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Interim Report IR-08-022

Exploratory Extension of IIASA's World Population Projections: Scenarios to 2300

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December 4, 2008

Contents

Abstract

This paper describes an exploratory extension of IIASA's world population projections for two centuries beyond their regular time horizon. IIASA's World Population Program recently published its newest 2007 projections in *Nature* (February 7, 2008) in the form of fully probabilistic projections for 13 world regions for single years of age with assumptions defined until 2080 and extended results presented up to 2100. The extensions presented here do not attempt to define uncertainty ranges for the more distant future but rather apply alternative fertility and mortality assumptions starting from the median of the probabilistic projections as well as from the upper and lower end of the 95 percent range in 2080, which is the last year for which substantive assumptions were defined in the IIASA projections. After that we apply several different fertility levels ranging from 1.0 to 2.5 children per woman, cross-classified with two alternative mortality assumptions assuming maximum life expectancies of 90 and 120 years. The results for the year 2300 range from a world population of merely 40 million to one of 56 billion. The assumptions of likely future fertility, mortality and migration trends based only on substantive reasoning can have a maximum time horizon of 30-50 years which, when explicitly accounting for uncertainty, could possibly be stretched to 70-80 years. Therefore, the extensions presented here should not be viewed as likely or even meaningful projections, but only as a sensitivity analysis of what would be the long term outcome of certain alternative assumptions.

The range of alternative fertility and mortality assumptions considered here is much broader than that of the recent UN (2004) projections to 2300 which consider 1.85 as the lowest possible long term fertility level. But similar to the UN study, a main result of our exercise is to demonstrate the great sensitivity of long term population trends to very small differences in fertility assumptions. In addition, our study shows that a world population size of around 3 billion, which several ecologists propagate as a sustainable population level, need not necessarily be reached through disastrous mortality increase – as many of them believe – but could be reached before 2300 through the benign fertility reduction to a level of around 1.7 children per woman.

Acknowledgement

The authors want to thank John Bongaarts for very helpful comments on an earlier draft of this paper.

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Exploratory Extension of IIASA's World Population Projections: Scenarios to 2300

Wolfgang Lutz and Sergei Scherbov

1 Introduction: How far into the future should we project?

Trends in the size and structure of human populations are more predictable than practically all other social and economic trends. The reason for this is that populations change only very slowly and we already know today with rather high precision what will be the size of all age groups above 25 in the year 2030. This is because these cohorts have already been born and their size can only change through mortality and migration. While mortality tends to change rather slowly and mostly in the direction of gradual further improvements, migration trends are more erratic and harder to predict. Particularly for small countries, migration constitutes the single, most important uncertainty for projecting population trends for the coming decades. For the younger age groups, the future trends in fertility also play an important role. But even if scenarios with greatly differing assumptions on future fertility and migration trends are being made, the differences in key indicators such as total population size and the proportion of the population above age 65 tend to be rather small for the coming 20-30 years. There is, hence, broad consensus among demographers that projections with such a time horizon are meaningful and can serve an important purpose. This is quite different, e.g., from the fields of economic growth or political change, where few people think that reliable projections can be made with such a long time horizon.

While demographic projections made today for the year 2030 tend to be unproblematic, extending them to 2050 or beyond already makes some demographers uneasy because we would be entering years in which about half of the population that will be alive in that year has not yet been born. Hence, the size of the cohorts born between now and 2050 not only depends on uncertain future mortality and migration, but also on uncertain future birth rates. In other words, the further one goes into the future, the more the projected population depends on assumptions rather than on the empirically given starting conditions.

For this reason, most official agencies producing population projections, such as national statistical agencies, Eurostat or the United Nations (UN) Population Division, have a time horizon of 2050 in their routinely-produced population projections. Projections with a longer time horizon are produced only in occasional special studies. The UN has a tradition of doing so every six years, while the regular projections are produced every two years.

The appropriate time horizon for demographic projections has been a topic of explicit scientific consideration at least since Nathan Keyfitz's 1981 contribution on "The Limits of Population Forecasting" (Keyfitz 1981). Summaries of the more recent discussions have been given by Lutz et al. (1996) and Ahlburg and Lutz (1999). In general, these assessments stress that the choice of the appropriate time horizon must always be based on a difficult compromise between the advantages of providing more information further into the future and the danger of making inaccurate assumptions about an increasingly distant and unknown future. Lutz et al. (1996) also stress that "the time scale of population projections is of distinctly human dimensions. This is not only because the human life span and the gap between generations have important demographic consequences, but also because forecasters' judgment about the speed of social change depend on their personal experiences" (p. 19). And they conclude: "The commonly accepted threshold of a little less than half a century emerges not so much as a clear demographic threshold (which might dictate a choice closer to the mean age of childbearing), but rather from the timing of the increased subjective uncertainty in demographic rates" (p. 22).

Another reason for shying away from longer term population projections is that the commonly held assumption about the absence of any physical limitations to population growth and possible feedbacks from the future course of population trends back to its drivers may not be true in the longer run. In the short term, it is plausible to assume that, at least in demographically advanced countries, these three components of population change will be determined in a fairly independent way. But with a time horizon of 2-3 decades, one may assume that migration patterns will not be independent of the past level of fertility, which will be reflected in the size of the younger domestic labor force. The further one goes into the future, the more important such interdependencies and feedbacks are likely to become. Since the time of Malthus, such feedback mechanisms have been the essential ingredients of the analysis of longer term population trends. Such feedbacks were also modeled in a quantitative way in the world models of the Club of Rome (Meadows et al. 1972) where it was assumed that around 2015, a combination of serious pollution and global food shortages due to overpopulation would increase the death rate by more than a factor of two and as a consequence, birth rates will rise to almost pre-modern levels. While demographers subsequently saw good reasons for not making such specific and hardly defendable assumptions, the idea of trying to explicitly capture feedbacks in population projections was not completely abandoned. In a set of "special interaction scenarios" in the context of the 1996 IIASA world population projections, Lutz et al. (1996) quantitatively demonstrated possible paths of "overshooting carrying capacity in sub-Saharan Africa" or "fertility responses to rapid ageing". The latter idea was reflected in the National Research Council's (2000) study *Beyond Six Billion,* where it was argued that if fertility fell too low, governments would likely take action to increase the level of fertility. It concluded with the statement that "even if such policies were adopted, the fertility response would not be predictable" (National Research Council 2000, p. 107). This statement succinctly summarizes the problem with any explicit consideration of feedbacks in population projections: Even if some feedback is considered likely, it is almost impossible to make specific assumptions about its timing, about the strength of the reaction and the ultimate effect of the reaction. Hence, the only practical solution to this problem is to (implicitly) include the possible effects of such feedbacks in the specification of the range of fertility, mortality and migration assumptions made. While this assumption is more defendable in the case of assumed fluctuations in the trajectory of the demographic components (as is done in stochastic population projections), it is more difficult to argue in the case of assumed constancy over time as is done in most of the long term scenarios. In this case assumed feedbacks may be partly reflected in the choice of which long term scenario is considered more plausible rather than modeled within individual scenarios.

Finally, the assessment of the tradeoffs in choosing the appropriate time horizon for published population projections also depends on the ways in which uncertainty is communicated to the users. In general one can say that the broader the range of alternative assumptions considered, the further one can justify going into the future. Such considerations have been at the heart of the discussion about probabilistic population projections in general[1] and in the design of the series of IIASA's probabilistic world population projections in particular. This series of so far three successive projections (which have all been published in *Nature,* see Lutz et al. 1997, 2001, 2008b) used expert argument based exercises for defining a range of assumptions for two points in time: 2030 and 2080. The assumed ranges in 2030 were defined by more specific quantitative analyses and arguments than the more speculative ranges for 2080. The choice of ranges was made after examining independent studies of the variance in past time series and *ex post* error analysis of existing series of past projections (see Lutz et al. 2004). While it was already considered problematic to make assumptions as far as 2080, this year was considered the absolute limit for substantive reasoning about likely levels. With respect to the tradeoffs discussed above, the costs in terms of credibility and likelihood of making unreasonable assumptions exceeded the possible gains in terms of useful information. But it was decided to present results up to 2100 which still illustrate the momentum of population dynamics beyond 2080 when keeping all rates at their 2080 level.

Given all these important caveats with very long term population projections, it was somewhat surprising when in 2004 the United Nations Population Division published a study entitled *World Population to 2300* which presents a number of alternative projections (scenarios) for 192 individual countries up to the year 2300 (UN 2004). This not only doubled the time horizon of their earlier occasional long range projections (which was 2150), but also moved from the projection at the level of major world regions to a 300 year projection of individual countries. Since the vast majority of countries that are UN members today did not exist 300 years ago (including the USA), it is not clear what motivated the authors to assume that all these countries will continue to exist with identical borders 300 years in the future. Given the speed in which new countries have been forming through the dissolution of bigger ones over the past two decades alone, and the groups of existing countries that are giving up national sovereignty to form a larger union, such as the EU, it seems odd to assume that in 2300, the world will still be structured in terms of the same nation states we see today. Making long range projections by continents (major world regions) is more defendable because the continental drift occurs much more slowly than changes in politically defined borders. Hence, the choice of the population aggregates that are being projected needs to enter the consideration of tradeoffs with respect to the choice of time horizon.

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[1] For a comprehensive discussion of this field, see a special issue of the *International Statistical Review* entitled "How to deal with uncertainty in population forecasting" edited by Lutz and Goldstein (2004).

Without substantive justification and without reference to the above described literature, the UN (2004) report presents the long term implications of three main fertility assumptions which are based on assumed global convergence to the total fertility rates (TFR) of 2.35, 2.05 and 1.85. Two additional scenarios were presented "for analytical purposes" which keep all fertility rates constant at current levels, resulting in 134 trillion people in 2300, and forcing fertility to the exact level that will produce zero growth under the assumed continued increase in life expectancy. No alternative scenarios with respect to the future course of mortality are being defined which makes it impossible to use the study with respect to the uncertainty of future population ageing. Beyond 2050 zero net migration per country is assumed, which is certain to be incorrect, but it is admittedly difficult to come up with any alternative numerical assumption.

The plausibility of the range covered by these alternative assumptions will be discussed in more detail below. Here it suffices to say that the lowest considered long term fertility level of 1.85 is actually identical to the assumed medium variant (most likely) fertility level up to 2050. Although more than 50 countries currently have fertility rates below 1.85, this is assumed to never and nowhere be the case in the longer term future. Hence, the guiding principle of this exercise seems to be to define the projections in terms of their results rather than in terms of a plausible range of driving forces. The central assumptions try to produce near constancy in national population sizes with the high and low scenarios only allowing minimal deviations from the fertility levels that would produce these results.

The problematic UN (2004) study and in particular the (mis)interpretation of its findings in the international community are the main motivations for us to produce these quite different, long term population scenarios which cover a broader range of possible fertility and mortality assumptions. The main carry home message from the UN study seems to have been that a sophisticated projections exercise shows that the most likely long run population future is that of a world population increasing to around 9 billion by the second half of this century and then remaining almost constant at this level over the next centuries. Similarly, all countries in the world would likely have constant long term population size. This "result", however, was the starting assumption of the whole exercise and has no visible scientific basis. Medium fertility levels have simply been chosen in order to produce such a predefined result. But there may be equally plausible or even more plausible alternative visions of long term futures for the number of humans on this planet. And since specific numbers about population trends beyond 2100 are requested and being used by modelers in the field of climate change, it seems a worthwhile exercise to try to give such numbers a bit more science based attention.

2 Definitions and reasoning behind alternative scenarios

2.1 The IIASA probabilistic world population projections as a basis

The projection exercise described in this paper presents an exploratory extension of IIASA's world population projections for two centuries beyond their regular time horizon. IIASA's World Population Program recently published its newest 2007 projections in the form of fully probabilistic projections for 13 world regions for single years of age with assumptions defined until 2080 and extended results presented up to

2100. These 2007 projections, published under the title “The coming acceleration of global population ageing” (Lutz et al. 2008b) are an update of earlier projections published under the title “The end of world population growth” in *Nature* in 2001 and in a full length book under the same title in 2004 (Lutz et al. 2001, 2004). The methods used for this set of probabilistic projections are comprehensively described in that book. It also includes lengthy substantive justifications of the specific fertility, mortality and migration assumptions. The 2007 update of the 2001 projections includes one methodological innovation and two noteworthy revisions of the fertility assumptions. Methodologically, the new projections also consider uncertainty ranges for the starting conditions of the projections for countries with unreliable information about current conditions. This is particularly relevant for China, where published fertility levels for around 2000 range from 1.2 to 1.8. After the analysis of about 30 different estimates of Chinese fertility levels, we assumed a median TFR of 1.5 with an 80 percent uncertainty range from 1.3 to 1.7 for the year 2000 (Lutz et al. 2007). This downward revision of Chinese fertility has visible impacts on the projected world population because of the great weight of China. However, this is partly compensated by an upward revision for African fertility rates which did not decline as rapidly as assumed in 2001. This is partly due to stalled fertility declines in some African countries due to worsening overall conditions, and in particular, a stagnation or even decline in female basic education.

But the overall picture drawn by the 2001 and 2007 projections is very similar. The probability that the world population will peak in size before the end of the century has now increased from 86 to 88 percent. Figure 1 puts the results of these probabilistic projections to 2100 into a millennial perspective, plotting world population size from 1000 AD to 2100. It shows that for centuries, world population has been below half a billion until around 1800, when population growth started to take off. The increase accelerated tremendously during the 20th century, when world population increased from 1.6 billion in 1900 to 6.1 billion in 2000. At the global level, the population growth rate was highest during the late 1960s, peaking at just over 2 percent per year. Since then the growth rate has been declining. Absolute increments started to decline around 1990. The graph also shows the decilies of uncertainty distribution of future world population based on IIASA’ probabilistic projections. It shows that the 80 percent range for 2100 goes from less than 6 billion to more than 12 billion. The line with dots in the center gives the median of the 2000 independent simulation runs. It shows a peak of 8.9 billion around 2070 and then falls to 8.4 by 2100. The 80 percent uncertainty range for 2100 is from 6.2 to 11.1 billion, i.e. a range of five billion. This quantification of uncertainty helps to put our thinking about long term population trends into perspective.

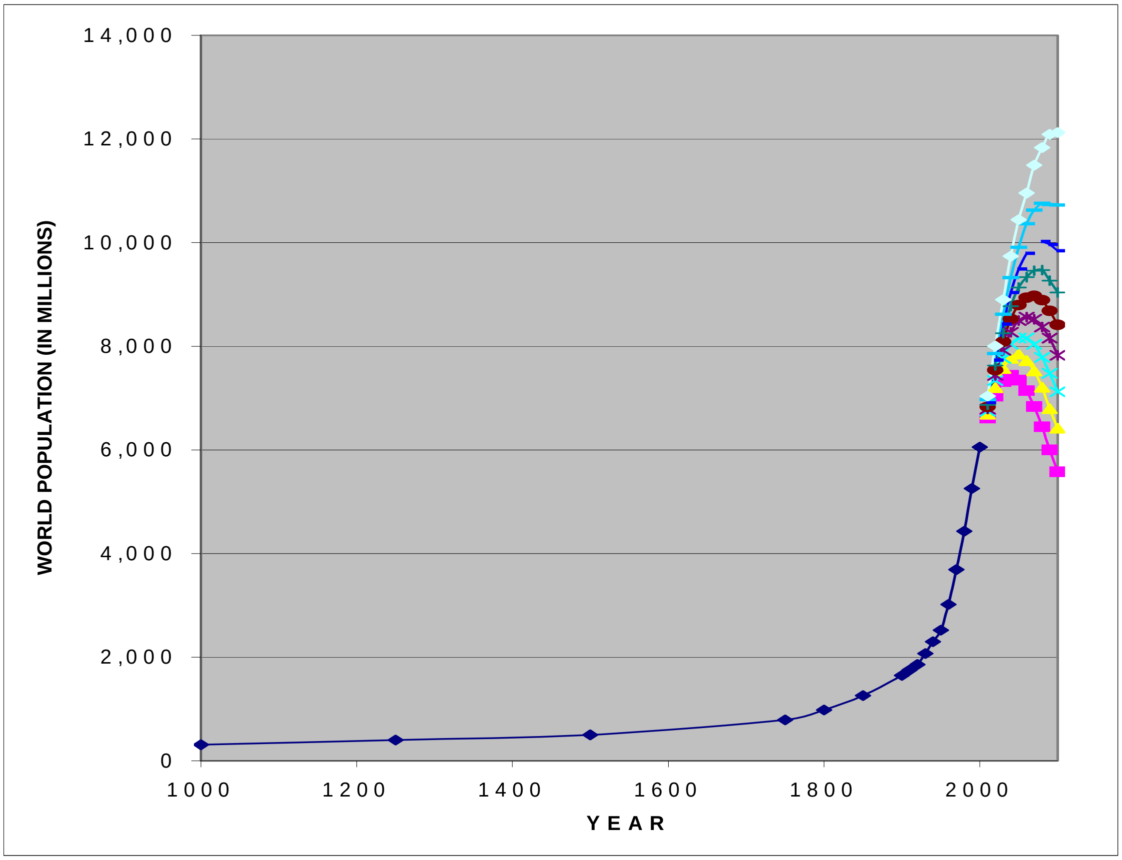

Figure 1. Historical world population growth and the results of IIASA's probabilistic projections: Plotting world population size from 1000 AD to 2100.

Within this century the uncertainty of the future proportion of elderly in our society is even larger. Figure 2 plots the resulting uncertainty ranges for the proportion of the population above the age of 80 in Western Europe. The proportion is almost certain to increase over the coming decades from currently around 3 percent of the population to between 6 and 14 percent in 2050. But during the second half of the century the uncertainty will explode to an incredible 80 percent range; from 8 to 37 percent of the entire population will be above the age of 80. This large uncertainty in the future proportion of elderly is a function of the current scientific uncertainty about the likely future course of old age mortality. While one school of thinking assumes that in the West we will not see much further increase in life expectancy, the other school assumes sustained further increases, if not an acceleration in the increase of life expectancy due to bio-medical progress. Without being able to scientifically reject one or the other view, the only thing a forecaster can do is to try to honestly reflect this uncertainty in the projections themselves and not pretend to know more than we know. Figure 2 also shows two horizontal lines in 2100 which represent the values given by the high and low variants of the UN long term population projections. These variants differ from our projections in two ways: First, they are lower because the UN assumes a slower increase in future life expectancy. Second, the interval between the two variants is very narrow because the UN does not consider alternative mortality scenarios, as mentioned above. The difference between the two lines is only a consequence of alternative fertility assumptions, i.e., different total population sizes by which an identical absolute number of elderly will be divided to calculate the proportion. For this reason the UN projections cannot be expected to describe the uncertainty associated with future ageing in a meaningful way.

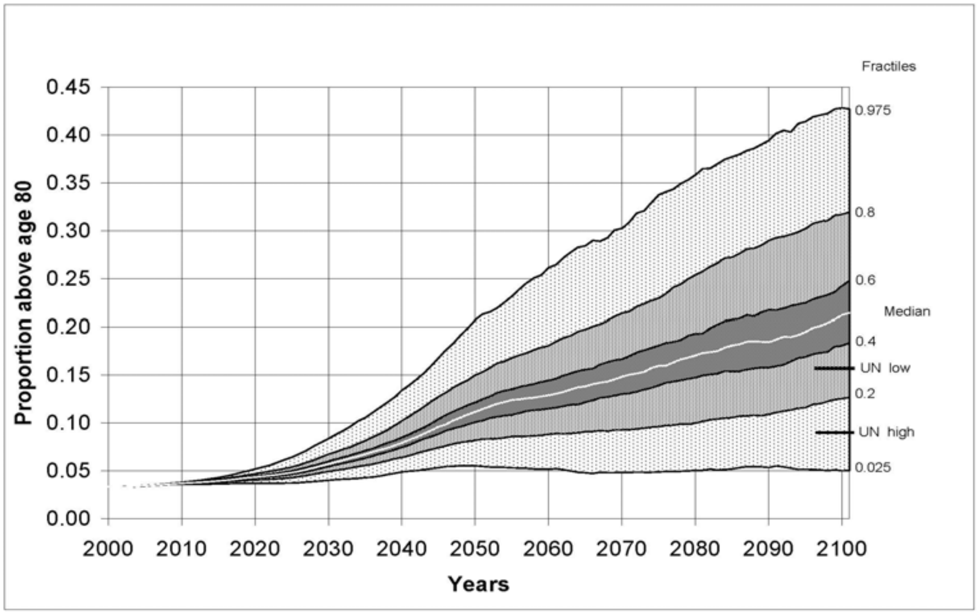

Figure 2. The uncertainty distribution of the proportion of the population above age 80 in Western Europe. Source: Lutz et al. (2008b: 718).

For the exploratory extensions of these projections to 2300, we considered two alternative approaches:

(1) Start the alternative assumptions in the year 2005. For this century, have them cover the full uncertainty range of the probabilistic projections while assuming continuations at the same levels for another 200 years. This full range would, however, result in an absurdly broad range of results which would likely generate feedback mechanisms that would check population growth or keep our species from voluntary extinction. This is the reason why the UN (2004), who start their alternative scenarios in 2000, chose to define such extremely narrow fertility ranges. As a compromise, we will present selected scenarios with more moderate fertility levels that originate at the high and low ends of the 95 percent distribution in 2080 when those projections stop making substantive assumptions.

(2) Leave the uncertainty ranges of the 2007 IIASA projections as they are and only define alternative scenarios starting from the median of the distribution in 2080.

> By doing so it will be evident to the user that these scenarios are not intended to cover the full range of uncertainty but are indeed only exploratory exercises in population dynamics. We chose this approach for most of our scenarios precisely for this reason, so that users do not mistake it for a comprehensive assessment of possible future ranges as can easily happen when presented with any range of alternative trends.

In the following projections we study a cross-classification of five different fertility scenarios with two mortality scenarios. Some of the assumptions have been applied as starting in 2005, and all assumptions have been applied as starting from the median in 2080.

2.2 Two alternative mortality scenarios

The choice of a large number of different fertility scenarios cross-classified with only two mortality scenarios reflects the greater sensitivity of very long term future population trends to fertility. But it also reflects the great dichotomy of the current scientific discussion about the likely future of old age mortality. There are two vigorously opposed schools of thinking, one suggesting that we will only see very modest future increases in life expectancy (possibly even a decline) in today's industrialized countries, while the other claims that we will see continued increases in life expectancy which possibly may even accelerate due to medical progress. Both positions have weighty arguments in their support. The "pessimistic" school of thinking, represented by Jay Olshansky (Carnes and Olshansky 2007), points primarily at negative changes in lifestyle leading, e.g., to higher obesity rates for younger cohorts, possible new infectious diseases and some fundamental constraints in our biology. The "optimists," represented by James Vaupel and Ken Manton, point out that there are no signs of a leveling off in the increase in life expectancy in the leading countries (Manton 1991; Oeppen and Vaupel 2002) and that our biology does not suggest a natural limit to life expectancy, at least not anything below age 120.

When trying to translate these opposing views about the future of mortality into alternative scenario assumptions, we chose the following rather simple operationalization. As in the medium assumption of the current IIASA probabilistic world population projections to 2100, it is assumed that life expectancy will continue its past trend of roughly two years of additional life expectancy per decade. This trend will be applied to all world regions. The only difference is the cut off point. In the first scenario representing the pessimistic view, the increase will be stopped whenever life expectancy (for both sexes) reaches 90 years. In the tables, this scenario will be labeled "LEMAX=90". For the optimistic case, a life expectancy of 120 years was chosen as the point at which it stops to increase, labeled "LEMAX=120" in the tables. The time at which these limits are reached will vary from region to region depending on their starting levels. While for the pessimistic scenario the assumed limit will be reached most likely during this century (and only for some current high mortality regions during the next one), the optimistic scenario will come close to the assumption of ever continuing life expectancy and limits will only be reached during the 23rd century.

2.3 Five alternative fertility scenarios

There is no widely accepted theory about the future course of fertility for countries that have reached the late phases of the universal process of demographic transition. The demographic transition paradigm assumes that at some point in their history, all human societies go through an irreversible process in which death rates fall and then with some time lag (which can be several decades) birth rates also start to fall. The different timing of the two declines is due to the fact that people always want their own mortality and that of their children to be lower whenever possible. This is not the case with birth rates, where pro-natalist norms are deeply embedded in most human cultures. It takes time for parents to understand that more of their children will survive and they only need fewer births in order to have a certain desired number of surviving offspring. Together with general social and economic development and in particular higher education, this results in the fertility transition which is currently well underway in most of the world's societies. Actually, already more than half of the current world population has fertility below replacement (Wilson 2004). While the irreversibility of the demographic transition implies that fertility will not increase back up to high pre-transition levels, it is completely unclear how low fertility will fall in the future. Theoretically, only zero is the bottom for possible future fertility rates.

Lutz (2006) recently produced a comprehensive review of different science based arguments that would suggest either further declines in fertility or a modest recovery of current low fertility levels in Europe. Viewed together, these different arguments can be interpreted as suggesting (unless unexpected new reasons come up in the future) that a plausible range of future fertility in modern societies that have gone through the process of demographic transition is somewhere between 1.0 and 2.5 children per woman on average.

This likely range of future fertility between 1.0-2.5 is in line with the conclusion of a National Academy of Sciences Panel on the future of world population which gave the (admittedly very vague) statement that the future fertility range in post-demographic transition countries should not be too different from the range of fertility levels observed today in such societies (National Research Council 2000). This range goes from around 0.8 in Hong Kong, Macao and the lowest fertility provinces in some low fertility countries, to 1.08 in Korea as the lowest fertility registered in a big nation state, to a high of around 2.0 in the USA. However, some of these very low levels may be short term trends where rates are depressed by the tempo effect. Hence, a range from 1.0 to 2.5 seems to be a sufficiently broad range to cover all future fertility trends that can be considered plausible for longer term averages from today's perspective. We also experimented with a TFR of 0.5, but this resulted in a near disappearance of the human species from this planet before 2300. Hence, we chose to show the results for the following five long term total fertility rate levels: 1.0, 1.5, 2.0 and 2.5, with 1.7 added as a plausible central assumption.

When discussing long term fertility trends, the notion of replacement fertility is often used as a guiding principle. Traditionally, replacement fertility has been assumed to be at 2.1 children per woman, which is the fertility that every woman needs on average to have two offspring surviving to reproductive age. This rate, however, is rarely exactly 2.1. In societies with high child mortality, such as in Africa, this ratio is around 2.3, whereas in very low mortality societies it is below 2.1. Even in the absence of child mortality, however, it is not 2.0 because the traditional definition of replacement fertility also considers the sex ratio at birth, i.e., the fact that somewhat over half of all babies born are boys. Another aspect of this view of replacement fertility is that it only considers replacement at the aggregate population level, i.e., two people (a man and a woman) having on average two children. We therefore call this the **population replacement level**.

Alternatively, one can think of an **individual replacement level**. This is in line with the frequently mentioned individual level rationale that every person wants to replace him/herself with one child. If every man or woman has one child on average, the TFR is 1.0. Because it takes two – biologically still a woman and a man (or at least his sperm) – to produce a child, the two people in such a condition typically share a child, which does not make it any less their own child. This individual level replacement rationale is not only reflected in the prominent and highly effective Chinese one child policy, it is also reflected in the answers of many fertility surveys in Europe. Asked for their motivation to have a certain number of children, many young men and women say they want to have the first child to reproduce themselves and have the experience of having a child, while a second child is mostly desired as a companion for the first child, something that is highly influenced by social norms. A possible alternative motivation for two children, namely, to have one as a replacement for dad and another for mom is hardly ever stated in opinion surveys. In this view, individual replacement level fertility implies a TFR of 1.0 which also implies that some couples have more than one child to compensate for people who (for whatever reasons) remain childless.

In our view, a likely range of future fertility is somewhere between individual and population level replacement (i.e., in low mortality conditions roughly between 1.0 and 2.0) with room for upward deviation to 2.5 (which is more likely than a TFR of 0.5, which would result in a disappearance of world population before 2300). But what would be the optimal level of fertility from a societal point of view? Such an optimal level would likely be above the individual replacement level of 1.0 since this would result in a halving from one generation to the next; the resulting strong ageing and shrinking would probably bring a high cost in terms of intuitional discontinuities. But the optimal fertility level can be somewhat below the population replacement level for several reasons, ranging from living space and global environmental considerations to the desire to invest more into the education of a slowly diminishing number of children. But it cannot be too far below population replacement because of the above mentioned social and economic discontinuities – e.g., for the pension and health care systems – that result from extended periods of very low fertility. This complex question of an optimal fertility level can by no means be treated exhaustively here. Many of the criteria involved have been discussed elsewhere (Lutz et al. 2004) and more work on this is currently underway. Here it should suffice to assume that a TFR of around 1.7 is a good candidate for a long term optimal fertility level. This is the rationale for having a specific scenario based on a stable long term level of 1.7. Viewing all things together, long term fertility around this level not only seems to be the most desirable, but also the most likely in the long run – a fortunate coincidence. The nearer term future of countries with incomplete demographic transitions, particularly in Africa, looks much less fortunate.

A fifth fertility scenario does not assume that in the very long run all world regions converge to one specified level of fertility, but that permanent fertility differentials remain. Since in the IIASA population projections fertility levels in 2080 are defined as a function of population density (Lutz et al. 2004; Lutz and Ren 2002) within the possible range of 1.5 to 2.0, these 2080 levels are then kept constant until 2300. In the figures and tables this scenario is labeled “TFR=IIASA”. Because of the persistent fertility differential, this scenario is expected to result in major changes in the distribution of the world population of the different regions.

3 Results

3.1 Alternative scenarios starting from 2005

As discussed above we have included a few scenarios which, for this century, follow the upper and lower 95 percent uncertainty bounds of the IIASA probabilistic projections, and then continue with the high and low fertility assumptions, respectively. All the other scenarios start from the median of the probabilistic projections in 2080 (see Figure 3) and will be described in more detail below.

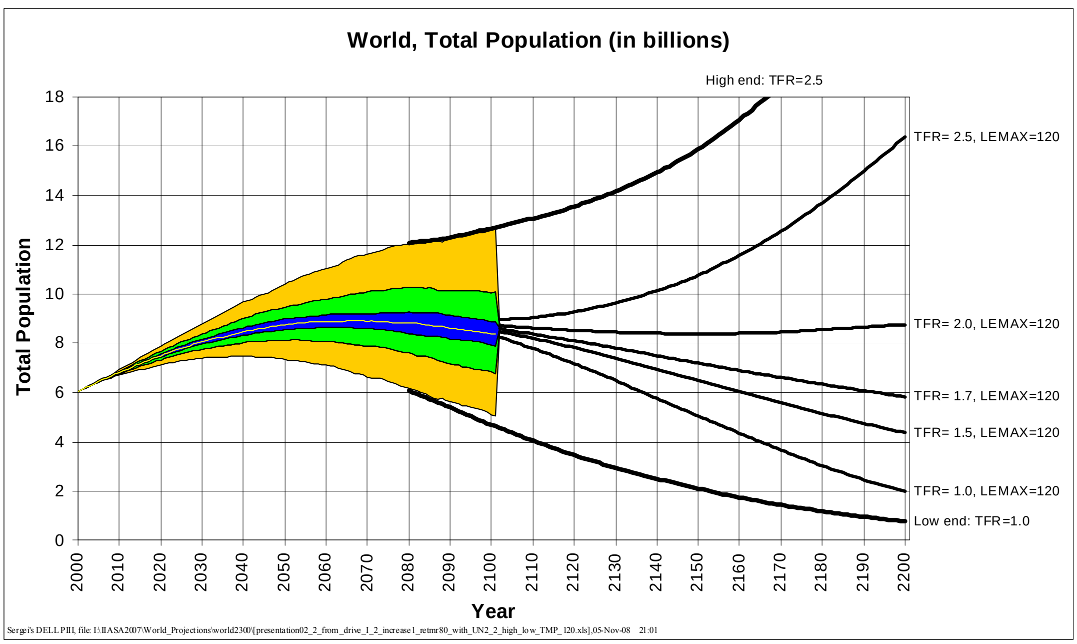

Figure 3. Total world population in billions: Probabilistic projections until 2100 (yellow [light gray] 95% interval; green [dark gray] 60%; blue [black] 20%) and extensions to 2200 (for scenario labels, see text below).

Figure 4 depicts the consequence of a long term TFR of 2.5 (top line) which starts from a population trajectory at the upper end of the 95 percent uncertainty range of the IIASA probabilistic projections. By 2080 this path will have resulted in a world population size of about 12 billion. Applying a constant TFR of 2.5 from 2080 onwards for all world regions and starting from the age structure of the above mentioned high path, this would lead to moderate further population increase during the first half of the

22nd century and an accelerating path thereafter, reaching 22 billion in 2200 and 47 billion by 2300. This is combined with the mortality assumption that increases in life expectancy stop at 90 years. For the alternative assumption that life expectancy will continue to increase to 120, the world population would be 24 billion in 2200 and 56 billion in 2300. The difference is much larger by 2300 because the difference between the two mortality assumptions will only come to bear during the 23rd century.

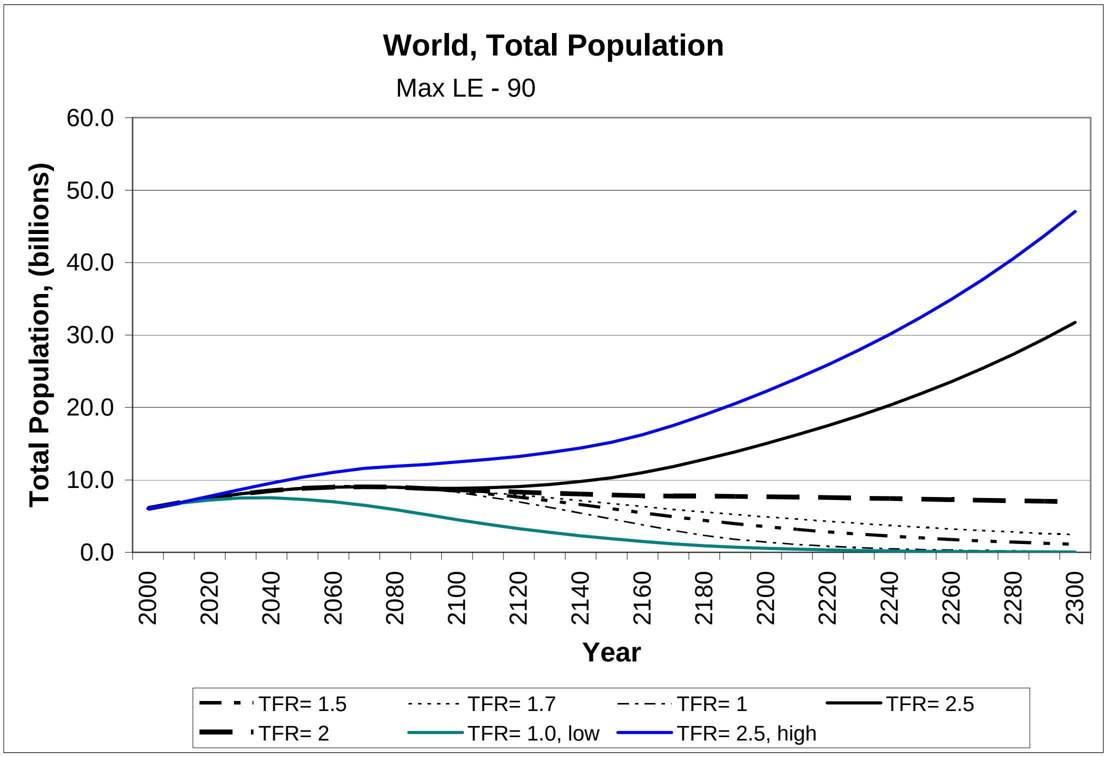

Figure 4. Alternative fertility assumptions resulting in different paths of world population size to 2300 (combined with the assumption that life expectancy will not improve beyond 90 years).

On the low end of the spectrum, a similar exercise has been applied. A population path that comes close to the lower 95 percent uncertainty bound in 2080 has been chosen and from there a constant TFR of 1.0 has been applied. Not surprisingly (as shown in Figure 4) this results in a further, quite rapid world population decline. Starting at a world population size of 5.9 billion in 2080, the number would fall to 4.5 billion in 2100 and 1.9 billion in 2100. By 2200 this extreme scenario on the low end would result in a world population of about half a billion and by 2300 of a mere 40 million. Combining this with a life expectancy limit of 120 years instead of 90 years would result in twice the world population of 80 million in 2300. This unlikely case would indeed imply a very old society with more than half of its population above the age of 90. While this is clearly hard to imagine, the assumptions leading to such an extreme situation are not absurd. A long term TFR of 1.0 may seem low from today's perspective, but it sounds less extreme when one considers that even the most recent official longer term population projections of Japan assume a TFR constant at 1.2 as the most likely variant.

3.2 Scenarios beyond 2080: Global population size

In the following we will take a more detailed look at scenarios that start from the median of the probabilistic population projections in 2080. As argued above this approach best illustrates the purely exploratory nature of this exercise in population dynamics. The probabilistic projections for this century shall not be interpreted as a comprehensive assessment of likely future population trends. Instead, they should inform the reader about the consequences of different long term assumptions beyond 2080 that cover a broader range of not-impossible assumptions than have been previously published.

As for the more extreme scenarios discussed above, the projections have been carried out at the level of 13 world regions corresponding to the regions used by the IPCC (Intergovernmental Panel for Climate Change) in their long term emissions scenarios (Nakićenović et al. 2000; Lutz et al. 2004) In this section the tables and figures give the results of this exercise for the aggregated total world population for three indicators: Total population size, proportion of the population above the age of 80, and the cohort succession ratio 20/60, i.e., the number of people at age 20 per every person at age 60. The following section will look at selected results by continents.

The results shown in Table 1 speak for themselves and do not need much discussion. As a consequence of the assumption that all scenarios follow the IIASA median until 2080, the paths only start to diverge by 2100. The differences among the scenarios become more distinct, the further one goes into the future. As expected the scenarios assuming a maximum life expectancy of 120 are always higher than the corresponding fertility scenarios with a maximum life expectancy of 90. Also, as expected, the scenarios assuming a higher level of fertility consistently have higher population sizes. Even very small differences in fertility levels have huge long term effects. A TFR of 1.5, which is about the average fertility level of the European Union today (combined with a maximum life expectancy of 90 years), results in a total world population of 1.11 billion in 2300. A long term TFR of only 0.2 children higher would result in 2.43 billion, more than twice that level. Assuming that the life expectancy limit is 120 instead of 90, this will add almost another 50 percent to the world population in 2300. This also illustrates that mortality assumptions are by no means irrelevant for the future total population size.

Table 1. Total population size of the world: 14 alternative extensions to 2300.

	2000	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	6.06	8.82	8.55	6.91	5.38	4.22	3.38
TFR= 1, LEMAX=90	6.06	8.82	8.28	4.59	1.40	0.38	0.10
TFR= 1.5, LEMAX=90	6.06	8.82	8.46	6.03	3.54	1.99	1.11
TFR= 1.7, LEMAX=90	6.06	8.82	8.53	6.73	4.89	3.46	2.43
TFR= 2, LEMAX=90	6.06	8.82	8.64	7.91	7.67	7.34	6.97
TFR= 2.5, LEMAX=90	6.06	8.82	8.83	10.29	15.00	21.88	31.73
TFR=IIASA, LEMAX=120	6.06	8.82	8.64	7.38	6.34	5.51	4.66
TFR= 1, LEMAX=120	6.06	8.82	8.37	5.05	1.99	0.68	0.21
TFR= 1.5, LEMAX=120	6.06	8.82	8.55	6.50	4.37	2.83	1.72
TFR= 1.7, LEMAX=120	6.06	8.82	8.63	7.19	5.82	4.63	3.49
TFR= 2, LEMAX=120	6.06	8.82	8.74	8.38	8.75	9.16	9.20
TFR= 2.5, LEMAX=120	6.06	8.82	8.92	10.76	16.37	25.30	38.10

As the comparison between Figures 5 and 6 illustrates (see also Table 2), the difference between population sizes resulting from assuming a life expectancy ceiling at 90 versus 120 years is almost entirely due to different numbers of people above the age of 80. While the absolute number of people above age 80 increases almost monotonically in all scenarios, the proportion of elderly depends crucially on the fertility assumptions. With global fertility constant (after 2080) at 2.0 or 2.5, the proportion of those above age 80 will only increase to around 10 percent in the case of a life expectancy limit of 90 and to 20-30 percent in the case of a limit at 120. In the other extremes of fertility falling to 1.0 or 0.5, the proportion above age 80 would increase to well above half of the entire population. In the more likely case of global fertility converging to 1.7, the global proportion of persons above age 80 would be stable around 15 if a life expectancy limit of 90 years is assumed, and increase to around 40 percent if the limit is 120 years.

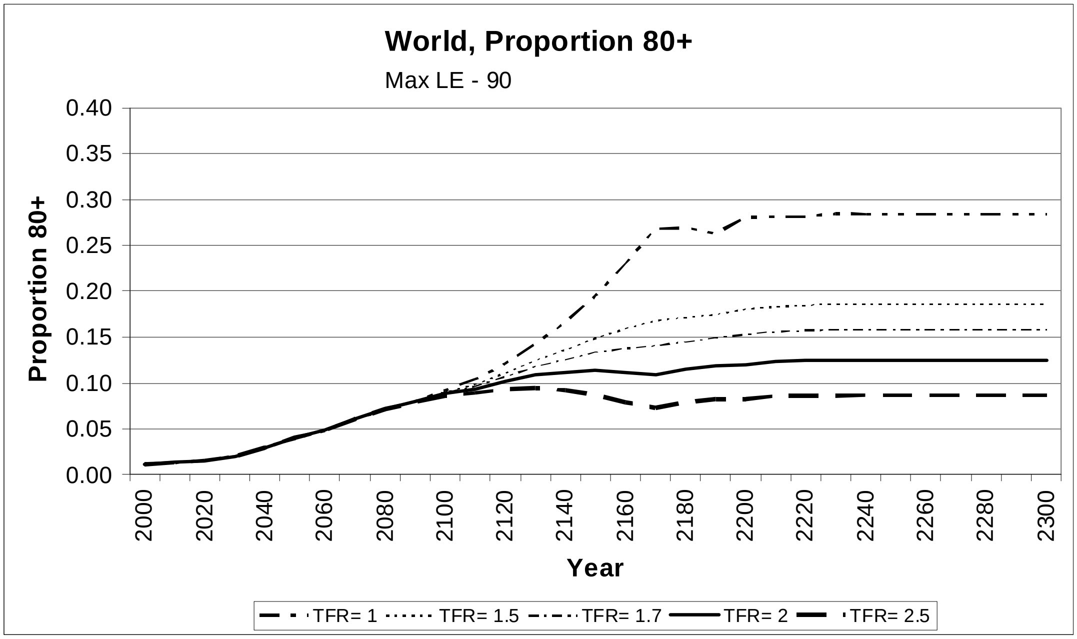

Figure 5. Proportion of the world population above the age of 80 according to alternative fertility scenarios, with life expectancy assumed to level off at 90.

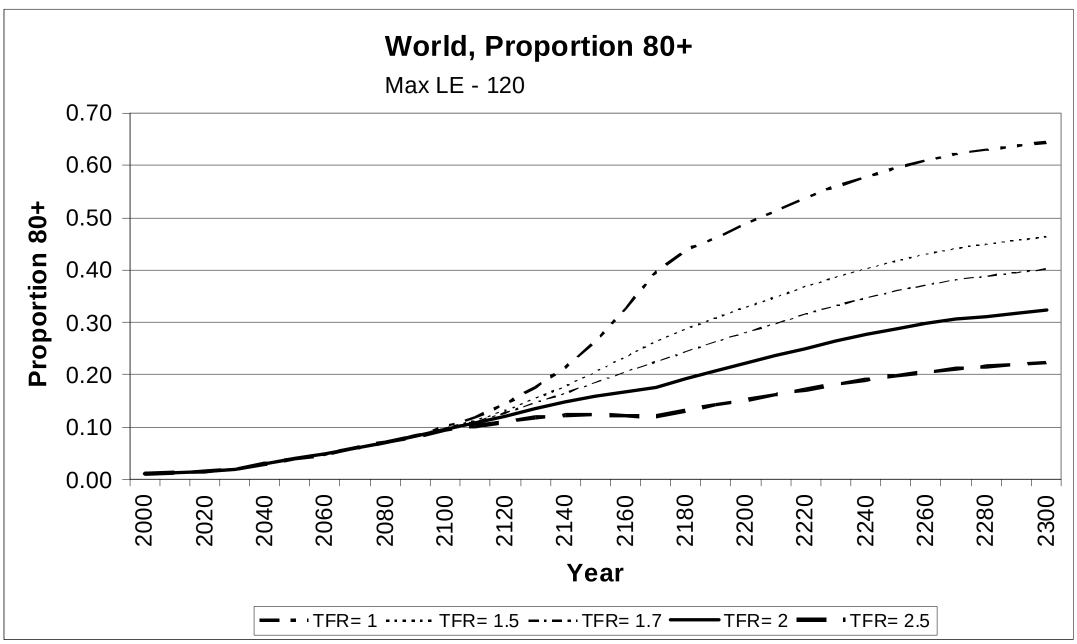

Figure 6. Proportion of the world population above the age of 80 according to alternative fertility scenarios, with life expectancy assumed to level off at 120.

Table 2. Proportion above age 80 in the world: 14 alternative extensions to 2300.

	2000	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.01	0.04	0.09	0.13	0.14	0.14	0.14
TFR= 1, LEMAX=90	0.01	0.04	0.09	0.20	0.28	0.28	0.28
TFR= 1.5, LEMAX=90	0.01	0.04	0.09	0.15	0.18	0.19	0.19
TFR= 1.7, LEMAX=90	0.01	0.04	0.09	0.13	0.15	0.16	0.16
TFR= 2, LEMAX=90	0.01	0.04	0.09	0.11	0.12	0.12	0.12
TFR= 2.5, LEMAX=90	0.01	0.04	0.09	0.09	0.08	0.09	0.09
TFR=IIASA, LEMAX=120	0.01	0.04	0.10	0.18	0.27	0.33	0.36
TFR= 1, LEMAX=120	0.01	0.04	0.10	0.26	0.49	0.59	0.64
TFR= 1.5, LEMAX=120	0.01	0.04	0.10	0.21	0.33	0.42	0.46
TFR= 1.7, LEMAX=120	0.01	0.04	0.10	0.19	0.28	0.36	0.40
TFR= 2, LEMAX=120	0.01	0.04	0.10	0.16	0.22	0.29	0.32
TFR= 2.5, LEMAX=120	0.01	0.04	0.09	0.12	0.15	0.20	0.22

It seems difficult to imagine societies in which more than half of the population is above the age of 80, yet levels of 15-30 percent above age 80 seem more feasible under the assumption of a continued increase in life expectancy. And clearly this could only happen if an 80 year old of the 23rd century were on average much healthier than an 80 year old today. They would probably resemble the 40-60 year olds today and would still be actively involved in the labor force. Otherwise such societies could not function.

Another interesting indicator of age structure is the ratio of two specific single year age groups. Lutz and Sanderson (2005) introduced such indicators under the name of "cohort succession ratios" (CSR). These could be either adjacent cohorts or cohorts that are otherwise functionally related, such as those at the typical ages of entering and leaving the labor market. Looking at Table 3, the ratio of the numbers of 20 to 60 year olds somehow captures the numbers of people entering the labor force to those leaving the labor force under today's retirement conditions in industrialized countries. It illustrates that currently and in the near future, about twice as many people will enter the labor market globally per year than leave it. Therefore, unemployment is likely unless the job market expands very rapidly. But by 2050 on the global level, the situation will be much easier for the job market and the number of entries will roughly equal the number of exits under the (greatly simplifying) assumption that the mean age of retirement is constant at around 60. This global average, however, hides huge regional differences. In 2050 in Africa, this ratio will still be 3.5, while in Eastern Europe it will already be as low as 0.5. This means that in Eastern Europe for every young person entering the labor market, two will retire, while at the same time in Africa, 3-4 young people will enter the labor market for every one who exits. Whether there will be massive international migration to compensate for some of these differentials, or whether investment will flow from the rapidly ageing to the still growing populations is difficult to predict.

Table 3. Ratio of 20 to 60 year olds in the world: 14 alternative extensions to 2300.

	2000	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	2.67	1.15	0.87	0.81	0.82	0.84	0.86
TFR= 1, LEMAX=90	2.67	1.15	0.87	0.33	0.35	0.35	0.35
TFR= 1.5, LEMAX=90	2.67	1.15	0.87	0.63	0.63	0.63	0.63
TFR= 1.7, LEMAX=90	2.67	1.15	0.87	0.77	0.76	0.76	0.76
TFR= 2, LEMAX=90	2.67	1.15	0.87	1.01	0.97	0.97	0.97
TFR= 2.5, LEMAX=90	2.67	1.15	0.87	1.44	1.37	1.36	1.36
TFR=IIASA, LEMAX=120	2.67	1.15	0.87	0.81	0.82	0.83	0.85
TFR= 1, LEMAX=120	2.67	1.15	0.87	0.33	0.35	0.35	0.35
TFR= 1.5, LEMAX=120	2.67	1.15	0.87	0.63	0.63	0.63	0.63
TFR= 1.7, LEMAX=120	2.67	1.15	0.87	0.77	0.76	0.76	0.76
TFR= 2, LEMAX=120	2.67	1.15	0.87	1.00	0.97	0.96	0.96
TFR= 2.5, LEMAX=120	2.67	1.15	0.87	1.43	1.37	1.35	1.35

It is interesting to see that for each scenario, the level to be reached for this ratio stabilizes after 2150. This is as predicted by the stable population theory, where the age structure remains unchanged if fertility and mortality rates remain constant for extended periods. Even though old age mortality continues to fall for the scenarios assuming a limit at 120 years, all of the action for these scenarios is only after the age of 60 and, hence, does not influence the 20 to 60 ratio.

3.3 Scenarios beyond 2080: Continents and world regions

The numerical results for all 13 world regions and all scenarios are listed in the Appendix. This section only highlights a few of these regional results that have global significance. For this purpose, we only focus on the scenario that combines a long term fertility level of 1.7 with a life expectancy limit of 120 years.

Figure 7 shows the results in terms of total population size for four continents (which result from aggregation of the corresponding regions). Asia will be by far the most populous continent throughout the projection period, but under this chosen scenario the total population of Asia will peak by the middle of this century and then enter an extended decline. Africa will be the second most populous continent with its population rapidly increasing over the 21^{st} century and then peaking during the early 22^{nd} century according to this scenario. The Americas will also see some increase by about 50 percent followed by a decline, while Europe is seeing monotonous decline in population size over the entire projection period.

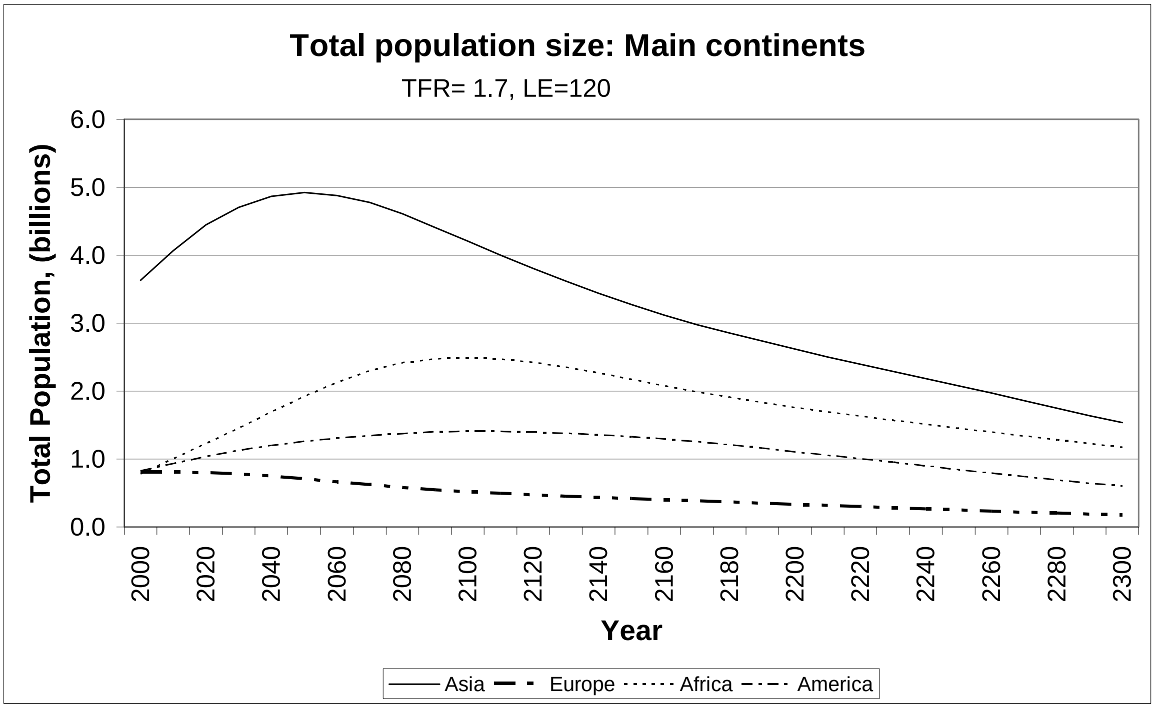

Figure 7. Trends in total population size of four continents under the scenario assuming a TFR of 1.7 and a life expectancy ceiling of 120 years.

Figure 8 plots these same trends in terms of the shares held by different continents of the total world population size. While the share of Asia would decline from currently around 60 percent to about 45 percent, that of Africa would increase from 13 to 35 percent. The share of Europe would continue to decrease from 13 to about 5 percent of the total world population. According to this scenario in 2300, 80 percent of the world population would live in Asia or Africa.

Figures 9 and 10 give two indicators of population ageing for selected world regions, again with reference to the scenario that assumes a TFR of 1.7 and a life expectancy ceiling of 120. For the four regions that already have relatively low fertility today, the trends are rather similar, with the proportions above age 60 increasing from around 20 percent today to 40-50 percent by the end of this century, and then a convergence to 60 percent in the very long run. This convergence is a consequence of the laws of stable population theory where constant levels of fertility and mortality will result in a constant age structure in the long run. Only Sub-Saharan Africa is still seeing changes in its age structure, because life expectancy will not have reached the ceiling by the late 23rd century. For the proportion of the population above age 80, the picture is rather similar with the long term stable level around 40 percent for this specific scenario, which is based on a TFR of 1.7 and a life expectancy ceiling of 120 years.

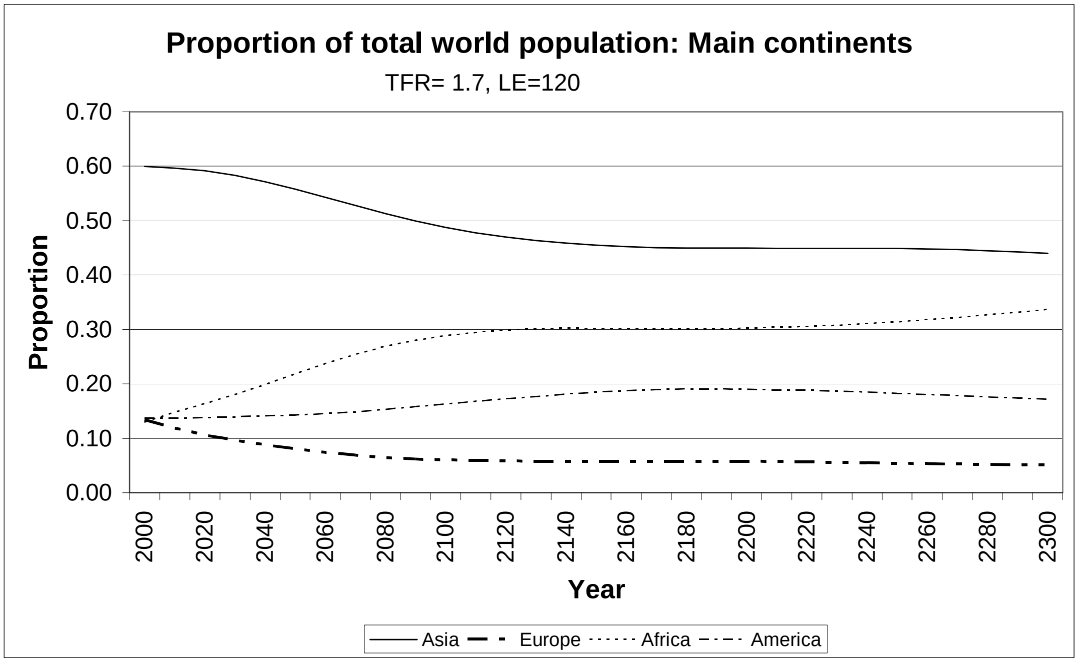

Figure 8. Proportions of total world population on four continents under the scenario assuming a TFR of 1.7 and a life expectancy ceiling of 120 years.

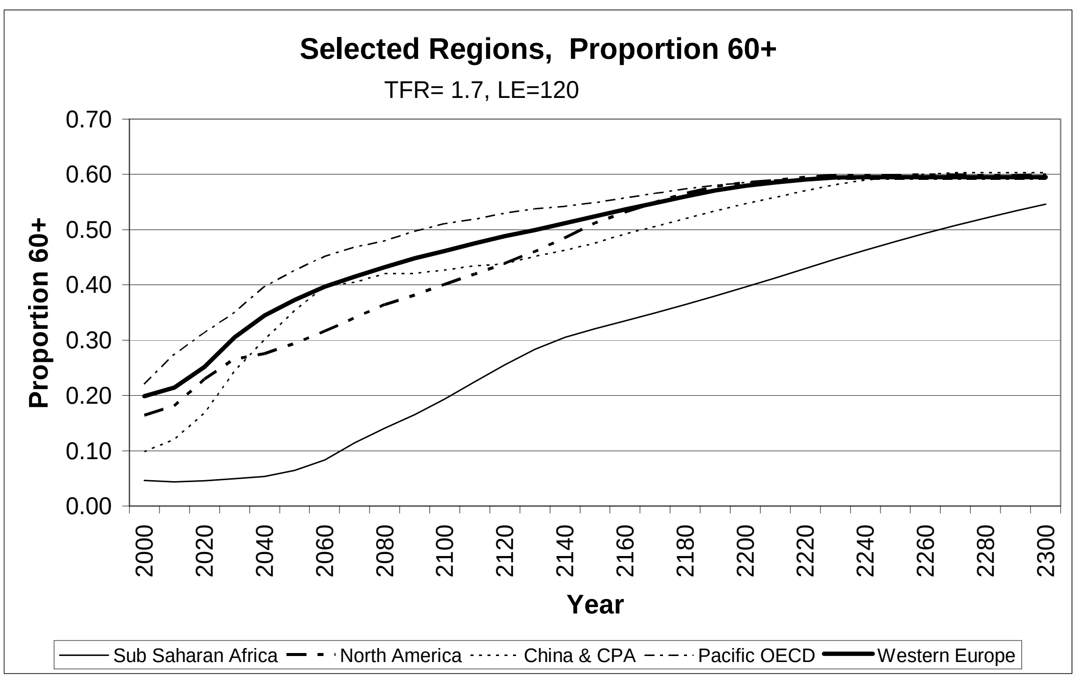

Figure 9. Proportions above the age of 60 in selected world regions under the scenario assuming a TFR of 1.7 and a life expectancy ceiling of 120 years.

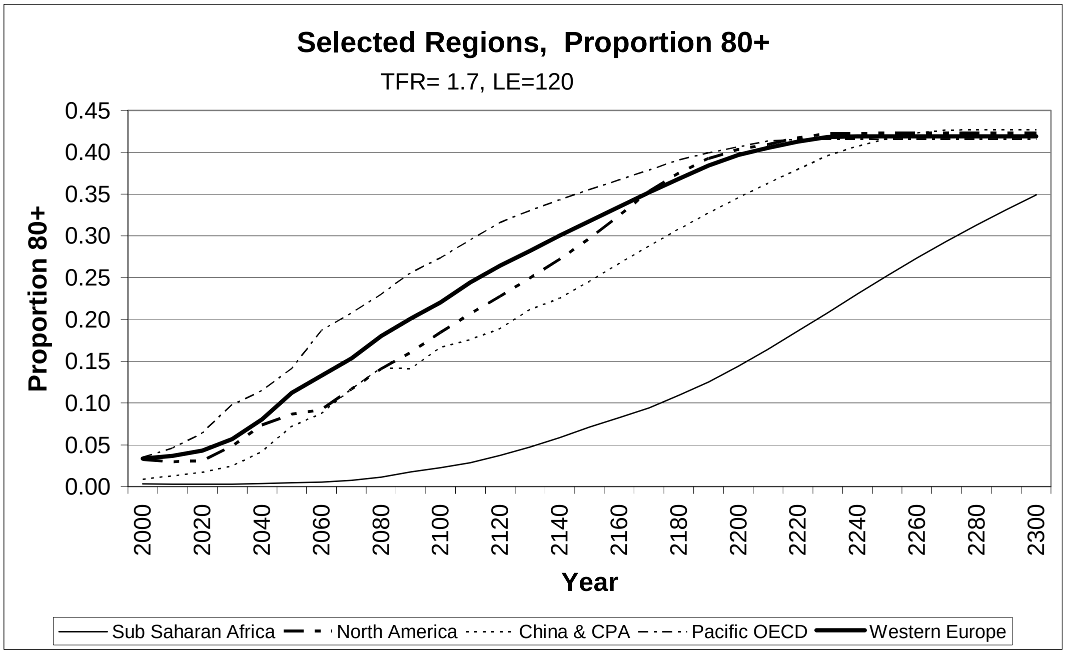

Figure 10. Proportions above the age of 80 in selected world regions under the scenario assuming a TFR of 1.7 and a life expectancy ceiling of 120 years.

4 Discussion

We can conclude that despite the highly speculative nature of this exercise, we can learn some interesting lessons in terms of long term population dynamics. We began by saying that the primary purpose was a sensitivity analysis, and in this sense it indeed turned out to be a worthwhile exercise. Similar to the UN long range projections, our scenarios have illustrated the great sensitivity of long run population size to very small differences in the assumed levels of fertility. Unlike the UN, which did not assume alternative mortality paths, we confirmed the significant role played by alternative assumptions about the limits to human life expectancy, not only on future population size but in particular on the future levels of population ageing.

Do these results imply anything about the most likely world population size in 2300? As discussed above, this is pure guess work. But if we were asked to give our guess as of today, we would say that a world of 2-4 billion people in 2300 is entirely possible and probably desirable. According to several criteria, a long term fertility level of 1.7 could be seen as desirable because it results in only modest discontinuities in terms of population ageing. At the same time, it leads to longer term population shrinking that is desirable from an environmental perspective, and results in a population size of between 2.4 and 3.5 billion in 2300, depending on the assumed mortality paths. If the future would follow this path, these 2-4 billion people would likely be well educated, healthy and wealthy due to the already massive ongoing improvements in educational levels. They would also have a good chance of living on a rather habitable planet, provided that not too much will have been destroyed in the meantime.

Although this is all highly speculative, this set of alternative scenarios can contribute to at least illustrating the feasibility of such a benign future. We have shown that entirely plausible paths based on an overall TFR of 1.7 would lead to such lower world population size in the long term future. This should come as highly welcome news to the environmental change research community, where numerous ecologists stress that around three billion people would be a sustainable population size for our planet. And even better, the world population size of 2-4 billion would not be reached through massive increases in mortality as predicted by pessimistic ecologists, but rather through a continuation of the already ongoing process of universal demographic transition, which does not stop at the population replacement level, but continues to fall to a lower level almost everywhere, particularly if women are becoming better educated.

But this development is not yet guaranteed for all parts of the world. In a number of African countries, the fertility decline has recently stalled due to discontinued family planning programs and actual declines in female school enrolment. Major new efforts for universal primary and broadly based secondary education have recently been shown to produce the boost in economic growth necessary to bring countries out of poverty (Lutz et al. 2008a). These investments will have a great payoff in the longer run in terms of fostering fertility decline in Africa and curbing its currently destructive speed of population growth, improving the health status of the population, and helping to manage the planet's environmental problems through a lower and sustainable total population size.

While in the long run, the global population is likely to decline, and there is hope that this will result in a better and more sustainable development around the world, in the meantime, there may still be a lot of population growth associated with poverty and human suffering, particularly in Africa. This will pose a formidable challenge to humanity and development efforts over the coming decades.

5 References

Ahlburg, D.A. and W. Lutz. 1999. Introduction: The need to rethink approaches to population forecasts. Pages 1-14 in W. Lutz, J.W. Vaupel, and D.A. Ahlburg (eds.), *Frontiers of Population Forecasting*. A Supplement to Vol. 24, 1998, *Population and Development Review*. New York: The Population Council.

Carnes, B. and S.J. Olshansky. 2007. A realistic view of aging, mortality and future longevity. *Population Development Review* 33: 367-381.

Keyfitz, N. 1981. The limits of population forecasting. *Population and Development Review* 7(4): 579-593.

Lutz, W. 2006. Alternative paths for future European fertility: Will the birth rate recover or continue to decline? Pages 83-100 in W. Lutz, R. Richter, and C. Wilson (eds.), *The New Generations of Europeans. Demography and Families in the Enlarged European Union.* London: Earthscan.

Lutz, W. and J. Goldstein, Guest Editors. 2004. Special issue on "How to deal with uncertainty in population forecasting?" *International Statistical Review* 72(1&2): 1-106, 157-208.

Lutz, W. and Q. Ren. 2002. Determinants of human population growth. *Phil. Trans. R. Soc. Lond*. B 357:1197-1210.

Lutz, W. and W. Sanderson. 2005. Toward a concept of population balance considering age-structure, human capital, and intergenerational equity. Pages 119-137 in S. Tuljapurkar, I. Pool, V. Prachubmoah, (eds.), *Population, Resources and Development. Riding the Age Waves, Vol. 1.* International Studies in Population, Vol. 1. Dordrecht, the Netherlands: Springer.

Lutz, W., J. Crespo Cuaresma, and W. Sanderson. 2008a. The demography of educational attainment and economic growth. *Science* 319: 1047-1048.

Lutz, W., J.R. Goldstein, and C. Prinz. 1996. Alternative approaches to population projection. Pages 14-44 in W. Lutz (ed.), *The Future Population of the World. What can we assume today?* London: Earthscan.

Lutz, W., A. Goujon, S. K.C., and W. Sanderson. 2007. Reconstruction of population by age, sex and level of educational attainment of 120 countries for 1970-2000. *Vienna Yearbook of Population Research 2007*, pp. 193-235.

Lutz, W., W. Sanderson, and S. Scherbov. 1997. Doubling of world population unlikely. *Nature* 387: 803-805.

Lutz, W., W. Sanderson, and S. Scherbov. 2001. The end of world population growth. *Nature* 412: 543-545.

Lutz, W., W.C. Sanderson, and S. Scherbov, Eds. 2004. *The End of World Population Growth in the 21st Century: New Challenges for Human Capital Formation and Sustainable Development*. London: Earthscan.

Lutz, W., W. Sanderson, and S. Scherbov. 2008b. The coming acceleration of global population ageing. *Nature* 451: 716-719.

Manton, K.G. 1991. New biotechnologies and the limits to life expectancy. Pages 97-116 in W. Lutz (ed.), *Future Demographic Trends in Europe and North America. What Can We Assume Today?* New York: Academic Press.

Meadows, D.H., D.L. Meadows, J. Randers, and W.W. Behrens III. 1972. *The Limits to Growth.* New York: Universe Books.

Nakićenović, N. et al. 2000. *Emissions Scenarios*. A Special Report of Working Group III of the Intergovernmental Panel on Climate Change. Cambridge, UK: Cambridge University Press.

National Research Council. 2000. *Beyond Six Billion: Forecasting the World's Population*. Panel on Population Projections. J. Bongaarts and R.A. Bulatao (eds.). Committee on Population, Commission on Behavioral and Social Sciences and Education. Washington, D.C.: National Academy Press.

Oeppen, J. and J. Vaupel. 2002. Broken limits to life expectancy. *Science* 296: 1029-1031.

UN. 2004. *World Population to 2300*. New York: United Nations.

Wilson, C. 2004. Fertility below replacement level. *Science* 5668: 207-209.

Appendix

The following Tables give the results for all scenarios at the level of major world regions. The scenarios were calculated on the basis of the original 13 IIASA world regions which were defined in the context of the IPCC Scenarios (Nakićenović et al. 2000). Data on several more indicators as well as for single years of age and single years of time are available upon request.

North Africa, Total Population (millions)

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LE=90	173.30	207.70	307.10	337.10	315.60	274.50	238.50	207.10
TFR= 1, LE=90	173.30	207.70	307.10	324.40	199.60	62.49	17.79	5.09
TFR= 1.5, LE=90	173.30	207.70	307.10	331.50	257.80	151.60	86.96	49.95
TFR= 1.7, LE=90	173.30	207.70	307.10	334.30	285.40	206.00	147.10	105.10
TFR= 2, LE=90	173.30	207.70	307.10	338.60	331.80	314.80	299.40	284.60
TFR= 2.5, LE=90	173.30	207.70	307.10	345.70	423.10	591.40	836.50	1182.00
TFR=IIASA, LE=120	173.30	207.70	307.10	337.10	335.00	330.20	321.10	289.50
TFR= 1, LE=120	173.30	207.70	307.10	324.40	218.70	92.81	35.39	11.04
TFR= 1.5, LE=120	173.30	207.70	307.10	331.50	277.10	195.60	132.80	80.43
TFR= 1.7, LE=120	173.30	207.70	307.10	334.30	304.70	255.80	209.60	156.50
TFR= 2, LE=120	173.30	207.70	307.10	338.60	351.20	373.60	393.70	387.40
TFR= 2.5, LE=120	173.30	207.70	307.10	345.70	442.70	666.40	1007.00	1458.00

Sub Saharan Africa, Total Population (millions)

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LE=90	611.20	799.40	1617.00	2166.00	1982.00	1739.00	1406.00	1106.00
TFR= 1, LE=90	611.20	799.40	1617.00	2074.00	1216.00	428.30	124.10	34.39
TFR= 1.5, LE=90	611.20	799.40	1617.00	2132.00	1656.00	1082.00	634.00	359.20
TFR= 1.7, LE=90	611.20	799.40	1617.00	2155.00	1868.00	1492.00	1091.00	773.60
TFR= 2, LE=90	611.20	799.40	1617.00	2189.00	2226.00	2327.00	2272.00	2165.00
TFR= 2.5, LE=90	611.20	799.40	1617.00	2247.00	2943.00	4505.00	6591.00	9467.00
TFR=IIASA, LE=120	611.20	799.40	1617.00	2166.00	1982.00	1752.00	1589.00	1424.00
TFR= 1, LE=120	611.20	799.40	1617.00	2074.00	1216.00	435.10	159.80	58.96
TFR= 1.5, LE=120	611.20	799.40	1617.00	2132.00	1656.00	1093.00	742.40	500.00
TFR= 1.7, LE=120	611.20	799.40	1617.00	2155.00	1868.00	1505.00	1245.00	1019.00
TFR= 2, LE=120	611.20	799.40	1617.00	2189.00	2226.00	2342.00	2520.00	2677.00
TFR= 2.5, LE=120	611.20	799.40	1617.00	2247.00	2943.00	4525.00	7075.00	10910.00

North America, Total Population (millions)

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LE=90	313.70	338.70	427.10	438.00	410.10	390.90	372.50	354.90
TFR= 1, LE=90	313.70	338.70	427.10	420.80	243.20	72.16	19.10	5.08
TFR= 1.5, LE=90	313.70	338.70	427.10	429.40	315.70	181.30	100.90	56.22
TFR= 1.7, LE=90	313.70	338.70	427.10	432.80	350.60	250.20	175.70	123.50
TFR= 2, LE=90	313.70	338.70	427.10	438.00	410.10	390.90	372.50	354.90
TFR= 2.5, LE=90	313.70	338.70	427.10	446.60	529.40	761.80	1109.00	1614.00
TFR=IIASA, LE=120	313.70	338.70	427.10	468.40	490.80	511.80	500.80	478.00
TFR= 1, LE=120	313.70	338.70	427.10	451.20	323.60	151.10	42.67	11.37
TFR= 1.5, LE=120	313.70	338.70	427.10	459.80	396.20	280.80	163.00	90.94
TFR= 1.7, LE=120	313.70	338.70	427.10	463.30	431.20	358.00	260.50	183.30

TFR= 2, LE=120	313.70	338.70	427.10	468.40	490.80	511.80	500.80	478.00
TFR= 2.5, LE=120	313.70	338.70	427.10	477.10	610.40	905.60	1340.00	1954.00

Latin America, Total Population (millions)

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LE=90	515.30	595.40	833.50	948.10	942.80	896.50	851.00	807.80
TFR= 1, LE=90	515.30	595.40	833.50	908.50	558.80	164.50	42.87	11.22
TFR= 1.5, LE=90	515.30	595.40	833.50	928.30	725.20	414.40	228.50	126.10
TFR= 1.7, LE=90	515.30	595.40	833.50	936.30	805.70	572.40	399.30	278.70
TFR= 2, LE=90	515.30	595.40	833.50	948.10	942.80	896.50	851.00	807.80
TFR= 2.5, LE=90	515.30	595.40	833.50	968.00	1219.00	1755.00	2556.00	3721.00
TFR=IIASA, LE=120	515.30	595.40	833.50	956.70	1036.00	1101.00	1136.00	1098.00
TFR= 1, LE=120	515.30	595.40	833.50	917.00	650.50	278.80	92.60	25.35
TFR= 1.5, LE=120	515.30	595.40	833.50	936.80	817.50	572.00	362.90	206.00
TFR= 1.7, LE=120	515.30	595.40	833.50	944.80	898.30	748.30	584.70	417.80
TFR= 2, LE=120	515.30	595.40	833.50	956.70	1036.00	1101.00	1136.00	1098.00
TFR= 2.5, LE=120	515.30	595.40	833.50	976.50	1313.00	2013.00	3085.00	4550.00

Central Asia, Total Population (millions)

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LE=90	55.88	65.28	96.02	104.10	89.34	69.82	54.35	42.29
TFR= 1, LE=90	55.88	65.28	96.02	100.70	58.88	17.17	4.49	1.18
TFR= 1.5, LE=90	55.88	65.28	96.02	102.80	76.36	43.35	23.98	13.27
TFR= 1.7, LE=90	55.88	65.28	96.02	103.70	84.79	59.87	41.86	29.26
TFR= 2, LE=90	55.88	65.28	96.02	105.00	99.13	93.66	88.94	84.42
TFR= 2.5, LE=90	55.88	65.28	96.02	107.10	127.90	182.60	265.00	384.50
TFR=IIASA, LE=120	55.88	65.28	96.02	104.50	97.29	87.07	75.78	61.11
TFR= 1, LE=120	55.88	65.28	96.02	101.10	66.73	27.45	9.37	2.65
TFR= 1.5, LE=120	55.88	65.28	96.02	103.20	84.26	57.88	37.31	21.64
TFR= 1.7, LE=120	55.88	65.28	96.02	104.10	92.72	76.20	60.29	43.82
TFR= 2, LE=120	55.88	65.28	96.02	105.40	107.10	112.80	117.40	114.80
TFR= 2.5, LE=120	55.88	65.28	96.02	107.50	136.00	207.00	317.90	470.50

Middle East, Total Population (millions)

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LE=90	172.10	214.50	358.60	405.20	341.50	270.90	214.90	170.40
TFR= 1, LE=90	172.10	214.50	358.60	392.10	227.50	71.63	20.75	6.05
TFR= 1.5, LE=90	172.10	214.50	358.60	400.30	293.60	172.90	100.10	57.97
TFR= 1.7, LE=90	172.10	214.50	358.60	403.60	324.80	234.50	168.40	121.00
TFR= 2, LE=90	172.10	214.50	358.60	408.50	377.10	356.90	340.00	323.70
TFR= 2.5, LE=90	172.10	214.50	358.60	416.70	479.80	665.90	937.70	1320.00
TFR=IIASA, LE=120	172.10	214.50	358.60	405.90	380.00	344.30	305.30	245.00
TFR= 1, LE=120	172.10	214.50	358.60	392.70	265.50	116.10	43.73	13.01
TFR= 1.5, LE=120	172.10	214.50	358.60	400.90	331.80	235.10	158.40	93.05
TFR= 1.7, LE=120	172.10	214.50	358.60	404.20	363.20	304.00	247.10	179.80
TFR= 2, LE=120	172.10	214.50	358.60	409.10	415.70	438.00	457.30	440.30
TFR= 2.5, LE=120	172.10	214.50	358.60	417.30	518.80	767.60	1146.00	1627.00

South Asia, Total Population (millions)

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LE=90	1367.00	1625.00	2289.00	2057.00	1366.00	741.20	398.10	213.70
TFR= 1, LE=90	1367.00	1625.00	2289.00	2016.00	1052.00	283.70	69.74	17.16

TFR= 1.5, LE=90	1367.00	1625.00	2289.00	2057.00	1366.00	741.20	398.10	213.70
TFR= 1.7, LE=90	1367.00	1625.00	2289.00	2074.00	1520.00	1038.00	712.30	488.40
TFR= 2, LE=90	1367.00	1625.00	2289.00	2099.00	1786.00	1659.00	1569.00	1482.00
TFR= 2.5, LE=90	1367.00	1625.00	2289.00	2140.00	2329.00	3349.00	4946.00	7297.00
TFR=IIASA, LE=120	1367.00	1625.00	2289.00	2057.00	1388.00	892.50	574.40	351.10
TFR= 1, LE=120	1367.00	1625.00	2289.00	2016.00	1073.00	381.60	128.50	39.60
TFR= 1.5, LE=120	1367.00	1625.00	2289.00	2057.00	1388.00	892.50	574.40	351.10
TFR= 1.7, LE=120	1367.00	1625.00	2289.00	2074.00	1542.00	1212.00	963.70	733.80
TFR= 2, LE=120	1367.00	1625.00	2289.00	2099.00	1808.00	1869.00	1972.00	2013.00
TFR= 2.5, LE=120	1367.00	1625.00	2289.00	2140.00	2351.00	3628.00	5743.00	8889.00

China & CPA, Total Population (millions)

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LE=90	1408.00	1468.00	1342.00	850.20	573.70	396.10	273.00	188.10
TFR= 1, LE=90	1408.00	1468.00	1342.00	829.40	398.00	109.60	26.93	6.63
TFR= 1.5, LE=90	1408.00	1468.00	1342.00	844.20	516.20	284.00	153.30	82.76
TFR= 1.7, LE=90	1408.00	1468.00	1342.00	850.20	573.70	396.10	273.00	188.10
TFR= 2, LE=90	1408.00	1468.00	1342.00	859.10	672.10	628.20	595.40	564.20
TFR= 2.5, LE=90	1408.00	1468.00	1342.00	874.00	871.10	1250.00	1839.00	2706.00
TFR=IIASA, LE=120	1408.00	1468.00	1342.00	857.10	644.40	516.60	401.00	283.30
TFR= 1, LE=120	1408.00	1468.00	1342.00	836.20	468.10	186.50	59.82	15.44
TFR= 1.5, LE=120	1408.00	1468.00	1342.00	851.10	586.70	391.60	245.30	136.40
TFR= 1.7, LE=120	1408.00	1468.00	1342.00	857.10	644.40	516.60	401.00	283.30
TFR= 2, LE=120	1408.00	1468.00	1342.00	866.00	743.20	769.10	794.50	767.50
TFR= 2.5, LE=120	1408.00	1468.00	1342.00	880.90	942.90	1428.00	2214.00	3301.00

Pacific Asia, Total Population (millions)

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LE=90	476.40	541.70	699.20	665.20	482.30	303.80	191.00	120.10
TFR= 1, LE=90	476.40	541.70	699.20	649.10	353.90	102.70	27.46	7.37
TFR= 1.5, LE=90	476.40	541.70	699.20	662.50	457.90	258.10	144.10	80.49
TFR= 1.7, LE=90	476.40	541.70	699.20	667.90	508.00	355.70	250.00	175.70
TFR= 2, LE=90	476.40	541.70	699.20	675.90	593.10	554.60	526.70	499.90
TFR= 2.5, LE=90	476.40	541.70	699.20	689.20	763.20	1075.00	1550.00	2233.00
TFR=IIASA, LE=120	476.40	541.70	699.20	665.20	527.00	391.20	285.70	186.90
TFR= 1, LE=120	476.40	541.70	699.20	649.10	398.20	159.40	57.14	16.45
TFR= 1.5, LE=120	476.40	541.70	699.20	662.50	502.60	340.20	224.40	130.90
TFR= 1.7, LE=120	476.40	541.70	699.20	667.90	552.80	448.50	360.70	262.90
TFR= 2, LE=120	476.40	541.70	699.20	675.90	638.10	664.20	696.70	680.30
TFR= 2.5, LE=120	476.40	541.70	699.20	689.20	808.80	1216.00	1865.00	2740.00

Pacific OECD, Total Population (millions)

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LE=90	149.90	151.60	136.50	86.96	55.07	35.78	23.24	15.10
TFR= 1, LE=90	149.90	151.60	136.50	85.14	40.53	12.56	3.62	1.05
TFR= 1.5, LE=90	149.90	151.60	136.50	86.66	52.35	30.61	17.77	10.33
TFR= 1.7, LE=90	149.90	151.60	136.50	87.27	57.91	41.59	30.01	21.65
TFR= 2, LE=90	149.90	151.60	136.50	88.18	67.19	63.39	60.67	58.03
TFR= 2.5, LE=90	149.90	151.60	136.50	89.70	85.28	118.10	166.90	235.50
TFR=IIASA, LE=120	149.90	151.60	136.50	100.00	73.67	53.59	35.43	23.05
TFR= 1, LE=120	149.90	151.60	136.50	98.22	59.10	26.23	7.78	2.25
TFR= 1.5, LE=120	149.90	151.60	136.50	99.74	70.94	47.72	28.26	16.44

TFR= 1.7, LE=120	149.90	151.60	136.50	100.30	76.51	60.10	44.08	31.85
TFR= 2, LE=120	149.90	151.60	136.50	101.30	85.81	84.04	81.43	78.05
TFR= 2.5, LE=120	149.90	151.60	136.50	102.80	103.90	142.40	202.90	286.90

Western Europe, Total Population (millions)

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LE=90	455.60	462.30	448.50	328.00	228.30	162.60	115.80	82.40
TFR= 1, LE=90	455.60	462.30	448.50	319.80	159.20	47.88	13.20	3.66
TFR= 1.5, LE=90	455.60	462.30	448.50	325.60	206.00	118.70	67.48	38.37
TFR= 1.7, LE=90	455.60	462.30	448.50	328.00	228.30	162.60	115.80	82.40
TFR= 2, LE=90	455.60	462.30	448.50	331.50	266.00	251.10	239.80	228.80
TFR= 2.5, LE=90	455.60	462.30	448.50	337.40	340.40	478.70	686.20	982.90
TFR=IIASA, LE=120	455.60	462.30	448.50	354.90	286.00	230.80	170.90	121.80
TFR= 1, LE=120	455.60	462.30	448.50	346.60	216.60	96.99	28.93	8.02
TFR= 1.5, LE=120	455.60	462.30	448.50	352.50	263.60	181.30	108.10	61.59
TFR= 1.7, LE=120	455.60	462.30	448.50	354.90	286.00	230.80	170.90	121.80
TFR= 2, LE=120	455.60	462.30	448.50	358.40	323.70	327.80	322.30	308.20
TFR= 2.5, LE=120	455.60	462.30	448.50	364.30	398.30	570.20	832.40	1195.00

Eastern Europe, Total Population (millions)

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LE=90	121.20	119.50	93.72	55.67	37.26	25.69	17.68	12.17
TFR= 1, LE=90	121.20	119.50	93.72	54.33	25.81	7.06	1.73	0.43
TFR= 1.5, LE=90	121.20	119.50	93.72	55.29	33.50	18.37	9.89	5.33
TFR= 1.7, LE=90	121.20	119.50	93.72	55.67	37.26	25.69	17.68	12.17
TFR= 2, LE=90	121.20	119.50	93.72	56.25	43.72	40.92	38.82	36.82
TFR= 2.5, LE=90	121.20	119.50	93.72	57.21	56.86	82.13	121.50	179.80
TFR=IIASA, LE=120	121.20	119.50	93.72	57.96	43.94	34.93	26.30	18.29
TFR= 1, LE=120	121.20	119.50	93.72	56.61	32.44	13.30	3.96	0.99
TFR= 1.5, LE=120	121.20	119.50	93.72	57.57	40.16	26.73	16.09	8.77
TFR= 1.7, LE=120	121.20	119.50	93.72	57.96	43.94	34.93	26.30	18.29
TFR= 2, LE=120	121.20	119.50	93.72	58.53	50.43	51.56	52.21	49.96
TFR= 2.5, LE=120	121.20	119.50	93.72	59.50	63.62	95.32	146.70	218.50

Former Soviet Union, Total Population (millions)

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LE=90	235.60	227.60	168.70	106.80	89.51	76.81	65.42	55.69
TFR= 1, LE=90	235.60	227.60	168.70	103.20	55.17	14.99	3.49	0.82
TFR= 1.5, LE=90	235.60	227.60	168.70	105.20	71.94	39.55	20.80	10.94
TFR= 1.7, LE=90	235.60	227.60	168.70	106.00	80.23	55.66	37.76	25.61
TFR= 2, LE=90	235.60	227.60	168.70	107.20	94.54	89.64	84.82	80.22
TFR= 2.5, LE=90	235.60	227.60	168.70	109.20	123.90	183.40	275.20	412.60
TFR=IIASA, LE=120	235.60	227.60	168.70	108.90	97.65	94.39	88.13	78.17
TFR= 1, LE=120	235.60	227.60	168.70	105.30	63.18	25.18	7.48	1.94
TFR= 1.5, LE=120	235.60	227.60	168.70	107.30	80.02	53.67	32.49	18.18
TFR= 1.7, LE=120	235.60	227.60	168.70	108.10	88.34	71.47	54.32	38.74
TFR= 2, LE=120	235.60	227.60	168.70	109.30	102.70	108.10	111.20	109.10
TFR= 2.5, LE=120	235.60	227.60	168.70	111.30	132.20	206.90	326.60	501.40

World, Total Population (millions)

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LE=90	6055.00	6816.00	8816.00	8549.00	6913.00	5383.00	4222.00	3376.00

TFR= 1, LE=90	6055.00	6816.00	8816.00	8278.00	4589.00	1395.00	375.30	100.10
TFR= 1.5, LE=90	6055.00	6816.00	8816.00	8461.00	6029.00	3536.00	1986.00	1105.00
TFR= 1.7, LE=90	6055.00	6816.00	8816.00	8534.00	6725.00	4891.00	3460.00	2425.00
TFR= 2, LE=90	6055.00	6816.00	8816.00	8644.00	7910.00	7666.00	7339.00	6971.00
TFR= 2.5, LE=90	6055.00	6816.00	8816.00	8827.00	10290.00	15000.00	21880.00	31730.00
TFR=IIASA, LE=120	6055.00	6816.00	8816.00	8640.00	7381.00	6341.00	5509.00	4658.00
TFR= 1, LE=120	6055.00	6816.00	8816.00	8369.00	5052.00	1991.00	677.20	207.10
TFR= 1.5, LE=120	6055.00	6816.00	8816.00	8552.00	6495.00	4368.00	2826.00	1715.00
TFR= 1.7, LE=120	6055.00	6816.00	8816.00	8625.00	7192.00	5822.00	4628.00	3491.00
TFR= 2, LE=120	6055.00	6816.00	8816.00	8735.00	8379.00	8754.00	9156.00	9201.00
TFR= 2.5, LE=120	6055.00	6816.00	8816.00	8919.00	10760.00	16370.00	25300.00	38100.00

North Africa, Proportion 60+

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.06	0.07	0.19	0.32	0.36	0.37	0.37	0.37
TFR= 1, LEMAX=90	0.06	0.07	0.19	0.33	0.57	0.60	0.60	0.60
TFR= 1.5, LEMAX=90	0.06	0.07	0.19	0.32	0.44	0.45	0.45	0.45
TFR= 1.7, LEMAX=90	0.06	0.07	0.19	0.32	0.40	0.41	0.41	0.41
TFR= 2, LEMAX=90	0.06	0.07	0.19	0.32	0.35	0.35	0.35	0.35
TFR= 2.5, LEMAX=90	0.06	0.07	0.19	0.31	0.27	0.27	0.27	0.27
TFR=IIASA, LEMAX=120	0.06	0.07	0.19	0.32	0.40	0.47	0.52	0.54
TFR= 1, LEMAX=120	0.06	0.07	0.19	0.33	0.61	0.73	0.80	0.81
TFR= 1.5, LEMAX=120	0.06	0.07	0.19	0.32	0.48	0.57	0.64	0.65
TFR= 1.7, LEMAX=120	0.06	0.07	0.19	0.32	0.44	0.52	0.58	0.59
TFR= 2, LEMAX=120	0.06	0.07	0.19	0.32	0.38	0.44	0.49	0.51
TFR= 2.5, LEMAX=120	0.06	0.07	0.19	0.31	0.31	0.34	0.38	0.39

Sub Saharan Africa, Proportion 60+

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.05	0.04	0.06	0.19	0.30	0.37	0.39	0.39
TFR= 1, LEMAX=90	0.05	0.04	0.06	0.20	0.49	0.59	0.61	0.61
TFR= 1.5, LEMAX=90	0.05	0.04	0.06	0.20	0.36	0.44	0.46	0.46
TFR= 1.7, LEMAX=90	0.05	0.04	0.06	0.19	0.32	0.39	0.41	0.41
TFR= 2, LEMAX=90	0.05	0.04	0.06	0.19	0.27	0.33	0.35	0.35
TFR= 2.5, LEMAX=90	0.05	0.04	0.06	0.19	0.21	0.25	0.26	0.27
TFR=IIASA, LEMAX=120	0.05	0.04	0.06	0.19	0.30	0.37	0.45	0.52
TFR= 1, LEMAX=120	0.05	0.04	0.06	0.20	0.49	0.59	0.69	0.77
TFR= 1.5, LEMAX=120	0.05	0.04	0.06	0.20	0.36	0.44	0.53	0.61
TFR= 1.7, LEMAX=120	0.05	0.04	0.06	0.19	0.32	0.40	0.48	0.55
TFR= 2, LEMAX=120	0.05	0.04	0.06	0.19	0.27	0.34	0.41	0.47
TFR= 2.5, LEMAX=120	0.05	0.04	0.06	0.19	0.21	0.26	0.31	0.36

North America, Proportion 60+

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.16	0.18	0.29	0.35	0.34	0.34	0.34	0.34
TFR= 1, LEMAX=90	0.16	0.18	0.29	0.37	0.57	0.61	0.61	0.61
TFR= 1.5, LEMAX=90	0.16	0.18	0.29	0.36	0.44	0.46	0.46	0.46
TFR= 1.7, LEMAX=90	0.16	0.18	0.29	0.36	0.40	0.41	0.41	0.41
TFR= 2, LEMAX=90	0.16	0.18	0.29	0.35	0.34	0.34	0.34	0.34
TFR= 2.5, LEMAX=90	0.16	0.18	0.29	0.35	0.27	0.26	0.26	0.26
TFR=IIASA, LEMAX=120	0.16	0.18	0.29	0.40	0.45	0.50	0.51	0.51
TFR= 1, LEMAX=120	0.16	0.18	0.29	0.41	0.68	0.81	0.83	0.83

TFR= 1.5, LEMAX=120	0.16	0.18	0.29	0.40	0.56	0.65	0.66	0.66
TFR= 1.7, LEMAX=120	0.16	0.18	0.29	0.40	0.51	0.59	0.60	0.60
TFR= 2, LEMAX=120	0.16	0.18	0.29	0.40	0.45	0.50	0.51	0.51
TFR= 2.5, LEMAX=120	0.16	0.18	0.29	0.39	0.36	0.38	0.39	0.39

Latin America, Proportion 60+								
	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.08	0.09	0.22	0.32	0.35	0.35	0.35	0.35
TFR= 1, LEMAX=90	0.08	0.09	0.22	0.33	0.57	0.62	0.62	0.62
TFR= 1.5, LEMAX=90	0.08	0.09	0.22	0.33	0.45	0.46	0.46	0.46
TFR= 1.7, LEMAX=90	0.08	0.09	0.22	0.32	0.40	0.41	0.41	0.41
TFR= 2, LEMAX=90	0.08	0.09	0.22	0.32	0.35	0.35	0.35	0.35
TFR= 2.5, LEMAX=90	0.08	0.09	0.22	0.31	0.27	0.26	0.26	0.26
TFR=IIASA, LEMAX=120	0.08	0.09	0.22	0.32	0.40	0.46	0.50	0.51
TFR= 1, LEMAX=120	0.08	0.09	0.22	0.34	0.63	0.77	0.82	0.83
TFR= 1.5, LEMAX=120	0.08	0.09	0.22	0.33	0.51	0.61	0.66	0.66
TFR= 1.7, LEMAX=120	0.08	0.09	0.22	0.33	0.46	0.55	0.59	0.60
TFR= 2, LEMAX=120	0.08	0.09	0.22	0.32	0.40	0.46	0.50	0.51
TFR= 2.5, LEMAX=120	0.08	0.09	0.22	0.32	0.32	0.35	0.38	0.38

Central Asia, Proportion 60+								
	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.08	0.08	0.20	0.33	0.39	0.39	0.39	0.39
TFR= 1, LEMAX=90	0.08	0.08	0.20	0.34	0.58	0.62	0.62	0.62
TFR= 1.5, LEMAX=90	0.08	0.08	0.20	0.34	0.45	0.46	0.46	0.46
TFR= 1.7, LEMAX=90	0.08	0.08	0.20	0.33	0.41	0.41	0.41	0.41
TFR= 2, LEMAX=90	0.08	0.08	0.20	0.33	0.35	0.35	0.35	0.35
TFR= 2.5, LEMAX=90	0.08	0.08	0.20	0.32	0.27	0.26	0.26	0.26
TFR=IIASA, LEMAX=120	0.08	0.08	0.20	0.34	0.43	0.50	0.55	0.57
TFR= 1, LEMAX=120	0.08	0.08	0.20	0.35	0.63	0.76	0.81	0.83
TFR= 1.5, LEMAX=120	0.08	0.08	0.20	0.34	0.50	0.59	0.65	0.66
TFR= 1.7, LEMAX=120	0.08	0.08	0.20	0.34	0.46	0.53	0.59	0.60
TFR= 2, LEMAX=120	0.08	0.08	0.20	0.33	0.40	0.45	0.50	0.51
TFR= 2.5, LEMAX=120	0.08	0.08	0.20	0.33	0.31	0.34	0.38	0.39

Middle East, Proportion 60+								
	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.06	0.06	0.18	0.35	0.38	0.38	0.38	0.38
TFR= 1, LEMAX=90	0.06	0.06	0.18	0.36	0.57	0.60	0.60	0.60
TFR= 1.5, LEMAX=90	0.06	0.06	0.18	0.35	0.44	0.45	0.45	0.45
TFR= 1.7, LEMAX=90	0.06	0.06	0.18	0.35	0.40	0.41	0.41	0.41
TFR= 2, LEMAX=90	0.06	0.06	0.18	0.34	0.35	0.35	0.35	0.35
TFR= 2.5, LEMAX=90	0.06	0.06	0.18	0.34	0.28	0.27	0.27	0.27
TFR=IIASA, LEMAX=120	0.06	0.06	0.18	0.35	0.44	0.51	0.56	0.56
TFR= 1, LEMAX=120	0.06	0.06	0.18	0.36	0.63	0.75	0.81	0.81
TFR= 1.5, LEMAX=120	0.06	0.06	0.18	0.35	0.51	0.59	0.65	0.65
TFR= 1.7, LEMAX=120	0.06	0.06	0.18	0.35	0.46	0.54	0.59	0.59
TFR= 2, LEMAX=120	0.06	0.06	0.18	0.35	0.41	0.46	0.51	0.51
TFR= 2.5, LEMAX=120	0.06	0.06	0.18	0.34	0.33	0.36	0.39	0.39

South Asia, Proportion 60+								
	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.07	0.08	0.17	0.34	0.46	0.47	0.47	0.47
TFR= 1, LEMAX=90	0.07	0.08	0.17	0.35	0.60	0.63	0.63	0.63
TFR= 1.5, LEMAX=90	0.07	0.08	0.17	0.34	0.46	0.47	0.47	0.47
TFR= 1.7, LEMAX=90	0.07	0.08	0.17	0.34	0.42	0.42	0.42	0.42
TFR= 2, LEMAX=90	0.07	0.08	0.17	0.34	0.36	0.35	0.35	0.35
TFR= 2.5, LEMAX=90	0.07	0.08	0.17	0.33	0.28	0.26	0.26	0.26
TFR=IIASA, LEMAX=120	0.07	0.08	0.17	0.34	0.47	0.56	0.63	0.67
TFR= 1, LEMAX=120	0.07	0.08	0.17	0.35	0.61	0.72	0.80	0.84
TFR= 1.5, LEMAX=120	0.07	0.08	0.17	0.34	0.47	0.56	0.63	0.67
TFR= 1.7, LEMAX=120	0.07	0.08	0.17	0.34	0.43	0.50	0.56	0.60
TFR= 2, LEMAX=120	0.07	0.08	0.17	0.34	0.37	0.42	0.47	0.51
TFR= 2.5, LEMAX=120	0.07	0.08	0.17	0.33	0.28	0.31	0.35	0.38

China & CPA, Proportion 60+								
	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.10	0.12	0.35	0.42	0.41	0.41	0.41	0.41
TFR= 1, LEMAX=90	0.10	0.12	0.35	0.43	0.59	0.63	0.63	0.63
TFR= 1.5, LEMAX=90	0.10	0.12	0.35	0.43	0.46	0.47	0.47	0.47
TFR= 1.7, LEMAX=90	0.10	0.12	0.35	0.42	0.41	0.41	0.41	0.41
TFR= 2, LEMAX=90	0.10	0.12	0.35	0.42	0.35	0.35	0.35	0.35
TFR= 2.5, LEMAX=90	0.10	0.12	0.35	0.41	0.28	0.26	0.26	0.26
TFR=IIASA, LEMAX=120	0.10	0.12	0.35	0.43	0.48	0.55	0.60	0.60
TFR= 1, LEMAX=120	0.10	0.12	0.35	0.44	0.65	0.78	0.83	0.84
TFR= 1.5, LEMAX=120	0.10	0.12	0.35	0.43	0.52	0.61	0.66	0.67
TFR= 1.7, LEMAX=120	0.10	0.12	0.35	0.43	0.48	0.55	0.60	0.60
TFR= 2, LEMAX=120	0.10	0.12	0.35	0.42	0.41	0.46	0.50	0.51
TFR= 2.5, LEMAX=120	0.10	0.12	0.35	0.42	0.33	0.35	0.38	0.38

Pacific Asia, Proportion 60+								
	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.08	0.09	0.23	0.36	0.43	0.43	0.43	0.43
TFR= 1, LEMAX=90	0.08	0.09	0.23	0.37	0.59	0.61	0.61	0.61
TFR= 1.5, LEMAX=90	0.08	0.09	0.23	0.36	0.46	0.46	0.46	0.46
TFR= 1.7, LEMAX=90	0.08	0.09	0.23	0.36	0.41	0.41	0.41	0.41
TFR= 2, LEMAX=90	0.08	0.09	0.23	0.35	0.36	0.35	0.35	0.35
TFR= 2.5, LEMAX=90	0.08	0.09	0.23	0.34	0.28	0.26	0.26	0.26
TFR=IIASA, LEMAX=120	0.08	0.09	0.23	0.36	0.48	0.56	0.62	0.63
TFR= 1, LEMAX=120	0.08	0.09	0.23	0.37	0.63	0.75	0.81	0.82
TFR= 1.5, LEMAX=120	0.08	0.09	0.23	0.36	0.50	0.59	0.65	0.66
TFR= 1.7, LEMAX=120	0.08	0.09	0.23	0.36	0.46	0.53	0.59	0.60
TFR= 2, LEMAX=120	0.08	0.09	0.23	0.35	0.40	0.45	0.50	0.51
TFR= 2.5, LEMAX=120	0.08	0.09	0.23	0.34	0.32	0.34	0.38	0.39

Pacific OECD, Proportion 60+								
	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.22	0.27	0.43	0.44	0.43	0.43	0.42	0.42
TFR= 1, LEMAX=90	0.22	0.27	0.43	0.45	0.57	0.59	0.59	0.59
TFR= 1.5, LEMAX=90	0.22	0.27	0.43	0.44	0.45	0.45	0.45	0.45
TFR= 1.7, LEMAX=90	0.22	0.27	0.43	0.44	0.41	0.40	0.40	0.40
TFR= 2, LEMAX=90	0.22	0.27	0.43	0.43	0.35	0.34	0.34	0.34

TFR= 2.5, LEMAX=90	0.22	0.27	0.43	0.43	0.28	0.27	0.27	0.27
TFR=IIASA, LEMAX=120	0.22	0.27	0.43	0.51	0.57	0.61	0.62	0.62
TFR= 1, LEMAX=120	0.22	0.27	0.43	0.52	0.71	0.81	0.81	0.81
TFR= 1.5, LEMAX=120	0.22	0.27	0.43	0.51	0.59	0.65	0.65	0.65
TFR= 1.7, LEMAX=120	0.22	0.27	0.43	0.51	0.55	0.59	0.59	0.59
TFR= 2, LEMAX=120	0.22	0.27	0.43	0.51	0.49	0.50	0.51	0.51
TFR= 2.5, LEMAX=120	0.22	0.27	0.43	0.50	0.41	0.39	0.39	0.39

Western Europe, Proportion 60+

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.20	0.21	0.37	0.42	0.41	0.41	0.41	0.41
TFR= 1, LEMAX=90	0.20	0.21	0.37	0.43	0.58	0.61	0.60	0.60
TFR= 1.5, LEMAX=90	0.20	0.21	0.37	0.42	0.45	0.45	0.45	0.45
TFR= 1.7, LEMAX=90	0.20	0.21	0.37	0.42	0.41	0.41	0.41	0.41
TFR= 2, LEMAX=90	0.20	0.21	0.37	0.41	0.35	0.34	0.34	0.34
TFR= 2.5, LEMAX=90	0.20	0.21	0.37	0.41	0.28	0.26	0.26	0.26
TFR=IIASA, LEMAX=120	0.20	0.21	0.37	0.46	0.52	0.58	0.59	0.60
TFR= 1, LEMAX=120	0.20	0.21	0.37	0.47	0.69	0.80	0.82	0.82
TFR= 1.5, LEMAX=120	0.20	0.21	0.37	0.46	0.57	0.64	0.66	0.66
TFR= 1.7, LEMAX=120	0.20	0.21	0.37	0.46	0.52	0.58	0.59	0.60
TFR= 2, LEMAX=120	0.20	0.21	0.37	0.46	0.46	0.50	0.51	0.51
TFR= 2.5, LEMAX=120	0.20	0.21	0.37	0.45	0.38	0.38	0.39	0.39

Eastern Europe, Proportion 60+

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.18	0.20	0.41	0.43	0.41	0.41	0.41	0.41
TFR= 1, LEMAX=90	0.18	0.20	0.41	0.44	0.59	0.63	0.63	0.63
TFR= 1.5, LEMAX=90	0.18	0.20	0.41	0.43	0.46	0.47	0.47	0.47
TFR= 1.7, LEMAX=90	0.18	0.20	0.41	0.43	0.41	0.41	0.41	0.41
TFR= 2, LEMAX=90	0.18	0.20	0.41	0.42	0.35	0.35	0.35	0.35
TFR= 2.5, LEMAX=90	0.18	0.20	0.41	0.42	0.27	0.26	0.26	0.26
TFR=IIASA, LEMAX=120	0.18	0.20	0.41	0.45	0.50	0.57	0.60	0.60
TFR= 1, LEMAX=120	0.18	0.20	0.41	0.46	0.67	0.80	0.84	0.84
TFR= 1.5, LEMAX=120	0.18	0.20	0.41	0.45	0.55	0.63	0.67	0.67
TFR= 1.7, LEMAX=120	0.18	0.20	0.41	0.45	0.50	0.57	0.60	0.60
TFR= 2, LEMAX=120	0.18	0.20	0.41	0.45	0.44	0.48	0.51	0.51
TFR= 2.5, LEMAX=120	0.18	0.20	0.41	0.44	0.35	0.36	0.38	0.38

Former Soviet Union, Proportion 60+

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.19	0.19	0.40	0.38	0.37	0.37	0.37	0.37
TFR= 1, LEMAX=90	0.19	0.19	0.40	0.39	0.58	0.64	0.64	0.64
TFR= 1.5, LEMAX=90	0.19	0.19	0.40	0.38	0.45	0.47	0.47	0.47
TFR= 1.7, LEMAX=90	0.19	0.19	0.40	0.38	0.41	0.42	0.42	0.42
TFR= 2, LEMAX=90	0.19	0.19	0.40	0.38	0.35	0.35	0.35	0.35
TFR= 2.5, LEMAX=90	0.19	0.19	0.40	0.37	0.27	0.26	0.26	0.26
TFR=IIASA, LEMAX=120	0.19	0.19	0.40	0.39	0.42	0.48	0.52	0.54
TFR= 1, LEMAX=120	0.19	0.19	0.40	0.40	0.64	0.78	0.83	0.85
TFR= 1.5, LEMAX=120	0.19	0.19	0.40	0.40	0.51	0.61	0.66	0.68
TFR= 1.7, LEMAX=120	0.19	0.19	0.40	0.39	0.46	0.54	0.59	0.61
TFR= 2, LEMAX=120	0.19	0.19	0.40	0.39	0.40	0.45	0.49	0.51
TFR= 2.5, LEMAX=120	0.19	0.19	0.40	0.38	0.31	0.33	0.36	0.38

World, Proportion 60+

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.10	0.11	0.22	0.32	0.37	0.39	0.39	0.38
TFR= 1, LEMAX=90	0.10	0.11	0.22	0.33	0.56	0.61	0.61	0.61
TFR= 1.5, LEMAX=90	0.10	0.11	0.22	0.32	0.43	0.46	0.46	0.46
TFR= 1.7, LEMAX=90	0.10	0.11	0.22	0.32	0.39	0.41	0.41	0.41
TFR= 2, LEMAX=90	0.10	0.11	0.22	0.31	0.33	0.34	0.35	0.35
TFR= 2.5, LEMAX=90	0.10	0.11	0.22	0.31	0.26	0.26	0.26	0.26
TFR=IIASA, LEMAX=120	0.10	0.11	0.22	0.32	0.41	0.48	0.52	0.54
TFR= 1, LEMAX=120	0.10	0.11	0.22	0.33	0.60	0.72	0.78	0.81
TFR= 1.5, LEMAX=120	0.10	0.11	0.22	0.33	0.47	0.56	0.62	0.65
TFR= 1.7, LEMAX=120	0.10	0.11	0.22	0.32	0.42	0.50	0.55	0.58
TFR= 2, LEMAX=120	0.10	0.11	0.22	0.32	0.37	0.42	0.47	0.50
TFR= 2.5, LEMAX=120	0.10	0.11	0.22	0.31	0.29	0.32	0.36	0.38

North Africa, Proportion 80+

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.00	0.01	0.02	0.09	0.13	0.14	0.14	0.14
TFR= 1, LEMAX=90	0.00	0.01	0.02	0.10	0.21	0.28	0.28	0.28
TFR= 1.5, LEMAX=90	0.00	0.01	0.02	0.10	0.17	0.18	0.18	0.18
TFR= 1.7, LEMAX=90	0.00	0.01	0.02	0.09	0.15	0.16	0.16	0.16
TFR= 2, LEMAX=90	0.00	0.01	0.02	0.09	0.13	0.13	0.13	0.13
TFR= 2.5, LEMAX=90	0.00	0.01	0.02	0.09	0.10	0.09	0.09	0.09
TFR=IIASA, LEMAX=120	0.00	0.01	0.02	0.09	0.18	0.27	0.34	0.36
TFR= 1, LEMAX=120	0.00	0.01	0.02	0.10	0.27	0.51	0.63	0.66
TFR= 1.5, LEMAX=120	0.00	0.01	0.02	0.10	0.22	0.36	0.45	0.48
TFR= 1.7, LEMAX=120	0.00	0.01	0.02	0.09	0.20	0.31	0.39	0.42
TFR= 2, LEMAX=120	0.00	0.01	0.02	0.09	0.17	0.25	0.32	0.34
TFR= 2.5, LEMAX=120	0.00	0.01	0.02	0.09	0.14	0.18	0.23	0.24

Sub Saharan Africa, Proportion 80+

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.00	0.00	0.00	0.02	0.07	0.13	0.14	0.14
TFR= 1, LEMAX=90	0.00	0.00	0.00	0.02	0.11	0.25	0.27	0.28
TFR= 1.5, LEMAX=90	0.00	0.00	0.00	0.02	0.08	0.16	0.18	0.18
TFR= 1.7, LEMAX=90	0.00	0.00	0.00	0.02	0.07	0.14	0.15	0.15
TFR= 2, LEMAX=90	0.00	0.00	0.00	0.02	0.06	0.11	0.12	0.12
TFR= 2.5, LEMAX=90	0.00	0.00	0.00	0.02	0.05	0.08	0.09	0.09
TFR=IIASA, LEMAX=120	0.00	0.00	0.00	0.02	0.07	0.13	0.23	0.32
TFR= 1, LEMAX=120	0.00	0.00	0.00	0.02	0.11	0.26	0.43	0.57
TFR= 1.5, LEMAX=120	0.00	0.00	0.00	0.02	0.08	0.17	0.29	0.40
TFR= 1.7, LEMAX=120	0.00	0.00	0.00	0.02	0.07	0.14	0.25	0.35
TFR= 2, LEMAX=120	0.00	0.00	0.00	0.02	0.06	0.11	0.20	0.28
TFR= 2.5, LEMAX=120	0.00	0.00	0.00	0.02	0.05	0.08	0.14	0.20

North America, Proportion 80+

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.03	0.03	0.09	0.13	0.12	0.12	0.12	0.12
TFR= 1, LEMAX=90	0.03	0.03	0.09	0.14	0.21	0.29	0.28	0.28
TFR= 1.5, LEMAX=90	0.03	0.03	0.09	0.13	0.16	0.18	0.18	0.18
TFR= 1.7, LEMAX=90	0.03	0.03	0.09	0.13	0.14	0.16	0.16	0.16

TFR= 2, LEMAX=90	0.03	0.03	0.09	0.13	0.12	0.12	0.12	0.12
TFR= 2.5, LEMAX=90	0.03	0.03	0.09	0.13	0.10	0.08	0.08	0.08
TFR=IIASA, LEMAX=120	0.03	0.03	0.09	0.18	0.26	0.32	0.34	0.34
TFR= 1, LEMAX=120	0.03	0.03	0.09	0.19	0.40	0.65	0.67	0.67
TFR= 1.5, LEMAX=120	0.03	0.03	0.09	0.19	0.32	0.47	0.49	0.49
TFR= 1.7, LEMAX=120	0.03	0.03	0.09	0.18	0.30	0.40	0.42	0.42
TFR= 2, LEMAX=120	0.03	0.03	0.09	0.18	0.26	0.32	0.34	0.34
TFR= 2.5, LEMAX=120	0.03	0.03	0.09	0.18	0.21	0.22	0.24	0.24

Latin America, Proportion 80+								
	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.01	0.01	0.04	0.10	0.13	0.13	0.13	0.13
TFR= 1, LEMAX=90	0.01	0.01	0.04	0.11	0.21	0.29	0.29	0.29
TFR= 1.5, LEMAX=90	0.01	0.01	0.04	0.10	0.16	0.19	0.19	0.19
TFR= 1.7, LEMAX=90	0.01	0.01	0.04	0.10	0.15	0.16	0.16	0.16
TFR= 2, LEMAX=90	0.01	0.01	0.04	0.10	0.13	0.13	0.13	0.13
TFR= 2.5, LEMAX=90	0.01	0.01	0.04	0.10	0.10	0.09	0.09	0.09
TFR=IIASA, LEMAX=120	0.01	0.01	0.04	0.11	0.20	0.28	0.33	0.34
TFR= 1, LEMAX=120	0.01	0.01	0.04	0.11	0.31	0.57	0.66	0.68
TFR= 1.5, LEMAX=120	0.01	0.01	0.04	0.11	0.25	0.40	0.48	0.49
TFR= 1.7, LEMAX=120	0.01	0.01	0.04	0.11	0.23	0.35	0.41	0.42
TFR= 2, LEMAX=120	0.01	0.01	0.04	0.11	0.20	0.28	0.33	0.34
TFR= 2.5, LEMAX=120	0.01	0.01	0.04	0.11	0.15	0.19	0.23	0.23

Central Asia, Proportion 80+								
	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.01	0.01	0.03	0.10	0.15	0.15	0.15	0.15
TFR= 1, LEMAX=90	0.01	0.01	0.03	0.11	0.22	0.29	0.29	0.29
TFR= 1.5, LEMAX=90	0.01	0.01	0.03	0.11	0.17	0.19	0.19	0.19
TFR= 1.7, LEMAX=90	0.01	0.01	0.03	0.10	0.15	0.16	0.16	0.16
TFR= 2, LEMAX=90	0.01	0.01	0.03	0.10	0.13	0.13	0.13	0.13
TFR= 2.5, LEMAX=90	0.01	0.01	0.03	0.10	0.10	0.09	0.09	0.09
TFR=IIASA, LEMAX=120	0.01	0.01	0.03	0.11	0.21	0.30	0.37	0.39
TFR= 1, LEMAX=120	0.01	0.01	0.03	0.11	0.31	0.55	0.65	0.67
TFR= 1.5, LEMAX=120	0.01	0.01	0.03	0.11	0.24	0.38	0.47	0.49
TFR= 1.7, LEMAX=120	0.01	0.01	0.03	0.11	0.22	0.33	0.40	0.42
TFR= 2, LEMAX=120	0.01	0.01	0.03	0.11	0.19	0.26	0.32	0.34
TFR= 2.5, LEMAX=120	0.01	0.01	0.03	0.10	0.15	0.18	0.22	0.23

Middle East, Proportion 80+								
	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.01	0.01	0.02	0.12	0.14	0.14	0.14	0.14
TFR= 1, LEMAX=90	0.01	0.01	0.02	0.12	0.22	0.28	0.27	0.27
TFR= 1.5, LEMAX=90	0.01	0.01	0.02	0.12	0.17	0.18	0.18	0.18
TFR= 1.7, LEMAX=90	0.01	0.01	0.02	0.12	0.15	0.16	0.16	0.16
TFR= 2, LEMAX=90	0.01	0.01	0.02	0.12	0.13	0.12	0.13	0.13
TFR= 2.5, LEMAX=90	0.01	0.01	0.02	0.12	0.10	0.09	0.09	0.09
TFR=IIASA, LEMAX=120	0.01	0.01	0.02	0.12	0.22	0.32	0.38	0.39
TFR= 1, LEMAX=120	0.01	0.01	0.02	0.12	0.32	0.55	0.65	0.65
TFR= 1.5, LEMAX=120	0.01	0.01	0.02	0.12	0.26	0.39	0.47	0.47
TFR= 1.7, LEMAX=120	0.01	0.01	0.02	0.12	0.23	0.34	0.41	0.42
TFR= 2, LEMAX=120	0.01	0.01	0.02	0.12	0.20	0.28	0.34	0.34

TFR= 2.5, LEMAX=120	0.01	0.01	0.02	0.12	0.16	0.20	0.24	0.24

South Asia, Proportion 80+

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.01	0.01	0.02	0.08	0.18	0.19	0.19	0.19
TFR= 1, LEMAX=90	0.01	0.01	0.02	0.08	0.24	0.30	0.30	0.30
TFR= 1.5, LEMAX=90	0.01	0.01	0.02	0.08	0.18	0.19	0.19	0.19
TFR= 1.7, LEMAX=90	0.01	0.01	0.02	0.08	0.17	0.16	0.16	0.16
TFR= 2, LEMAX=90	0.01	0.01	0.02	0.08	0.14	0.13	0.13	0.13
TFR= 2.5, LEMAX=90	0.01	0.01	0.02	0.08	0.11	0.08	0.09	0.09
TFR=IIASA, LEMAX=120	0.01	0.01	0.02	0.08	0.20	0.32	0.43	0.49
TFR= 1, LEMAX=120	0.01	0.01	0.02	0.08	0.25	0.47	0.61	0.69
TFR= 1.5, LEMAX=120	0.01	0.01	0.02	0.08	0.20	0.32	0.43	0.49
TFR= 1.7, LEMAX=120	0.01	0.01	0.02	0.08	0.18	0.27	0.37	0.43
TFR= 2, LEMAX=120	0.01	0.01	0.02	0.08	0.15	0.22	0.29	0.34
TFR= 2.5, LEMAX=120	0.01	0.01	0.02	0.08	0.12	0.15	0.20	0.23

China & CPA, Proportion 80+

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.01	0.01	0.07	0.16	0.16	0.16	0.16	0.16
TFR= 1, LEMAX=90	0.01	0.01	0.07	0.16	0.23	0.30	0.30	0.30
TFR= 1.5, LEMAX=90	0.01	0.01	0.07	0.16	0.18	0.19	0.19	0.19
TFR= 1.7, LEMAX=90	0.01	0.01	0.07	0.16	0.16	0.16	0.16	0.16
TFR= 2, LEMAX=90	0.01	0.01	0.07	0.16	0.14	0.13	0.13	0.13
TFR= 2.5, LEMAX=90	0.01	0.01	0.07	0.16	0.11	0.08	0.09	0.09
TFR=IIASA, LEMAX=120	0.01	0.01	0.07	0.17	0.25	0.35	0.42	0.43
TFR= 1, LEMAX=120	0.01	0.01	0.07	0.17	0.34	0.58	0.68	0.69
TFR= 1.5, LEMAX=120	0.01	0.01	0.07	0.17	0.27	0.40	0.48	0.49
TFR= 1.7, LEMAX=120	0.01	0.01	0.07	0.17	0.25	0.35	0.42	0.43
TFR= 2, LEMAX=120	0.01	0.01	0.07	0.16	0.21	0.27	0.33	0.34
TFR= 2.5, LEMAX=120	0.01	0.01	0.07	0.16	0.17	0.19	0.23	0.23

Pacific Asia, Proportion 80+

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.01	0.01	0.04	0.11	0.17	0.17	0.17	0.17
TFR= 1, LEMAX=90	0.01	0.01	0.04	0.11	0.23	0.29	0.29	0.29
TFR= 1.5, LEMAX=90	0.01	0.01	0.04	0.11	0.18	0.19	0.19	0.19
TFR= 1.7, LEMAX=90	0.01	0.01	0.04	0.11	0.16	0.16	0.16	0.16
TFR= 2, LEMAX=90	0.01	0.01	0.04	0.10	0.14	0.12	0.13	0.13
TFR= 2.5, LEMAX=90	0.01	0.01	0.04	0.10	0.11	0.09	0.09	0.09
TFR=IIASA, LEMAX=120	0.01	0.01	0.04	0.11	0.24	0.35	0.43	0.45
TFR= 1, LEMAX=120	0.01	0.01	0.04	0.11	0.31	0.53	0.65	0.67
TFR= 1.5, LEMAX=120	0.01	0.01	0.04	0.11	0.25	0.37	0.47	0.48
TFR= 1.7, LEMAX=120	0.01	0.01	0.04	0.11	0.22	0.32	0.40	0.42
TFR= 2, LEMAX=120	0.01	0.01	0.04	0.10	0.19	0.26	0.32	0.34
TFR= 2.5, LEMAX=120	0.01	0.01	0.04	0.10	0.15	0.18	0.23	0.24

Pacific OECD, Proportion 80+

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.04	0.05	0.14	0.17	0.16	0.16	0.16	0.16
TFR= 1, LEMAX=90	0.04	0.05	0.14	0.17	0.22	0.28	0.26	0.27
TFR= 1.5, LEMAX=90	0.04	0.05	0.14	0.17	0.17	0.18	0.18	0.18

TFR= 1.7, LEMAX=90	0.04	0.05	0.14	0.17	0.16	0.15	0.15	0.15
TFR= 2, LEMAX=90	0.04	0.05	0.14	0.17	0.13	0.12	0.12	0.12
TFR= 2.5, LEMAX=90	0.04	0.05	0.14	0.17	0.11	0.08	0.09	0.09
TFR=IIASA, LEMAX=120	0.04	0.05	0.14	0.27	0.37	0.44	0.44	0.44
TFR= 1, LEMAX=120	0.04	0.05	0.14	0.28	0.46	0.65	0.65	0.65
TFR= 1.5, LEMAX=120	0.04	0.05	0.14	0.28	0.38	0.47	0.48	0.47
TFR= 1.7, LEMAX=120	0.04	0.05	0.14	0.27	0.36	0.41	0.42	0.42
TFR= 2, LEMAX=120	0.04	0.05	0.14	0.27	0.32	0.33	0.34	0.34
TFR= 2.5, LEMAX=120	0.04	0.05	0.14	0.27	0.26	0.23	0.24	0.24

Western Europe, Proportion 80+

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.03	0.04	0.11	0.16	0.15	0.15	0.15	0.15
TFR= 1, LEMAX=90	0.03	0.04	0.11	0.17	0.22	0.28	0.28	0.28
TFR= 1.5, LEMAX=90	0.03	0.04	0.11	0.16	0.17	0.18	0.18	0.18
TFR= 1.7, LEMAX=90	0.03	0.04	0.11	0.16	0.15	0.15	0.15	0.15
TFR= 2, LEMAX=90	0.03	0.04	0.11	0.16	0.13	0.12	0.12	0.12
TFR= 2.5, LEMAX=90	0.03	0.04	0.11	0.16	0.10	0.08	0.09	0.09
TFR=IIASA, LEMAX=120	0.03	0.04	0.11	0.22	0.32	0.40	0.42	0.42
TFR= 1, LEMAX=120	0.03	0.04	0.11	0.23	0.42	0.64	0.66	0.66
TFR= 1.5, LEMAX=120	0.03	0.04	0.11	0.22	0.34	0.46	0.48	0.48
TFR= 1.7, LEMAX=120	0.03	0.04	0.11	0.22	0.32	0.40	0.42	0.42
TFR= 2, LEMAX=120	0.03	0.04	0.11	0.22	0.28	0.32	0.34	0.34
TFR= 2.5, LEMAX=120	0.03	0.04	0.11	0.21	0.23	0.22	0.24	0.24

Eastern Europe, Proportion 80+

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.02	0.03	0.09	0.17	0.16	0.16	0.16	0.16
TFR= 1, LEMAX=90	0.02	0.03	0.09	0.17	0.23	0.30	0.30	0.30
TFR= 1.5, LEMAX=90	0.02	0.03	0.09	0.17	0.18	0.19	0.19	0.19
TFR= 1.7, LEMAX=90	0.02	0.03	0.09	0.17	0.16	0.16	0.16	0.16
TFR= 2, LEMAX=90	0.02	0.03	0.09	0.17	0.14	0.12	0.13	0.13
TFR= 2.5, LEMAX=90	0.02	0.03	0.09	0.16	0.11	0.08	0.08	0.08
TFR=IIASA, LEMAX=120	0.02	0.03	0.09	0.20	0.28	0.37	0.42	0.43
TFR= 1, LEMAX=120	0.02	0.03	0.09	0.20	0.38	0.62	0.68	0.69
TFR= 1.5, LEMAX=120	0.02	0.03	0.09	0.20	0.31	0.43	0.49	0.50
TFR= 1.7, LEMAX=120	0.02	0.03	0.09	0.20	0.28	0.37	0.42	0.43
TFR= 2, LEMAX=120	0.02	0.03	0.09	0.20	0.24	0.29	0.34	0.34
TFR= 2.5, LEMAX=120	0.02	0.03	0.09	0.19	0.19	0.20	0.23	0.23

Former Soviet Union, Proportion 80+

	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.02	0.03	0.08	0.13	0.13	0.14	0.14	0.14
TFR= 1, LEMAX=90	0.02	0.03	0.08	0.14	0.22	0.31	0.31	0.31
TFR= 1.5, LEMAX=90	0.02	0.03	0.08	0.14	0.17	0.20	0.19	0.19
TFR= 1.7, LEMAX=90	0.02	0.03	0.08	0.14	0.15	0.16	0.16	0.16
TFR= 2, LEMAX=90	0.02	0.03	0.08	0.13	0.13	0.13	0.13	0.13
TFR= 2.5, LEMAX=90	0.02	0.03	0.08	0.13	0.10	0.08	0.08	0.08
TFR=IIASA, LEMAX=120	0.02	0.03	0.08	0.15	0.20	0.29	0.35	0.37
TFR= 1, LEMAX=120	0.02	0.03	0.08	0.15	0.31	0.58	0.67	0.70
TFR= 1.5, LEMAX=120	0.02	0.03	0.08	0.15	0.24	0.40	0.47	0.50
TFR= 1.7, LEMAX=120	0.02	0.03	0.08	0.15	0.22	0.34	0.40	0.43

TFR= 2, LEMAX=120	0.02	0.03	0.08	0.15	0.19	0.26	0.32	0.34
TFR= 2.5, LEMAX=120	0.02	0.03	0.08	0.15	0.15	0.18	0.21	0.23

World, Proportion 80+								
	2000	2010	2050	2100	2150	2200	2250	2300
TFR=IIASA, LEMAX=90	0.01	0.01	0.04	0.09	0.13	0.14	0.14	0.14
TFR= 1, LEMAX=90	0.01	0.01	0.04	0.09	0.20	0.28	0.28	0.28
TFR= 1.5, LEMAX=90	0.01	0.01	0.04	0.09	0.15	0.18	0.19	0.19
TFR= 1.7, LEMAX=90	0.01	0.01	0.04	0.09	0.13	0.15	0.16	0.16
TFR= 2, LEMAX=90	0.01	0.01	0.04	0.09	0.11	0.12	0.12	0.12
TFR= 2.5, LEMAX=90	0.01	0.01	0.04	0.09	0.09	0.08	0.09	0.09
TFR=IIASA, LEMAX=120	0.01	0.01	0.04	0.10	0.18	0.27	0.33	0.36
TFR= 1, LEMAX=120	0.01	0.01	0.04	0.10	0.26	0.49	0.59	0.64
TFR= 1.5, LEMAX=120	0.01	0.01	0.04	0.10	0.21	0.33	0.42	0.46
TFR= 1.7, LEMAX=120	0.01	0.01	0.04	0.10	0.19	0.28	0.36	0.40
TFR= 2, LEMAX=120	0.01	0.01	0.04	0.10	0.16	0.22	0.29	0.32
TFR= 2.5, LEMAX=120	0.01	0.01	0.04	0.09	0.12	0.15	0.20	0.22