FLASH POINTS AND TIPPING POINTS:
Security Implications of Global Population Changes, 2005-2025

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There are six major trends in global population that are likely to pose significant security challenges to Europe and most other developed nations in the next two decades. These are (1) disproportionate growth in large and Muslim countries; (2) shrinkage in population in the European Union and European former Soviet countries; (3) sharply opposing age shifts between aging First World countries and youthful Third world countries; (4) increased immigration from Third World to First World countries; (5) impacts of AIDS and other possible pandemics; (6) the rapid growth and predominant role of urban populations in Third World countries.

For the most part, these trends cannot be altered by any reasonably practical means during the next several decades. Thus, the security establishments of the global (UN) and leading national powers need to think about how to mitigate their impacts, to prevent these trends from having the worst possible effects.

I. Introduction – How to Think about Demography and Security

For the past twenty-five years, sociologists and political scientists have looked with renewed interest at the intersection of population change and political conflict (Goldstone

1991, Homer-Dixon 1991, 1999). The result has been an explosion of literature, so that a recent compilation (Woodrow Wilson Center 1998) lists over 11,000 items.

Prior to the 1990s, the debate over population and security still was organized in fairly simple Malthusian terms. Pessimists such as Paul Ehrlich (1968) argued that we were approaching the limits of population that the Earth could support, and that the result sometime in the near future would be massive famines, uncontrolled migration in search of food from poor countries, and a world-wide, or at least extensive, breakdown of law and order. Optimists such as Julian Simon (1981) countered that technical innovation and discovery would provide adequate resources for a growing population, as they have throughout history, and that only increasing prosperity lay ahead.

This simple-minded debate did little to advance our understanding of security threats arising from population change. The simple either/or visions of misery or prosperity were too extreme, and in the long run there is no doubt that the prosperity vision has proved more accurate to date.

In the 1990s this debate advanced in two major respects. First, historical study showed that even though *in the long run* the world has grown more prosperous despite continued expansion of population, there were quite notable short-term periods during which cumulative population growth led to a temporary breakdown of civil order, including revolutions and civil wars. These occurred in the fourteenth and seventeenth centuries, and again in late eighteenth and early nineteenth centuries. These were periods of global state breakdowns, causing millions of deaths and reshuffling regimes across the world (Goldstone 1991, Parker and Smith 1978). They were also periods preceded by substantial surges in population growth.

Thus the process of adaptation to population increase could be bumpy, violent, and dangerous, even if 'in the long run' things work out. This meant that the question about whether population growth had limits in the long run or not was irrelevant to concerns about security and conflict. What matters is to identify the relevant 'short run' period in which population changes could lead to serious and large-scale problems.

Second, detailed empirical studies of recent patterns of population change and conflict led to a number of consistent findings regarding how population change leads (or fails to lead) to civil conflict and large-scale violence. These findings, also consistent with the historical data, were roughly as follows:

(1) Most conflict over resources caused by population growth leads to *only local and small-scale violence. Large-scale violence is almost never caused mainly by population growth* (Hauge and Ellingsen 1998, Baechler 1998, Urdal 2005)

(2) Conflict over resources caused by population growth is a challenge, not simply a threat, and has often been resolved in ways leading to greater cooperation, not conflict. For example, there have been hardly any confirmed examples of 'water wars' over river basins, but there are many examples of international and cross-regional cooperative agreements on how to manage scarce water resources in the face of growing demand (Wolf 1999).

(3) Conflicts caused by population growth *only* lead to large-scale violence when such conflicts interact with *weak state capacity* or *inflexible state policies* that tend to exacerbate these conflicts, channel them into political lines, and produce cross-regional, cross-class, or cross-ethnic coalitions against state authorities (Goldstone 2002, Kahl 2006).

These findings have changed how we think about population and conflict. One *cannot* simply deduce from the size of population changes or the condition of environmental resources any conclusions regarding conflict. Rather, the relationship between population change and political conflict is *always mediated by state capacity and state responses*. To understand when and where population changes may threaten security, we need to trace the impact of such changes on the economy, fiscal conditions, and political capacity of states, and on the coalitions and goals of major political actors.

For each of the sections below, we shall therefore begin by stating the main trends, then focus on tracing their consequences on states and on political conditions, and then on how nations might mitigate that impact.

II. The Bigger They Are ... Big Emerging Markets and the World Economy

Trends: Countries are growing today for two major reasons: high population growth rates and demographic momentum. In some countries, mainly in Africa and the Middle East, plus a few in Latin America and south Asia, birth rates remain much higher than mortality rates, so that growth rates are over 2.0% per year. In these countries – including Guatemala, Iraq, Jordan, Yemen, Afghanistan, Dem. Republic of Congo, Saudi Arabia, Pakistan, Nepal, to name a few -- population is still doubling every generation, or roughly every 30-35 years.

In other countries, such as China and India and Indonesia, population growth rates have recently dropped substantially, so that in percentage terms they are growing more slowly. However, because of past population growth, these countries are so large, and

have such a large cohort of women of child-bearing age, that their populations continue to add significant numbers each year. In China, for example, although most couples have less than two children, zero population growth is still several decades away. While current growth rates have sunk to around 0.6 percent per annum, that still adds nearly 80 million people to China's population for each of the next two decades before its population peaks. India, though not quite as large as China today, is still growing twice as fast, at 1.4% per annum, and will add roughly 135 million people per decade for the next two decades. Even with a continued decline in their birth rates, these two countries alone are expected to add roughly 400 million people by 2025 – that is more than the entire population of the United States, the United Kingdom, the Netherlands, and Belgium today *combined* (UN *World Population Prospects 2004*).

Table 1 shows expected population growth in the twenty largest countries in the world over the next two decades. These are mainly countries with modest growth rates, but large demographic momentum, and thus the countries that will make the largest contributions to total world population growth in the next twenty years. Table 2 shows the current *rate of growth* in the fastest-growing countries with populations over one million; these are generally smaller countries, but facing the largest percentage burden of additional growth.

If we sought the consequences of such growth we might simply ask whether countries have the means to educate, employ, and integrate such population increases into their economy and polities, and put 'warning flags' on those countries where population and labor force growth rates exceed average rates of economic growth.

Yet things are not that simple. Even countries with rapid economic growth that far exceeds their population growth, such as China, are often confronted by the fact that population growth tends to be fastest among poor regions and groups, and slowest among those who are most upwardly mobile. If economic growth within countries is uneven as well, tending to favor certain regions or groups, this creates a reverse 'scissors' effect, where those areas falling behind economically often continue to reproduce faster, while those areas gaining wealth the fastest have less growth and tend to concentrate the country's available wealth. This can lead to conflicts with groups that feel 'left out' over the distribution of income and wealth, as one can observe in China today (UNDP 2005),

Moreover, even countries that have succeeded in slowing population growth, such as Nigeria, Indonesia and Turkey, often face regional strife because economic growth often involves high dependence on resources such as oil, hardwood timber, or hydro-electric power that is concentrated in regions occupied mainly by minorities who are demanding greater control over 'their' resources.

Finally, even countries with relatively modest population growth rates, like Mexico and India, face enormous challenges because their sheer size and demographic momentum together mean that millions of people are being added to the population each year, at a time when there is already a shortage of land and excess of population in rural agriculture. This means that large numbers of people must be absorbed into the urban and industrial economies, in order to prevent a rapid rise in unemployment or exacerbation of rural poverty (for more on this aspect, see section VI below).

In addition, we must note that population growth for the next several decades is going to be concentrated in only a few regions and countries, mainly Islamic societies

(almost the entire top half of Table 2) and huge states with populations of 75 million or more. Most of the states that dominate Tables 1 and 2 are also among the world's lower income countries. By contrast, in Europe and Japan, population growth rates are already low and in some cases negative.

Map 1, which presents estimates for projected growth rates in the next five years, shows the world divided into states with no or negative growth (less than .1 % per year) moderate growth (up to 1.21 % per year), high growth (up to 2.34% per year), and very rapid growth (up to 3.46% growth and beyond). The high growth and very rapid growth areas form a bright red crescent stretching from the Andean region of Latin America across Brazil, most of Africa and the Middle East and the Caucasus, then to South Asia and parts of Southeast Asia. This sweep takes in most of the world's poorer countries, and almost all of its predominantly Muslim countries (excepting only Indonesia). By contrast, the region of no or negative growth includes Russia and the Ukraine and all of Eastern, Central, and Southern Europe. This pattern is not expected to change much in the next fifty years.

In sum, most of the population increase of the globe in the next several decades is going to have the effect of boosting the proportion of the world's population living in Muslim states, or in the very largest and very poorest states, and shrinking the proportion of the world's population living in First World countries. The sole exception is the United States, which is expected to add 50 million people in the next twenty years, but much of this is due to recent and projected immigration of people born elsewhere.

While some countries with extremely rapid population growth are likely to manage such growth reasonably well due to sound management and strong economic

growth with fair distribution of such growth (e.g., Kuwait, UAE), Table 2 is likely to also include a number of 'flash points,' where the inability to integrate rapidly expanding populations into politics and the economy will lead to radical political mobilization among those angry that their generation, or their country as a whole, is unable to attain the level of prosperity reached by some of their neighbors.

Some of the extremely large countries in Table 1 will probably also manage their anticipated growth without conflicts. Yet the sheer size of the population increases they face in coming years, combined with their efforts to rapidly industrialize, means that many will also face 'tipping points,' when uneven development leaves tens of millions of disadvantaged watching other millions reap the benefits of rapid growth, and the disparities of economic fortune among classes or regions or ethnic groups become so great as to spark violent protests, or difficulties in managing the movement of rural masses into urban and industrial centers (see section VI below) produce a social crisis.

We cannot predict which countries will face such crises, as they result much more from failed political leadership and administrative management than from population changes *per se*. Rather, we can say that the countries in Table 1 and Table 2 include many countries where governments will face exceptional challenges in meeting demands from their populations for both strong and equitable economic growth and sound political management. Of course there are also other countries, even small ones without exceptionally rapid growth such as Haiti or Georgia, that will continue to pose threats of political violence due to past episodes of abhorrent government, ethnic separatism, or economic failures.

Nonetheless, there is one thing we can say with certainty about the global pattern of demographic growth shown in Tables 1 and 2, and that is that these trends pose a major dilemma for the economic policy and development of Europe.

If we look at the twenty-five largest countries in the world in 2005, we find that among them are only five European countries, with a population of roughly 400 million, or about one-tenth the total population of the remaining twenty countries. By 2025, just two decades distant, there will be only four European countries in the top twenty-five with a total population of 338 million, or about seven percent of the 5.5 billion inhabitants of the other twenty-one countries. By 2050, the situation grows even more severe; under current projections (UN middle-range), there will be only three European countries in the top twenty-five with a total population of 258 million, or just four percent of the 6.3 billion in the other twenty two countries – so that Europe's weight in the top twenty five countries is shrinking dramatically.

Of course, Europe is more than just its few largest countries. But even many of the countries in a more expansive Europe, including the Ukraine and Eastern Europe, have shrinking populations. Thus in 2000, all of Europe comprised 727 millions, against a global population outside of Europe of 5.33 billion. In 2030, however, the population of all of Europe is projected to shrink to just 670 millions, against 7.6 billion outside of Europe (*UN World Urbanization Prospects*, 2001 edition). That is, global population outside of Europe will increase by 2.4 billions in the next twenty five years, while Europe's population will *decrease* by about 50 millions.

Consequences: The impact of the shrinking demographic weight of European countries puts them on the horns of a dilemma. If the economies of fast-growing developing countries do NOT catch up to those of the richer countries, then the standard of life enjoyed by the West will seem more elite and unfair than ever, fueling resentment of developing country populations against the G-8. On the other hand, if economic growth in those countries DOES exceed that of the West, so that living standards in these countries starts to close the gap between rich and poor countries (and rich and poor regions in developing countries), then the combination of shrinking populations and lagging economies will render the G-8 countries more and more economically irrelevant to the world economy in the future. Greater resentment or greater irrelevance – a difficult choice!

For *all* of Europe, from Russia to Iceland, 2004 GDP is just over 14 trillion dollars (in current US dollars; CIA 2005). Population is growing very slightly in some parts of Europe, but falling rapidly in others (esp. Russia), so no net growth is expected in the next two decades (see Table 3). Assuming GDP growth per capita of 2.5% per year, and no net population growth, Europe's economy would increase by 9 trillion dollars (excluding inflation). For Asia (excluding Japan), 2004 GDP is already slightly larger, at 17.76 trillion dollars (again in current US dollars; CIA 2005). But due to modest growth in GDP per capita plus large population increases in most countries, total GDP is growing far more rapidly in this region. Even Pakistan and Iran have achieved recent growth rates over 5% per year, while India and China have been growing by 6% or 8% or more per year (CIA 2005). If Asia (excluding Japan) can sustain a population-weighted growth rate of total GDP of 5% for the next twenty years, the increase in Asia's GDP over the

next twenty years would be *30 trillion dollars*¸ or more than three times the total economic growth of Europe.

Thus the dilemma – if Asian GDP does not grow at five percent per year, living standards in Asia will not catch up to those in Europe (and Japan). Yet if Asian GDP does grow at that pace, then given the size of Asia versus Europe, the preponderance of Economic growth on the Eurasian continent will be occurring outside of Europe. That means that greater degrees of investment and innovation are likely to be drawn to areas outside of Europe, further weakening Europe's economic strength and leadership. In other words, we are on the cusp of a global tipping point, in which East and South Asia come to eclipse Europe and Japan as major sources of global economic growth.

These demographic and economic changes also imply that the military capacities of large developing countries will increase, while the ability of rich nations to puts 'boots on the ground' to actually control the sites of conflict will diminish. Thus managing conflicts involving developing countries will become more difficult, and more of a strain on Europe's economy, than before.

The imbalance stands out very clearly in Map 2. In the next 20 years, the EU 27, shown in grey, is projected to have a net population gain of only 3.4 million people, accounting for *less than one quarter of one percent of world population growth*. The top twenty growth countries, by contrast, are projected to grow in size by over one billion people, accounting for 73% of world population growth. Most of these top growth countries, moreover, are not poor isolated African nations (although a few are); most are strongly-growing economies, including the United States, Brazil, Mexico, Turkey, China, India, and Indonesia.

Mitigation: There is no avoiding the fact that Europe's total economic growth will slow in coming decades. Even if immigration or changes in fertility stop the decline in Europe's population, Asia has already achieved so much population and economic growth that – barring political disasters – Asia will inevitably grow faster and from a larger base for the next two decades. What is crucial for Europe is to maintain active trade relations with fast growing economies so that Europe can invest in and benefit from their growth. These large and fast-growing economies also need to be kept integrated into the world economy so that they welcome trade and investment from Europe.

In this regard, the 'rich nations clubs' need to be opened up to integrate the large developing countries both for their manpower and to create a climate of cooperation between rich and poor countries. Economic growth will only be sustained in the developing countries, and Europeans will only be able to share in that growth, if European countries continue to embrace globalization and have heavy investment and participation of European firms and individuals in non-European countries. Thus smooth relations and clear understanding of responsibilities and obligations involving international trade and financial relations between more and less developed nations is essential for both' groups future growth.

In particular, such institutions as the EU, the UN security council, and the G-8 need to be considerably expanded to incorporate large developing countries on a more equal basis. Integration of Turkey and perhaps Morocco or Tunis into the EU is essential to avoid the Islam/Christian split across the Mediterranean from developing into a conflict line; integration of Brazil, Mexico, Nigeria, Indonesia, Japan, India, and other

major regional powers into the UN security council is vital if the UN is to retain legitimacy in the eyes of most of the world's population; and inclusion of the big emerging democratic economies of Brazil, India, and Indonesia into an expanded G-group is required if this group is truly going to grapple with the global economy.

Naturally, all of these measures will provoke great opposition and controversy. However, if Europe chooses to isolate itself from the global population and the global economy, it will continue to shrink in relation to the whole. Moreover, if Europe fails to support rapid economic growth outside of Europe, the rapidly increasing numbers of inhabitants in non-European and mainly Muslim countries is simply going to fuel ever greater resentment of Europe's position, exacerbating the problems of terrorism, smuggling, and illegal trafficking as the ways to 'get ahead' and 'get even.' In short, Europe has no choice but to support and actively engage the fast-growing countries of the world, improve relations with their populations, and support and seek to share in their growth.

III. Bye Bye Love … The Great Slowdown in Population Growth in High-income Countries

Trends: Table 3 shows the projected decline in population in major European countries over the next forty-five years. A few countries, such as the UK, France, and the Low Countries, will not grow but will remain stagnant in population. However, most of the countries of Europe, including not only Russia and the Ukraine, but Germany, Italy, Spain, Poland, Hungary, the Czech Republic and Portugal, will shrink substantially.

This represents a highly novel and abnormal pattern. In the great sweep of history, there have been long periods in which population growth was stagnant, or even when major epidemics (such as the Black Death) substantially reduced populations in large areas. However, in these periods the cause of population stagnation or decline was high mortality, especially among the young. Birth rates remained high, and when conditions were more propitious to growth, population increase resumed. In modern Europe (and other high-income countries, such as the US, Canada, and Japan), it is changing *birth rates* that have precipitated population decline, as people have chosen to have smaller and smaller families. Women are marrying later, if at all, and having fewer children. When, on average, the number of children that couples have falls below two children per couple, population size as a whole begins to decline, a phenomenon that is evident in much of Europe.

The extent of the change from recent patterns, which were dominated by the post-World War II baby boom, is striking. From 1950 to 2000, the populations of major European and other high-income countries grew substantially, ranging from a roughly 20% increase in population in the UK and Germany to 30-50% increases in France, Russia, Poland, Ukraine, Spain, and Japan, and increases of 85% in the US and 123% in Canada. In the following half-century to 2050, these countries' growth projections are as follows: under 3% for France, under 8% for the UK, and declines ranging from 10-12% in Germany and Poland and Spain to over 20% in Japan, Ukraine, and Russia. Even in the US and Canada, rates of growth for 2000-2050, while still substantial, are expected to decline sharply from 1950-2000 levels, being projected at just under 50% in the US and only 32% (one quarter of the earlier growth rate) in Canada.

Consequences: This slowdown in population growth has major implications for overall economic growth (Eberstadt 2001). Stimulus to the economy from growing numbers of consumers, and growing demands for housing, will simply be absent. The capital growth generated by larger generations of young people approaching their peak earning years and saving for retirement will cease as well. When European populations were growing at 1% or 2% per year, even modest increases in real income per capita, of 2% per year, provided overall growth levels of 3-4% per year or better. With European populations instead *shrinking* by .3 to .5% per year, the same 2% increase in real income per capita will yield only 1.7 to 1.5% in overall growth. In other words, *even if Europe's income per capita growth remains constant, its overall economic growth rate will likely be cut in half, from 3% to around 1.5%, over the next thirty to fifty years.*

An overall growth rate this small allows few margins for accumulation to head off economic downturns, or to invest for the future. As Benjamin Friedman (2004) has recently argued, substantial growth rates allow more groups to share to some degree in growth, and provide social resources for a variety of services and investments. Overall growth rates below 2% per year, by contrast, allow for little redistribution or investment, and tend to heighten social conflicts over such issues as pensions, migration, and labor/employer relations.

This situation also has implications for military spending. As Europe's economic growth slows, while big emerging countries gain population and resources, the ability of Europe to increase its spending to cope with the likely conflicts and humanitarian disasters of the coming century will be sharply constrained. This is particularly a

problem since, as the American experience in Iraq has shown, for many of the pacification missions of the future, sheer technical superiority is unlikely to resolve all needs. "Boots on the ground'—large numbers of trained troops – are needed as well. This is something a slowly-growing Europe will find ever more difficult to provide.

Mitigation: There are three routes by which Europe can try to head off this impending growth slowdown. The first is to ramp up investment in productivity increasing technology. An increase in productivity producing a 1% greater gain in output per capita per year would more than offset the change in population. Increased technological prowess would also help Europe maintain its global economic leadership role, as companies and countries in areas of rapid growth would turn to Europe for technology, and in turn invest in Europe.

However, increasing productivity will require major changes in the way Europe's economy is organized. The most important source of productivity-increasing growth has been new firms and entrepreneurial enterprises (Goldstone 2006). Europe will have to develop not only a more entrepreneurial culture, but also make it easier for individuals to start companies and to flexibly use capital and labor. Depending on large companies and large government programs to drive the economy and absorb labor is unlikely to provide the kind of rapid productivity and output growth needed to counterbalance population stagnation and decline.

Universities in Europe will also have to increase their research productivity and collaborations with industry. In some countries this is already being done, but in others

the ‘ivory tower’ needs more support for training and research in the most technically important fields of biology, materials science, and engineering.

Human capital will also have to lean more heavily to technical and engineering fields. This may mean providing incentives to individuals to seek education in those areas. Nor can human capital be allowed to sit unused with relatively high unemployment rates. In the US and Canada in 2004 roughly 63% of the population over age 16 were employed; in the EU-15, only 52% of people over age 16 were employed. Although some European countries had workforce participation rates of 60% or more – Denmark, the Netherlands, Norway, Sweden, and the UK – France, Germany and Spain were at only 50%, and Italy at 45% (US Labor Department 2006). Increasing Europe’s overall employment participation rates to North American or upper European levels would by itself offset the decline in the working age population for nearly a decade.

The second route is to increase immigration and seek as quickly as possible to raise immigrants’ productivity and earnings to the average level in European countries. This is not a short-term fix; integration and education of immigrants can take a generation or more. However, the US, Australia and Canada have enjoyed the benefits of making it easy for immigrants – especially skilled immigrants – to start business, acquire educations, and move into the mainstream of life, such that the incomes of many immigrant groups exceeds the national norm. It should be noted that even low-skill migrants can raise the overall productivity of a society, if they are willing to work for lower wages than had previously been paid to non-migrants for similar work.

Unfortunately, both in Europe and recently in America, debates on immigration have expressed the fear that immigration steals wealth from the countries that attract

immigrants. This mistaken view is as pernicious as the idea that protecting trade through high tariffs, or blocking foreign investment, will preserve the prosperity of a country that builds such walls to global exchange around itself. Migrants tend to self-select for entrepreneurial talent, ambition, and energy, and make net gains for national economies that accept them (Simon 1999). A Europe (or Japan) that has lost much of its own demographic momentum and energy can ill afford to exclude new generations, even if they come from abroad, in place of the ones they are no longer producing themselves.

A third way would be to pursue pro-natalist policies that encourage larger families among the existing populations. Unfortunately, it is not clear what policies would produce this gain, as the reasons for the baby-boom are still not fully agreed upon by demographers. Unless a value-shift occurs that places a higher value on larger families than on the endless expansion of consumer goods consumption, small families will continue to be preferred. It is striking that higher fertility is found in richer countries mainly among more religious families – this is one of the factors accounting for much higher population growth in the US than in Europe (Longman 2006). Short of a religious revival in Europe, a major increase in fertility and family size seems the least likely solution to Europe's demographic decline.

No doubt, a combination of all three methods will be required to offset the slowdown in growth in high-income countries (excepting the US): changes in education, labor laws, business flexibility, and investments in research to boost productivity; higher levels of immigration from outside Europe; and some means to increase Europeans' own fertility in coming decades.

Finally, although some authors have waxed anachronistically nostalgic about meeting current security threats by bringing back some form of 'empire' (Lal 2004, Ferguson 2002) under American domination, there is one sense in which older imperial practice does seem useful for the future. England's empire was manned largely by armies recruited from its colonies. Although colonies are gone, the free market suggests that developing countries with large numbers of youth should be willing to contract many of them for training and deployment in international militias.

The best way for Europe, the US, and Japan to maintain their capacity to intervene militarily with large numbers of troops, but in an economical fashion, may be for developed countries to train, arm, and finance multi-national militias for intervention in stabilization and reconstruction operations. This may provide the ideal combination of developed country technology and developing country manpower to make meaningful interventions.

IV. Will You Still Love Me When I'm 64? …. Aging Populations, Health, Work, and Retirement

Trends. Demographers speak of the 'demographic transition' to describe the major change in population dynamics that occurred in the 19th and 20th centuries. Prior to the transition – that is virtually throughout history – human populations had both high birth rates and high death rates. Death rates were especially high for newborns and young children. The result was that while many children were born each generation, the number that survived to adulthood to reproduce themselves was quite limited. Out of four or five children born to each pair of parents, only rarely did more than two live to have children

of their own. This pattern kept population growth very low for most of history, rarely even reaching rates of 1% per year.

In pre-industrial societies, higher rates of population growth were usually only found where there was plentiful land to settle (as in the United States or Russia in the eighteenth century), or where countries had such great technological advantages over neighbors that they could reap tremendous economic growth internally (as in China in the eighteenth century, or Britain in the nineteenth century). Plentiful resources encouraged people to marry earlier or have more children, and allowed them to nourish them better, boosting population growth rates.

Industrial societies created a major change in demographic patterns. All of a sudden, a host of technological advantages, ranging from cheap mass-manufactured soap, to cheap pipes for sanitation, and eventually knowledge of germs and the development of antibiotics, drastically reduced the vulnerability of children to fatal infections. People continued to have three or four children, but now usually three, and sometimes four, survived to have children of their own. Population began to double within a generation, producing growth rates of over 3% per year, something virtually unknown in earlier times. It is the spread of such reduced child mortality throughout the world that led to the demographic explosion of the 19th and 20th centuries and fears of a 'population bomb' destroying the earth (Ehrlich 1968).

This period of rapid population growth, however, is only the midway point of the 'demographic transition.' Industrial technology also greatly improved the means of contraception. As populations came to realize that child mortality had fallen dramatically, people began to adjust their child-bearing accordingly. Thus, completing

the transition, societies again achieved a balance with roughly two children surviving to adulthood for each pair of parents, reducing population growth to very low levels.

In other words, before the transition, families have high birth rates and high death rates, but population growth is slow. During the transition, child death rates drop rapidly, but birthrates remain high; this creates a period of rapid population growth. The transition is completed when birth rates drop, so that birth and death rates are *both* low, and population growth is restored to low levels.

Most of the world has either completed or progressed well toward completing the demographic transition. As shown in Table 2, less than a third of world's countries, and only three of the largest twenty-five (Democratic Republic of Congo, Nigeria, and Pakistan) still have growth rates above 2.0% per year.

Yet the transition has not gone quite according to this smooth textbook pattern everywhere. Some countries – mainly those with large Muslim populations – have been quite resistant to a reduction in birth rates; thus their population growth rates have remained high, as we saw in section I. Other countries – mainly in Eastern and Central Europe – have undergone what some call a 'second demographic transition,' in which birth rates continue to fall, leading populations to actually shrink over time (Surkyn and Lesthaeghe 2004). While no countries except Russia and Ukraine have started shrinking yet, the projection for most European countries and Japan is that as the baby boomers age and start to die off, low birth rates mean that their will not be sufficient youngsters to replace them. Hence from about 2030 onwards, their populations will undergo a significant decline. Actually, more European countries in recent years would have experienced declines in population if not for immigration; but even with current levels of

immigration, a sharp decline will commence in most European nations in the next five to ten years (European Commission 2004, pp. 9-10).

Even before the populations of Europe and Japan start to decline, however, the aging of the baby boomers will have a sharp impact on the overall age-structure of these societies. In the midst of the demographic transition, the high survival rates of young children mean that the age structure of fast growing societies tilts heavily toward the young; indeed the higher the growth rate, in general, the higher percentage of youth in the population. Conversely, the completion of the demographic transition, and even more the onset of the 'second demographic transition' leaves a much smaller number of children. In that case, society's age-structure tilts toward the elderly.

Given the irregular fashion in which the demographic transitions have moved across the globe, in the next few decades the world faces an extreme divergence in age structures, with a belt of poor and largely Muslim countries having extremely young populations, while Europe and Japan, and to a lesser extent the US, Canada, and even China, start to develop rapidly aging populations.

The extent of this divergence is evident in Tables 4 and 5. Table 4 shows the situation in the youngest countries in the world today. Nearly half their populations are under 14, while only a few percent of the population is over sixty. Table 5 shows the situation in the oldest countries today and in 2050. Already today, the older countries – which aside from Japan are entirely in Europe -- have nearly a quarter of their populations aged sixty or older. (Russia does not appear on the list of 'aging' countries because the collapse of its health and pension systems and high rates of alcoholism and smoking mean that adults are dying much more rapidly than elsewhere in Europe; Russia

is shrinking more rapidly than other countries because not only are birth rates are low, but in addition its adult death rates are high). What is truly striking, however, is that by 2050 so many countries are expected to have thirty-five to forty percent their populations aged sixty or older. This is almost the mirror image of the youngest countries, where nearly forty percent or more of the population has yet to reach their fifteenth birthdays!

The 'mirror image' is also visible in Map 3, which shows the geographic distribution of countries with varying age structures. The 'older' countries, those in which the under 15 form less than 20% of the population, mark a band all across the upper edge of the world map; the 'younger' countries, where the under 15 are 40% of the population or more, are almost all in the tropics or southern hemisphere. Moreover, the place where the largest number of 'older' countries is in close proximity to the largest number of 'younger' countries is Europe, looking across the Mediterranean at a very young Africa.

We have already said that the slowdown in population growth means relative stagnation for European economies. However, those estimates were simply based on total numbers of people, without noting the dramatic divergence in age structures. In younger countries, larger numbers of people will be entering their most potentially productive years. This has contributed greatly to the growth of China and India in the last two decades (Krugman 1994). By contrast, as the populations of Europe and Japan age, more and more people will be exiting their most productive years.

Consequences. The effect of this shift in age structures is likely to be an amplification of the economic stagnation in Europe contrasted with high growth in Asia outside of Japan.

Although one could certainly ask many people in Europe and Japan to simply keep working longer, to avoid a dramatic contraction of the labor force, this by no means resolves the problem. Older workers tend to be much less desirable than younger ones. They tend to be paid more, be less trainable for new tasks, and less innovative and productive than younger workers. Rarely if ever will keeping a worker on the job from age sixty to eighty provide profits comparable to keeping a worker on the job from age twenty to forty, or from age forty to sixty. Retirement is not merely a matter of letting people 'rest' after their work careers; it is also a way to refresh the talent pool, adapt to organizational change, and reduce production costs.

Of course older workers can indeed be productive, and I am not claiming they are usually liabilities. However, a workforce in which the number of workers under sixty (aged 15-59) and the number of workers over sixty are about equal – the projected distribution for Europe in 2050 – is simply unlikely to be quite as productive, innovative, flexible, and energetic as a workforce in which the proportion of workers over sixty is a more 'normal' ten to twenty percent.

The shift in age structure also has severe implications for pension and health costs in aging societies. By 2050, European societies will not only have roughly the same number of adults over and under age sixty, those over sixty will be expecting pension and health provisions to meet their needs. Even if they continue to work until age seventy, or seventy-five, the costs of keeping such a large elderly population in good health will be extraordinary. When heart and hip and cornea replacements become as commonly demanded as tonsillectomies today, and demands for pharmaceuticals to cope with diabetes, high blood pressure, and other chronic illnesses of age extend to half the adult

population, health costs will accelerate enormously. Countries with younger populations will not face such a burden of geriatric care. And even if the elderly do work through their seventies, they are likely to demand pensions in their eighties and nineties, for as people work longer they will still live even longer; in recent years the number of centenarians has skyrocketed with improved health care. The number of surviving centenarians in developed countries is expected to grow by tenfold by 2050 (United States AoA 2003).

Who will pay for the health care and pensions of the elderly when the latter make up nearly half of the adult population? Clearly this will impose an enormous burden on the working generation, probably more than they will care to support. We have seen a preview of this process in the United States, where companies such as United Airlines and General Motors have been brought to bankruptcy or the brink of bankruptcy because of the accumulated burden of providing health care and pensions for their retired workers. While the US – where for historical reasons much health care and pensions are provided by private employers – has responded to demographic change by restructuring private companies, in Europe and Japan these costs are general obligations of the government. The rapid aging of their populations means that these governments will face similar pressures, and like GM and United will either have to repudiate or substantially modify these promised benefits or face bankruptcy (cf. European Commission 2005).

Mitigation. Tinkering with retirement ages will likely be wholly insufficient to deal with the difficulties imposed by rapidly aging populations. If the problem was simply keeping people working, rather than entering retirement, delaying the onset of normal retirement

could be effective. But the issue is far more complicated. Keeping an elderly population in good working health will likely be far more expensive than maintaining the same level of health for a younger population. In addition, as life expectancies creep upward, a later age of retirement will be partly offset by extended lifespans *after* retirement, thus again increasing the burden of pension payments.

Not only will expenses for maintaining an elderly population be much higher, the overall growth rate of the economy is likely to be reduced by a decline in the rate of innovation. Most companies are founded, and most innovations made, by people under forty. As more and more of the population ages beyond that point, the level of innovation and entrepreneurship may decline, robbing modern industrial economies of their main engines of growth. This on top of the fact that as population stabilizes or shrinks, overall economic growth rates will drop to relatively low levels.

The populations of European countries are moving toward being pathologically tilted toward the elderly. At the same time, the populations of the countries that surround Europe to the south and the east are still extremely young. The obvious solution is a swap: Europe should export older people and import young ones.

I will leave the issue of importing young people to the section on migration below. However, it is clear that it would be desirable for Europe's retirees not merely to flock to southern Spain, Greece, and Portugal, but to move further afield, to countries where the provision of health care and personal services to the elderly could be far less costly. Setting up retirement villages with high-caliber medical care in Morocco, Tunis, and Egypt, or in the Philippines or Indonesia, would be far more cost-effective (and

perhaps even more enjoyable) than maintaining such facilities in Europe, where labor and land costs are all higher.

As things stand now, European countries import doctors from the Middle East and South Asia and nurses from East Asia. This is in large part because health professionals in developing countries cannot find jobs in their own countries that are sufficiently remunerative compared to what they can earn abroad, but also because of shortages of skilled health professionals to meet the needs of an aging population consuming ever more health care. It would be more cost effective if European countries paid these health professionals to stay in their own countries and accept wages far higher than they could normally earn at home, but less than they would need to live well in Europe. The cost of housing and personal services (cleaning, personal care) would also be lower in Third World countries.

Currently, European (and American and Japanese and Hong Kong) corporations invest in hotels and shopping areas in Third World countries designed to cater to First-world tourists. Given the shifts in the age structure of Europe, it would make eminent sense to encourage similar trend of investment in retirement communities for First world citizens in Third World countries.

To some extent, this process is taking place spontaneously, as Americans retire 'south of the border' in Mexico and Costa Rica. However, we may expect this trend to both accelerate and even be subsidized by the state as a way to provide more affordable pensions and health care to vastly increased numbers of elderly in high-income countries, without breaking the state budget.

However, to avoid the feeling of retirees that they are being 'pushed out' of their own countries, the prospects of retirement overseas need to be made more attractive to the average retiree. This can only happen with greatly improved relations with Europe's neighbors, so that Europeans view north Africa as a friendly domain, rather than as dangerous and enemy territory. Thus I must emphasize the points made earlier about the need to embrace globalization and improve regional relationships between Europe and non-European societies. The alternatives are a drastic decline in living standards as government-promised welfare supports collapse under the weight of a huge tilt in the age structure toward elderly consumers of ever-greater amounts of government-provided health and pension services.

V. Here We Come… Third to First World Migration, Problem or Solution?

Trends. Historically, Europe has been a net source of migrants to other countries, principally North and South America and Oceana. Only in recent years have net inflows of immigration characterized European nations. However, they have now become an important component of Europe's demography. In 2002, the annual net migration rate into Europe was 0.28%, accounting for 85% of Europe's total growth (for EU-25, European Commission 2004, p. 25). The number of non-nationals living in the enlarged 25-nation EU is 14.7 million people, around 3.3% of the total population (European Commission 2004, p. 9). In some countries with high immigration, such as the UK, France, and the Netherlands, this figure is higher.

By comparison, in the United States from 2000 to 2005, the annual net migration rate averaged 0.42 percent per year, and this accounted for only about 40% of the United

States' national growth rate. Moreover, since the United States has been experiencing a much higher rate of immigration than Europe for decades, the number of foreign-born individuals living in the United States has risen dramatically as well. The proportion of immigrants in the US adult population has roughly doubled from 1980 to 2000, from 9.6 to 20.6 percent. This ratio is higher than for all foreign-born residents, as immigrants are concentrated in working ages. However, the percentage of all foreign born residents in the United States in 2003 is estimated to be 12%, still almost four times greater than Europe.

Of course, Europe will not approach American rates of foreign born population any time soon – the United States has been a nation of immigrants for a very long time. Even if the EU would increase its immigration rates to American levels, from .28% to .42% per year, this would only boost Europe's population growth rate by .14%; barely enough to offset the decline in population growth and keep population constant, and not enough to have any impact on the aging of the population. Indeed, it would take immigration levels of almost 1% per year, or over 4 million per year, to more than offset Europe's population decline and sustain even just under a one percent rate of positive population growth.

Nonetheless, there are good reasons for Europe to expect that it will gradually move toward a more American percentage of foreign born, probably doubling or tripling the current very low percentage of non-Europeans (3.3%) in the EU, and that Europe will have to learn to make this a positive experience for both natives and immigrants.

The first reason for admitting more immigrants is that they create net gains to economic growth (Simon 1999). Although there is considerable economic debate on how

to calculate the net gains, and some economists still dispute the conclusion, much of this debate is about the role of unskilled labor. There is no doubt that the migration of skilled laborers boosts the economy – indeed many of the leading companies of Silicon Valley resulted from the entrepreneurial efforts of skilled immigrants from south Asia. Unfortunately for Europe, many of the skilled Chinese and Indian and Pakistani engineers who headed for the US are now more likely to head home, as economic growth in those regions will provide opportunities that they lacked two and three decades ago. However, it seems likely that even if African and Arab countries increase their supply of well-trained doctors, nurses, technicians, and scientists, in the next generation, their countries will not be able to provide them with competitive opportunities, and many will seek to migrate to Europe, where they should be welcomed. The greater risk is that with far fewer skilled people from China and India seeking to migrate, and with the U.S., Canada, Australia, Japan, and other countries with slowing economic growth compete for skilled migrants, Europe may not get its share.

The second reason for admitting more immigrants is that they will be difficult to keep out. The fact that there will be an enormous surplus of young people in the countries of Africa and the Middle East, and a looming shortage of young workers in Europe, means that the normal forces of supply and demand will impel workers to migrate to Europe and employers to hire them. Many of these jobs will be precisely the kind of low-skill service jobs – in retail, janitorial, in-home care, and domestic service – that an aging population in Europe will need, and that cannot be 'outsourced' to labor overseas. The enormous pressure this market situation will create will make it difficult to hold off substantially increased migration in the future.

Consequences: It is already clear that rising numbers of immigrants are creating problems of assimilation in western Europe; the consequences range from petty violence to major acts of terrorism. This is not because Europe has large numbers of migrants; it has far less, in percentage terms, than the U.S. or Canada or Australia. Rather, it is because large-scale immigration is relatively new to Europe. European countries do not have a centuries-long tradition of accepting immigrants, and even in the last few decades have tended to treat even their long-term migrants as if they were 'guest workers' come for a temporary stay. The results, especially for second generation immigrants, who are native born but not identified as true members of their new nations, are a growing sense of exclusion and alienation toward their countries of residence, and a sometimes morbid flight into extremist versions of the ideology and culture of their parents' country of origin.

Mitigation. There are numerous mechanisms to help migrants and native populations adapt to increased numbers of foreign born and their descendants in their midst. At the least, politicians must be shamed and restrained from seeking to make political gains from denouncing immigration and foreign cultures. Sadly, taking advantage of people's normal fears of the unknown and anxieties about differences is an easy way for politicians to gain support – much easier than actually solving the unavoidable problems of adapting to the actual situation. The difference between diverse peoples living and working together, or forming hostile groups aiming at conflict, is most often whether politicians seek to overcome or inflame such hostility (Teitelbaum and Winter, 1998).

Successful assimilation depends on both attitudes and opportunities. If migrants have opportunities to work, seek education, and open businesses, they will view migration positively; but natives also need to view and treat migrants as valuable members of the community. The problem is rarely so much for first-generation migrants, who are clear about their identities and have migrated mainly to work, and are usually grateful for it. The real problems arise chiefly with second-generation immigrants. These individuals are caught between cultures, native to their parent's land of immigration, but not treated as native by the long-standing native population, or often, by the authorities. They often face problems of motivation and identity that lead them to do poorly in school; in addition, they often face subtle discrimination that makes it difficult for them to achieve up to their potential.

There are thus three major solutions to the immigration problem. The first is political – elites and authorities must recognize that increased migration is inevitable and desirable, and work to praise migrants and lead their populations in accepting them. The second is practical – extra effort must be given to the children of immigrants, in regard to education, counseling, job-placement, even recreation, to help their integration into society. The third is to offer reassurance. There should be concrete programs to reassure long-standing natives that immigrants will not be 'taking advantage' of them. This could mean that first-generation migrants have to demonstrate they are working, and be ineligible for extended unemployment benefits until they have worked for a substantial number of years. It could mean that first-generation migrants have to demonstrate that some family members are working in order to place their children in schools.

Migrants virtually all migrate for economic opportunity (putting asylum seekers aside). They thus want to work. Natives mainly fear that immigrants will either not work and take advantage of state benefits or will take 'their' jobs. Politicians thus need to take concrete steps to assure long-standing natives that immigrants will *not* qualify for state benefits unless they are working, and show that with the native labor-force set to shrink rapidly, the only way to provide needed services and increase economic output to provide for everyone's benefits is to admit and utilize the work and success of immigrant workers.

Assimilation of immigrants is not easy, and differences in religion, language, and culture are probably greater today for migrants to Europe than they were for earlier European migrants to Canada and the United States. Europe thus will probably have an exceptionally difficult time assimilating migrants. Conversely, the advantage that Europe does have is that it already is composed of groups of diverse language, religion, and histories, so that making room for a few more newcomers and added variety should not prove an overwhelming task (as opposed to the homogeneity of Japan).

In this regard, admission of Turkey to the EU could provide substantial advantages. Although many Europeans are concerned about admitting a large, young, and Muslim country to the Union, there is already a substantial population of young Muslim immigrants and their children within Europe. What matters most for Europe's future stability and success is whether those migrants and especially their descendants view themselves as outsiders, or as fully contributing Europeans. Having a large secular Muslim country within the Union should provide a touchstone for all Muslim immigrants in the Union, and provide a positive model for their behavior and integration into Europe.

VI. Oops, I Did It Again… AIDS, SARS, Bird Flu, and the next bad thing

Trends. It is heartening that the latest news regarding the HIV-AIDS epidemic is that its spread in Africa it is not nearly as bad as once feared. Surveys have been skewed by focusing on urban groups, where the rate of AIDS infection appears to be higher than for most countries as a whole (Timberg 2006). Still, the rate of infection in Botswana, if not 37%, is still a fearsome 25%, and in other African countries, even where prevalence is only 3-10%, the social impacts are great because of the difficulty in providing treatment to all with limited health care budgets means that mortality rates among AIDS victims is high. Moreover, if AIDS kills a disproportionate number of urban residents, it is most likely killing off a disproportionate number of the skilled and educated. This may lead to further obstacles to economic growth in the countries most severely affected (Garrett 2005).

Nonetheless, AIDS is now fairly well understood, and what had initially seemed like a terrible and unstoppable pandemic has been contained to become an expensive but chronic illness in most of the developed world.

What is far more disturbing is the rapid rise in the number of anti-biotic resistant diseases, such as tuberculosis, and the discovery of more and more new and highly lethal human and animal diseases, including Ebola, Marburg, SARS, HIV-AIDS, and (so far lethal only to birds) HN51. Also distressing is the return of once-vanquished killers and childhood diseases, such as polio, mumps, and TB.

Consequences. In contrast to AIDS, the greater risks are from diseases that kill more quickly, in weeks not in years, and that spread easily from person to person. While AIDS is a horrible disease, the fact that its gestation is measured in years, and mortality

in decades, after infection, has allowed a concerted research program to provide counter-measures for the illness in time to save most potential victims.

A far more difficult epidemic to respond to would be a relatively fast spreading and lethal illness. Whether that threat comes from a disease like SARS, or a new flu pandemic, or from some as-yet unknown threat, it is clear that global patterns of trade and travel mean that great international cooperation will be required to deal with diseases that will travel readily around the world. The greatest threats would come from some combination of genes that produced either great drug-resistance in a common and fast-spreading illness, such as streptococcus, or great ease in transmission from a rare but lethal germ.

Every few hundred years, the historical records show that a new, unknown killer disease has struck mankind – from the Athenian plague in 400 BC to the epidemics of the early Roman empire, then the vast epidemics of Justinian in 600 AD, to the Black Death in the 1300s. The 1600s saw epidemics of typhoid and smallpox in Europe, and sweeping pandemics in the New World. The 1900s saw pandemics of flu and cholera and the arrival of something completely different in HIV-AIDS.

The question is not whether a new scourge will arrive, but how we will deal with it when it does.

Mitigation: We have generally left the response to disease to the private sector, where both pharmaceutical and hospital industries (although the latter not in Europe or Canada) operate for profit, estimating the number of patients and treatments that they can normally expect and seeking the most efficient and profitable way to treat them.

However, such commercial-based planning is wholly inadequate and inappropriate for the emergence of a new, lethal and fast-spreading disease. Such a disease would quickly overwhelm the routine capabilities of the medical and pharmaceutical sectors, which are geared to serving reasonably predictable markets for chronic illnesses, not once-in-a-lifetime epidemics.

Fortunately, the reaction to SARS and the mobilization of expertise for HN51 preparations are providing something of a 'dress rehearsal' for coming epidemics. For the future, however, countries will need to devote a steady portion of their national and international security budgets to preparation for the next internationally-spreading killer disease. Plans for quarantine, school closures, business closures, and other responses need to be mapped out now, and rehearsed, so that they can be put into smooth operation when an emergency truly arises. To gear up the necessary expertise and resources only after such a disease appears will be too late.

VII. How are You Going to Keep them Down on the Farm?… Hyper-urbanization in the Third World

Trends: In most developed nations, upwards of 75 percent of the population lives in cities. Until recently, this urban concentration was considered a characteristic of advanced industrialized economies, where cities provided central locations for the production and distribution of goods.

The last thirty years, however, have shown this assumption to be mistaken, as urban concentration has risen dramatically even in relatively modestly developed nations.

Over the next twenty years, current rural-to-urban migration patterns suggest, there will be as many great urban concentrations in middle and low-income countries as in developed ones. As shown in Table 6, alongside New York, Los Angeles, and Tokyo, the mega cities a decade from now will include Lagos, Nigeria; Jakarta, Indonesia; Mumbai, Delhi and Calcutta, India; Karachi, Pakistan; Cairo, Egypt, and Manila, Philippines. These will all have anywhere from 10 to 20 million inhabitants, comparable to New York City today.

Nor is this simply a matter of a few mega-cities in a few unusual countries. As Table 7 shows, in a quarter century, nearly all of Africa is expected to have nearly half or more of its population located in urban areas.

The growth of these cities in less developed countries has been fueled by a lack of productive opportunities in the countryside, and the hope for government support or employment in the commercial or political capitals. Unfortunately, neither housing nor sanitation has kept pace with such growth, such that even relatively prosperous cities, such as Sao Paulo, Brazil, are surrounded by hundreds of thousands of makeshift dwellings, in unsafe areas, housing migrants hoping for better things.

Consequences: The risks associated with such mega-cities in poor countries are both practical and political. The practical problems arise in providing adequate shelter, education, sanitation, water and services (including criminal justice) and employment to such concentrations of people in countries with modest resources. Natural disasters – from mudslides to earthquakes to tsunamis – find thousands of victims where millions are

crowded together in unsafe shelter. Diseases spread easily are and difficult to treat. Work is often black-market or hard to find at all.

However, perhaps the greater risks are political. Individuals packed into the margins and crevices of vast cities need help finding shelter, jobs, and basic services. Where the government cannot provide them, other groups – religious organizations, criminal gangs, even terrorist networks, often step in. Governments risk being seen as illegitimate when they cannot provide for obvious concentrations of struggling people; yet this is an opportunity for individuals who oppose the government to seek supporters. Even where violent conflict does not result (and such conflict is rare, as even the poor often have too much at risk to act unless truly threatened), a polarization of politics around redistributive issues may paralyze governments, and lead to endless and fruitless contention.

Mumbai may be the most economically vibrant city in India, but it was also the scene of the worst and most violent religious conflict in India in recent years. Lagos is currently the scene of violent conflict between locals demanding a greater share of oil revenues and the central government that ships most revenue to the north. Karachi is a famously lawless city. Large cities concentrate opportunity and growth, but they may also concentrate conflict.

Mitigation: It is probably too late to prevent much Third World migration, as it is occurring at a fast pace, and improving the rural economy enough to retain population would probably take years, even decades, in many countries. Still, where government

price or market regulation is making rural life difficult or unprofitable, a change in government policies may help.

However, for the millions already in Third World cities and the millions more on the way, the best response is likely for governments to concentrate on offering labor intensive services, such as primary education, sanitation, water supply, and simple health clinics. Fortunately, NGO's are capable of offering much assistance in these areas. Such labor intensive services are relatively cheap in low-income countries, provide much legitimacy for the government, and substantially improve the ability of people to work (aside from the jobs created by the efforts themselves). Where past foreign aid has often gone to waste, providing massive capital-intensive programs for poor and rural countries, the future may be lie in providing labor-intensive programs that give people the tools and strength they need to develop their own economic destiny (Easterly 2006).

VIII. Conclusion

It is clear that demographic issues hold a host of challenges and pressing issues for the world, and especially for Europe, in the coming decades. Europe and Japan will have to deal with an unprecedented decline in population growth coupled with a degree of population aging never seen before in world history. At the same time, the younger and rapidly growing countries of Asia are likely to enjoy the lion's share of the world's economic growth, with the United States – whose falling fertility and aging has been substantially mitigated by several decades of high immigration – close behind.

Europe will also have to cope with enormous pressures for the immigration of young people from Africa and the Middle East, while also preparing itself to cope with

the threats from global epidemics that the flow of commerce and people will make inevitable at some point in the future. All of this will come at the same time that massive urbanization in lesser developed countries creates both practical and political vulnerabilities in those nations, while the military resources of growing developing countries is increasing as well.

These are significant challenges, but there is no reason to believe they cannot be met if planning and work on mitigation begin now. Europe (and Japan and the US) need to be more flexible and creative to make the best use of their human capital, boost productivity, and keep their technological edge. They need to embrace globalization, so that their abundant capital can flow to earn the best returns and participate in the global growth of the future, while accepting that immigration is an inevitable counterpart of the asymmetries of age and growth between them and the developing world. They need to prepare to deal with a disorderly and often dangerous world, while nonetheless focusing on keeping open and accommodating societies.

These tasks will demand creative and exemplary political leadership; both to explain the need for changes and to implement them. But ignoring these challenges will be the most dangerous course, as the rapid aging and growth decline of most of Europe will be upon us within the decade, and will transform conditions entirely within a generation.

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Table 1. Largest Countries

2005		2025	
China	1,315,844,000	China	1,441,426,000
India	1,103,371,000	India	1,395,496,000
USA	298,213,000	USA	350,103,000
Indonesia	222,781,000	Indonesia	263,746,000
Brazil	186,405,000	Pakistan	229,353,000
Pakistan	157,935,000	Brazil	227,930,000
Russia	143,202,000	Bang'desh	193,752,000
Bang'desh	141,822,000	Nigeria	190,287,000
Nigeria	131,530,000	Mexico	129,381,000
Japan	128,085,000	Russia	129,230,000
Mexico	107,029,000	Japan	124,819,000
Viet Nam	84,238,000	Ethiopia	118,354,000
Philippine	83,054,000	Philippines	109,084,000
Germany	82,689,000	Viet Nam	104,343,000
Ethiopia	77,431,000	Congo, DR	103,224,000
Egypt	74,033,000	Egypt	101,092,000
Turkey	73,193,000	Iran	89,042,000
Iran	69,515,000	Turkey	90,565,000
Thailand	64,233,000	Germany	81,967,000
France	60,496,000	Thailand	72,635,000
UK	59,668,000	UK	63,601,000
Italy	58,093,000	France	63,407,000
Congo, DR	57,549,000	Uganda	60,601,000
South Korea	47,817,000	Myanmar	59,002,000
South Africa	47,432,000	Columbia	57,738,000

Table 2: Fastest Growing Countries 2000-2005

(At Least 1 Million People)

	Annual Growth Rate, %
United Arab Emirates	6.5
Afghanistan	4.6
Eritrea	4.3
Sierra Leone	4.1
Kuwait	3.7
Chad, Uganda, Niger	3.4
Burkina Faso, Benin, Somalia, Palestine (occupied)	3.2
Yemen	3.1
Burundi, Congo, Mali, Mauritania, Guinea-Bissau	3.0
Congo (Dem. Rep.), Gambia, Iraq, Madagascar, Angola	2.8
Jordan, Saudi Arabia, Togo	2.7
Syria	2.5
Ethiopia, Guatemala, Paraguay, Rwanda, Senegal	2.4
Honduras, Laos, Equatorial Guinea	2.3
Nigeria, Guinea, Kenya, Malawi, Bhutan	2.2
Ghana, Nepal, Papua New Guinea	2.1
Bolivia, Cambodia, Nicaragua, Mozambique, Pakistan, Israel, Libya, Malaysia, Tanzania	2.0
Bangladesh, Cameroon, Costa Rica, Egypt	1.9

Table 3: Projected European Population Decline to 2050 (Millions)

	2005	2025	2050
United Kingdom	59.7	63.7	67.1
France	60.5	63.4	63.1
Germany	82.7	82.0	78.8
Italy	58.1	56.3	50.9
Spain	43.1	44.2	42.5
Netherlands	16.3	17.2	17.1
Belgium	10.4	10.6	10.3
Poland	38.5	37.1	31.9
Czech Republic	10.2	9.8	8.4
Austria	8.2	8.3	8.1
Hungary	10.1	9.4	8.3
Portugal	10.5	10.9	10.7
Greece	11.1	11.2	10.7
Romania	21.7	19.9	16.8
Bulgaria	7.7	6.6	5.1
Russia	143.2	129.2	111.8
Ukraine	46.5	37.3	26.4

Table 4: Youngest Countries

	age groups in 2005 (%)		
Country	**0-14**	**15-59**	**60+**
Uganda	50.5	45.7	3.8
Niger	49.0	47.7	3.3
Guinea-Bissau	47.5	47.7	4.7
Mali	48.2	47.5	4.2
Chad	47.3	48.1	4.7
Dem. Rep. of Congo	47.3	48.5	4.3
Malawi	47.3	48.0	4.7
Burkino Faso	47.2	48.6	4.2
Congo	47.1	48.3	4.5
Liberia	47.1	49.3	3.6
Afghanistan	46.5	49.1	4.4
Angola	46.5	49.6	3.9
Yemen	46.4	50.0	3.6
Zambia	45.8	49.5	4.6
Palestine (Occ. Terr.)	45.5	50.0	4.5
Burundi	45.0	50.8	4.2
Eritrea	44.8	51.3	4.0
Ethiopia	44.5	50.8	4.7
Eq. Guinea	44.4	49.6	6.0
Nigeria	44.3	50.9	4.8
Benin	44.2	51.5	4.3
Somalia	44.1	51.7	4.2

Table 5: Oldest Countries

	2005		2050	
Country	**15-59**	**60+**	**15-59**	**60+**
Japan	59.7	26.3	44.9	41.7
Italy	60.4	25.6	45.5	41.3
Germany	60.6	25.1	50.1	35.0
Sweden	59.2	23.4	53.0	30.9
Greece	62.7	23.0	49.6	36.8
Austria	61.8	22.7	49.2	37.2
Latvia	62.8	22.5	48.0	38.3
Belgium	60.8	22.4	51.4	33.3
Bulgaria	63.8	22.4	48.4	38.8
Portugal	61.8	22.3	49.3	36.3
Croatia	62.4	22.1	50.0	35.6
Switzerland	61.7	21.8	50.8	33.7
Estonia	63.3	21.6	50.6	33.6
Spain	64.3	21.4	46.1	39.7
Finland	61.4	21.3	52.0	32.6
Denmark	60.1	21.1	55.2	28.2
France	60.7	21.1	51.2	33.0
United Kingdom	60.9	21.1	54.2	29.4
Ukraine	64.2	20.9	48.1	38.7
Hungary	63.5	20.8	50.1	36.2
Lithuania	62.6	20.7	48.9	37.9
Slovenia	65.6	20.5	47.2	40.2
Czech Republic	65.3	20.0	47.5	39.3
Norway	60.4	20.0	53.7	30.0

Table 6: Urban Agglomerations, 2015

Over 20 million

Tokyo
Mumbai
Delhi
Mexico City
Sao Paulo

15 to 20 million

New York
Jakarta
Lagos
Calcutta
Karachi

11 to 15 million

Buenos Aires
Cairo
Los Angeles
Shanghai
Manila
Rio de Janeiro
Osaka
Istanbul
Beijing

Table 7: Projected Urban Populations, percentage in 2030

REGION	2003	2030
E. Africa	26	41
N. Africa	35	48
M. Africa	37	54
W. Africa	42	59
S. Africa	54	67
SE Asia	42	60
Europe	73	80

Sources for Tables

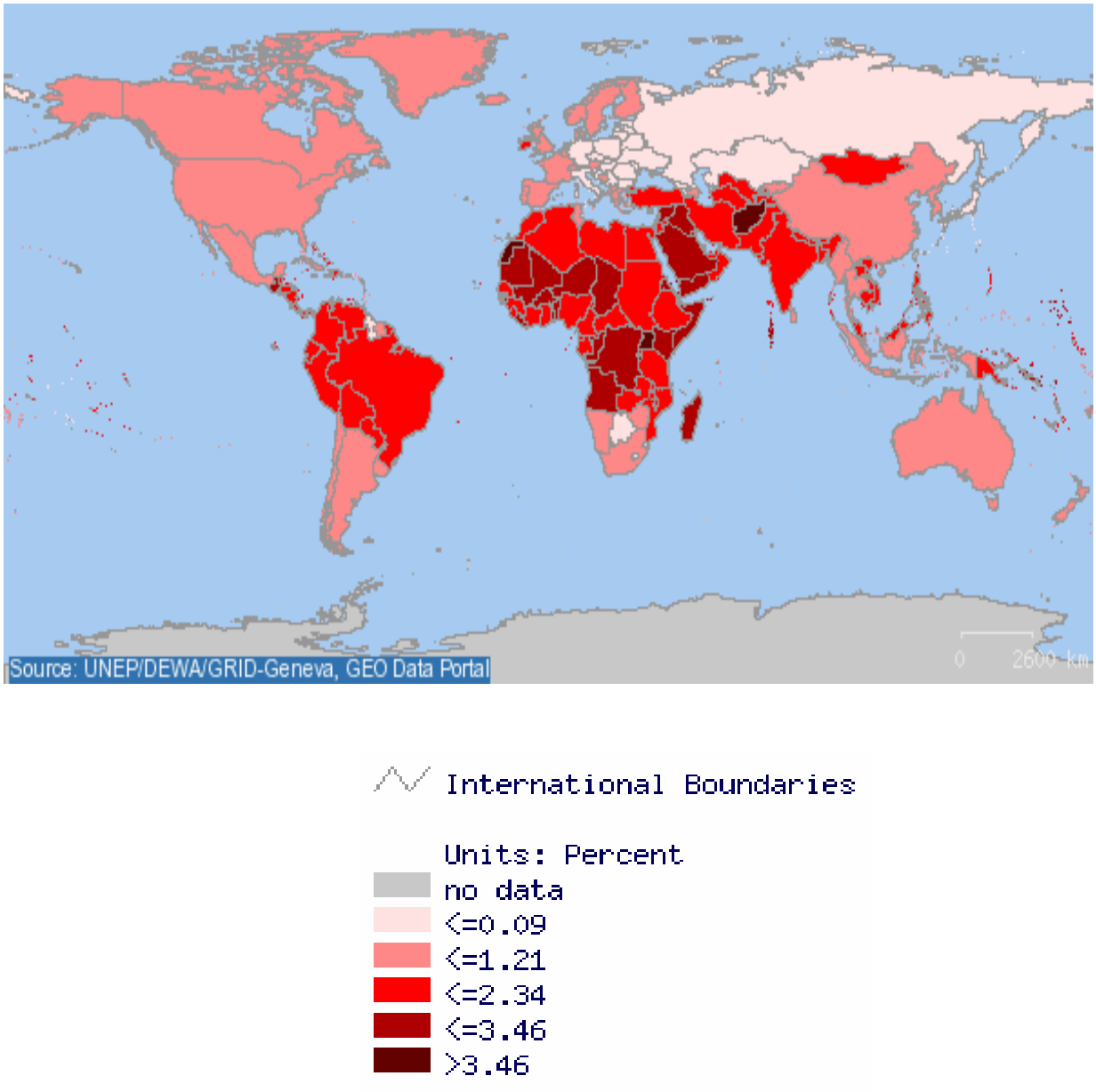
Tables 1 and 2: UN Population Division: World Population Prospects, 2004 Revision
http://www.un.org/esa/population/publications/WPP2004/2004Highlights_finalrevised.pdf

Table 3: US Bureau of the Census, International Data Base.
http://www.geohive.com/global/geo.php?xml=idb&xsl=idb&par1=eu

Tables 4 and 5: UN Population Division.
note: projection for 2045-2050 based on medium-variant for global population growth estimates by the UN.
http://www.geohive.com/charts/pop_age.php

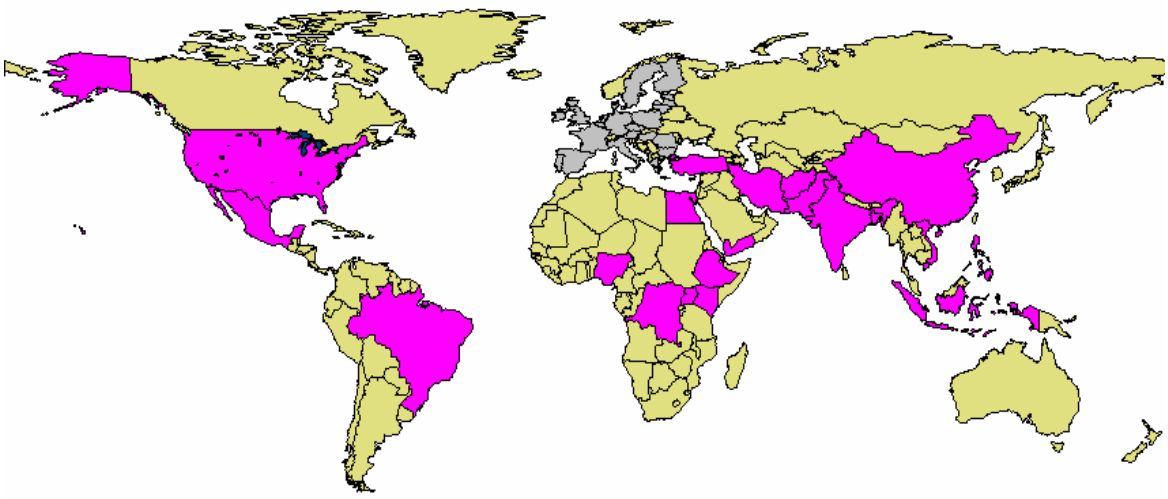
Tables 6 and Table 7: UN Population Division: World Urbanization Prospects, 2003 Revision
http://www.un.org/esa/population/publications/wup2003/WUP2003Report.pdf

Map 1: Global Population Growth Rates, expected 2005-2010



Source: UN Environmental Programme, Geo Data Portal, http://geodata.grid.unep.ch/page.php

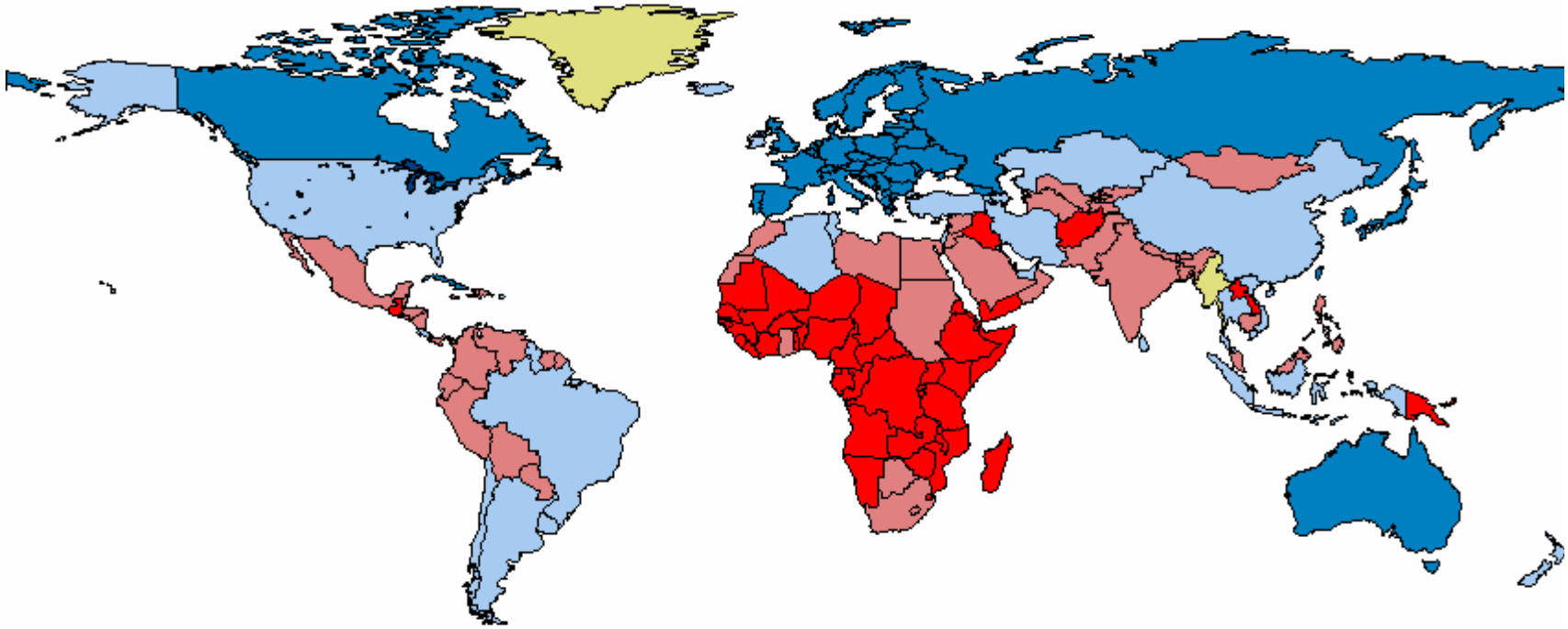
Map 2: The Weight of World Population Growth



POPULATION GROWTH 2005-2025

TOTAL WORLD	1,440 million
EU 27 (in Grey)	3.4 million (0.24%)
Top Twenty Growth Countries (in Purple)	1,047 million (73%)

MAP 3: Age Structures, 2005



Percentage of Population under 15 years old, 2005

Red: 40+ Pink: 30-39 Light Blue: 20-29 Dark Blue: <20