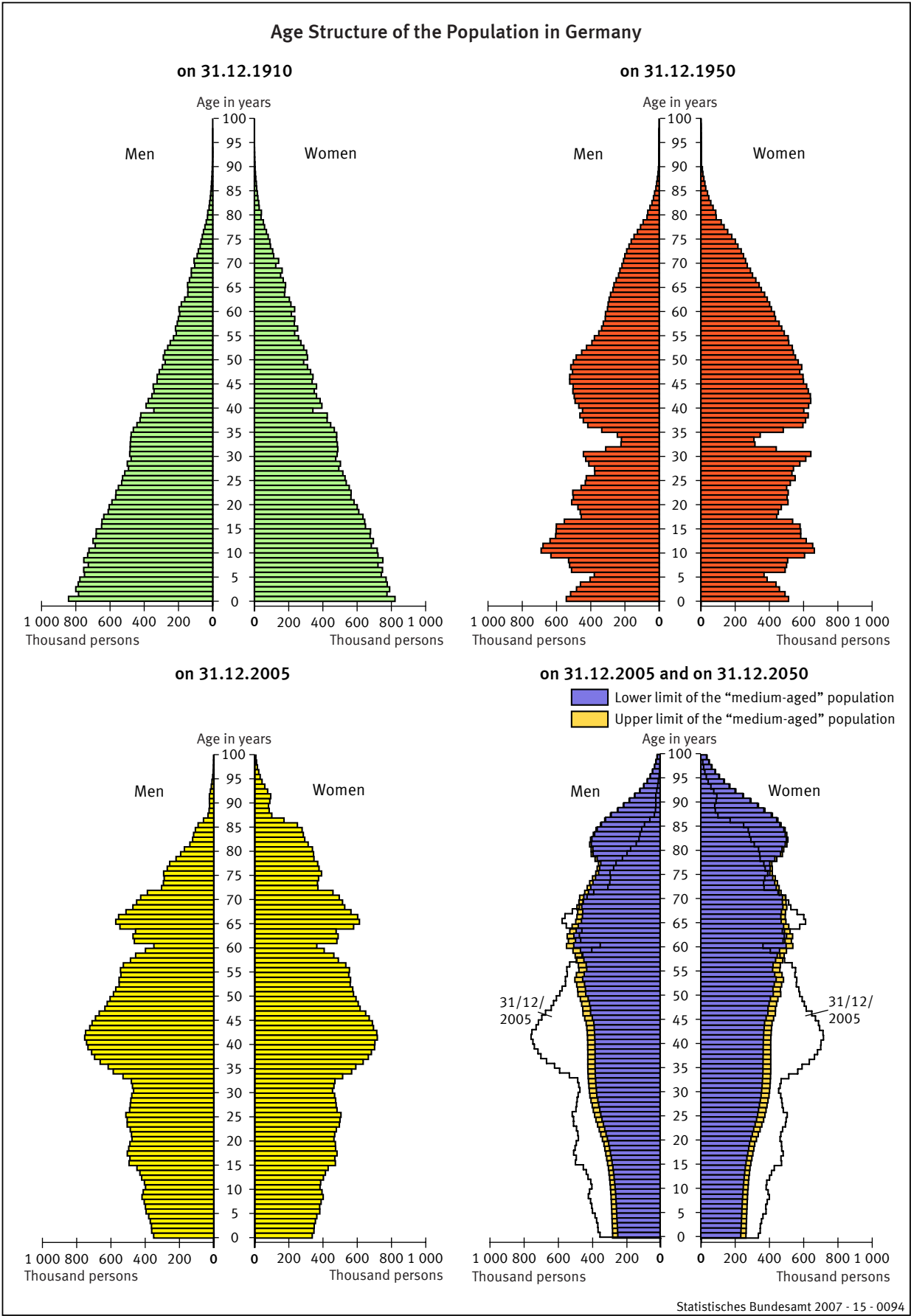


82.4 million people lived in Germany in late 2005. Assuming a rise in life expectancy by 7.6 years for men and 6.5 years for women and a migration balance of 100 000 people (“medium-aged” population, lower limit), the size of the population will drop to nearly 69 million by 2050. That means that it will be some 14 million below today’s size and even fall short of the 1950 level. An increased migration balance (“medium-aged” population, upper limit) will slow down the decrease, so that 74 million people will live in Germany by 2050. Accordingly, the population will decrease by 10% to 17% during the period from 2005 until 2050, unless there is a fundamental change in current demographic trends.

***In late 2005 Germany had
82 million inhabitants***

***Current trends will bring
the population size down
to 69-74 million by 2050***

Figure 3



3.3 Changes in the age structure of the population

For a long time the current population structure has diverged from the ideal conception that can be depicted by the classic population pyramid: Children represent the strongest cohorts, while the size of the elder cohorts slowly decreases due to mortality. The age structure of the German Reich in 1910, for instance, had the form of a pyramid (fig. 3). In 1950, we see that the pyramid has deep recesses caused by two world wars and the world economic crisis of the early 1930s. Today Germany's population structure resembles a "dishevelled fir tree", rather than a pyramid. The medium ages are numerically strongest, whilst there are fewer and fewer older and younger people. By 2050, the numerically strong cohorts will move further upward and they will be replaced by cohorts which are less numerous, so that the age structure will keep changing. As a result, the structure of the population increasingly obtains a sleek and steep shape, reminding us of a Bavarian church's spire. In late 2005, the 41-year-olds born in 1964 were the numerically strongest cohort and in 2030, when they will be 66 years old, they will still be the largest group. In 2050, twice as many 60-year-olds will be alive than children will be born ("medium-aged" population). At the same time, age group relationships will change significantly.

The current age structure disagrees with the classic pyramid form

Fig. 4 displays the age structure for three age groups covering the "medium-aged" population with a migration balance of 100 000 as well as spanning the full range from the "relatively young" to the "relatively old" population. The age structure existing today will have a decisive influence on future population trends for a long time. Consequently, different assumptions will just strengthen or weaken the basic pattern, rather than lead to a completely new age structure. The younger and medium-aged groups lose their importance, the older one gains in importance. While in late 2005 people of less than 20 years of age still outnumbered those of 65 and over to a small extent, in 2050 the older group in the "medium-aged" population will be twice as large as the younger one.

The current age structure will profoundly determine evolution over the next few decades

According to all three described variants, the share of working-age people (20 to 64 years) in the total population will fall from 61% in 2005 to 55% by 2030 and then to slightly more than 50% by 2050.

Age group ratios will strongly change in future

As far as the remaining part of the population is concerned, there will be a clear distinction between the "relatively young" and "relatively old" population: While the proportion of the age group of the 0 to under 20-year-olds will fall in respect of the "relatively young" population just slightly from 20% in 2005 to 17%, there will be a much stronger reduction of 14% in respect of the "relatively old" population. Vice versa, the proportion of people aged 65 and more (2005: 19%) will rise less strongly in respect of the "relatively young" population (2050: 30%) than in respect of the "relatively old" population (2050: 36%).

The population's average age (fig. 5) will rise inexorably. Between 1990 and 2005 it went up already from 39 to 42 years. This trend will continue according to all variants of the population projection: From 2005 to 2050 the average age will rise by at least six ("relatively young" population) and maximally ten years ("relatively old" population). If the birth rate remains approximately constant and life expectancy evolves along the base assumption ("medium-age" population), the average age will be up to circa 50 years by 2050.

The average age of population will rise from 42 to circa 50 years by 2050

Figure 4

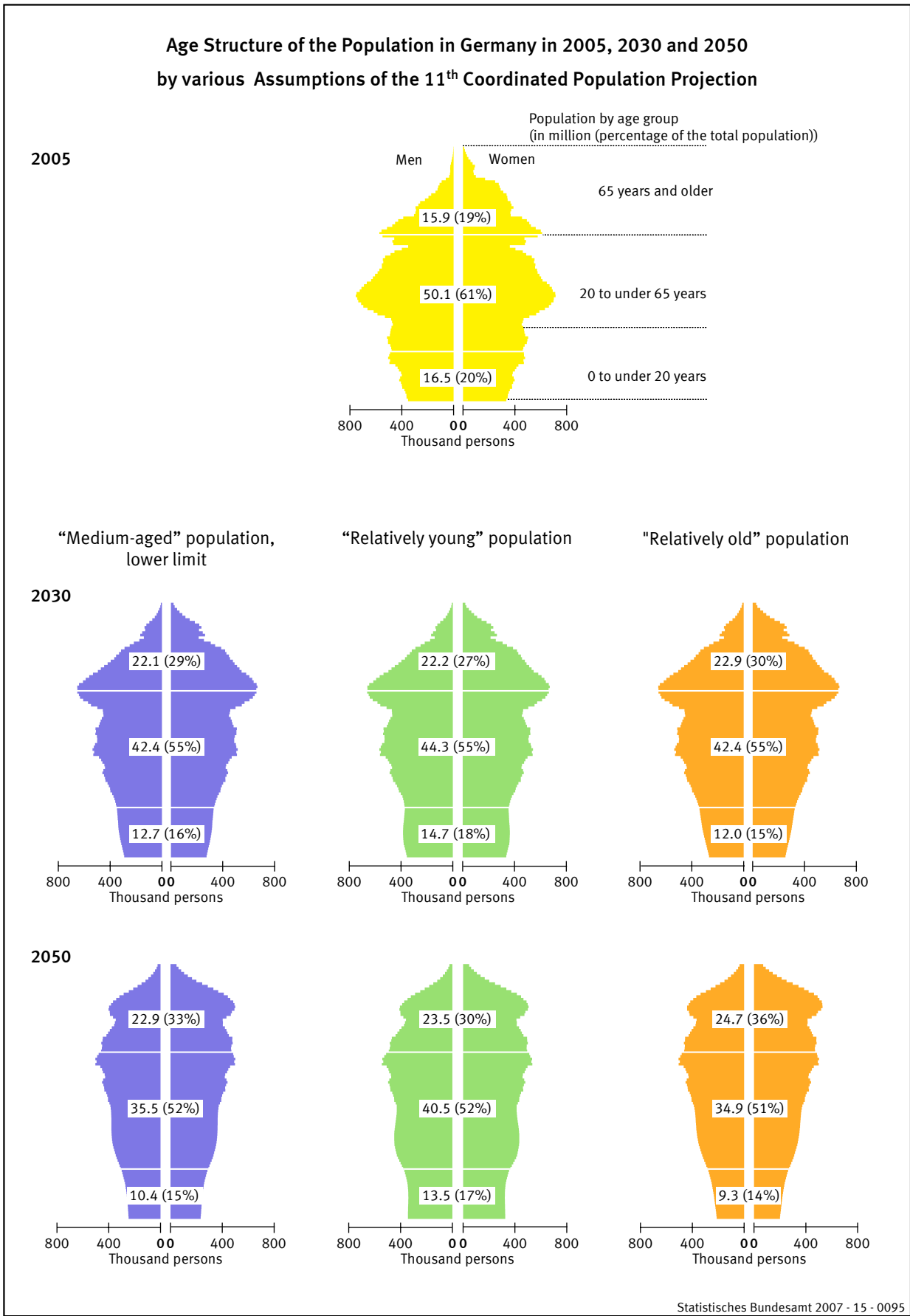
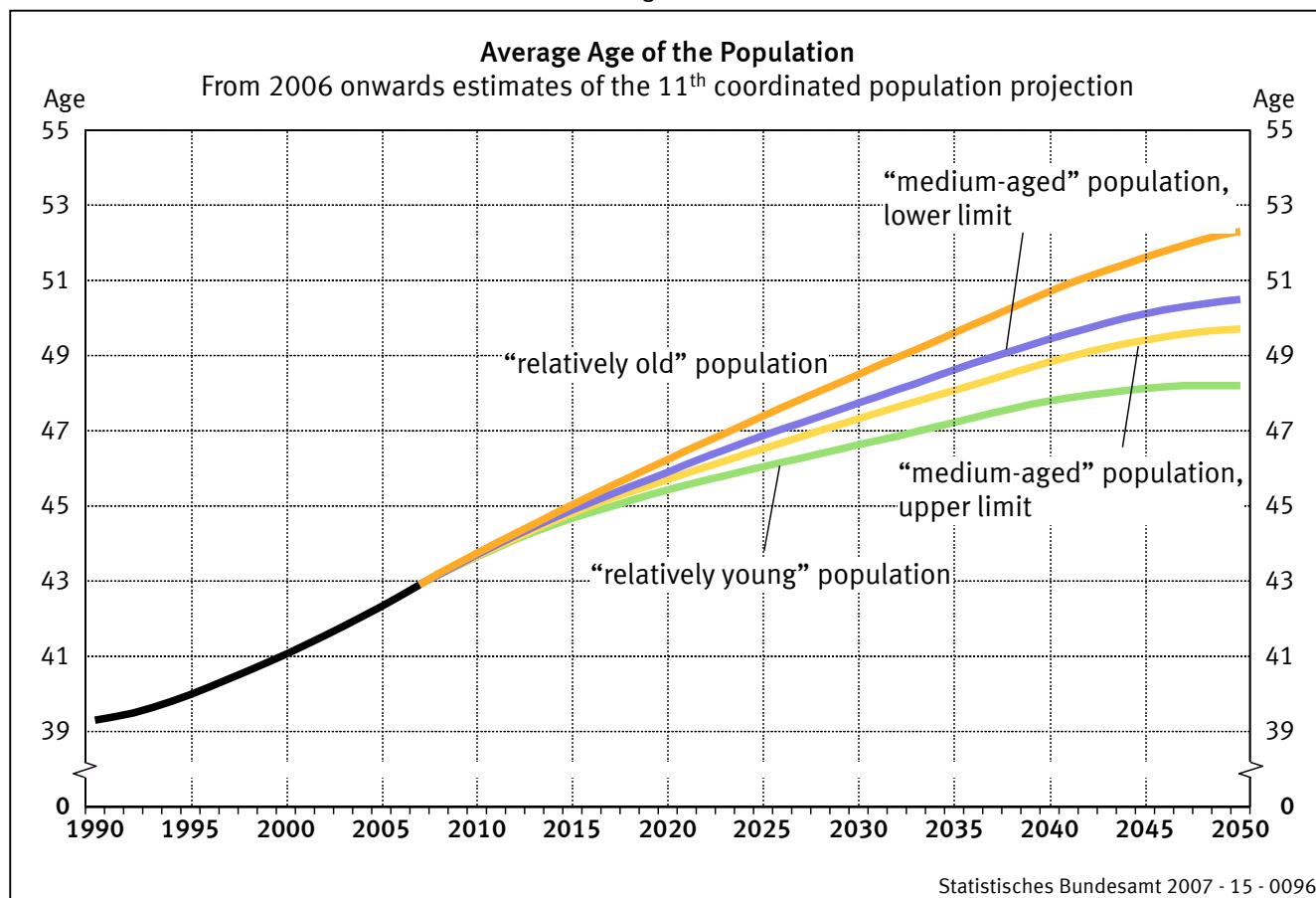


Figure 5



3.3.1 Fewer children, juveniles and young adults in future

By 2050 the total number of **people aged under 20** will drop by more than 30%, if current trends continue (“medium-aged” population). If the assumptions of the “relatively young” population came true, the decrease would be as low as 18%, while it would be 44% in respect of the “relatively old” population.

The number of the under 20 year-olds will drop by more than 5 million from today's 16.5 million by 2050

Fig. 6 shows how the various age groups of the under 20-year-olds will evolve at child-care, school and apprentice age. All age groups will rapidly be affected by reductions. Here we are faced with the immediate effects of the demographic change, which can be felt by child-care and educational institutions already today.

As early as in 2010 the number of children at child-care and pre-school age of **under 6 years** will be about a tenth less than today (4.3 million in 2005). The next drop to circa 3 million (by 2050) will set in after 2020, when relatively strong cohorts of mothers will increasingly abandon childbearing age.

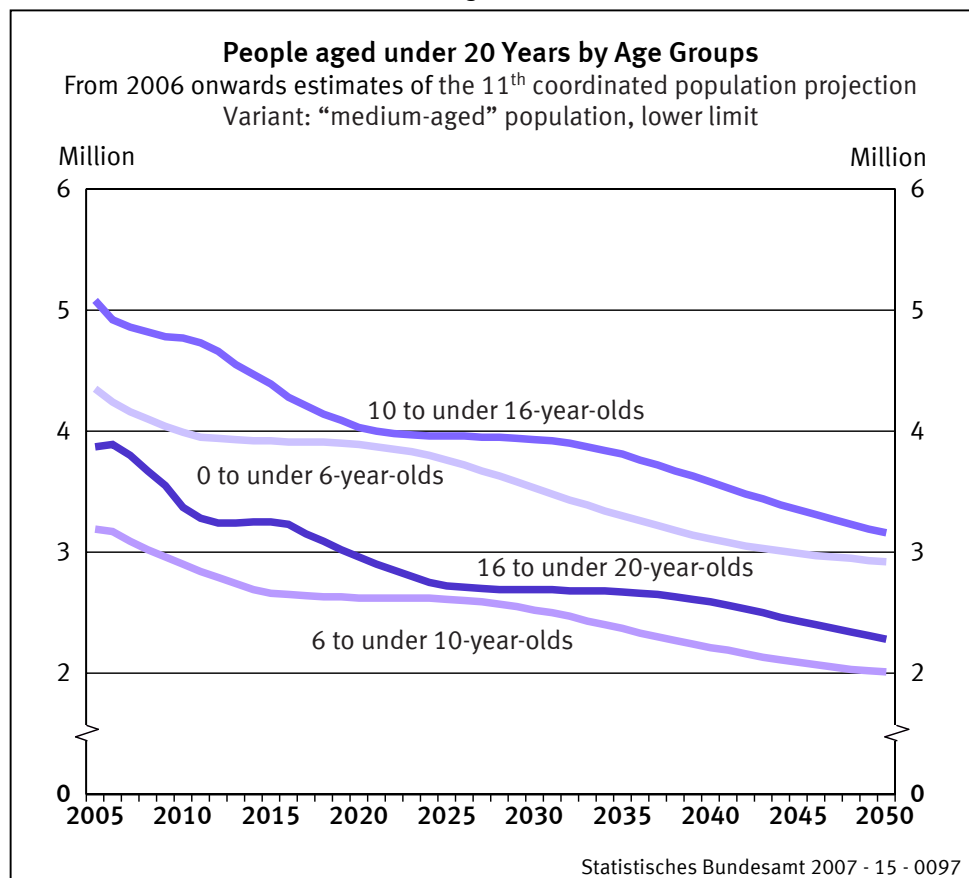
In 2005 there were 3.2 million children at school age **between 6 and under 10 years**. In the next ten years this number will drop to approximately 600 000 and then remain at 2.6 million by the end of the 2020s. Afterwards it will continuously drop to 2.0 million by 2050.

The phases of drop and stagnation of the under 6-year-olds will be repeated by the evolution of the **10 to under 16-year-olds** – only with a delay of 10 years. After a reduction from currently 5.1 million to some 4 million by 2020, this age group will

remain stable until 2034 or so. Then it will successively fall by another million to 3.2 million.

Today there are nearly 4 million young people **between 16 and under 20 years** at the age of relevance to education. As the evolution of this age group is determined by the drop in birth numbers from 1990 to 2005, it will shrink even more strongly than the younger age groups described above. As early as in 2012 it will count only 3 million. After a short period of stagnation it will continue to decrease. By 2050 the number of the 16 to under 20-year-olds will fall short of 2005 levels by more than 40 %.

Figure 6



These data relate to the lower limit of the "medium-aged" population. A higher migration balance (upper limit of the "medium-aged" population) would lead to figures that would be nearly 10 percent higher for 2050.

More births would strengthen the group of the under 6-year-olds

A rise in the birth rate would have a direct effect on the youngest age group. Under the conditions of a "relatively young" population it would only be by 8% smaller in 2050 than it is today.

3.3.2 Working-age population will age and shrink in the long term as well

Like the total population, the population at working age between 20 and 64 years (today 50 million) is likely to shrink and age considerably. The size of the shrinking will be influenced by the size of immigration to a perceptible, though not decisive extent.

	Working-age population “medium-aged” population	
	lower limit	upper limit
	million	
2005	50.1	50.1
2020	48.0	49.0
2030	42.4	44.2
2050	35.5	39.1

Around 2030, when people born before 1965 will be at least 65 years old, the reduction will be clearly perceptible and grow stronger afterwards. By 2050, 22% less people than today will be at working age, if 200 000 persons immigrate annually (“medium-aged” population, upper limit). In case of an immigration, which is only half as high (lower limit of the “medium-aged” population), the potential working-age population will be even smaller in 2050 (-29% as against 2005).

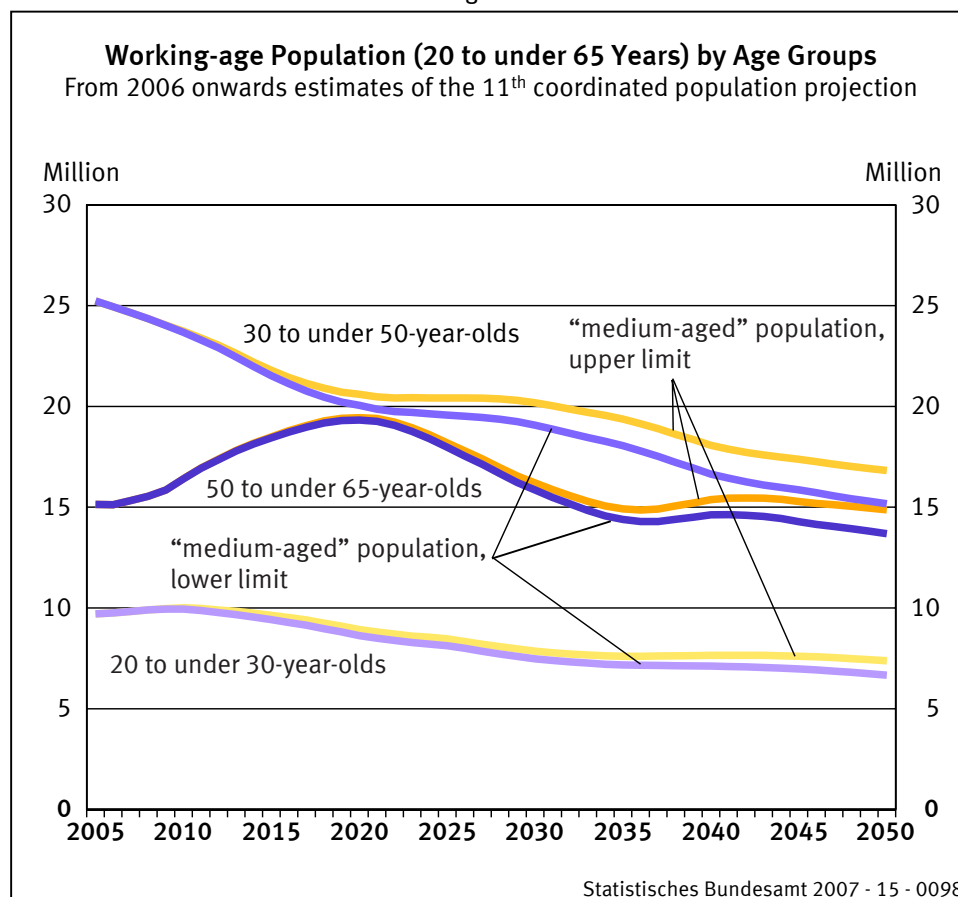
Raising the retirement age from 65 to 67 years would enlarge the working-age population by more than 2.5 million until 2030 and by about 2 million people until 2050.

The change in the total number of working-age population is overlaid by diverging trends in individual age groups (fig. 7): Those who according to present standards are considered the older group of working-age people, i.e. people aged between 50

By 2050 the number of working-age people will drop by 22% - 29% on 2005

Pension age at 67 years would raise the number of working-age people slightly

Figure 7



**Working-age
population will be
dominated by older
people**

and under 65 years will initially record so strong an increase that it will balance the considerable reduction in the number of working-age people of under 50 years to the effect that there will be no change in the total number of working-age population for some time. Later on the number of these older people will fall as well. Younger people at working age will record a rapid reduction in the age group of the 30 to under 50-year-olds, whilst the number of the 20 to under 30-year-olds (the typical age group of university graduates) will remain constant for some time, before it will start shrinking later.

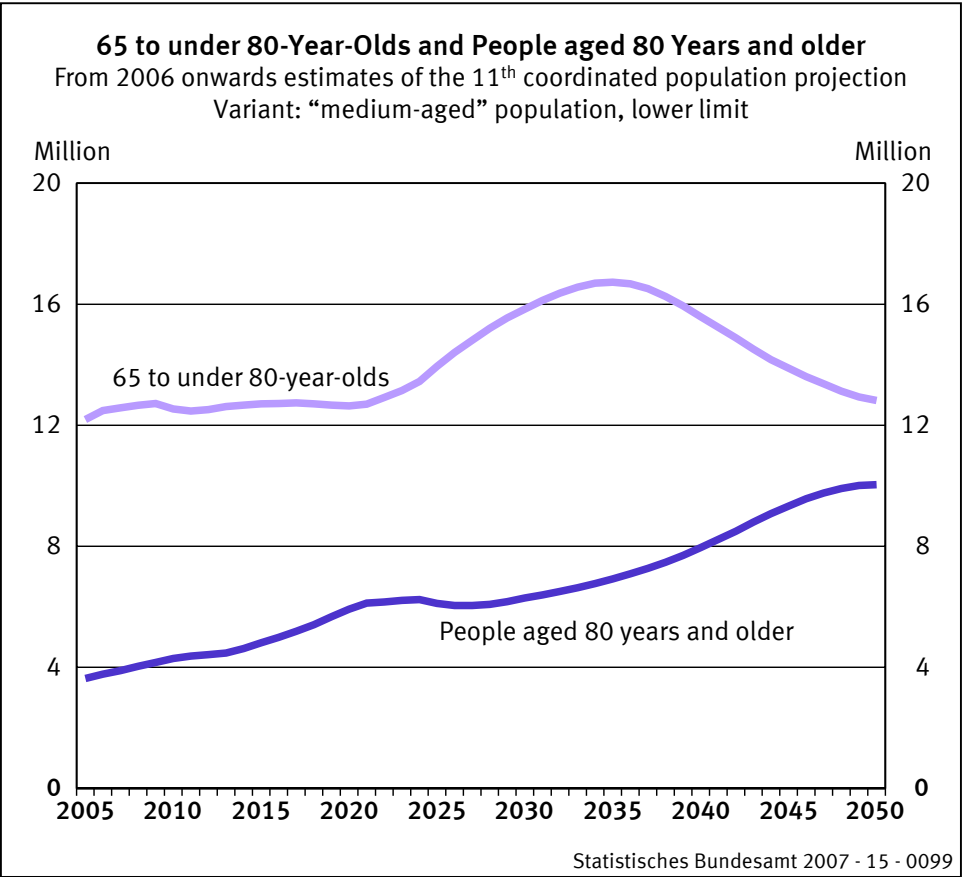
As a result, the age structure at working age will see a clear shift in favour of older people. At present, the medium age group of the 30 to 49-year-olds accounts for 50% of working-age people, the older age group of 50 to 64 years for 30% and the younger age group of 20 to 29 years for nearly 20% of people at working age. By 2020, the older age group, then accounting for about 40% of working-age people, will be almost as strong as the medium age group, which will still account for a mere 42%. By 2050, the situation will have changed just slightly in favour of the medium age group ("medium-aged" population). The labour market will need to rely on older people as much as it relies on people at medium age.

A legitimate question that can be asked in this context is to what extent the increasing weight of older people and the decreasing number of those at working age will have an influence on Germany's position as a competitor on the global market. But that is a question that cannot be answered from a purely demographic perspective alone.

3.3.3 More people at old age

The number of people aged 65 and older will rise by about half until the late 2030s and then begin to fall slightly. While nearly 16 million people were at that age in 2005, that

Figure 8



number will grow to about 23 million by 2050 ("medium-aged" population). These people not only represent the generation of pensioners. With increasing age they will also need care more and more frequently.

The number of younger people at senior age, i.e. people aged 60 to under 80 years, will grow rapidly after 2020, when the strong cohorts from the 1950s and the 1960s will reach that age, and it will fall again strongly after 2030 (fig. 8). More than 12 million people were in this age group in 2005, that number will rise to about 16 million by 2030 and amount to circa 13 million by 2050 ("medium-aged" population).

By contrast, the age group of the 80-year-olds and older ones, consisting of 3.7 million people today, will clearly grow by 2050. Their number will rise to almost 6 million in a first stage by 2020. After 2030 it will grow even more strongly, exceeding 10 million by 2050 ("medium-aged" population). Then it will be almost three times as high as it is today. The share of the very old ones in all people aged 65 years and older will no longer amount to less than a quarter, but to more than 40%.

The very strong increase in the number of people aged 80 years and older will probably cause the number of people in need of care to rise as well.

More than 10 million people of 80 years and older will live in Germany in 2050; in 2005 their number amounted to 3.7 million

3.3.4 Slight fall of the youth dependency ratio, strong rise of the old-age dependency ratio and total dependency ratio

In addition to the absolute number of people at a given age, the age-group dependency ratio is another characteristic feature of the ageing process. By relating the working-age population to those younger people, who need to be cared for in terms of childcare, education and training, we obtain the youth ratio. The old-age dependency ratio is obtained if the older population at pension age as a group of potential beneficiaries of payments made in line with a pension insurance scheme or other old-age protection systems is related to the working-age population. The two ratios together add up to the total dependency ratio, showing the extent to which the medium age group in the widest sense has to care for both younger and older people, who are economically inactive. In future this "burden" will clearly get larger.

Youth and old-age dependency ratios related to the population aged between 20 and 65 years

What will still determine these ratios for a long time is, apart from the assumptions made, the age structure of today's population in Germany with its strong medium-aged cohorts and its weak young cohorts (see age structure 2005 in fig. 3).

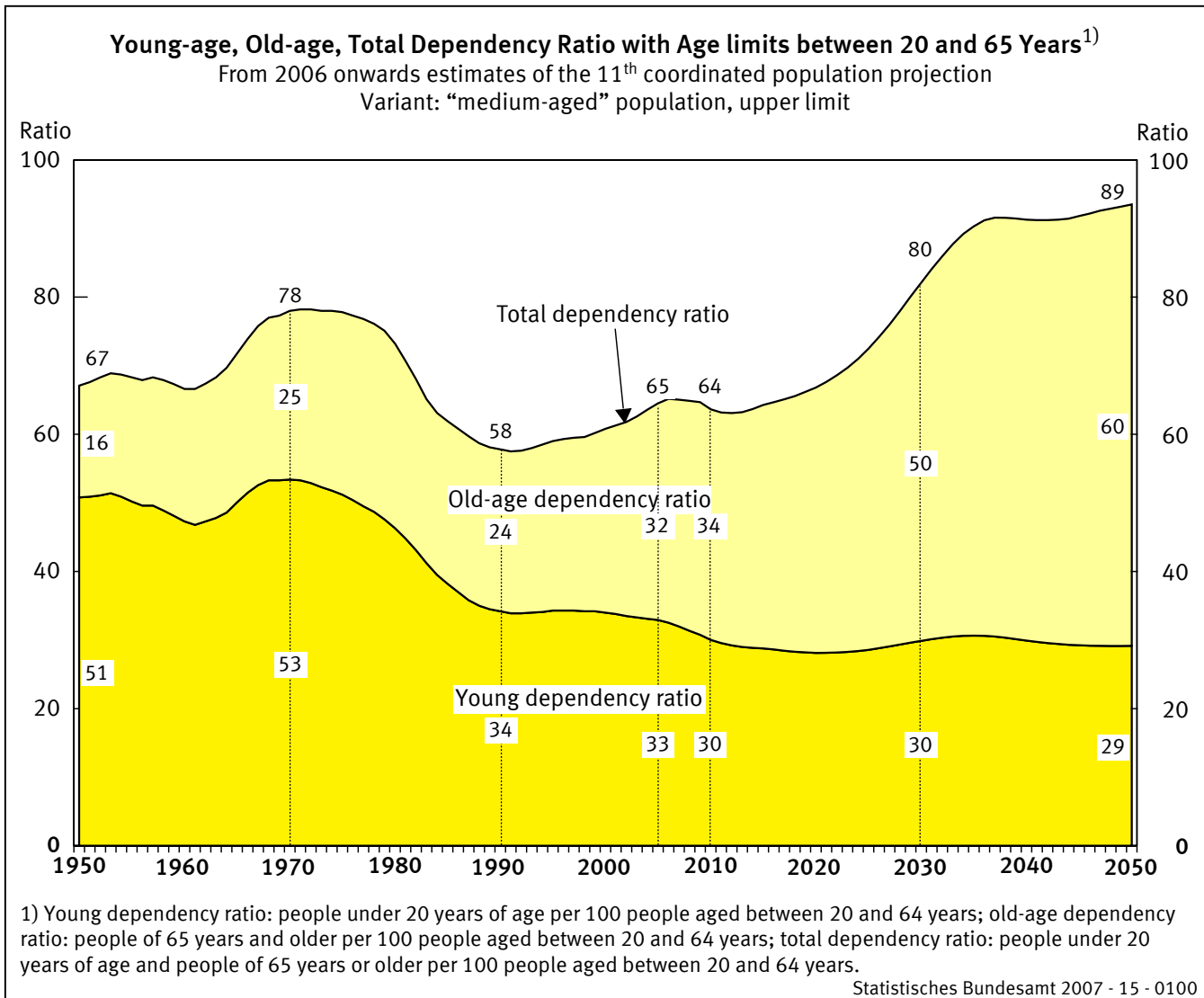
The youth dependency ratio – the number of the under 20-year-olds per 100 individuals aged 20 to under 65 years – is 33 today. In contrast to the years since 1970, when it was falling rather rapidly, it will not change strongly any longer, but finally remain at 29 by 2050. This is equally true of the two variants of the "medium-aged" population (fig. 9).

The youth dependency ratio will remain stable in future

The old-age dependency ratio – the number of people aged 65 and older per 100 persons of 20 to under 65 years of age – is currently at 32. In the next few years a clear rise will set in and during the 2020s it will skyrocket, when the strong cohorts will enter pension age. On the assumption of a constant birth rate, a circa 7 years' rise in life expectancy by 2050 in total and more than 4.5 years for people aged 65 and an annual migration balance of 100 000 people (lower limit of the "medium-aged" population) it will already be up at 52 by 2030 and continue to rise to 64 by 2050. Assuming an annual immigration of 200 000 people (upper limit of the "medium-aged" population, fig. 9), the rise would not be quite as strong, because the increase in immigration would strengthen the medium age group and the old-age dependency ratio would amount to 60 by 2050. Assuming also a rise in the birth rate

At first, the old-age dependency ratio increases slowly

Figure 9



After 2010 the old-age dependency ratio will skyrocket and practically double by 2050

to 1.6 children per woman, so that a "relatively young" population comes true, the old-age dependency ratio would be even lower at 58 by 2050. But even in that case by 2050 it would still be almost twice as high as it is today.

In accordance with the assumed patterns of development, the most unfavourable situation regarding the old-age dependency ratio would occur, if life expectancy at birth rose very strongly by about nine years and that of the 65-year-olds by circa 6.5 years, the birth rate simultaneously fell to 1.2 children by 2050 and just 100 000 people immigrated annually on a net basis. With this "relatively old" population the old-age dependency ratio due to the high life expectancy level would rise to 71 by 2050.

Not even a rise in pension age can keep the old-age dependency ratio at its present level

The delimitation of the old-age dependency ratio at 65 years corresponds to the current age limit of the statutory pension insurance scheme, but it should be considered that the age at which people actually retire is lower at present. What implications would a rise of the age limit to 67 years have? Even if population trends in terms of ageing evolve in a comparatively favourable way (variant of a "relatively young" population), the old-age ratio with an age limit of 67 years will amount to 51 by 2050.

That means that in 2050 it will clearly exceed today's old-age dependency ratio with an age limit of 65 years and even be above the present-day old-age ratio with an age limit of 60 years.

		Old-age dependency ratio for:		
		60 years	65 years	67 years
2005		45	32	26
2050	<u>"medium-aged" population, lower limit</u>	91	64	56
	<u>"medium-aged" population, upper limit</u>	85	60	52
	<u>"relatively young" population</u>	82	58	51
	<u>"relatively old" population</u>	99	71	62

The old-age dependency ratio of 32, which now exists with an age limit of 65 years, cannot be reached by 2050 even under farther reaching assumptions. It cannot be reached, even if the annual migration balance rose to 300 000 or if, with a migration balance of 100 000, 2.1 children were born per woman on a permanent basis. In spite of such conditions the old-age ratio would rise considerably even according to the base assumption on life expectancy. By 2050, with an age limit of 67 years, it would then be just slightly higher than today's old-age dependency ratio with an age limit of 60 years, but it would be far away from the present-day old-age dependency ratio with an age limit of 65 years.

Higher immigration or a higher birth rate can just slightly attenuate the old-age dependency ratio

So far the youth ratio has exceeded the old-age ratio. In 2006, the old-age ratio defined for 65 years will exceed the youth ratio for the first time. In future the old-age dependency ratio will determine the total dependency ratio (fig. 9). Today's ratio is 65 people at non-working age to 100 people aged between 20 and 64 years. In 2050, that ratio will be 94 or 89 per 100 working-age people ("medium-aged" population, lower or upper limit). While the total ratio of the "relatively young" population (91) will not change very much by 2050, that of a "relatively old" population (98) will clearly exceed it by 2050.

In 2005, 100 working-age people were faced with 65 children, juveniles and adolescents or people at pension age, by 2050, this number will rise to about 90

4. Evolution of the birth rate, life expectancy and migration in the past and assumptions on future trends

4.1 Birth rate

4.1.1 Important trends in the evolution of births since 1950

The evolution of births depends on the generative behaviour of people at reproductive age. It is reflected, above all, by the number of children per woman and by mother's age at the moment of delivery (age at delivery). The text below describes characteristic trends of the evolution in the former federal territory, in the new federal states and among foreign women. This information provides the basis for hypotheses on future developments.

The two parts of Germany saw an increase in birth numbers at the beginning of the 1960s, when the total fertility rate (see glossary, page 66) reached its post-war peak of 2.5 children per woman (fig. 12). The children born at that time constitute the strong cohorts which are in their early forties today. The rapid reduction in the number of children born to a woman and in the absolute number of births, which was reported later, began in the ex-GDR as early as in 1964, whilst in the former federal territory birth numbers started falling continuously in 1967 as well. By 1975, the total fertility rate fell to 1.45 in the old federal states and to 1.54 in the ex-GDR.

After the mid-1970s the development of birth rates proceeded very differently in the two parts of Germany. In the former federal territory the birth rate continued to decline, reaching its bottom in the mid-1980s, when less than 1.3 children were born to a woman. Afterwards the birth rate rose again to 1.45 by 1990, oscillating since then moderately around 1.4 children per woman – except in 1994 and 1995.

A total fertility rate that remains constant over several decades does not, however, automatically mean a standstill in the evolution of generative behaviour. A comparison of two calendar years with almost identical total fertility rates may reveal that there are enormous differences at times between the birth rates of different age groups: For example, the total fertility rate in the west of Germany was 1.37 children per woman in both 1987 and 2004. However, a fact hidden by the average was that the age structure had changed: The 25-year-olds gave birth to 30% less and the 35-year-olds to 60% more children in 2004 than women of the same age did in 1987.

These age-specific distinctions are characteristic and they are caused by the fact that an increasing number of women postpone the moment of family formation to a higher age and have their first child only in their early thirties. In 1960, 30 to 40 years old women accounted for as little as 16% of first births; in 2004 that proportion had risen already to almost 50% (cf. glossary, key word birth sequence). Most of further births also take place between the 30th and the 37th year of age and their share in all marital births has remained relatively stable in the last 30 years. That means that first and further births are concentrated within this age group. Thus, a rise in the number of births of the over 30-year-olds is not an indication of an increase in the final number of children.

Number of children per woman and age of mothers at the moment of birth determine birth rate as behavioural components

From the mid-1960s the number of children per woman began to drop in both parts of Germany

The total fertility rate has been low in the former federal territory since the mid-1970s

Age-specific changes in spite of constant total fertility rates

Rise in the birth rate among women in their early to mid thirties is caused by catch-up birth of first child

Further delay of first births to higher age might lead to a further reduction in the total number of children born to a woman

Postponing the first birth shortens the fertile phase in a woman's life. If the birth rate is generally low, this can lead to a further decline in the final number of children. The currently stagnating birth rate among the 30 to 32-year-olds – the age at which most children are born – could be a first indication of such development. Fewer and fewer women have their second or further child at that age.

As far as the future evolution of birth rates is concerned, it is of crucial importance to know whether or not women will continue to postpone their first births to higher ages. If in the future more and more young women continue to postpone the birth of their first child, the final number of children born to a cohort depends on whether exactly as many women as today will be mothers – even though at higher ages – and whether there is a sufficiently large number of women, who will have more children than just one.

Birth rates of the ex-GDR were different from those of the former federal territory

In the former GDR birth rates developed differently from those of the former federal territory after the mid-1970s. There the government adopted comprehensive benefits for families with children to counteract a further decline of birth numbers. In 1980, this policy even led to a clear increase in the total fertility rate to 1.94 children per woman. Afterwards the birth rate again began to decline slowly. A strong decline of birth numbers was recorded in the new federal states in the aftermath of the fundamental socio-economic changes caused by the reunification of Germany: Between 1990 and 1994 the number of births fell from 178 000 to 79 000. The total fertility rate fell from 1.52 to 0.77 in the same period.

Number of children per woman again on the increase in the new federal states since the mid-1990s

Since the mid-1990s the birth rate has again been on the increase in the new federal states. In 2004, the average number of children per woman already amounted to 1.31 (data for the New Länder, excluding East Berlin) to the effect that it rose to a level just 5% below that of the former federal territory (1.37; data for the former federal territory, excluding West Berlin), whereas it had still been 30% below the West German average in 1991.

Those who most contributed to the new rise in birth numbers in the New Länder were women aged 25 to 35 years (fig. 10). In the last 13 years their birth rate has more than doubled: In 1991, 1 000 25 to 35 years old women gave birth to a bit more than 400 children, in 2004, that number had risen to 900, just 18 children below that of the corresponding age group in the former federal territory. By contrast, the age group with the once highest fertility, i.e. that of the 20 to 24-year-olds, recorded a continuous decline of fertility, even though their fertility is still slightly above the West German average.

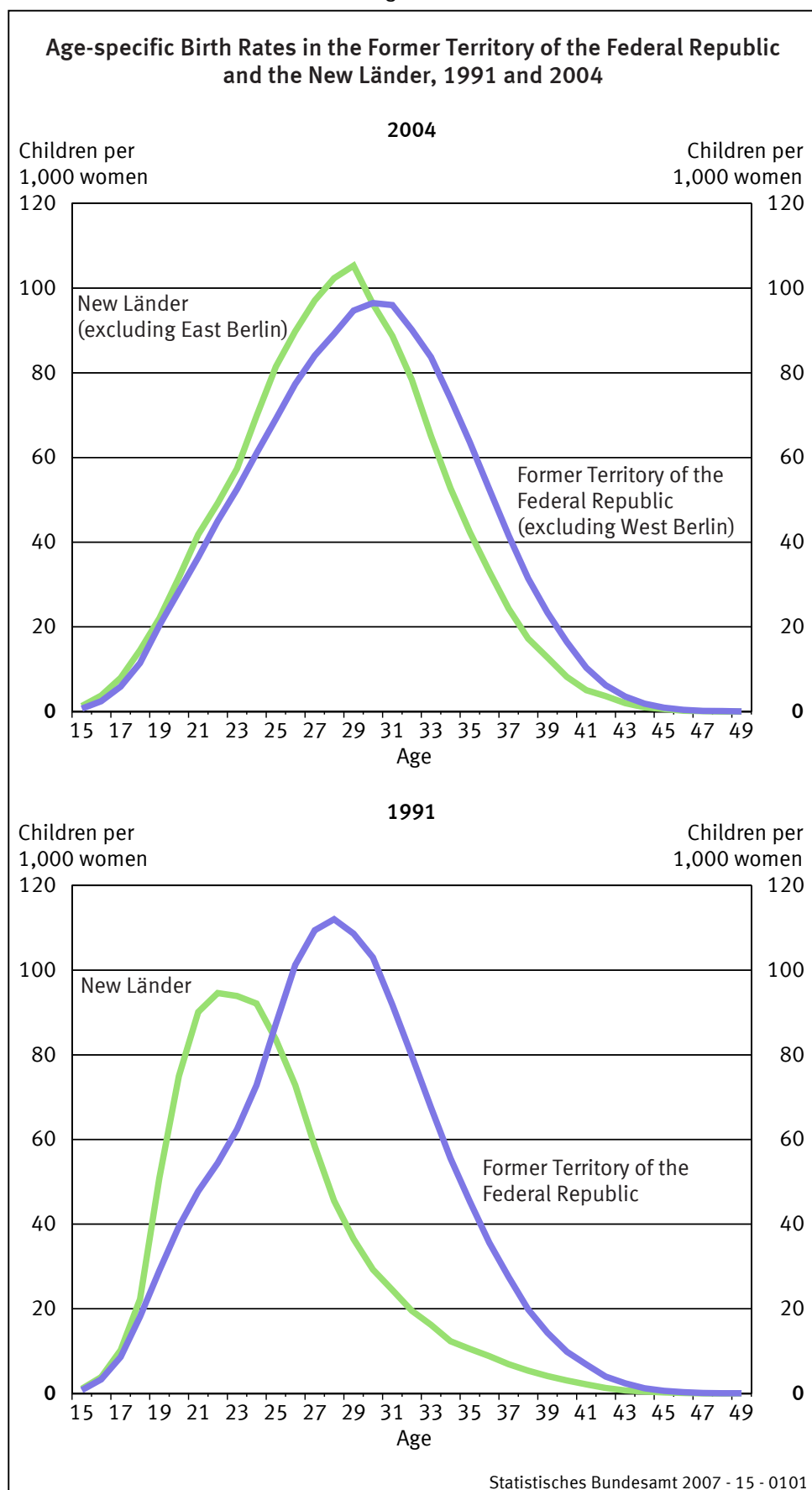
Increase of the average age of mothers at birth in the new federal states

The age-specific changes mentioned have made the average age of mothers rise in the new federal states, too. However, this process has evolved much more quickly than it had in the former federal territory, so that we have witnessed a clear adaptation to the West German pattern in just 15 years (fig. 10). Approximately since 2000 we have observed a stagnant or falling birth rate among the various cohorts of the 25 to 29-year-olds. This evolution agrees with the general stagnating trend observed in the former federal territory. For the medium term we can assume that the generative behaviour in the new federal states and the former federal territory will increasingly evolve along one and the same lines.

18% of all children born in Germany in 2004 have mothers with a foreign nationality

In 2004, 18% of all new-born children were born by mothers with a foreign citizenship. This is 5 percentage points more than in 1991 (13%). The main reason is that the numerical proportion of German and foreign women at fertile age has changed: While the number of German women of 15 to 49 years of age fell from 17.6 million in 1991 to 17.4 million in 2004 (-1%), the number of female foreigner of the same age rose by 27%: from 1.7 million in 1991 to 2.2 million in 2004. Furthermore, the fertility of foreign women is still higher than that of German women, although birth rates have fallen continuously also among female foreigners. In 2004, the average number of children per foreign woman exceeded that of a German woman by circa 30%.

Figure 10



The birth rates of female foreigners are decreasing

The total fertility rate of foreign women has fallen by 17% since 1991. Although it cannot be excluded that the current level of the total fertility rate mentioned above is underestimated to some extent due to an increasing uncertainty of population numbers in absolute terms, a general trend towards a decline in the birth rates of female foreigners seems to be, nevertheless, plausible in view of the following developments:

1. The global decline of the birth rate does not bypass those countries, from which the majority of female migrants originate. Some of these countries witnessed dramatic social and political changes, which even accelerated the decline of fertility. In Turkey the average number of children per woman dropped by more than half from 5.3 in the mid-1970s to 2.2 in 2004; in Italy and Greece it fell from circa 2.3 to circa 1.3, in Poland from 2.3 to 1.2 and in Croatia from 1.9 to 1.4.
2. Foreign women, living in Germany today, stem from countries other than those foreigners came from in 1990. The proportion of female migrants from East- and Central European countries has increased. Some of these countries have a level of fertility, which is even lower than that of Germany. On the other hand, the proportion of Turkish women has decreased: In 1990, Turkish women accounted for circa 30% of all foreign women aged between 15 and 49 years, in 2004, that proportion was just 22%, even though their number in absolute terms had remained almost unchanged (slightly over 470 000). In 1990 almost every second child (45%) with a foreign mother was born to a Turkish woman, in 2004 this was true of only every fourth child (26%).
3. Over the last 15 years a mother's average age at birth has increased among foreign mothers as well. If this adaptation of the behavioural pattern is long-lasting and also agrees with current trends in the countries of origin, it would lead to an approximation of birth levels between foreign and German females.

At EU level, the new Central and East European memberstates as well as Greece, Spain and Italy record lower birth rates than Germany

In 2004 Greece, Spain and Italy were the only countries in the European Union to have total fertility rates lower than those of Germany, apart from the new Central and East-European member states such as Slovenia, the Czech Republic, Poland, Latvia, Slovakia, Lithuania and Hungary.

Germany is a country with permanently low birth rates also at international level

However, Germany – and especially the former federal territory – has been the only country to record so low a birth level, i.e. circa 1.4 children per woman, for 30 years (fig. 11). The rapid decline in birth numbers of East-European states occurred in the late 1980s and early 1990s as a reaction to the breakdown of socialism; as late as in 1985 these states still reported total fertility rates between 1.7 children per woman in Slovenia and 2.3 in Slovakia. Of all countries of the European Union the Federal Republic of Germany was the one with the lowest birth rate already in 1971, although it was still at a high level at that time (1.9 children per woman). The birth rate fell to 1.4 children per woman in 1977 for the first time. At that time Italy, Greece and Spain, reporting birth levels of 2.0 to 2.7 children per woman, were still far ahead of Germany (table 1).

Now as before the rest of the old EU member states have higher fertility rates than Germany. Many of these countries have reported an increase in birth rates since 1996. In 2004 the total fertility rate varied between circa 1.42 children per woman in Austria and Portugal, on the one hand, and 1.99 in Ireland, on the other hand.

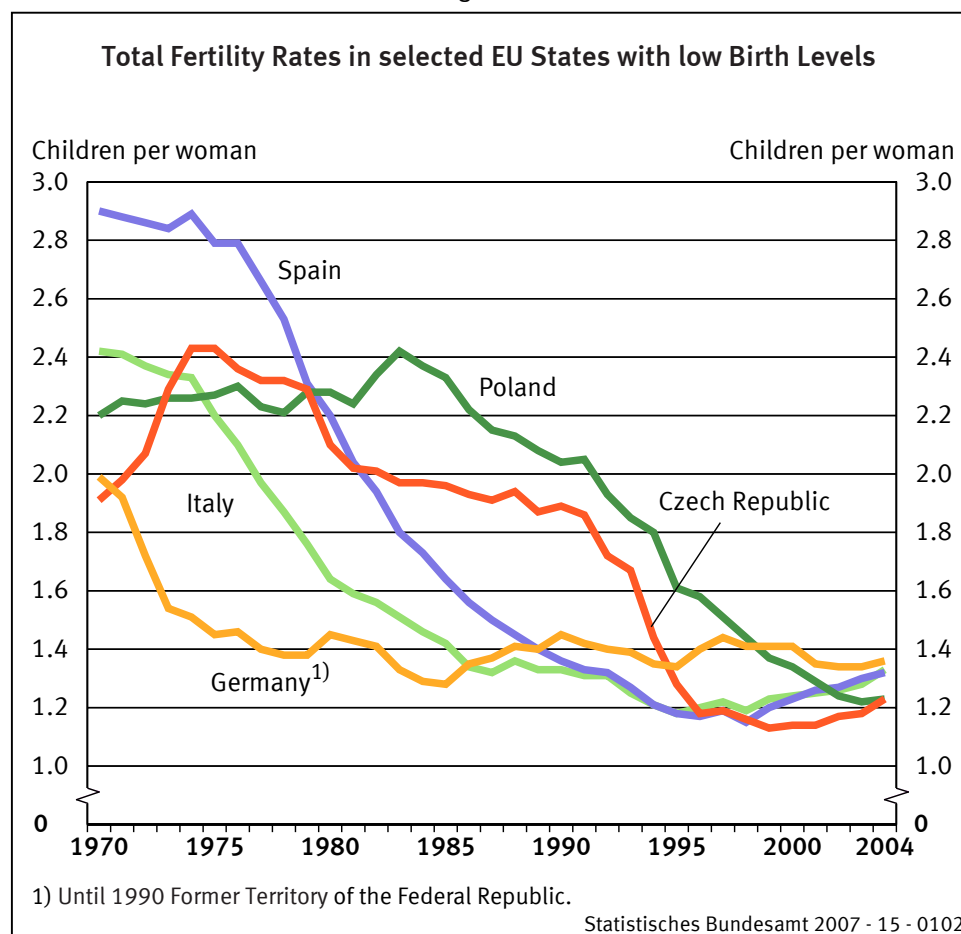
Table 1: Total fertility rate in selected states

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
EU states												
Austria	1.5	1.5	1.4	1.5	1.4	1.4	1.3	1.4	1.3	1.4	1.4	1.4
Belgium	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.6	1.6	1.6	1.6
Cyprus	2.3	2.2	2.1	2.1	2.0	1.9	1.8	1.6	1.6	1.5	1.5	1.5
Czech Republic	1.7	1.4	1.3	1.2	1.2	1.2	1.1	1.1	1.1	1.2	1.2	1.2
Denmark	1.8	1.8	1.8	1.8	1.8	1.7	1.7	1.8	1.7	1.7	1.8	1.8
Estonia	1.5	1.4	1.3	1.3	1.2	1.2	1.2	1.3	1.3	1.4	1.4	1.4
Finland	1.8	1.9	1.8	1.8	1.8	1.7	1.7	1.7	1.7	1.7	1.8	1.8
France	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.9	1.9	1.9	1.9	1.9
Germany	1.3	1.2	1.2	1.3	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.4
Greece	1.3	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Hungary	1.7	1.7	1.6	1.5	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Ireland	1.9	1.9	1.8	1.9	1.9	2.0	1.9	1.9	1.9	2.0	2.0	2.0
Italy	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3
Latvia	1.5	1.4	1.3	1.2	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.2
Lithuania	1.7	1.6	1.6	1.5	1.5	1.5	1.5	1.4	1.3	1.2	1.3	1.3
Luxembourg	1.7	1.7	1.7	1.8	1.7	1.7	1.7	1.8	1.7	1.6	1.6	1.7
Malta	2.0	1.9	1.8	2.1	2.0	. ¹⁾	1.7	1.7	1.7	1.5	1.5	1.4
Netherlands	1.6	1.6	1.5	1.5	1.6	1.6	1.7	1.7	1.7	1.7	1.8	1.7
Poland	1.9	1.8	1.6	1.6	1.5	1.4	1.4	1.3	1.3	1.2	1.2	1.2
Portugal	1.5	1.4	1.4	1.4	1.5	1.5	1.5	1.6	1.5	1.5	1.4	1.4
Slovakia	1.9	1.7	1.5	1.5	1.4	1.4	1.3	1.3	1.2	1.2	1.2	1.3
Slovenia	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.3	1.2	1.2	1.2	1.2
Spain	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3
Sweden	2.0	1.9	1.7	1.6	1.5	1.5	1.5	1.5	1.6	1.7	1.7	1.8
United Kingdom	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.6	1.6	1.7	1.7
Other states												
Iceland	2.2	2.1	2.1	2.1	2.0	2.1	2.0	2.1	2.0	1.9	2.0	2.0
Japan	1.5	1.5	1.4	1.4	1.4	. ¹⁾	1.4	1.4	1.3	1.4	1.4	. ¹⁾
Norway	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.9	1.8	1.8	1.8	1.8
Switzerland	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.4
Turkey	2.9	2.8	2.8	2.7	2.6	2.6	2.5	2.3	2.3	2.2	2.2	2.2
USA	2.1	2.0	2.0	2.0	2.1	. ¹⁾	2.1	2.1	2.0	2.1	2.1	. ¹⁾

1) Data not available

Sources: Eurostat Online Database, 5 October 2006; Federal Statistical Office; Turkish Statistical Institute (TURKSTAT).

Figure 11



4.1.2 Three assumptions on the future evolution of births

The three assumptions on birth rates focus on different aspects of former trends

A stable trend in the former federal territory

The new federal states quickly adapt themselves to the west German pattern

Female foreigners living in Germany show trends in generative behaviour ...

To show the effects of alternative developments, we make three assumptions on future birth trends. All three assumptions are based on the former evolution, but each one underlines different aspects. Today we cannot yet foresee the extent to which the current discussion on population problems will change people's attitudes or political measures planned will influence the evolution of births. In addition to the developments outlined, the assumptions are mainly based on the trends described below:

A clear and stable trend has been observed among German women in the former federal territory for more than 30 years: The birth rate of the under 30-year-olds has continuously fallen, except for a few years, which (so far) has largely been compensated for by a rise in the birth rate of women who are older than 30 years. This has created an insecure balance, which ensures relative stability of the total fertility rate on a low level. The new federal states are in a process of rapid approximation to this trend. The birth rates of future decades will in the final analysis depend on whether even more women of under 30 years of age will postpone family formation and to what extent births are deferred to a higher age. The extent to which this behaviour will change is outlined by different assumptions.

Birth trends in the countries of origin of foreign females and developments in Germany show that the generative behaviour of foreign females increasingly proceeds along lines similar to those of German females. That means that foreign females will be faced with a similar situation in future. Besides, the future birth rates of foreign females will depend on the extent and the type of migration. From today's point of

view we can assume that in the decades to come the labour market (including free movement of labour force from the new EU member states) – apart from family reunion - will have a decisive impact on immigration. Female migrant workers will, above all, be interested in safe jobs. In this case we can assume a shorter duration of stay and higher mobility of female migrants. Under such circumstances it does not seem very likely that the birth rates of foreign females will quickly rise again, leading to an overall change in the fertility rates of Germany.

... that are similar to those of German women

Assumption of “approximate stability”: The evolution of the last 15 to 20 years will continue largely unchanged during the next 20 years: The total fertility rate remains on a level of nearly 1.4 children per woman with a simultaneous rise in the average age at birth by circa 1.6 years. From 2026 to 2050 birth ratios will remain constant.

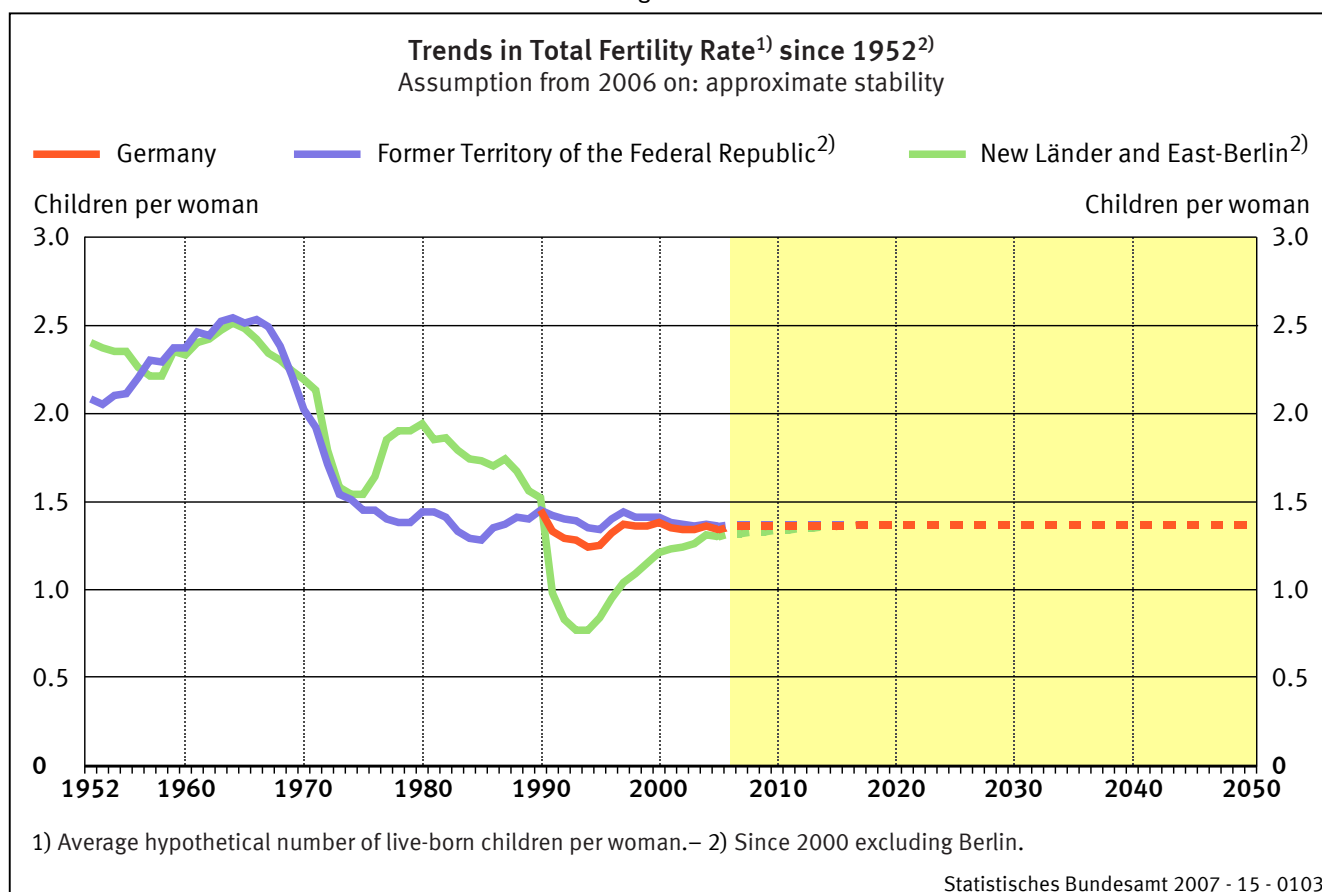
Assumption of “approximate stability”: current trends of nearly 1.4 children per woman will continue

In this context stability does not mean a freezing of birth rates at current levels, but the continuation of current age-specific birth trends described above. By doing so, we assume that more and more women will have their first child at a higher age and that the proportion of women with two and more children will not change.

This assumption is defined as the main assumption, for at present we do not have empiric information that would indicate a turn of trends. This is the scenario on which the presentation of results will be focussed.

For Germany as a whole this results in a slight increase to nearly 1.4 children per woman by 2025 with a simultaneous rise in the average age at birth by about 1.6 years. The total fertility rate of the new federal states will approximate the largely stable level of the old federal states during the coming eight years and the average age at birth will increase, which will reduce the respective distinctions.

Figure 12



Assumption of a “slight increase”: positive dynamics, rise to 1.6 children per woman by 2025

Assumption of a “slight increase”: Increase of the birth rate to 1.6 children per woman by 2025 with a simultaneous rise in the average age at birth by circa one year. The birth rate will remain constant from 2026 to 2050.

A rise in the total fertility rate is imaginable, if the fertility behaviour of younger women aged under 30 years does not change considerably, on the one hand, and if more women decided in favour of having another child, on the other hand. That means that not only the birth ratios of the under 30-year-olds should remain unchanged, but also the positive trends among the over 30-year-olds should continue.

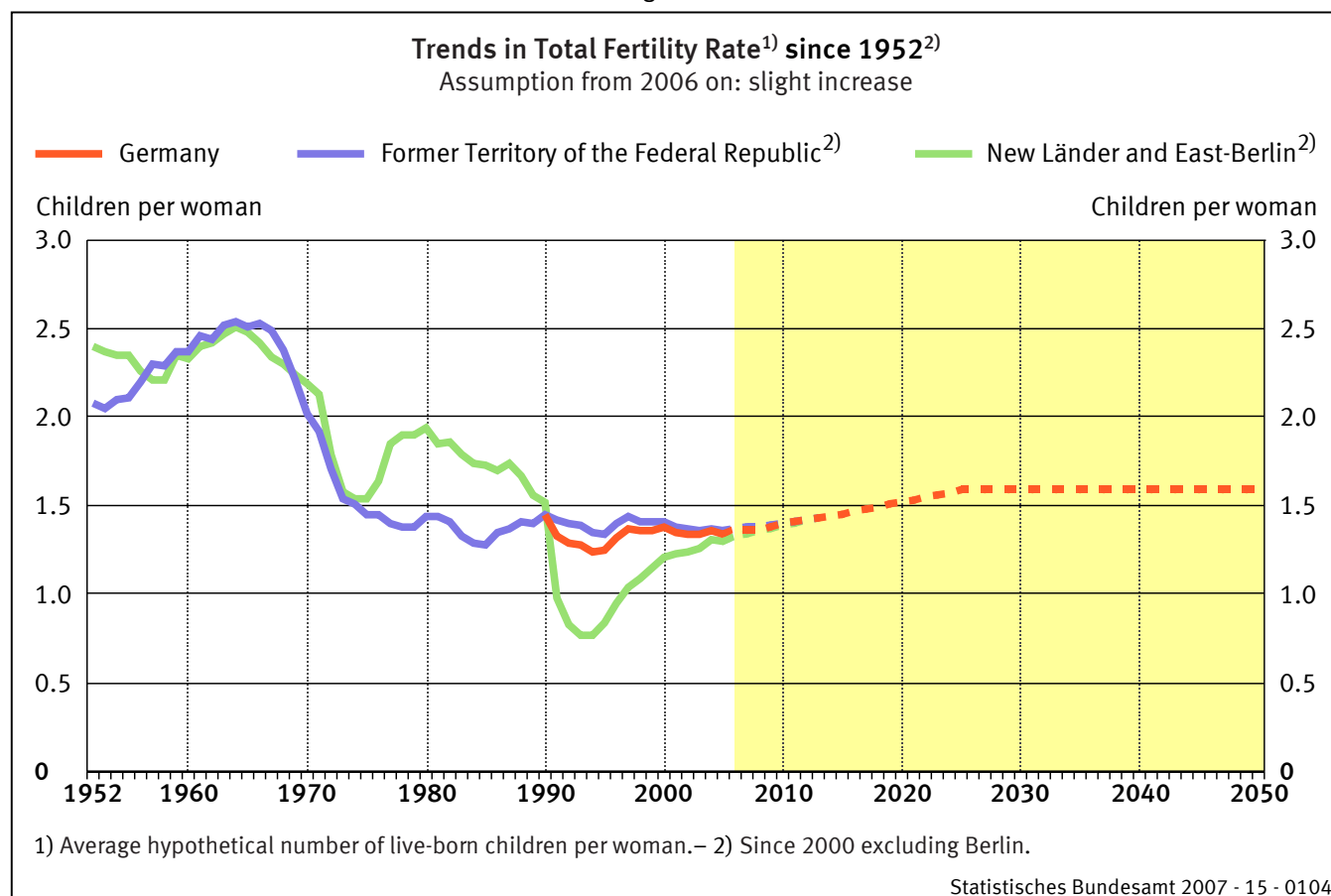
Under these conditions a total fertility rate of 1.6 could possibly be achieved for Germany by 2025. Mothers' average age at birth would rise by circa 1 year.

Assumption of a “slight decrease”: negative dynamics, drop to 1.2 children per woman by 2050

Assumption of a “slight decrease”: Decrease of the birth rate to 1.2 children per woman by 2050 and a simultaneous rise of the average age at birth by circa two years.

A further rise in the age of women giving birth to their first child is likely to go along with a decrease in total fertility. This situation is imaginable both as a result of an

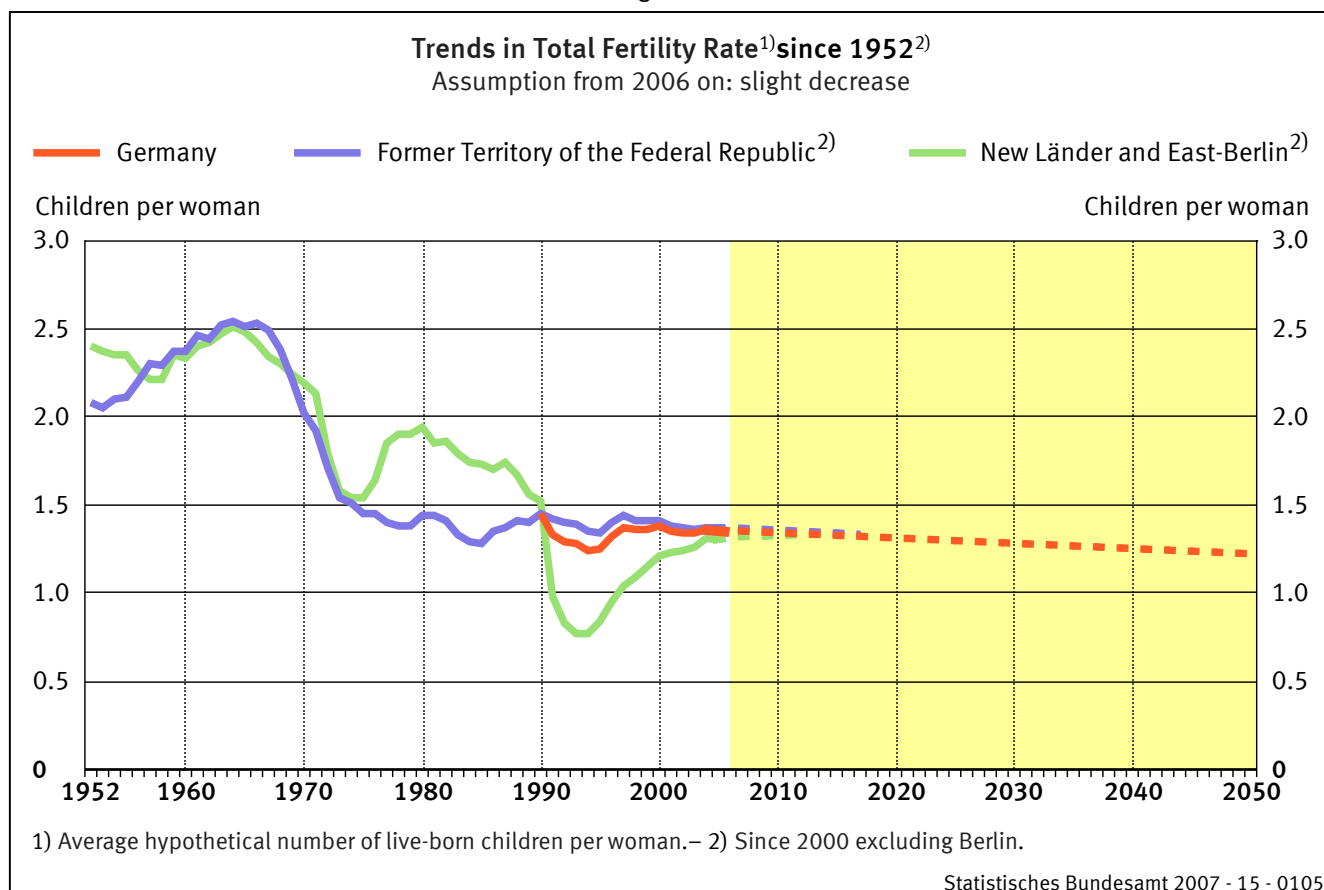
Figure 13



even stronger polarisation (i.e. a rise in life-long childlessness, on the one hand, and in the number of families with two and more children, on the other hand) and a further proliferation of one-child families.

In this case we assume that the number of children per woman will successively fall to 1.2 by 2050. The average age at birth will simultaneously rise by nearly two years.

Figure 14



Overview of assumptions on the future evolution of the total fertility rate

Assumption	Trend	Target values
Approximate stability	Continuation of current age-specific trends until 2025; total fertility rate remains nearly constant at 1.4 children per woman until 2050	2006 – 2050 nearly 1.4 children per woman
Slight increase	Increase of the total fertility rate to 1.6 children per woman until 2025, the birth rate remaining constant afterwards	2006 – 2025 increase from nearly 1.4 to 1.6 children per woman 2026 – 2050 1.6 children per woman
Slight decrease	Decrease of the total fertility rate to 1.2 children per woman until 2050	2006 – 2050 Decrease from nearly 1.4 to 1.2 children per woman

4.2 Life expectancy

4.2.1 Evolution of life expectancy

Another factor influencing future population trends is a change in mortality and life expectancy.

Continuous increase in life expectancy due to progress in medicine, hygiene, nutrition and prosperity

For 130 years we have witnessed a continuous fall of mortality and a rise of life expectancy in Germany. This development is to a large extent attributable to the progress of medical services, better hygiene and nutrition, improvements in the housing situation as well as to better conditions of work and a rise in material well-being. Due to that progress, for instance, infectious diseases such as tuberculosis, a major cause of death in the early 20th century, have become much less important. Today the most frequent causes of death are cancer and diseases of the circulatory system, which in most cases affect the higher ages only. At the end of the 19th century mortality began to fall strongly, first of all, in respect of infants and children. In the second half of the last century the mortality of old people also fell to a considerable extent.

Life expectancy as a measure of lifetime

Since the foundation of the German Reich in 1871, mortality rates and average life expectancies have been recorded regularly using life tables. They allow us to see how long a new-born child's average life expectancy is. They also indicate what is called average further life expectancy, i.e. the number of further years of life for persons who have already reached a certain age.

130 years ago the life expectancy of new-born children was lower by half

In 1871/1881 average life expectancy at birth in the German Reich was 35.6 years for boys and 38.4 years for girls. It is noteworthy that due to the then high infant and childhood mortality a 5 year-old boy already had an average further life expectancy of 49.4 years and a 5 year-old girl of 51 years. Since then boys' and girls' life expectancies at birth have more than doubled, provided that we neglect the different territorial statuses. In 2002/2004 life expectancy at birth in Germany amounted on average to 75.9 years for boys and 81.5 years for girls.

According to 1871/1881 mortality rates half of all men lived at least to the age of 38 years, half of all women to the age of 42 years. At that time the age of 60 years was reached by just about 31% of men and 36% of women. Even the fifth decade of life was reached only by some 65% of men and 68% of women. By comparison, according to 2002/2004 mortality rates about 88% of men and 93% of women live to the age of 60 and about 99.5% of men and women reach the age of 50. Half of all men and women can even hope to reach the age of 78 and 84 years, respectively.

Half of all men and women can reach 78 and 84 years of age, respectively, under today's conditions

A more precise examination of life expectancy trends reveals that the rise in average life expectancy at birth proceeded rather quickly at first till the mid 20th century. Between 1871/1881 in the German Empire and 1949/1951 in the former federal territory average life expectancy at birth rose by 29 years for boys and by 30 years for girls. In the second half of the 20th century till the early 21st century, from 1949/1951 to 2002/2004, average life expectancy at birth grew by another 11.3 years for boys and 13 years for girls (fig. 15).

Rapid growth of life expectancy until the mid 20th century

Table 2: Life expectancy 1871/1881 and 2002/2004 ¹⁾

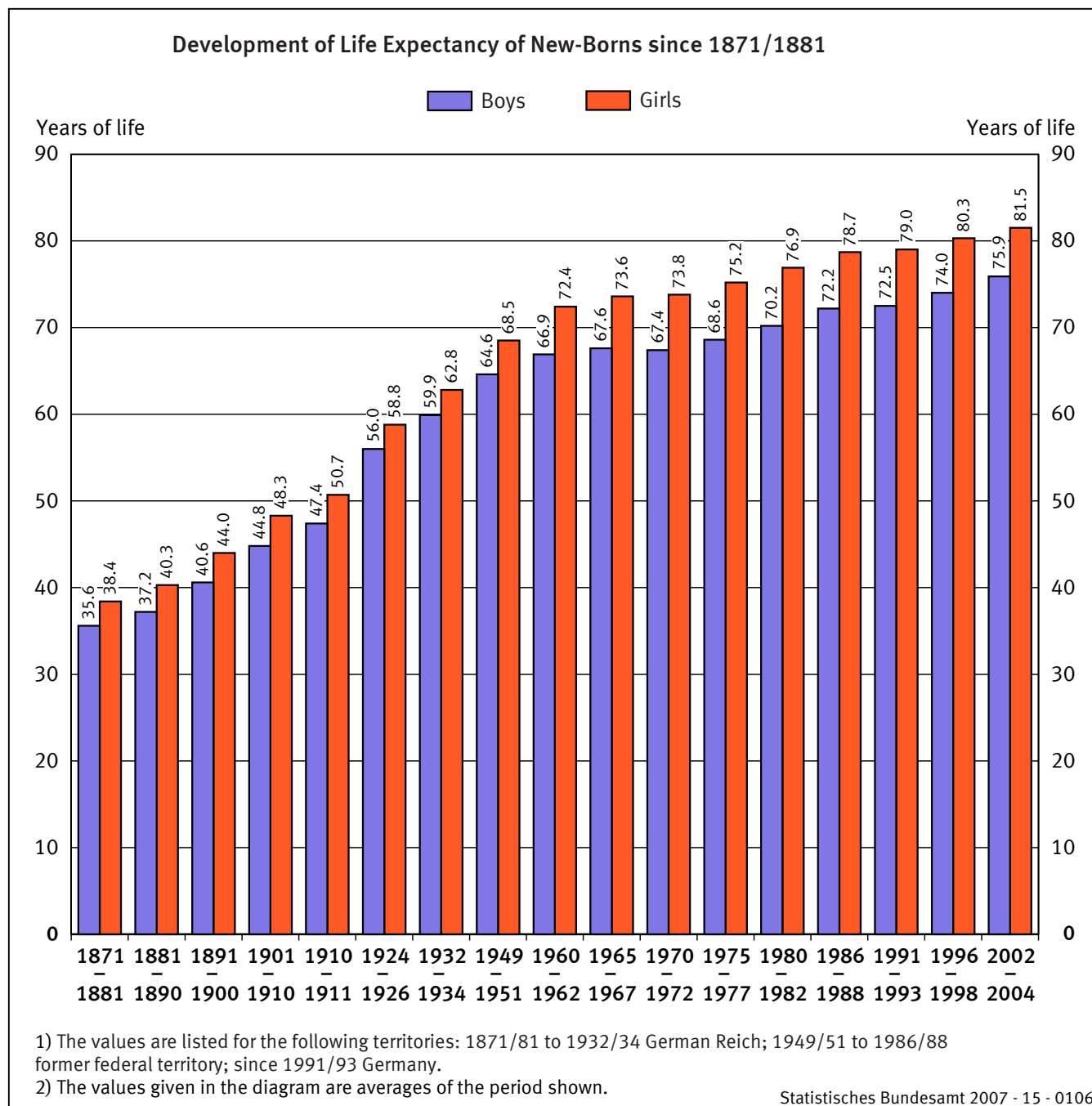
Age	Men				Women			
	Further life expectancy in years		Survivors of 100 000 new-born children		Further life expectancy in years		Survivors of 100 000 new-born children	
	1871/1881	2002/2004	1871/1881	2002/2004	1871/1881	2002/2004	1871/1881	2002/2004
0	35.6	75.9	100 000	100 000	38.4	81.5	100 000	100 000
1	46.5	75.2	74 727	99 544	48.1	80.9	78 260	99 620
5	49.4	71.3	64 871	99 452	51.0	76.9	68 126	99 535
10	46.5	66.4	62 089	99 393	48.2	72.0	65 237	99 488
20	38.4	56.6	59 287	99 059	40.2	62.1	62 324	99 324
30	31.4	46.9	54 454	98 331	33.1	52.2	57 566	99 049
40	24.5	37.4	48 775	97 306	26.3	42.5	51 576	98 545
50	18.0	28.3	41 228	94 447	19.3	33.0	45 245	97 026
60	12.1	20.0	31 124	87 765	12.7	24.1	36 293	93 483
70	7.3	12.8	17 750	73 595	7.6	15.7	21 901	85 994
80	4.1	7.2	5 035	46 179	4.2	8.6	6 570	66 178
90	2.3	3.6	330	12 671	2.4	4.0	471	25 436

1) The values are listed for the following territories: The values are indicated for the following territorial statuses: 1871/1881 German Reich; 2002/2004 Germany.

The rapid increase in average life expectancy recorded until the mid 20th century can to a very large extent be attributed to a strong reduction of infant and childhood mortality. If about one quarter of all new-born children died in their first year of life back in 1871/1881, that proportion had fallen to as few as 6 % by 1949/1951. Presently infant mortality is below 0.5%.

Strong reduction of infant mortality as a major factor

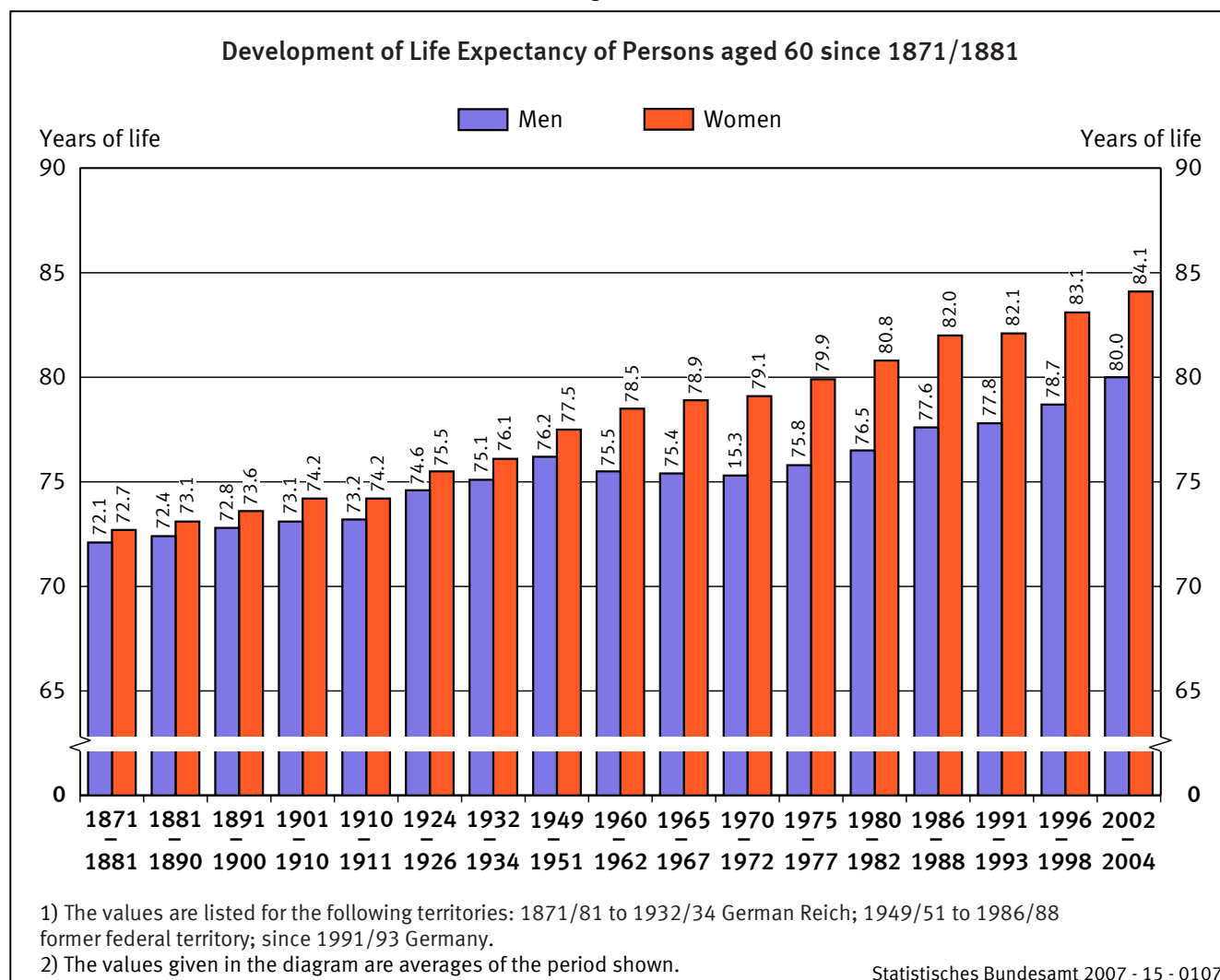
Figure 15



Life expectancy increase for older people too

Older people's average life expectancy has increased as well. Even in 1871/1881 a 60 years old man could expect to stay alive for 12.1 more years and a woman of the same age for even 12.7 more years. This corresponds to a total life expectancy of 72.1 years for men and 72.7 years for women. In 2002/2004 total life expectancy of 60-year-olds is 80.0 years for men and 84.1 years for women. This shows clearly that both men and women could live to a very high age as early as 130 years ago. A necessary condition was to survive the time of high infant mortality and children's diseases, as every additional year of life reduced the mentioned health hazards and led to an increase in total life expectancy.

Figure 16



This increase in older people's life expectancy has considerable implications for the age structure and related social issues. The older generation of today is numerically larger than older generations of former times and that means that, with other conditions remaining unchanged, there are potentially more pensioners, who are retired for a longer time.

Longer pension payments to be expected

Until the mid 1970s the evolution of life expectancy in the ex-GDR was similar to that of the former federal territory. In the first half of the 1970s boys' life expectancy at birth in the GDR was higher than it was in West Germany, whereas girls' life expectancy was almost equal in both parts of Germany. After 1977 life expectancy stagnated in the ex-GDR and until the end of the 1980s it rose there much less rapidly than in the old federal states. In 1991/1993 boys' life expectancy at birth in the New Länder was 3.2 years and that of girls 2.3 years shorter than in the former federal territory. After Germany's reunification life expectancy rose in the New Länder, so that the gap with regard to the former federal territory has now been narrowed to 1.5 years for boys and 0.4 years for girls.

Differences in life expectancy between the two parts of Germany since the mid 1970s

Germany does not hold a top position in an international context. Even some of the member states of the European Union report clearly higher life expectancies than Germany. For instance, in 2003 average life expectancy at birth was 77.9 years for boys in Sweden and 83.6 years for girls in Spain, i.e. 2.0 or 2.1 years above the respective

Higher life expectancy in other EU member states

values in Germany. Compared to the average life expectancy across the European Union (15 countries in 2003), Germany's life expectancy is the same for boys and 0.3 years higher for girls. At the international level, Japan is one of the countries with the highest average life expectancy at birth, which in 2003 amounted to 77.6 years for boys and 84.3 years for girls, so that there was a difference of 1.7 and 2.8 years to the disadvantage of Germany.

Table 3: Life expectancy at birth in selected states

	Life expectancy at birth, 2003		Deviation from Germany	
	Boys	Girls	Boys	Girls
European Union ^{1) 3)}	75.9	81.8	+ 0.0	+ 0.3
Belgium	75.9	81.7	+ 0.0	+ 0.2
Denmark	75.1	79.9	– 0.8	– 1.6
Germany ²⁾	75.9	81.5	x	x
Finland	75.1	81.8	– 0.8	+ 0.3
France	75.9	82.9	+ 0.0	+ 1.4
Greece	76.5	81.3	+ 0.6	– 0.2
Ireland	75.8	80.7	– 0.1	– 0.8
Italy	76.8	82.5	+ 0.9	+ 1.0
Luxembourg	75.0	81.0	– 0.9	– 0.5
Netherlands	76.2	80.9	+ 0.3	– 0.6
Austria	75.9	81.6	+ 0.0	+ 0.1
Poland	70.5	78.8	– 5.4	– 2.7
Portugal	74.2	80.5	– 1.7	– 1.0
Sweden	77.9	82.5	+ 2.0	+ 1.0
Spain	76.9	83.6	+ 1.0	+ 2.1
United Kingdom	76.2	80.7	+ 0.3	– 0.8
Iceland	79.7	82.7	+ 3.8	+ 1.2
Norway	77.1	82.0	+ 1.2	+ 0.5
Switzerland	78.0	83.1	+ 2.1	+ 1.6
Turkey [*]	68.6	73.4	– 7.3	– 8.1
United States	74.4	80.0	– 1.5	– 1.5
Japan	77.6	84.3	+ 1.7	+ 2.8

1) 15 states

2) As of 2002/04

3) Estimate or provisional value

Source: Eurostat Online Database. Federal Statistical Office; Turkish Statistical Institute (TURKSTAT) .

4.2.2 Two assumptions on the evolution of life expectancy by 2050

Life expectancy supposed to keep rising until 2050

In the light of past developments in Germany and life expectancy in other developed states of the world we can assume that improvements in the circumstances of life compared to those of former generations and other improvements in medical and social welfare systems will lead to a further rise of life expectancy in Germany in the years to come.

Life expectancy supposed to increase more slowly

In the context of the 11th coordinated population projection two assumptions have been made on the development of life expectancy by 2050. Both assumptions are based on the trends of rising life expectancy. In future, however, life expectancy is supposed to grow less rapidly than it has grown in recent years.

A point in favour of this assumption is the fact that some cohorts have exhausted nearly all of their potentials for improvement, so that serious changes are unlikely to occur in the future. The mortality risk of the young age groups, e.g. at babyhood, is already very low. It was the reduction of this risk that contributed to the rise of life expectancy to a very considerable extent. Although some reserves may possibly still be tapped, this in all probability will have no measurable effect on total life expectancy. If, for example, it were possible to reduce the mortality risk to zero for all age groups up to 30, this would raise total life expectancy by as little as one year for men and by even less than a year for women. In the future, the rise of life expectancy will increasingly depend on the older age groups. It is still open whether the mortality of the future will be influenced by the same factors as in the past or whether these factors will be replaced by different determinants with similar effects.

Mortality in young age groups already very low

Growth of life expectancy stems increasingly from older age groups

In order to define the assumptions more precisely, we examined men's and women's mortality risks in respect of each individual age cohort, which enabled us to identify all past changes in the long and short term as well as future potentials for improvement. Here, long term means the evolution since 1871, short term the evolution since 1970.

Assumptions on future trends

The short-term trend takes into account the clear reduction in the mortality risk recorded for people of 60 years and older during the last 30 years, in most cases due to medical progress regarding diseases of the circulatory system. These diseases are the most frequent cause of death for people in the older age groups. Since 1980 it has been possible in the age groups from 60 to 90 years to reduce the share of people dying from these diseases in relation to the average population by more than half. That is why the future evolution of this trend is based on the assumption that medical progress will continue to be as effective as before until 2050 and compensate for life-shortening effects such as the spread of obesity.

Another discernible trend of the short-term development is the reduction of the difference in life expectancy between men and women, whilst the life expectancy of both sexes keeps growing. This approximation has been observable in the former federal territory since 1978/1980. One of the reasons certainly is that those male cohorts that have suffered from health damages caused by the war and consequently had higher mortality rates are gradually passing away. Another reason is perhaps an approximation of health-relevant forms of behaviour between men and women. The trend ever since 1970 has indicated that the difference between men and women, i.e. 5.6 years in 2002/2004, will fall by more than a year until 2050. That difference had already been smaller once in the past, namely 3.9 in 1949/1951.

Approximation of men's and women's life expectancies

Base assumption on life expectancy: According to the base assumption average life expectancy at birth in 2050 will be 83.5 years for men and 88.0 years for women. This is an increase of 7.6 and 6.5 years, respectively, related to the 2002/2004 level of life expectancy in Germany. The difference in life expectancy between men and women falls from 5.6 to 4.5 years by 2050. 60 years old men or 60 years old women are still likely to live 25.3 or 29.1 more years, i.e. about 5 years more than in 2002/2004. The base assumption takes account of both the long-term development since 1871 and the short-term development since 1970.

Base assumption on life expectancy: gain in life expectancy of 7.6 years for men and 6.5 years for women

**Assumption with a
“high increase”: gain
in life expectancy of
9.5 years for men and
8.3 years for women**

High increase in life expectancy: In an assumed scenario of high life expectancy men are supposed to live from birth on average for 85.4 years and women for 89.8 years. That means that men will live 9.5 years and women 8.3 years more than in 2002/2004. The difference in life expectancy between men and women falls from 5.6 to 4.4 years. 60 years old men or women are still likely to live 27.2 and 30.9 more years, respectively. The assumption of high life expectancy is based on the evolution of trends since 1970 and represents the upper limit of all assumptions. A necessary condition for that assumption to come true is that the reduction of the mortality risk in older age groups brought about by improvements in the medical care systems continues to proceed along the same lines by 2050 as during the last 30 years (fig. 17).

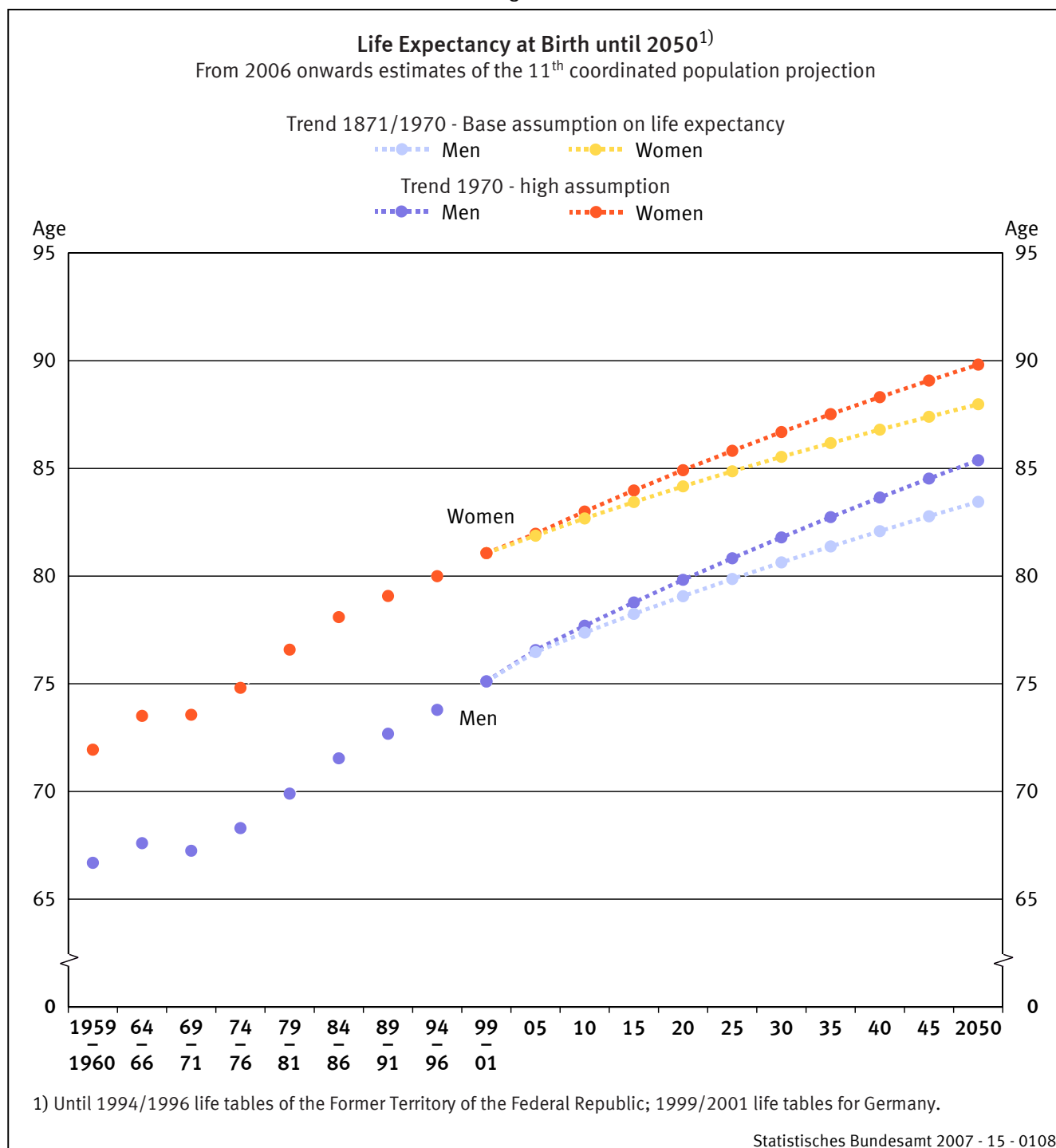
**Synoptic table of assumptions on the future evolution
of life expectancy by 2050**

	Life expectancy at birth					Change as against 2002/2004 Germany	
	2002/ 2004 Germany	2002/ 2004 West ¹⁾	2002/ 2004 East ¹⁾	2050 Base assum- ption	2050 Assum- ption of a high increase	2050 Base assum- ption	2050 Assum- ption of a high increase
Men	75.9	76.2	74.7	83.5	85.4	+7.6	+9.5
Women	81.5	81.6	81.3	88.0	89.8	+6.5	+8.3
Gender difference	5.6	5.4	6.6	4.5	4.4	-1.1	-1.2

	Further life expectancy at the age of 60					Change as against 2002/2004 Germany	
	2002/ 2004 Germany	2002/ 2004 West ¹⁾	2002/ 2004 East ¹⁾	2050 Base assum- ption	2050 Assum- ption of a high increase	2050 Base assum- ption	2050 Assum- ption of a high increase
Men	20.0	20.2	19.4	25.3	27.2	+5.3	+7.2
Women	24.1	24.2	23.7	29.1	30.9	+5.0	+6.8
Gender difference	4.1	4.0	4.3	3.8	3.7	-0.3	-0.4

1) Without Berlin.

Figure 17



4.3 External migration

4.3.1 A retrospective view of external migration

The balance of external migration will influence the future population size and age structure

In addition to births and deaths there is another important factor, which influences population trends in Germany. It is the migration of people, who cross the border of the country, the so-called external migration. The balance of migration – the difference between the number of people moving into the country and the number of people leaving the country – is particularly important for the future population number and age structure. But unlike birth rates and life expectancy data, the balance of migration does not allow us to derive a trend substantiated by retrospective data. On the one hand, the balance of migration depends on the potential of migrants, which is subject to political, economic, demographic and even ecological developments in the countries of origin. On the other hand, it is influenced by Germany's migration policy and by the extent to which Germany is perceived as an attractive country of destination in socio-economic terms.

Figure 18

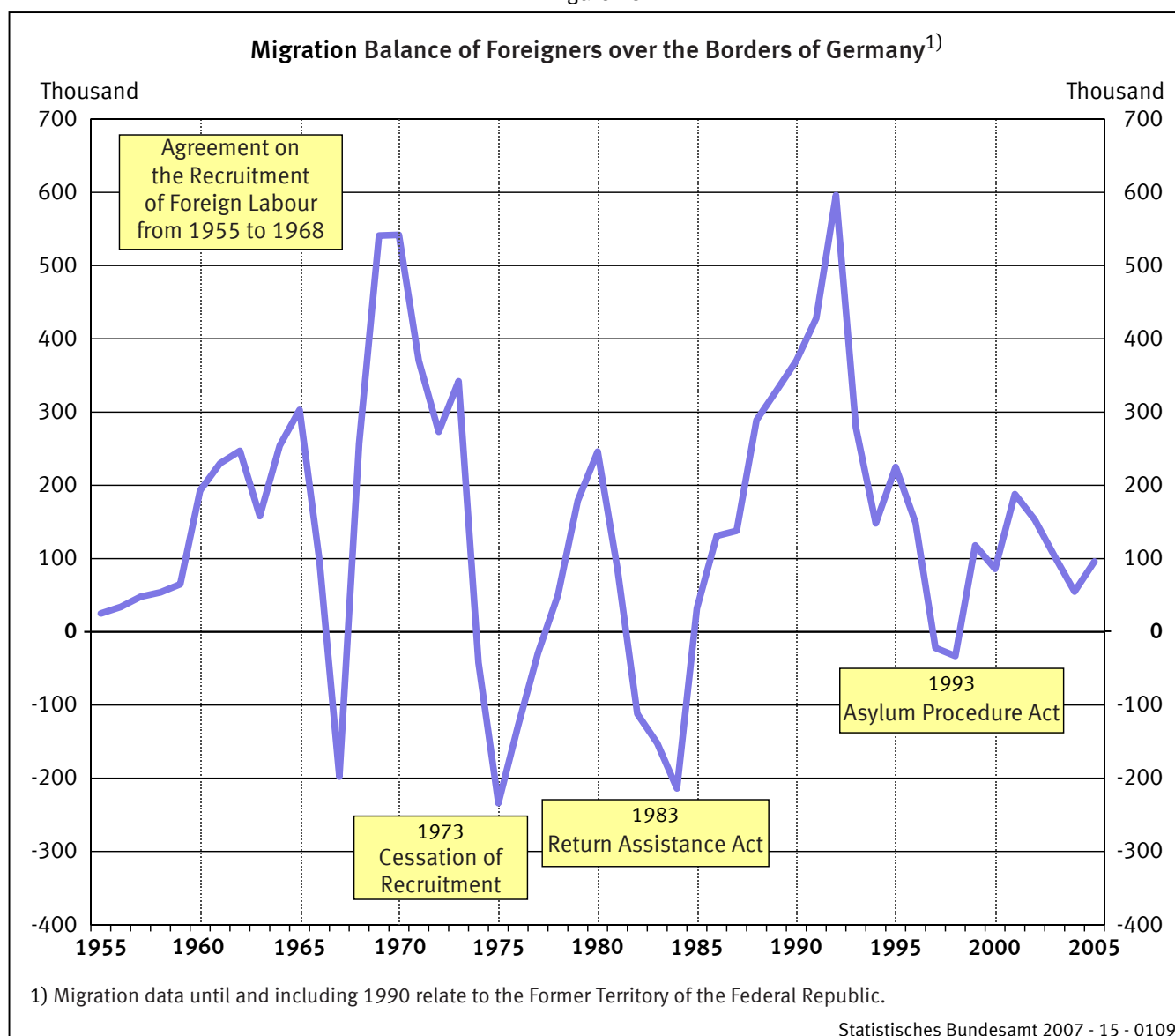
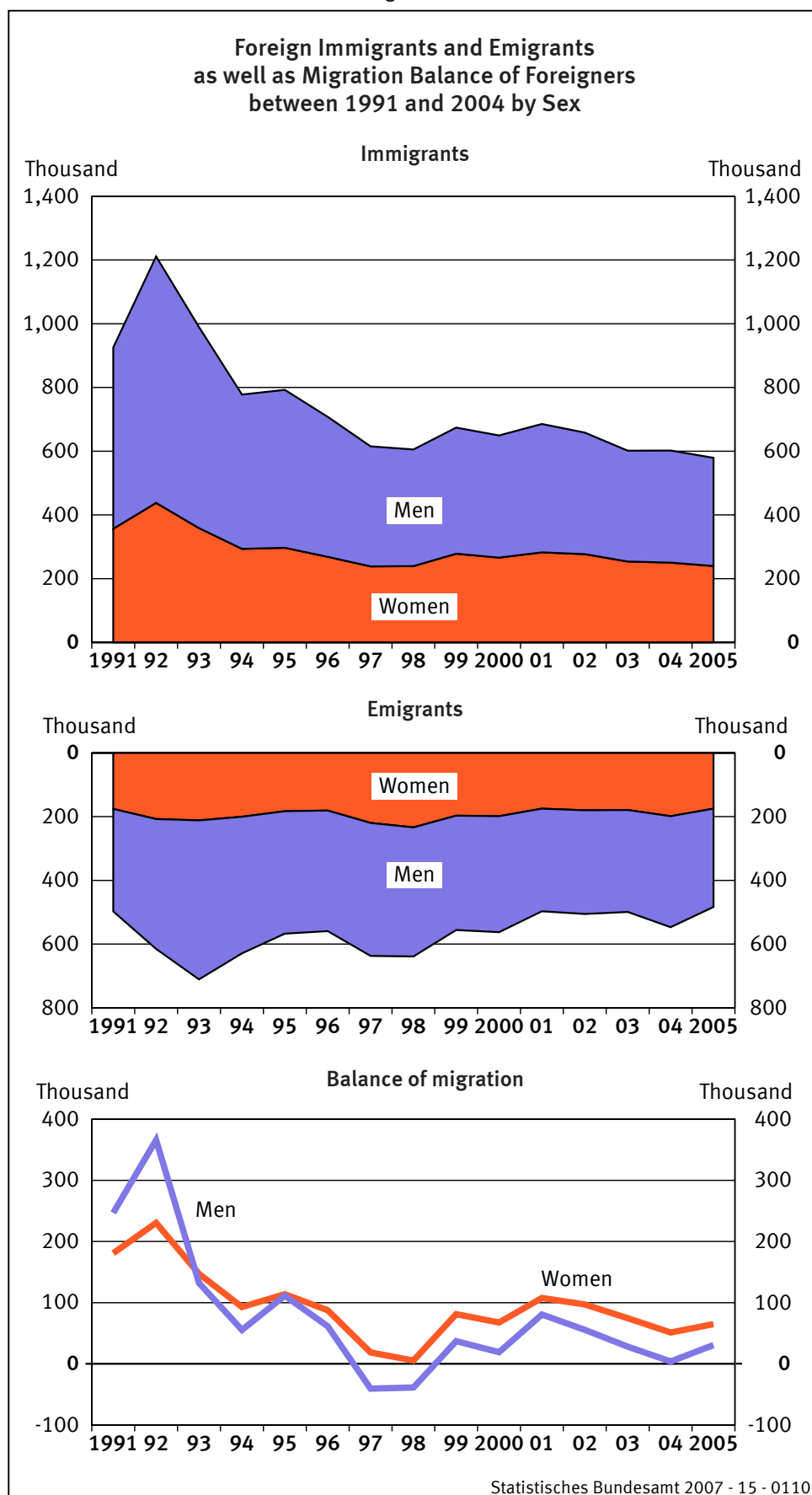


Figure 19



***The assumptions on external migration are very insecure
Characteristic trends are discernible in the past***

For the earlier years of migration, however, we can identify some trends, which should be considered in the assumptions on the future balance of migration. That is why we below describe the evolution and the characteristic features of external migration. We will describe the migration of Germans and foreigners separately, because they behave differently as immigrants and emigrants.

External migration is dominated by foreigners

Circa 80% of the total volume of migration – i.e. immigration and emigration – are caused by individuals with a foreign citizenship. They have dominated migration movements and the balance of migration, except for a few years. As fig. 18 shows, the balance of migration of foreign males and females was subject to strong oscillations in the past, which were influenced by political decisions.

The migration balance is positive, however, with strong oscillations in recent years (circa 190 000 in 2001 and about 55 000 in 2004). In 2005, it amounted to 96 000 individuals.

The volume of outward migration has been stable in recent years

Beside the migration balance we should also consider another important factor, which influences the evolution of the population, i.e. the fact that several hundreds of thousands of people leave Germany even in those years that record a very strong net immigration. The level of emigration tends to remain stable over many years. Because of the stability of emigration figures one speaks of a so-called basic migration (*Sockelwanderung*). This feature is adequately considered in the assumptions on migration.

A characteristic age and sex structure of foreign migrants moving in and out

Foreign immigrants and emigrants have a characteristic sex and age structure (fig. 19). Migration figures show that the mobility of male migrants is generally higher than that of female migrants: About two thirds of all inward and outward movements are those of males. On balance, however, more females have stayed since 1993 than males: For example, women accounted on average for circa 70% of net immigration during 2002-2004.

Foreign migrants are in most cases under 35 years old

Foreign males in their early 20s to mid-30s and females aged between 19 and 29 migrate most frequently: this age group on average accounted for every second inward or outward migration movement between 2002 and 2004; only one component is a bit lower, i.e. the outward migration of females, amounting to circa 43% (fig. 20). The younger age groups are, as a rule, dominated by immigration; this is true of men up to their early 30s and of women up to their mid-50s. Emigration of foreigners becomes the dominant factor beyond these age limits.

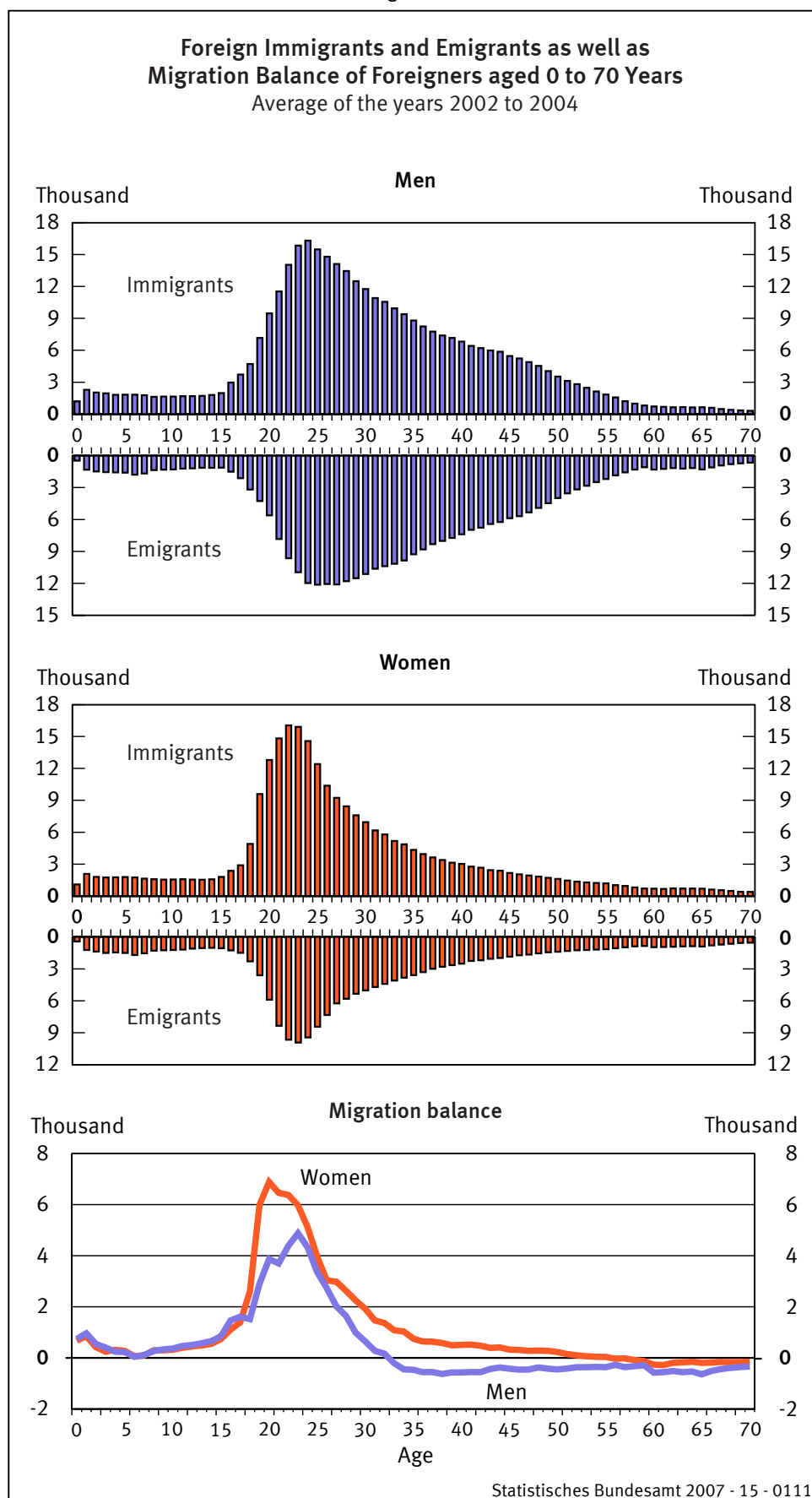
Most foreign migrants presently come from South and Eastern Europe and go to Italy, Serbia and Montenegro and Greece

At present, the most important countries, from which foreign migrants originate, are Poland, Turkey, Russia, Rumania, Serbia and Montenegro as well as Italy. This also relates to emigration movements, which are in most cases directed towards Poland, Turkey, Italy, Serbia and Montenegro, Rumania and Greece. As a 2002-2004 average, the countries with the highest positive migration balance were Poland (about 20 000), Russia (about 18 000) and Turkey (about 14 000); net emigration was recorded, first of all, with regard to Italy (circa -11 000), Serbia and Montenegro (circa -7 500) and Greece (-6 000).

The immigration of Germans reached a maximum of 312 000 in 1990

Over many decades Germans have not played a major role in immigration in numerical terms (fig. 20). A rise of net immigration was recorded only after the political changes in East and South-East Europe in the late 1980s owing to the inbound flow of ethnic Germans resettling to Germany, which reached its maximum (312 000) in 1990.

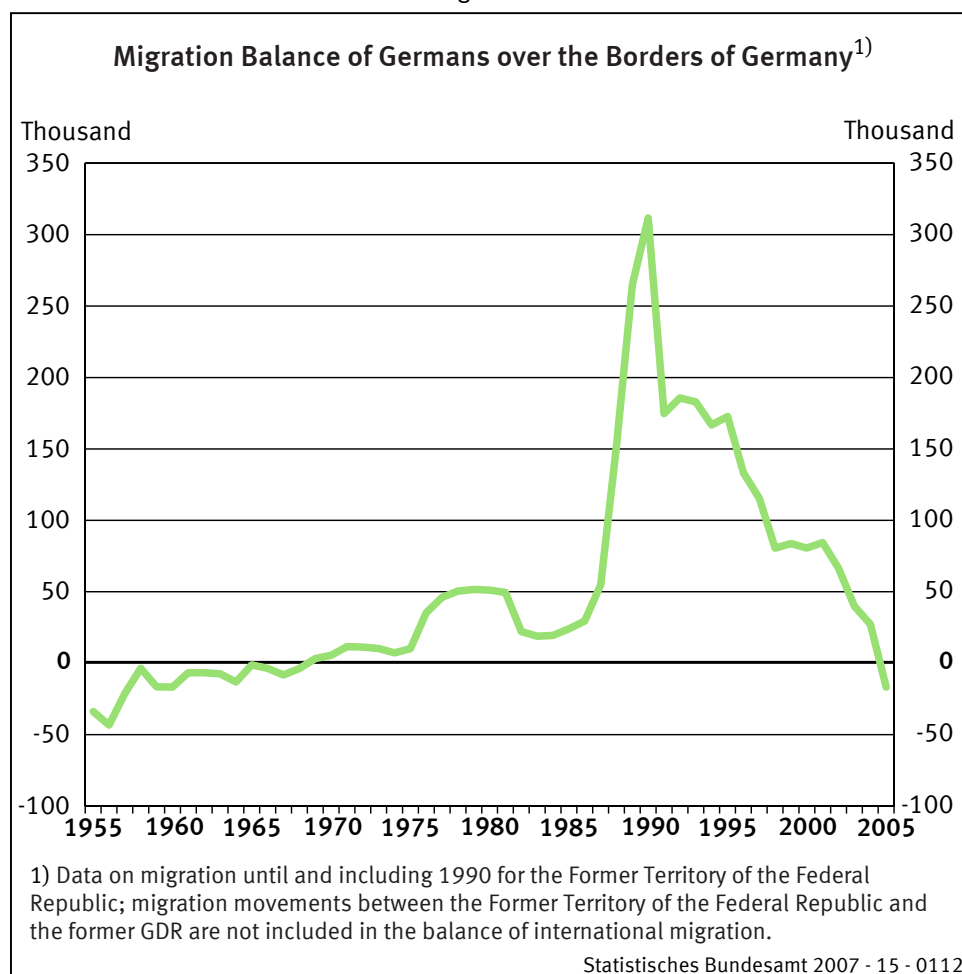
Figure 20



The balance of migration of Germans has clearly dropped in recent years

In recent years the migration balance of Germans has recorded a drop in absolute terms, reaching nearly -17 000 in 2005. On the one hand, this development was caused by falling numbers of ethnic Germans resettling to Germany: Their number fell from more than 98 000 in 2001 to circa 35 500 in 2005. On the other hand, more and more Germans moved abroad: Their number rose from 110 000 in 2001 to 145 000 in 2005. As to the future, it can be taken for granted that the number of ethnic Germans

Figure 21



resettling to Germany will continue to fall.

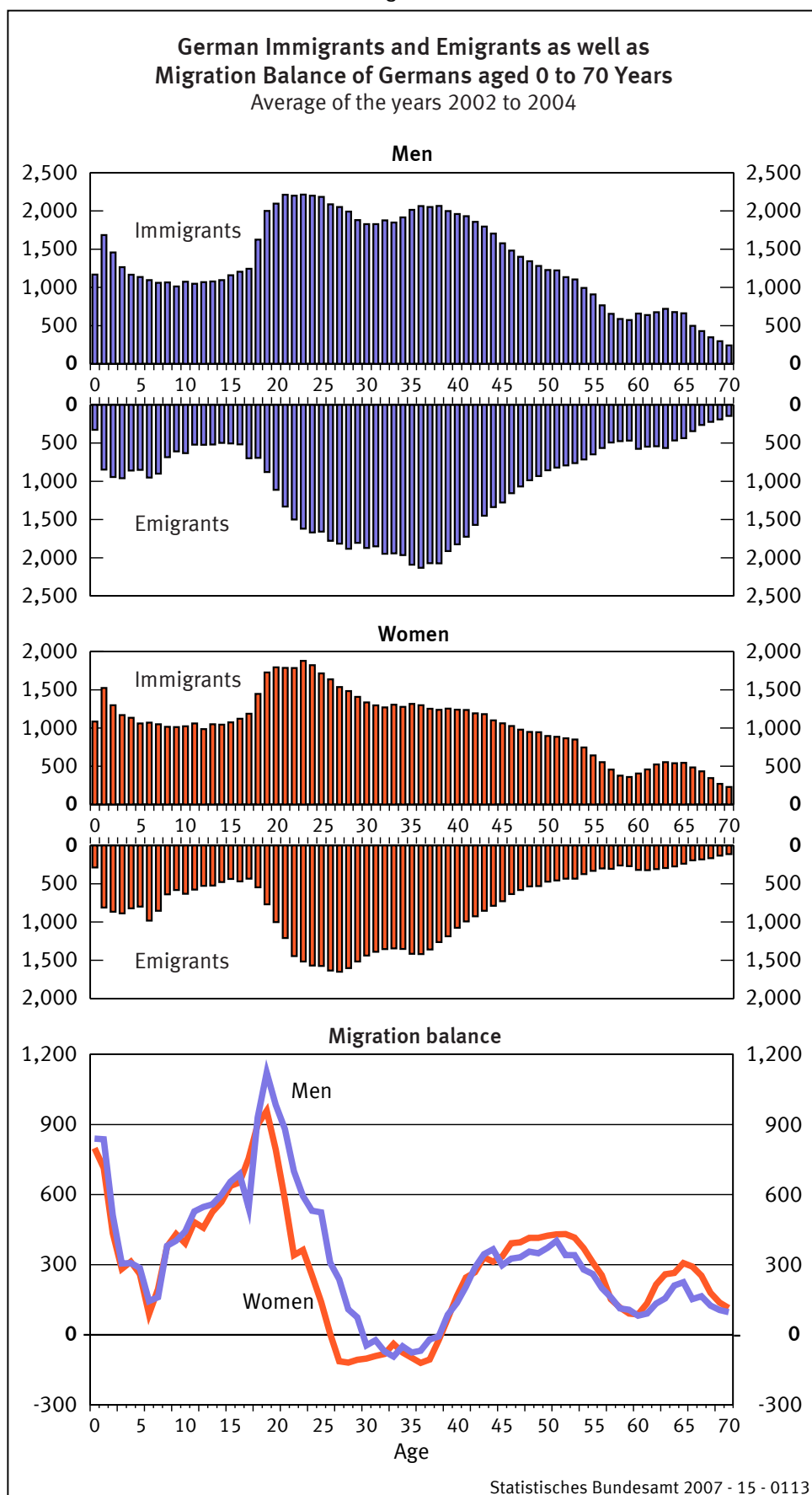
German migrants consist of an approximately equal number of women and men

Men and women are almost equally represented among German migrants. In the early 1990s inward and outward movements were balanced between men and women, as was the migration balance. Since 1994 the share of males has increased regarding both inward and outward movements. On a net basis, men tend to stay in Germany a bit more frequently than women do.

German migrants are on average older than foreign migrants

The migration movements of Germans have an age distribution, which is much more even than that of the foreign population (fig. 22). The age distribution reflects typical family migration movements: In contrast to foreign migrants, the migration balance of Germans is positive even in the older age groups. The migration balance of men aged between 30 and 38 years and women aged between 27 and 38 years was even or slightly negative as an average for 2002-2004. Comparing the last few years we see that more and more age groups between 20 and 40 years of age have been affected by net emigration. Due to weakened immigration it has been increasingly impossible to make up for the rapidly rising numbers of Germans leaving Germany at that age

Figure 22



4.3.2 Population trends in selected regions of the world – based on projections of the United Nations –

Demographic development shows potential of migration

In order to assess future migration trends it is important to know the demographic changes that are supposed to occur in regions of origin which are of relevance to Germany. Demographic evolution shows a potential of migration. The extent to which it will be exhausted depends on different factors. Demographic changes are not the only decisive factor, but unlike economic, social, political or ecological developments they are better foreseeable.

Eastern Europe to face a drop of population; the age group of the 20 to 34-year-olds will shrink by half until 2050

The currently relevant regions of origin that foreign immigrants in Germany come from are, first of all, regions in Eastern and Southern Europe. The population of **Eastern Europe** has fallen already since the early 1990s. This downward trend will continue and lead to a 25% decrease in the population by 2050: from circa 310 million to 224 million people. The age group of the 20 to 34-year-olds, which is likely to be most strongly affected by migration, will shrink by half during this period – from 70 million to only 35 million. This disproportionately strong decrease in the young age groups is the reason why half of the population will be older than 47 years in 2050.

This demographic scenario means that in future fewer young people will be available as labour force in the East-European countries. This might have a dampening effect on one of the key causes of migration – the search for a job. On the other hand, a sufficiently large number of available jobs in the countries of origin are not enough to stop the migration of labour force. If there are relevant differences in wage levels and structural labour force deficits in Germany, further inward movements of labour force from Eastern Europe are likely to occur after 2011 with the end of the transitional period regarding free movement of labour force in the European Union.

The population of Southern Europe will shrink and get older in the long run

The population in **Southern Europe** will slightly increase by 2015, then it will also fall, which will result in an estimated drop from 151 million in 2015 to circa 139 million in 2050 (-8%). Due to higher life expectancy the South-European population will grow even older than the East-European population; in 2050 half of all inhabitants will be older than 50. The expected demographic development in this region will probably not encourage strong emigration flows to Germany. Labour market-related arguments could only be quoted in respect of the Balkan states in a way similar to the East-European countries. This might lead to a positive migration balance with the Balkan region.

Turkey to expect a further growth of population

Population at active migration age to remain constant

Since the 1960s **Turkey** has been one of the most important regions of origin for Germany. Turkey is supposed to record an increase in population by about 38% from currently 73 million to 101 million in 2050. But the growth of the population will not continue forever at that speed, it will lose momentum, as time goes on. In line with the reduction of birth rates assumed in the UN projection, the increase in the potentially most active group of migrants will be as small as 2%: The number of the 20 to 34-year-olds will rise from currently 19.5 million to 19.9 million in 2050. The population will grow older in Turkey as well; however, half of the population will still be younger than 39.5 years in 2050. That means that the average age of Turkish people in 2050 will be below that of Germany's current population (42 years in 2004).

One of the regions with a high pressure of migration will be North Africa in future

North Africa is one of the regions that have not recorded large migration flows to Germany so far. But its demographic development can lead to a high potential of emigration. This development will be exemplified here. North Africa's population will rise from currently 191 million to 310 million in 2050 (+63%). At the same time the population at active migration age of 20 to 34 years will grow from currently 50

million to 66 million (+31%). In 2050 half of North Africa's inhabitants will be younger than 36. The key target countries for migrants from North Africa are France and Spain. Germany concluded just one recruitment contract with Morocco and at times recorded a relatively high balance of migration in respect of this state. Today it is unknown how the migration flows from North Africa will evolve in the future. However, it is foreseeable that due to a strong growth of the population the countries of North Africa will record a strengthening of emigration flows with Europe as a possible first destination.

4.3.3 Assumptions on future migration trends

The developments described above allow us to make the following basic statements regarding future migration trends in Germany:

1. The volume of migration depends on the target country's needs and on the migration potential of the countries of origin. That and the comparison of living conditions in different states may have a sucking effect on migrants, on the one side, and exert a pressure to migrate, on the other side. The extent to which migration movements are implemented is influenced by political decisions.
2. The balance of external migration has largely been positive during the last 50 years. The long-term annual average varied, with different constellations, between 150 000 and circa 300 000 individuals:

Political action influences the implementation of migration pressures

Span of time	Individuals in total	Germans	Foreigners
1951 – 2005 (55 years)	179 000		
1956 – 2005 (50 years)	200 000	53 000	146 000
1976 – 2005 (30 years)	218 000	92 000	126 000
1986 – 2005 (20 years)	311 000	120 000	191 000
1996 – 2005 (10 years)	159 000	70 000	89 000
2001 – 2005 (5 years)	159 000	40 000	119 000

3. Foreign migrants who move into Germany are, as a rule, younger than those who leave Germany. As a result, we have a "rejuvenating effect" with regard to the people staying in Germany.
4. Migration is dominated by foreign males and females who move into and out of Germany. The immigration of ethnic Germans, living in other countries and resettling to Germany, is supposed to decrease further – also as a consequence of the immigration law, which is expected to control and restrict immigration to Germany as a whole. That is the reason why it is no longer advisable to make separate assumptions on the migration balance of Germans, in contrast to the time of continuously high immigration flows of ethnic Germans from abroad. Hence all assumptions on the balance of migration relate to the total population.

External migration "rejuvenates" the population

Migration is dominated by external migration movements of foreign women and men

Germany will face a potential of immigration from abroad alongside a falling potential of working-age population

5. Now as before there is a gap in demographic and economic terms between Germany and the typical countries of origin and other countries such as those situated on the southern coast of the Mediterranean. Turkey and the states of North Africa will have growing young societies even in the decades to come and probably be subject to an increasing pressure of migration, unless they ensure a sufficiently large amount of training opportunities and jobs. This pressure need not necessarily lead to more immigration into Germany, but it could substantiate the existence of a migration potential. Germany, in its turn, is faced with a shrinking potential of working-age people so that in future it may again be faced with the need to recruit foreign workers.

Increased immigration from the new EU states will be possible from 2011 on

6. By 2011 the new member states of the European Union will enjoy full freedom of movement on the labour market, including Germany. This will probably lead to increased immigration from the East European EU countries from 2011 on. However, this immigration potential is not unlimited, because the states concerned are supposed to be also confronted in the decades to come with a demographically conditioned decline in the number of young workforce.

The two assumptions on the migration balance – 100 000 and 200 000 people – mark the range of external migration for the long term

Two assumptions are made on the future migration balance. They provide for long-term annual net immigration figures of 100 000 or 200 000 individuals, describing an exemplary evolution in both cases. As the real migration figures will clearly be subject to variations, the assumed values should only be interpreted as long-term annual averages. The difference between the two assumptions takes account of the long-term external migration average, forming a corridor within which migration is

**Synoptic table of assumptions on the future development of external migration
- Total population -**

Assumption	Annual net immigration figures		Cumulated migration gains until 2050
Both assumptions	2006:	50 000	
	2007:	75 000	
Balance of migration 100 000	2008 to 2050:	100 000	4 425 000
Balance of migration 200 000	2008:	100 000	
	2009:	150 000	
	2010 to 2050:	200 000	8 575 000

supposed to evolve in the future.

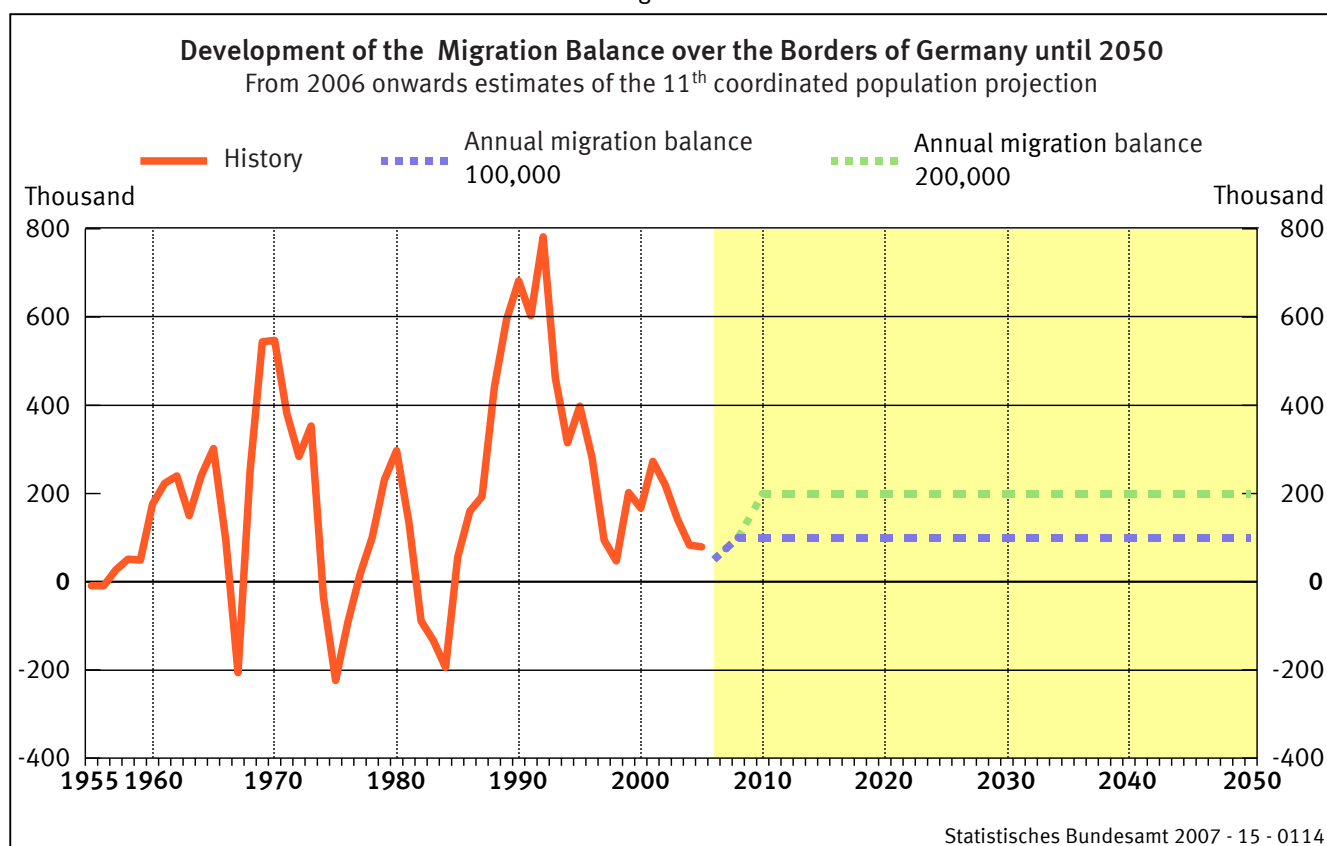
A higher migration balance cannot be ruled out entirely

Basically, higher net immigration figures are imaginable, e.g. provided that the attitude towards immigration would change as a consequence of the introduction of the freedom of movement on the labour market and as a reaction on the strongly felt decline in the number of young people in Germany and progressing integration.

Total net immigration between 2006 and 2050 will amount to 4.4 million people, if the balance of migration is 100 000, or 8.6 million people, if it is 200 000. Fig. 23 depicts both the balances of migration for past periods and the assumptions on future population trends.

The sex and age structure of the balance of migration is based on empirical values of inward and outward movements. To take into account the abovementioned “rejuvenating effect” of migration on the future population structure, we made the imputation that there is a “basic migration” flow (Sockelwanderung). According to that imputation we assumed that every year a certain number of persons would leave Germany and would be replaced by an at least equally large group of new people, who would be on average younger and move into Germany.

Figure 23



Synoptic table of variants of the 11th coordinated population projection

Appendix A

If combined with each other, the assumptions on birth rates, life expectancy and the migration balance yield 12 variants. For the sake of clarity they are summarised in two blocks, each of which containing six variants: Three assumptions on birth rates by two assumptions on life expectancy, which are combined with a migration balance of 100 000 (W1) in the first block and with a migration balance of 200 000 (W2) in the second block:

Annual balance of external migration until 2050: 100 000 people (W1)	Birth rate*		
	nearly constant 1.4 (G1)	Slightly rising, from 2025: 1.6 (G2)	Slightly falling until 2050 to 1.2 (G3)
Life expectancy of new-born children in 2050			
Males: 83.5 Base assumption (L1) Females: 88.0	Variant 1-W1 "medium" population, lower limit	Variant 3-W1	Variant 5-W1
Males: 85.4 High increase (L2) Females: 89.8	Variant 2-W1	Variant 4-W1	Variant 6-W1 "relatively old" population

Annual balance of external migration until 2050: 200 000 people (W2)	Birth rate*		
	Nearly constant at 1.4 (G1)	Slightly rising, from 2025: 1.6 (G2)	Slightly falling until 2050 to 1.2 (G3)
Life expectancy of new-born children in 2050			
Males: 83.5 Base assumption (L1) Females: 88.0	Variant 1-W2 "medium" population, upper limit	Variant 3-W2 "relatively young" population	Variant 5-W2
Males: 85.4 High increase (L2) Females: 89.8	Variant 2-W2	Variant 4-W2	Variant 6-W2

*) Average number of children per woman = total fertility rate.

Further model calculations were made in addition to these 12 variants of the 11th coordinated population projection. In that way a very broad range of migration movements was covered and the effects of immigration were identified even more precisely (models with a migration balance of 300 000 people per year as well as with an even balance of migration). Besides, the question was answered what implications an unrealistic from today's point of view and merely hypothetical increase of the fertility rate to 2.1 children per woman would have.

List of variants of the 11th coordinated population projection and additional model calculations

Name of variant	Assumptions		
	Birth rate (children per woman)	Life expectancy	Annual balance of migration
Variant 1-W1 “medium” population, lower limit	Nearly constant at 1.4	Base assumption ¹⁾	100 000
Variant 1-W2 “medium” population, upper limit	Nearly constant at 1.4	Base assumption ¹⁾	200 000
Variant 2-W1	Nearly constant at 1.4	High increase ²⁾	100 000
Variant 2-W2	Nearly constant at 1.4	High increase ²⁾	200 000
Variant 3-W1	rising, from 2025 on at 1.6	Base assumption ¹⁾	100 000
Variant 3-W2 “relatively young” population	rising, from 2025 on at 1.6	Base assumption ¹⁾	200 000
Variant 4-W1	rising, from 2025 on at 1.6	High increase ²⁾	100 000
Variant 4-W2	rising, from 2025 on at 1.6	High increase ²⁾	200 000
Variant 5-W1	Falling to 1.2 until 2050	Base assumption ¹⁾	100 000
Variant 5-W2	Falling to 1.2 until 2050	Base assumption ¹⁾	200 000
Variant 6-W1 “relatively old” population	Falling to 1.2 until 2050	High increase ²⁾	100 000
Variant 6-W2	Falling to 1.2 until 2050	High increase ²⁾	200 000
Model calculation migration balance 300 000	Nearly constant at 1.4	Base assumption ¹⁾	300 000
Model calculation migration balance zero	Nearly constant at 1.4	Base assumption ¹⁾	0
Model calculation 2.1 children per woman	Strongly rising, from 2010 at 2.1	Base assumption ¹⁾	100 000

1) Life expectancy of new-born boys in 2050: 83.5 years;
life expectancy of new-born girls in 2050: 88.0 years.

2) Life expectancy of new-born boys in 2050: 85.4 years;
life expectancy of new-born girls in 2050: 89.8 years.

Table A 1: Development of Germany's population by 2050¹⁾

Appendix B

Variant: Lower limit of the "medium" population

Birth rates: nearly constant, life expectancy: base assumption, migration balance: 100 000

Specification		31/12/ of the year					
		2005	2010	2020	2030	2040	2050
Old-age dependency ratio with an age limit of 60 years							
Population size	1000....	82 438	81 887	80 057	77 203	73 422	68 743
	2005 = 100....	100	99.3	97.1	93.6	89.1	83.4
under 20 years	1000....	16 486	15 025	13 501	12 673	11 487	10 362
	%....	20.0	18.3	16.9	16.4	15.6	15.1
	2005 = 100....	100	91.1	81.9	76.9	69.7	62.9
20 to under 60 years	1000....	45 412	45 361	42 075	36 179	33 755	30 592
	%....	55.1	55.4	52.6	46.9	46.0	44.5
	2005 = 100....	100	99.9	92.7	79.7	74.3	67.4
60 years and older	1000....	20 540	21 501	24 482	28 351	28 179	27 789
	%....	24.9	26.3	30.6	36.7	38.4	40.4
	2005 = 100....	100	104.7	119.2	138.0	137.2	135.3
Youth, old-age, total dependency ratio							
Per 100 20 to under 60-year-olds there are							
	under 20-year-olds.....	36.3	33.1	32.1	35.0	34.0	33.9
	60-year-olds and older..	45.2	47.4	58.2	78.4	83.5	90.8
	together	81.5	80.5	90.3	113.4	117.5	124.7
Old-age dependency ratio with an age limit of 65 years							
Population size	1000....	82 438	81 887	80 057	77 203	73 422	68 743
	2005 = 100....	100	99.3	97.1	93.6	89.1	83.4
under 20 years	1000....	16 486	15 025	13 501	12 673	11 487	10 362
	%....	20.0	18.3	16.9	16.4	15.6	15.1
	2005 = 100....	100	91.1	81.9	76.9	69.7	62.9
20 to under 65 years	1000....	50 082	50 038	47 992	42 399	38 384	35 524
	%....	60.8	61.1	59.9	54.9	52.3	51.7
	2005 = 100....	100	99.9	95.8	84.7	76.6	70.9
65 years and older	1000....	15 870	16 824	18 565	22 132	23 550	22 856
	%....	19.3	20.5	23.2	28.7	32.1	33.2
	2005 = 100....	100	106.0	117.0	139.5	148.4	144.0
Youth, old-age, total dependency ratio							
Per 100 20 to under 65-year-olds there are							
	under 20-year-olds.....	32.9	30.0	28.1	29.9	29.9	29.2
	65-year-olds and older..	31.7	33.6	38.7	52.2	61.4	64.3
	together	64.6	63.6	66.8	82.1	91.3	93.5
Old-age dependency ratio with an age limit of 67 years							
Population size	1000....	82 438	81 887	80 057	77 203	73 422	68 743
	2005 = 100....	100	99.3	97.1	93.6	89.1	83.4
under 20 years	1000....	16 486	15 025	13 501	12 673	11 487	10 362
	%....	20.0	18.3	16.9	16.4	15.6	15.1
	2005 = 100....	100	91.1	81.9	76.9	69.7	62.9
20 to under 67 years	1000....	52 422	51 612	50 089	45 032	40 095	37 374
	%....	63.6	63.0	62.6	58.3	54.6	54.4
	2005 = 100....	100	98.5	95.5	85.9	76.5	71.3
67 years and older	1000....	13 531	15 250	16 467	19 498	21 839	21 007
	%....	16.4	18.6	20.6	25.3	29.7	30.6
Youth, old-age, total dependency ratio							
Per 100 20 to under 67-year-olds there are							
	under 20-year-olds.....	31.4	29.1	27.0	28.1	28.7	27.7
	67-year-olds and older..	25.8	29.5	32.9	43.3	54.5	56.2
	together	57.3	58.7	59.8	71.4	83.1	83.9

1) From 2010 onward estimates of the 11th coordinated population projection.

Table A 2: Development of Germany's population by 2050¹⁾**Variant: Upper limit of the "medium" population**

Birth rates: nearly constant, life expectancy: base assumption, migration balance: 200 000

Specification		31/12/ of the year					
		2005	2010	2020	2030	2040	2050
Old-age dependency ratio with an age limit of 60 years							
Population size	1000....	82 438	82 039	81 328	79 750	77 288	73 958
	2005 = 100....	100	99.5	98.7	96.7	93.8	89.7
under 20 years	1000....	16 486	15 051	13 754	13 266	12 349	11 403
	%....	20.0	18.3	16.9	16.6	16.0	15.4
	2005 = 100....	100	91.3	83.4	80.5	74.9	69.2
20 to under 60 years	1000....	45 412	45 481	43 032	37 943	36 303	33 790
	%....	55.1	55.4	52.9	47.6	47.0	45.7
	2005 = 100....	100	100.2	94.8	83.6	79.9	74.4
60 years and older	1000....	20 540	21 507	24 542	28 540	28 636	28 766
	%....	24.9	26.2	30.2	35.8	37.1	38.9
	2005 = 100....	100	104.7	119.5	138.9	139.4	140.0
Youth, old-age, total dependency ratio							
Per 100 20 to under 60-year-olds there are							
	under 20-year-olds.....	36.3	33.1	32.0	35.0	34.0	33.7
	60-year-olds and older..	45.2	47.3	57.0	75.2	78.9	85.1
	together	81.5	80.4	89.0	110.2	112.9	118.9
Old-age dependency ratio with an age limit of 65 years							
Population size	1000....	82 438	82 039	81 328	79 750	77 288	73 958
	2005 = 100....	100	99.5	98.7	96.7	93.8	89.7
under 20 years	1000....	16 486	15 051	13 754	13 266	12 349	11 403
	%....	20.0	18.3	16.9	16.6	16.0	15.4
	2005 = 100....	100	91.3	83.4	80.5	74.9	69.2
20 to under 65 years	1000....	50 082	50 160	48 973	44 240	41 105	39 071
	%....	60.8	61.1	60.2	55.5	53.2	52.8
	2005 = 100....	100	100.2	97.8	88.3	82.1	78.0
65 years and older	1000....	15 870	16 828	18 601	22 243	23 835	23 485
	%....	19.3	20.5	22.9	27.9	30.8	31.8
	2005 = 100....	100	106.0	117.2	140.2	150.2	148.0
Youth, old-age, total dependency ratio							
Per 100 20 to under 65-year-olds there are							
	under 20-year-olds.....	32.9	30.0	28.1	30.0	30.0	29.2
	65-year-olds and older..	31.7	33.5	38.0	50.3	58.0	60.1
	together	64.6	63.6	66.1	80.3	88.0	89.3
Old-age dependency ratio with an age limit of 67 years							
Population size	1000....	82 438	82 039	81 328	79 750	77 288	73 958
	2005 = 100....	100	99.5	98.7	96.7	93.8	89.7
under 20 years	1000....	16 486	15 051	13 754	13 266	12 349	11 403
	%....	20.0	18.3	16.9	16.6	16.0	15.4
	2005 = 100....	100	91.3	83.4	80.5	74.9	69.2
20 to under 67 years	1000....	52 422	51 734	51 076	46 895	42 868	41 030
	%....	63.6	63.1	62.8	58.8	55.5	55.5
	2005 = 100....	100	98.7	97.4	89.5	81.8	78.3
67 years and older	1000....	13 531	15 254	16 498	19 588	22 071	21 526
	%....	16.4	18.6	20.3	24.6	28.6	29.1
	2005 = 100....	100	112.7	121.9	144.8	163.1	159.1
Youth, old-age, total dependency ratio							
Per 100 20 to under 67-year-olds there are							
	under 20-year-olds.....	31.4	29.1	26.9	28.3	28.8	27.8
	67-year-olds and older..	25.8	29.5	32.3	41.8	51.5	52.5
	together	57.3	58.6	59.2	70.1	80.3	80.3

1) From 2010 onward estimates of the 11th coordinated population projection.

Table A 3: Development of Germany's population by 2050 ¹⁾

Variant: "relatively young" population

Birth rates: rising, life expectancy: base assumption, migration balance: 200 000

Specification		31/12/ of the year					
		2005	2010	2020	2030	2040	2050
Old-age dependency ratio with an age limit of 60 years							
Population size	1000....	82 438	82 095	81 896	81 190	79 652	77 516
	2005 = 100....	100	99,6	99,3	98,5	96,6	94,0
under 20 years	1000....	16 486	15 107	14 322	14 651	14 146	13 523
	%....	20,0	18,4	17,5	18,0	17,8	17,4
	2005 = 100....	100	91,6	86,9	88,9	85,8	82,0
20 to under 60 years	1000....	45 412	45 481	43 032	37 999	36 870	35 227
	%....	55,1	55,4	52,5	46,8	46,3	45,4
	2005 = 100....	100	100,2	94,8	83,7	81,2	77,6
60 years and older	1000....	20 540	21 507	24 542	28 540	28 636	28 766
	%....	24,9	26,2	30,0	35,2	36,0	37,1
	2005 = 100....	100	104,7	119,5	138,9	139,4	140,0
Youth, old-age, total dependency ratio							
Per 100 20 to under 60-year-olds there are							
	under 20-year-olds.....	36,3	33,2	33,3	38,6	38,4	38,4
	60-year-olds and older..	45,2	47,3	57,0	75,1	77,7	81,7
	together	81,5	80,5	90,3	113,7	116,0	120,0
Old-age dependency ratio with an age limit of 65 years							
Population size	1000....	82 438	82 095	81 896	81 190	79 652	77 516
	2005 = 100....	100	99,6	99,3	98,5	96,6	94,0
under 20 years	1000....	16 486	15 107	14 322	14 651	14 146	13 523
	%....	20,0	18,4	17,5	18,0	17,8	17,4
	2005 = 100....	100	91,6	86,9	88,9	85,8	82,0
20 to under 65 years	1000....	50 082	50 160	48 973	44 296	41 672	40 508
	%....	60,8	61,1	59,8	54,6	52,3	52,3
	2005 = 100....	100	100,2	97,8	88,4	83,2	80,9
65 years and older	1000....	15 870	16 828	18 601	22 243	23 835	23 485
	%....	19,3	20,5	22,7	27,4	29,9	30,3
	2005 = 100....	100	106,0	117,2	140,2	150,2	148,0
Youth, old-age, total dependency ratio							
Per 100 20 to under 65-year-olds there are							
	under 20-year-olds.....	32,9	30,1	29,2	33,1	33,9	33,4
	65-year-olds and older..	31,7	33,5	38,0	50,2	57,2	58,0
	together	64,6	63,7	67,2	83,3	91,1	91,4
Old-age dependency ratio with an age limit of 67 years							
Population size	1000....	82 438	82 095	81 896	81 190	79 652	77 516
	2005 = 100....	100	99,6	99,3	98,5	96,6	94,0
under 20 years	1000....	16 486	15 107	14 322	14 651	14 146	13 523
	%....	20,0	18,4	17,5	18,0	17,8	17,4
	2005 = 100....	100	91,6	86,9	88,9	85,8	82,0
20 to under 67 years	1000....	52 422	51 734	51 076	46 951	43 435	42 467
	%....	63,6	63,0	62,4	57,8	54,5	54,8
	2005 = 100....	100	98,7	97,4	89,6	82,9	81,0
67 years and older	1000....	13 531	15 254	16 498	19 588	22 071	21 526
	%....	16,4	18,6	20,1	24,1	27,7	27,8
	2005 = 100....	100	112,7	121,9	144,8	163,1	159,1
Youth, old-age, total dependency ratio							
Per 100 20 to under 67-year-olds there are							
	under 20-year-olds.....	31,4	29,2	28,0	31,2	32,6	31,8
	67-year-olds and older..	25,8	29,5	32,3	41,7	50,8	50,7
	together	57,3	58,7	60,3	72,9	83,4	82,5

1) From 2010 onward estimates of the 11th coordinated population projection.

Table A 4: Development of Germany's population by 2050¹⁾**Variant: "relatively old" population**

Birth rates: declining, life expectancy: high, migration balance: 100 000

Specification		31/12/ of the year					
		2005	2010	2020	2030	2040	2050
Old-age dependency ratio with an age limit of 60 years							
Population size	1000....	82 438	81 908	80 210	77 391	73 633	68 884
	2005 = 100....	100	99.4	97.3	93.9	89.3	83.6
under 20 years	1000....	16 486	15 003	13 249	12 009	10 578	9 286
	%....	20.0	18.3	16.5	15.5	14.4	13.5
	2005 = 100....	100	91.0	80.4	72.8	64.2	56.3
20 to under 60 years	1000....	45 412	45 359	42 079	36 162	33 511	29 916
	%....	55.1	55.4	52.5	46.7	45.5	43.4
	2005 = 100....	100	99.9	92.7	79.6	73.8	65.9
60 years and older	1000....	20 540	21 546	24 883	29 220	29 544	29 683
	%....	24.9	26.3	31.0	37.8	40.1	43.1
	2005 = 100....	100	104.9	121.1	142.3	143.8	144.5
Youth, old-age, total dependency ratio							
Per 100 20 to under 60-year-olds there are							
	under 20-year-olds.....	36.3	33.1	31.5	33.2	31.6	31.0
	60-year-olds and older..	45.2	47.5	59.1	80.8	88.2	99.2
	together	81.5	80.6	90.6	114.0	119.7	130.3
Old-age dependency ratio with an age limit of 65 years							
Population size	1000....	82 438	81 908	80 210	77 391	73 633	68 884
	2005 = 100....	100	99.4	97.3	93.9	89.3	83.6
under 20 years	1000....	16 486	15 003	13 249	12 009	10 578	9 286
	%....	20.0	18.3	16.5	15.5	14.4	13.5
	2005 = 100....	100	91.0	80.4	72.8	64.2	56.3
20 to under 65 years	1000....	50 082	50 037	48 006	42 401	38 157	34 868
	%....	60.8	61.1	59.9	54.8	51.8	50.6
	2005 = 100....	100	99.9	95.9	84.7	76.2	69.6
65 years and older	1000....	15 870	16 868	18 955	22 980	24 898	24 731
	%....	19.3	20.6	23.6	29.7	33.8	35.9
	2005 = 100....	100	106.3	119.4	144.8	156.9	155.8
Youth, old-age, total dependency ratio							
Per 100 20 to under 65-year-olds there are							
	under 20-year-olds.....	32.9	30.0	27.6	28.3	27.7	26.6
	65-year-olds and older..	31.7	33.7	39.5	54.2	65.3	70.9
	together	64.6	63.7	67.1	82.5	93.0	97.6
Old-age dependency ratio with an age limit of 67 years							
Population size	1000....	82 438	81 908	80 210	77 391	73 633	68 884
	2005 = 100....	100	99.4	97.3	93.9	89.3	83.6
under 20 years	1000....	16 486	15 003	13 249	12 009	10 578	9 286
	%....	20.0	18.3	16.5	15.5	14.4	13.5
	2005 = 100....	100	91.0	80.4	72.8	64.2	56.3
20 to under 67 years	1000....	52 422	51 611	50 110	45 049	39 879	36 731
	%....	63.6	63.0	62.5	58.2	54.2	53.3
	2005 = 100....	100	98.5	95.6	85.9	76.1	70.1
67 years and older	1000....	13 531	15 294	16 851	20 333	23 176	22 867
	%....	16.4	18.7	21.0	26.3	31.5	33.2
	2005 = 100....	100	113.0	124.5	150.3	171.3	169.0
Youth, old-age, total dependency ratio							
Per 100 20 to under 67-year-olds there are							
	under 20-year-olds.....	31.4	29.1	26.4	26.7	26.5	25.3
	67-year-olds and older..	25.8	29.6	33.6	45.1	58.1	62.3
	together	57.3	58.7	60.1	71.8	84.6	87.5

1) From 2010 onward estimates of the 11th coordinated population projection.

Table A 5: People under 20 years of age by age group

11th coordinated population projection

Base: 31/12/2005

Year (as of 31/12/)	Variant 1-W1 ¹⁾		Variant 1-W2 ²⁾	
	1.000	2005 = 100	1.000	2005 = 100
under 6 year-olds				
2010	3.988	91,8	3.995	91,9
2020	3.888	89,5	4.007	92,2
2030	3.530	81,2	3.749	86,3
2040	3.110	71,6	3.372	77,6
2050	2.922	67,2	3.247	74,7
6 to under 10 year-olds				
2010	2.896	90,7	2.900	90,8
2020	2.624	82,2	2.672	83,7
2030	2.523	79,0	2.656	83,2
2040	2.215	69,4	2.389	74,8
2050	2.005	62,8	2.211	69,2
10 to under 16 year-olds				
2010	4.767	93,9	4.774	94,0
2020	4.032	79,4	4.078	80,3
2030	3.934	77,5	4.091	80,6
2040	3.576	70,5	3.834	75,5
2050	3.157	62,2	3.457	68,1
16 to under 20 year-olds				
2010	3.375	87,2	3.383	87,4
2020	2.957	76,4	2.996	77,4
2030	2.686	69,4	2.770	71,6
2040	2.586	66,8	2.754	71,2
2050	2.279	58,9	2.488	64,3
Total				
2010	15.025	91,1	15.051	91,3
2020	13.501	81,9	13.754	83,4
2030	12.673	76,9	13.266	80,5
2040	11.487	69,7	12.349	74,9
2050	10.362	62,9	11.403	69,2

¹⁾ Nearly constant fertility, base assumption on life expectancy, balance of migration 100 000 people/year.-²⁾ Nearly constant fertility, base assumption on life expectancy, balance of migration 200 000 people/year.-

Table A 6: Working-age population of 20 to under 65 years
 11th coordinated population projection
 Base: 31/12/2005

Year (as of 31/12/)	Variant “medium” population, lower limit ¹⁾			Variant “medium” population, upper limit ²⁾		
	1 000	% ³⁾	2005 = 100	1 000	% ³⁾	2005 = 100
Aged 20 to under 30 years						
2010	9 951	19.9	102.5	10 010	20.0	103.1
2020	8 627	18.0	88.9	8 929	18.2	92.0
2030	7 484	17.7	77.1	7 855	17.8	80.9
2040	7 119	18.5	73.3	7 647	18.6	78.8
2050	6 665	18.8	68.7	7 377	18.9	76.0
Aged 30 to under 50 years						
2010	23 673	47.3	93.8	23 726	47.3	94.0
2020	20 046	41.8	79.4	20 599	42.1	81.6
2030	19 065	45.0	75.6	20 182	45.6	80.0
2040	16 645	43.4	66.0	18 073	44.0	71.6
2050	15 168	42.7	60.1	16 824	43.1	66.7
Aged 50 to under 65 years						
2010	16 414	32.8	108.4	16 424	32.7	108.5
2020	19 318	40.3	127.6	19 445	39.7	128.4
2030	15 850	37.4	104.7	16 202	36.6	107.0
2040	14 620	38.1	96.5	15 384	37.4	101.6
2050	13 691	38.5	90.4	14 869	38.1	98.2
Total						
2010	50 038	100	99.9	50 160	100	100.2
2020	47 992	100	95.8	48 973	100	97.8
2030	42 399	100	84.7	44 240	100	88.3
2040	38 384	100	76.6	41 105	100	82.1
2050	35 524	100	70.9	39 071	100	78.0

1) Nearly constant fertility. basic assumption on life expectancy. migration balance 100 000 persons/year.

2) Nearly constant fertility. basic assumption on life expectancy. migration balance 200 000 persons/year.

3) Percentage of the working-age population

Table A 7: 65 to under 80 year-olds and persons aged 80 years and older**11th coordinated population projection**

Base: 31/12/2005

Year (as of 31/12/)	Variant 1-W1 ¹⁾		Variant 1-W2 ²⁾	
	1.000	2005 = 100	1.000	2005 = 100
65 to under 80 year-olds				
2010	12.537	102,9	12.540	102,9
2020	12.641	103,7	12.667	103,9
2030	15.845	130,0	15.936	130,7
2040	15.592	127,9	15.831	129,9
2050	12.817	105,1	13.334	109,4
80 year-olds and older persons				
2010	4.287	116,5	4.288	116,5
2020	5.924	160,9	5.933	161,2
2030	6.287	170,8	6.307	171,3
2040	7.959	216,2	8.003	217,4
2050	10.040	272,8	10.151	275,8
All 65 year-olds and older persons in total				
2010	16.824	106,0	16.828	106,0
2020	18.565	117,0	18.601	117,2
2030	22.132	139,5	22.243	140,2
2040	23.550	148,4	23.835	150,2
2050	22.856	144,0	23.485	148,0

1) Nearly constant fertility, base assumption on life expectancy, balance of migration 100 000 people/year.-

2) Nearly constant fertility, base assumption on life expectancy, balance of migration 200 000 people/year.

Table A 8: Trends in population in Germany from 2006 to 2050
11th coordinated population projection

Year (as of 31/12/)	Variant 1-W1 ¹⁾		Variant 1-W2 ²⁾	
	1.000	2005 = 100	1.000	2005 = 100
2006	82.293	99,8	82.293	99,8
2007	82.197	99,7	82.197	99,7
2008	82.109	99,6	82.109	99,6
2009	82.005	99,5	82.055	99,5
2010	81.887	99,3	82.039	99,5
2011	81.756	99,2	82.011	99,5
2012	81.611	99,0	81.971	99,4
2013	81.453	98,8	81.921	99,4
2014	81.284	98,6	81.860	99,3
2015	81.102	98,4	81.790	99,2
2016	80.910	98,1	81.710	99,1
2017	80.708	97,9	81.623	99,0
2018	80.499	97,6	81.531	98,9
2019	80.283	97,4	81.433	98,8
2020	80.057	97,1	81.328	98,7
2021	79.822	96,8	81.215	98,5
2022	79.576	96,5	81.093	98,4
2023	79.320	96,2	80.962	98,2
2024	79.052	95,9	80.821	98,0
2025	78.773	95,6	80.670	97,9
2026	78.481	95,2	80.507	97,7
2027	78.177	94,8	80.333	97,4
2028	77.863	94,4	80.148	97,2
2029	77.537	94,1	79.953	97,0
2030	77.203	93,6	79.750	96,7
2031	76.860	93,2	79.538	96,5
2032	76.509	92,8	79.319	96,2
2033	76.152	92,4	79.092	95,9
2034	75.786	91,9	78.859	95,7
2035	75.414	91,5	78.618	95,4
2036	75.033	91,0	78.370	95,1
2037	74.644	90,5	78.113	94,8
2038	74.246	90,1	77.847	94,4
2039	73.839	89,6	77.573	94,1
2040	73.422	89,1	77.288	93,8
2041	72.995	88,5	76.995	93,4
2042	72.558	88,0	76.691	93,0
2043	72.111	87,5	76.378	92,6
2044	71.654	86,9	76.056	92,3
2045	71.188	86,4	75.725	91,9
2046	70.714	85,8	75.385	91,4
2047	70.231	85,2	75.038	91,0
2048	69.741	84,6	74.684	90,6
2049	69.245	84,0	74.324	90,2
2050	68.743	83,4	73.958	89,7

¹⁾ Constant fertility, base assumption on life expectancy, balance of external migration 100 000 people/year.-

²⁾ Constant fertility, base assumption on life expectancy, balance of external migration 200 000 people/year.-

B Glossary

Appendix C

Basic migration

Basic migration assumes a certain number of persons moving abroad. For the balance to break even or to be positive we need the same or a higher number of people moving into the country. This takes account of the fact that foreigners moving into Germany are younger than those leaving Germany, which has a “rejuvenation effect”, although the balance is even.

Birth sequence

Official statistics can only provide birth sequence data for marital births.

Life expectancy

The average number of additional years a person of a certain age could expect to live if current mortality rates were to continue for the rest of that person's life. Life expectancy is determined using the life table of the Federal Statistical Office of Germany, which considers the current probabilities of death at a specific age. It is a hypothetical indicator, because mortality ratios may change in the course of further life. Life expectancy is shown in a breakdown by sex.

We speak of average life expectancy at birth (i.e. at the age of 0 years) and of further life expectancy, for instance at the age of 60 or 65 years. The sum of the age reached and further life expectancy or the total number of years a person may still expect to live rises with increasing age. For instance, a one-year old child's life expectancy is higher than that of a new-born child, because that child has already overcome the risks of dying in the first months of his or her life. That improves the child's chances to reach a higher age.

Migration balance

The difference between arrivals to Germany and persons moving abroad.

Migration surplus

Migration surplus or a positive migration balance means that the people who move into the country outnumber those who leave the country.

Mortality

Mortality is one of the two main components of natural population change. By mortality we understand the number of deaths during a period related to the population. We can regard deaths in total or subdivided by age or sex and related to a given population group.

Old-age dependency ratio

The old-age dependency ratio displays the relationship of people at pension age (presently at the age of 65 and older) to 100 people at working age (as a rule, 20 to 64 years).

Resettlers

Ethnic Germans („late resettlers“) returning to Germany, whose spouses and descendants are persons who acquired German citizenship, abandoned their regions of origin in the states of Eastern Europe or the successor states of the Soviet Union and have settled at a new domicile under the coverage of the Basic Constitutional Law (Grundgesetz).

Total fertility rate

Total fertility rate is a birth rate measure, indicating the average number of children per woman. This indicator is of a hypothetical nature, as it shows the fertility rate with respect to a modelled, rather than a concrete, generation of women. However, it has the advantage that it measures the birth rate irrespectively of the population's age structure. All data in this publication on births and children born strictly relate to live-born children.

Young-age dependency ratio

The young-age dependency ratio displays the relationship of persons at the age of 0 to 19 years to 100 people at working age (as a rule, 20 to 64 years).

