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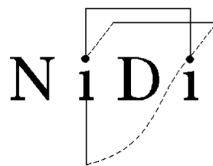
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Population and Development Scenarios for 11 EU Neighbour Countries in the Mediterranean region

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Abstract

The European Neighbourhood Policy (ENP) was implemented in 2004 at the time of enlargement of the EU, and was followed in 2008 by the establishment of the Union for the Mediterranean (UfM), a multilateral partnership between 26 EU and 16 neighbour countries of which 11 are Mediterranean Basin countries (MED11). ENP and UfM goals are to avoid emergence of new dividing lines between the EU and neighbour countries and instead strengthen prosperity, stability and security of all countries. Realization of these goals is influenced by demographic factors and pressures in both EU and neighbour countries. Objective of this paper is to present four population scenarios for MED11 countries (Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine (OPT), Syria, Tunisia, and Turkey). Scenario results were obtained as follows. In a first step, four qualitative economic-political development scenarios were composed to describe plausible futures in terms of economic development (increase vs. decrease) and political/economic cooperation between EU and MED11 countries (strong vs. weak) covering the period 2010-2050. Scenarios were labelled Business-as-Usual (BAU), Integration, Alliance, and Stress. In a second step, four qualitative scenarios were composed describing how indicators of fertility, mortality, and international migration might change if people in MED11 countries would come to live in different macro-economic and political contexts. In a third step, qualitative scenarios were operationalized leading to four different sets of quantitative assumptions about expected trends in indicators of fertility, mortality, and international migration. These were used to make population scenarios for MED11 countries. The paper concludes by reflecting on (1) implications of scenario results for the total population and working-age and old-age population segments in MED11 countries, (2) scenario results in light of expected population change in EU countries, and (3) population scenario assumptions and results with those of UN medium variant projections.

1. Introduction

A European Neighbourhood Policy (ENP) was developed in 2004, with the goal of avoiding the emergence of new dividing lines between an enlarged EU (EU15->EU27) and new neighbour countries and instead strengthening the prosperity, stability and security of all. The idea of the ENP was taken revamped in 2008 by launching the Union for the Mediterranean (UfM), a multilateral partnership between the 27 EU countries and 16 Mediterranean partner countries from North Africa, the Middle East and the Balkans. The UfM (a.k.a. the Barcelona Process) was launched after plans to create an autonomous Mediterranean Union, akin to the EU, was dropped. Realization of common goals in terms of prosperity, stability and security is influenced by demographic factors and pressures in both EU27 countries and 16 ENP countries (Algeria, Armenia, Azerbaijan, Belarus, Egypt, Georgia, Israel, Jordan, Lebanon, Libya, Moldova, Morocco, Occupied Palestinian Territory, Syria, Tunisia and Ukraine). Factors and pressures in these two regions are quite different though as ageing and slow population growth characterise EU countries while young population structures and population growth still characterize most populations in countries of North Africa and the Middle East. However, as many ENP countries have almost completed the second phase of the demographic transition of declining birth and death rates, the issue of ageing, including health and economic implications, is becoming important.

This is the context of a multi-country project, funded under the EU 7th Framework Program, called MEDPRO – Mediterranean Prospects. Since 2010, a consortium of 17 institutions from EU and selected ENP neighbouring countries explores future challenges faced by 11 (MED11) countries in Mediterranean Basin (Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Occupied Palestinian Territory, Syria, Tunisia, and Turkey¹) for the period 2010-2050. The project explores and analyses future challenges in the following fields: (1) geopolitics and governance, demography, health, ageing, (2) management of environment and natural resources, (3) energy and climate change mitigation, (4) economic integration, trade and investment; (5) financial services and capital markets; (6) human capital, social protection, and inequality. In these key-fields, country-specific differences and common features are identified and analysed, including linkages with ongoing and expected developments in EU countries and the EC political arena, leading to the derivation of different scenarios of future economic and political development for MED11 countries and the region as a whole.

The focus of this paper is on population and development scenarios of MED11 countries for the period 2010-2050. More specifically, this paper describes (1) design aspects of the MEDPRO population and development scenarios, (2) main results of the population scenarios for MED11 countries and compares these with the UN medium variant projection for MED11 countries and with EUROSTAT population growth perspectives of EU-27 countries, and, (3) implications of the scenarios for policy and planning.

Concepts, method and data

Development scenarios describe possible and plausible roadmaps to the future in terms of indicators of social, economic and political development. Population scenarios describe how population size, composition, and drivers, may develop in the future if demographic behavior would be shaped in different economic, political and social contexts. Population scenarios are a special type of population projections and they require a set of different but related assumptions regarding fertility, mortality and international migration behavior. Population scenarios thus do not attempt to predict what might most likely happen in the future based on what we know about past demographic events and trends. Such kind of assumptions underlie another type of population projections, such as variant-projections or

¹ The ENP is addressed to countries which do not, or do not presently, have an accession perspective. Turkey was recognised as a candidate country, at the Helsinki European Council in December 1999 and is therefore not covered by the European Neighbourhood Policy. In the MEDPRO project Turkey was included because it is a key player in economic, socio-political and environmental developments in the Mediterranean Basin.

Low-Medium-High projections as produced by the United Nations Population Division, World Bank, ILO and national statistical offices (e.g. see: United Nations, 2010). Results of the UN 'Medium variant' are most often referred to by policy makers and planners as these reflect what demographers think what is most likely to happen regarding future changes population size and composition. Such kind of projections are often based on assumptions that extrapolate past trends in fertility, mortality and migration without making assumptions about possible changes in the economic, political and social context. The low and high variant projections reflect lower and upper bands around the medium variant. Below, we examine how results of the Medium Variant projection position compare to the results of the MEDPRO population scenarios.

The methodology for the population scenarios in this report is the same as the one used by international organizations, including UN Population Division, national statistical offices and is called the cohort component projection method (e.g. Preston *et al.*, 2011). This methodology projects a population by age and sex into the future, based on informed choices about expected changes in the primary drivers of population change: age and sex specific levels of mortality, fertility and migration. A general description of the projection methodology can be summarized as follows. An age-sex distribution of a population in some base-year (t) is projected to, say, the next year (t+1) by applying sets of age-specific fertility rates, age and sex-specific survival ratios, and age and sex-specific (net) international migration rates or numbers. An assumption is made regarding the sex ratio at birth, to distinguish male from female births. In a subsequent step the projected population (t+1) is projected forward to year (t+2), using new sets of fertility, survival and (net) migration rates or numbers.

Thus, to project a population into the future (say 2010-2050) assumptions about future changes in levels and age-pattern of fertility, mortality and international migration must be developed. This methodology can be extended to make multi-state projections of populations not only by age and by sex, but also by education and health status (and other relevant characteristics). However, application of the multi-state projection methodology is more demanding in terms of availability and quality of input data. Unfortunately such type of data are not availability for MED11 countries.

To formulate quantitative assumptions, data on past trends in indicators of (net) international migration, fertility and mortality were collected, examined and used. Data come from National Statistical Offices of MED11 countries, database of the UN Population Division (United Nations, 2011a), The World Health Organisation (Health statistics and health information systems) (WHO, 2011), United Nations Global Migration Database (version 0.3.6) (United Nations, 2011b).

Development scenarios

The MEDPRO project developed a general conceptual framework for deriving economic-political development scenarios for the period 2010-2050 (Sessa, 2011). These scenarios each sketch a different context within which demographic behaviour would unfold leading to the formulation of different qualitative and quantitative demographic response scenarios for MED11 countries.

In a first step, two key dimensions of this general framework were identified: (1) future development of total wealth in MED11 countries (decreases or increases), and (2) future options for international cooperation (i.e. EU27-MED11 integration or EU27-Pan Arab alliance) whereby a distinction was made whether a particular option would become a success or failure. This is summarized in Table 1, implying eight potential scenarios.

Table 1: Identification of potential economic-political scenarios for the future

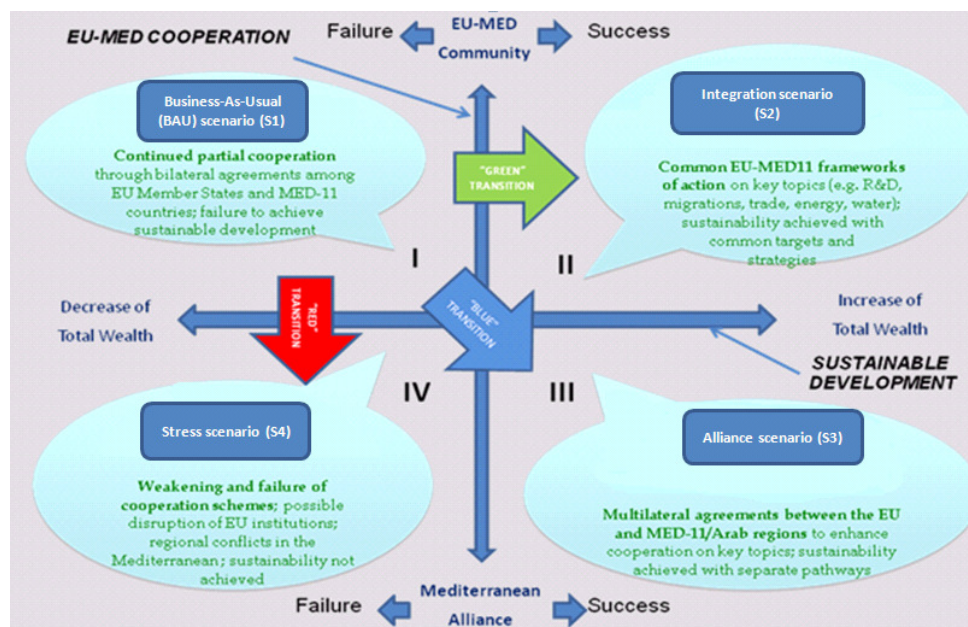
				Total wealth	
				Increase	Decrease
EU-MED11 cooperation			Success	2	
			Failure		1
Mediterranean Alliance cooperation			Success	3	
			Failure		4

In a second step, to avoid dealing with a large number of potential scenarios, four were selected from the eight potential scenarios by introducing the following assumptions:

- Future increases in total wealth cannot co-exist or be achieved without interregional or regional cooperation.
- Future options of international cooperation are limited to two types: (1) cooperation with EU countries and integration of MED11 countries in an expanding EU market, (2) launching of an independent Pan-Arab political and economic system akin to the EU.
- MED11 countries either cooperate within a framework with EU countries or in one with all other Arab league nations, not in both.

In a third step, a general framework for economic-political development was constructed, including the labelling and description of four development scenarios for MED11 countries (Figure 1). Each development scenario describes a possible economic-political future in which inhabitants may come to live, should such a future materialize. Below, we describe each of these economic-political scenarios.

Figure 1. Framework of economic-political scenarios for MED11 countries (Sessa, 2011)



In a fourth step, demographic response scenarios were derived from each of the economic-political development scenarios. These are described in the next section.

Business-as-usual (BAU) scenario (S1). This scenario describes a future in which past trends are to some extent extrapolated. This includes emerging issues on the political front in various MED11

countries (Arab spring) since 2010 as well as the financial crisis in the EU region but it assumes that internal MED11 and EU market problems will be resolved by 2015. It means that in this period the situation settles around the observed past trend of gradual decrease in total wealth resulting from the partial and *ad hoc* style of MED11-EU cooperation failing to develop firm action and collaboration regarding key political, security, economic, socio-cultural and environmental issues. The BAU scenario (S1) assumes that the EU also pays a price for not expanding EU-membership beyond the current 27 countries in terms of foregoing certain economic and political benefits. Overall, the BAU scenario (S1) assumes that in the period 2010-2050 the economic influence of the EU in the Middle East will diminish. On the political front, the scenario assumes that the Israel-Palestine conflict will not be resolved which will hamper economic development and political stability in the Middle East. Apart from the recent political developments in the 2010-2012 period, this scenario foresees no further breakthrough political, social, technological, and cultural changes in the future.

Integration scenario (S2) describes a brighter future. EU-MED11 cooperation is assumed to improve significantly so that, over time, by 2050 a common market exists in which EU and MED11 countries are highly integrated at the political, economic, social and military levels. The Integration scenario (S2) is essentially a vision of an expanding European Union to include all MED11 countries as full members. This means emergence of one common market with a free flow of capital, goods and persons. In this vision, the Palestinian-Israeli conflict is resolved and the expectation is that in due time the EU-MED11 region will prosper. This also means that extreme wealth-differences between and within countries will decrease, partly as a result of “good governance” practices. At the global scale, the pay-off is that the EU-MED11 market becomes one of the three key economic and political powers in the world, including the USA and China.

Alliance scenario (S3) also sketches a brighter future than the BAU scenario (S1) but this future is shaped in a different manner. This scenario describes a future where the EU expands, but only includes Russia and Turkey. MED11 countries will increase their collaboration and expand to include other countries in the Middle East (e.g. Iraq, Jemen, Saudi Arabia, Sudan) and form one large Pan-Arab common market, akin to the EU. Due to their geographic proximity a strategic alliance is formed between the EU and Pan-Arabic markets to ensure that the two adjacent and independent markets are connected in an efficient and effective manner, contributing to economic prosperity and political stability in both regions. Thus, economic and political interaction and development is first and foremost taking place between countries *within* the two regional markets. In this scenario, the Israel-Palestinian conflict is also assumed to be resolved so that a major barrier to internal (south-south) market cooperation is removed. Eventually, the Mediterranean region emerges as a peaceful and inspiring meeting and business place of people living in two adjacent regional markets. The EU and Pan-Arab markets do collaborate, in particular on some key issues such as security and quality of environmental resources. However, development of an independent and effective Pan-Arab economy and political system takes time so that economic benefits in terms of total wealth increases, compared to the Integration scenario (S2), are expected at a later stage in the period 2010-2050. Eventually, this scenario foresees a multi-polar global market with several economic regions competing and without a particular one dominating.

Stress scenario (S4) sketches a grim outlook to the future. The Mediterranean Sea is perceived as dividing line between two opposing and competing cultures, i.e. European vis-à-vis Arab cultures. Socioeconomic development and international cooperation is under threat. Within the Arab region, the Israel-Palestinian conflict lingers on, hampering economic development and political cooperation within the region. This scenario is a worse-case scenario regarding economic and political development in the Arab world. Although inhabitants of MED11 countries pay a highest price in terms of decreasing prosperity, security and well-being, people in adjacent EU countries will in the medium and long run also be affected by negative economic and political spill-over effects. This scenario describes a future with increases in poverty, political instability and -insecurity, natural resource depletion and pollution, and social and ethnic conflicts.

Population scenarios

Qualitative population scenarios

What kind of response might result if people in MED11 countries would be exposed to each of the above described economic-political contexts? Before addressing this question, a brief reconnaissance of some main demographic indicators of MED11 countries is justified.

Table A1.1 in Annex 1 shows that MED11 countries comprise more than 80% of the population of Arab League countries (i.e. generally referred to as the Arab world). The table also shows that population growth in these countries has been substantial in the past decades and that future population prospects are mainly determined by demographic behaviour in the largest countries Egypt and Turkey, and, to a lesser extent, Algeria and Morocco. To date, about 45% of the population in MED11 countries live in these four MED11 countries.

Furthermore, macro-economic and political changes have resulted in quite different demographic behavioural responses. For example, in the case of Israel, in 2008, the population consisted of about 75.5% Jews, 16.8% Arabs, 2.1% Christians, 1.7% Druze, and 3.9% others unclassified by choice. These groups have responded in different ways to macro-economic and political changes. The overall level of fertility in terms of the Total Fertility Rate (TFR²) has more or less remained constant at about 2.9 children per woman between 1990 and 2009. However, this figure masks changes that took place in fertility rates in population sub-groups during that period. For instance, fertility levels of the Jews increased from 2.6 to almost 3.0, but fertility among Arabs decreased from 4.8 to 3.8 children, while among Christians it remained unchanged at replacement level fertility (2.1). Among the Druze, TFR declined from 3.8 to 2.5 and among people that choose not to indicate their ethnic affiliation fertility remained more or less constant and (far) below replacement level fertility (1.6) (ICBS, 2012). In the case of Turkey, the demographic response of past macro-economic and political change lead to an overall decline in TFR of 3.1 children per woman in 1990 to replacement level fertility (2.1) in 2009. However, macro-economic change has resulted in declines in fertility among the two main ethnic groups, Turks and Kurds, but the decline was much slower among Kurds. Among others this becomes visible in spatial differences in fertility rates, notably between the core area of Turks (urban areas of West Turkey) and the core area of Kurds (rural Central and Eastern Turkey). In Western Turkey fertility levels declined since 1990 to below replacement level in 2003 (i.e. 1.85) while levels in a major rural parts of Turkey, such as in Eastern Turkey, remained fairly high at 3.8 live births per woman (HUIPS, 2009).

Below, we composed four different demographic response scenarios, i.e. story lines, that describe how migration, fertility and health/mortality might be affected if people in MED11 countries would come to live in a macro-economic and political future context as derived from the MEDPRO common scenario framework.

BAU-scenario (S1) sketches a future (2010-2050) in which past poor macro-economic performance and political instability continues without major breakthroughs.

International Migration. Regarding developments in international migration we assume that in the BAU scenario (S1), currently observed annual net numbers of migration (2005-2010) for individual countries will more or less remain the same during the projection period 2010-2050, with the exception of the years 2010-2015. For those years we expect that for some countries emigration numbers will be higher as a result of 'Arab Spring'-related turmoil and insecurity in a number of countries during the 2010-2012 period (e.g. Tunisia, Egypt, Libya, Syria). The assumed net numbers

² Mean number of children that a woman in the age rang 15-49 is expected to give birth to under the assumption that all women will survive until the end of their reproductive life (i.e. about age 50).

for the future are similar to the ones assumed³ by the UN Population Division (Medium Variant projections for MED11 countries) (UN, 2011a). These numbers are shown in Annex 2, Table A2.2, second column.

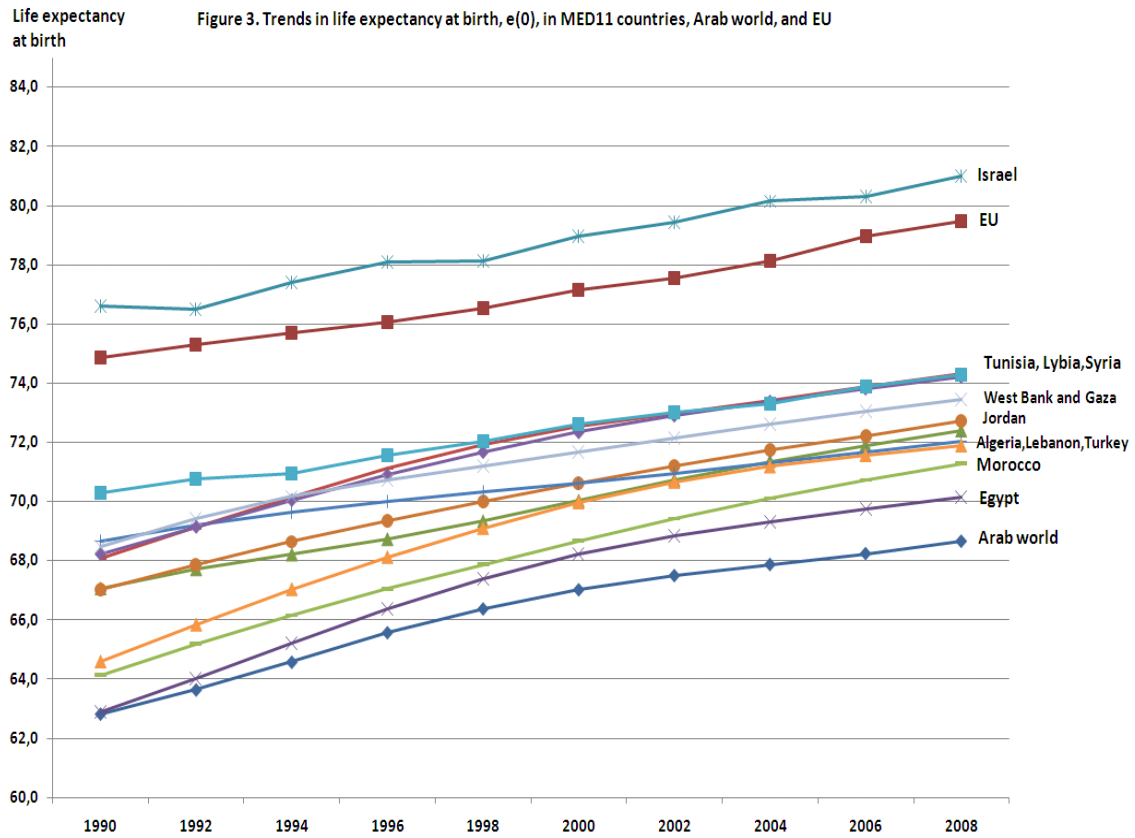
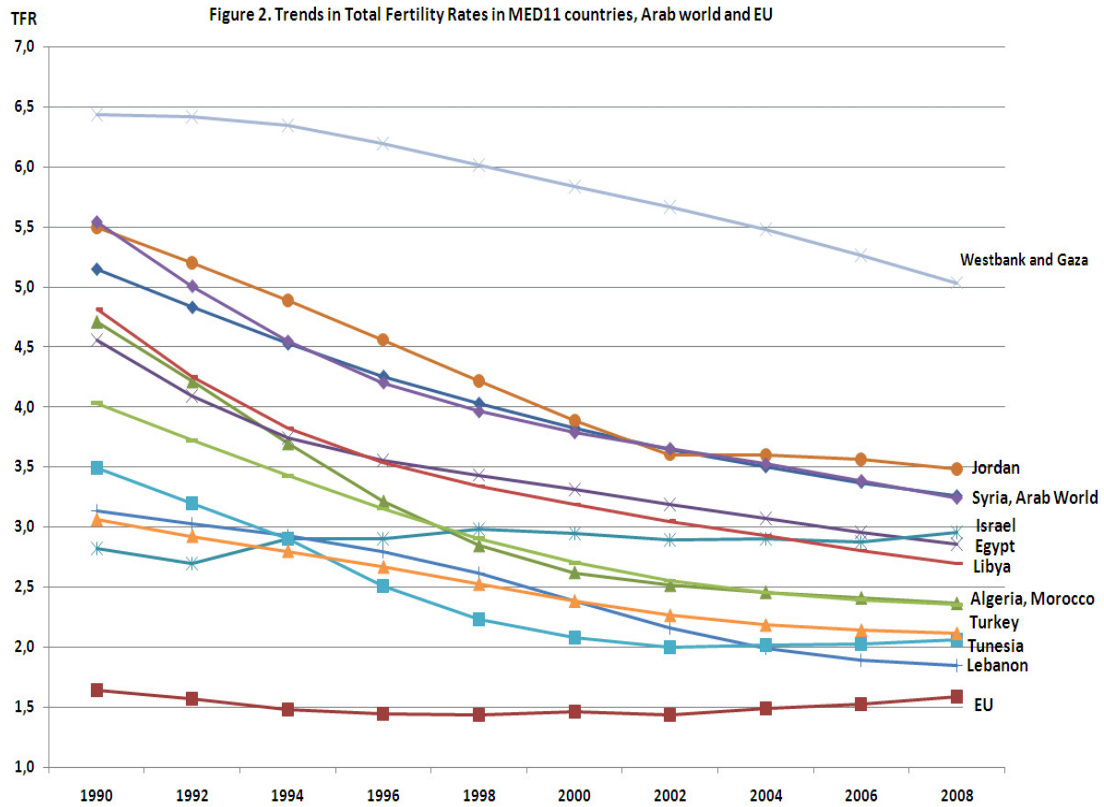
Regarding international migration in MED11 countries it is also relevant to note that much of the international migration moves in the past decades concerned temporary labour migration of men working on well-defined time-contracts in nearby oil-producing countries (e.g. Gulf States, Libya). After expiration of their contract, most migrant-workers return to their country of origin, often waiting for another opportunity to migrate. Furthermore, legal emigration to EU is severely restricted and this is not assumed to change in the BAU scenario (S1). Also, this scenario (as well as the Stress scenario (S4)) assumes that net numbers of refugees in countries will not alter much. Their presence (e.g. Iraqi refugees in Jordan) is relevant as they put pressure on available health, employment, housing and ecosystem resources affects health and living conditions of nationals.

Fertility. In the BAU scenario (S1) the observed decline of fertility rates in most countries is assumed to continue, though the speed of the fertility change will differ by country, depending on past rates of decline or increase. Thus, this scenario permits fertility rates for some countries to decline even further while it permits fertility rates of other countries to increase. However, by 2050, at the level of the MED11 region, the average of country-specific fertility rates is assumed to have settled at replacement level fertility (2.1). This means that, on average, women in MED11 countries are expected to give birth to 2.1 children during their reproductive life, meaning that when mortality risks are accounted for each woman will exactly be replaced by a daughter who also will become a mother and survive at least up to the end of her reproductive life (i.e. about age 50). Figure 2 and Table A.1. (Annex 1) illustrate observed past trends in Total Fertility Rates in MED11 countries, the Arab world and in the EU countries, while assumed future change in fertility rates, by country, are presented in Table A2.1 (Annex 2). The latter are addressed in more detail in the next section.

Mortality. Figure 3 and Table A1.3 in Annex 1, show that MED11 countries have life expectancies that are above the average of the Arab world as whole, and that life expectancies of Israel are even above EU average. Further improvements in life expectancy at birth, $e(0)$ are foreseen in this scenario but the pace is dependent on levels currently attained and the past rate of change in levels of $e(0)$. Thus, existing relative differences between life expectancies in countries as well as effects of underlying factors (e.g. health practices, health system infrastructure and access, epidemiological risk factors, educational attainment, household wealth) are assumed to prevail to the same extent in this scenario permitting different country-specific pathways of change in life expectancy. The latter is subject matter of the next section.

To summarize, key-characteristic of the BAU scenario (S1) is that *diversity* in terms of demographic rates are assumed to prevail in future. More specifically, existing *relative differences* between MED11 countries in mortality and fertility rates, and volumes of net migration are assumed to remain intact during the period 2010-2050.

³ These numbers do not come from registration systems as these severely underreport emigration and immigration events (e.g. Neto, 2009). Such numbers are generally derived by applying (variants) of intercensal survival techniques whereby net international migration numbers (emigration minus immigration) are derived as a residual after subtraction of a first census population from a subsequent census population and after accounting for intercensal births and deaths. The latter can be estimated quite accurately contrary to numbers of emigrants and immigrants.



Integration scenario (S2) sketches the brightest macro-economic and political outlook to the future of the four scenarios. The EU-MED11 region becomes a tolerant and popular meeting place for intercultural contact, a place where people with different backgrounds, life styles and religions live together in peace and tolerance. In this scenario, cultural traditions and distinct national and sub-national identities are maintained, cultivated and respected, while the identity of EU-MED11 citizenship strongly develops. After 2015 the region becomes a safe place to live, businesses flourish and most people gain an income that comes close to needs and aspirations. Main contributing factors are that during the 2010-2015 period the Israel-Palestine conflict is resolved and that most countries have adopted national democratic political systems akin to those in Europe. Furthermore, the current financial crisis in the Euro zone is resolved after major economic and financial restructuring programmes have successfully been implemented in various EU countries during this period. As a result, during the 2015-2020 period, economic and political cooperation between restructured EU and MED11 countries becomes more effective leading to full integration of these countries in a single EU-MED11 market.

International Migration. In the initial period (2010-2030) it is expected that emigration from MED11 countries to EU will increase because labour demand in EU countries is on the increase due to a rapidly ageing working age population, notably in southern EU member states. Furthermore, during that period, it takes MED11 economies more time to match the economic growth rates of EU countries. In this period, many of the MED11 emigrants who now work as contract labourers in the oil-producing countries of other Middle Eastern countries are expected to migrate to EU countries because access and stay in EU countries have become much easier and living conditions are better there. As a result, negative net numbers of migrants are expected to increase during the period 2010-2030 as emigrants from MED11 countries to the EU outnumber immigrants and return migrants. During the period 2030-2050, economies and welfare in MED11 countries have come to full development and potential emigrants find it increasingly easier to find attractive income earning opportunities in their own country. Furthermore, return migration will increasingly become important, including children of first generation emigrants who were born in EU countries of destination. As costs of international travel relative to total income decreases in this scenario, temporary short term and circular types of migration will be on the increase too. As a result, the net effect will be that all MED11 countries currently having negative net migration numbers (i.e. emigration being higher than immigration) will experience negative net migration numbers turning into positive ones.

Fertility. Intercultural contact with EU citizens as well as EU rules and regulations regarding equality and equal opportunities of men and women will lead to fertility rates declining more rapidly than in the BAU scenario (S1), leading to rates resembling the currently observed low levels in EU countries (average TFR (2008) is 1.5 in EU27 countries). This is expected because, as time goes by, similar economic, social, cultural and psychosocial factors underlying European fertility decline, will affect fertility levels in MED11 countries, notably in population groups that currently exhibit high fertility rates. For instance, larger numbers of women in MED11 will successfully participate in the educational system leading to much higher levels of educational attainment. This in turn will lead to a significantly improvement in decision making power regarding personal aspirations (e.g. number of children to have, timing and spacing of births, labour force participation), household and community matters (participation in councils, local governments). Furthermore, this scenario foresees that 'individualism' becomes more widespread and that secularisation levels will also increase. On the demand side of the economy, women in MED11 countries will increasingly be called upon to participate in the labour market to cope with local labour shortages resulting from economic development and growth. Women of MED11 countries, notably those with the right diplomas, will have opportunities to work in Europe and will increasingly make use of that opportunity. Overall, the expected educational attainment level increases of women are expected to lead to irreversible increase of female labour force participation (i.e. paid work outside the home and overseas) which competes with childbearing and rearing, eventually resulting in lower fertility aspirations and low fertility rates. Another fertility reducing effect in this high economic growth scenario comes from expected improvements in health infrastructure in MED11 countries. Such improvements are expected to lead to

a further reduction of levels of unmet need of family planning services from 25% in 1990 to 10% in 2008 and to 0% by 2020.

Mortality. Economic growth and political changes will also have a positive effect on the availability, access and affordability of health services. Furthermore, governments will deal more adequately with unhealthy living conditions in congested cities in most MED11 countries. Pre- and post natal care, immunization of children, child care practices of mothers (among others due to increases in educational attainment levels) will improve significantly leading to lower infant and child mortality rates. With the exception of Israel, and acknowledging differences between MED11 countries, current under-five mortality levels are much higher than in EU countries. For instance in Lebanon, in 2008, 12 children per 1,000 in the age group 0-4 died while in Morocco it was as high as 38. The Arab world average hovers around 50 deaths per 1,000 children below age 5. This contrasts with EU country figures that are about 5 deaths per 1,000 children in that age range (see Annex 1, Table A1.3). However, this scenario also perceives a negative development as unhealthy western-style food habits and life-styles will increasingly be adopted in the region leading to further increases in obesity and related welfare diseases and higher risks of mortality at intermediate and higher ages. As ageing becomes apparent in a number of countries (e.g. Turkey) disease patterns will also change. Various countries will move from the second phase of the Epidemiological Transition with death rates mainly determined by injuries, infectious and communicable diseases to the third phase in which injuries and non-communicable diseases (e.g. degenerative diseases such as forms of cancer, diabetes). The net effect of the above developments is that the speed with which life expectancies in MED11 countries will increase will resemble those currently observed in EU countries⁴.

To summarize, the Integration scenario (S2) assumes that, starting around 2030, patterns of international migration will change. The general pattern becomes one where large numbers emigrating, among other to EU countries during the 2015-2030 period, will gradually become outnumbered by immigrants and return migrants after 2030. Fertility rates will decline to the average level currently observed in EU27 levels while life expectancy values will increase with a speed that is similar to the average speed currently observed in EU27 countries.

Alliance scenario (S3) differs from the Integration scenario in that instead of one successful single union of EU-MED11 countries, two separate geographically adjacent political and economic unions will develop. In this scenario MED11 will have formed a successful Pan-Arab political and economic market alliance with other Arab states while operating in competition but in good spirit with the EU union market. Similar to the Integration scenario (S2), the Israel-Palestine conflict is assumed to be resolved. The political situation in Iraq and the democratisation process in the Arab world will turn out to be a success in the sense of contributing to total wealth increases and political freedom. In this scenario a Pan-Arab identity is cultivated with a common set of norms, values and legal rights that are somewhat distinct from but not incompatible with those maintained in EU countries.

International migration. As economies grow and the movement of people and goods within the newly established market area has become easy, it is expected that net negative migration volumes of many MED11 countries increase as working in the Gulf States has become much easier. These volumes will level-off during the period 2015-2030 as the growing MED11 economies increasingly provide job-opportunities to their own citizens. Similar to the Integration scenario (S2), the economic growth process in MED11 takes time to gain momentum and success so that this scenario foresees that negative net migration numbers, as a result of declining numbers of emigrants and increasing numbers of immigrants, will gradually turn into positive net numbers of migration by 2030 and later. By 2050 this process will result in a situation whereby numbers emigrating and immigrating will balance so that the net numbers of migrants is zero. This is different from the situation in the Integration scenario (S2) where numbers immigrating and returning will outnumber numbers emigrating leading to a positive net number of migrants in MED11 countries by 2050. Thus, the orientation of migrants in this scenario is primarily on labour markets in the Arab region and not on EU or US labour markets as in

⁴ EUROSTAT projected life expectancies for EU-27 countries for 2030 and 2050

the Integration scenario (S2). In this scenario it is also expected that most of the long-term refugees will have managed to establish a new life in their host country and have integrated in these societies.

Fertility. There are two main forces at play determining future trends in fertility in this scenario. On the one hand economic growth is expected to lead to major improvements in availability and access to health services. This will have a fertility reducing effect as, similar to the situation in the Integration scenario (S2), levels of unmet need for family planning (around 10% in many MED11 countries (bron)) will reduce to 0%. On the other hand, western-style individualism will have much less of an effect on the lives of people in MED11 countries than in the Integration scenario (S2). Traditional family norms and values will remain intact and the influence of the larger social group and concomitant control mechanisms will lead to family size preferences that are, on average, somewhat higher than in the Integration scenario (S2). However, such traditions are under pressure as the labour market in this scenario will increasingly expect women to participate and this will stimulate governments to stimulate parents to invest in the education of their daughters, eventually leading to higher levels of educational attainment and occupational skills among women (and men). In this scenario, the net effect of both forces is believed to be that fertility levels will decline, but the speed of the decline will be slower than in the Integration scenario (S2) so that, by 2050, fertility levels will have settled at a somewhat higher level than in the Integration scenario (S2).

Mortality. Health status and life expectancy improvements will be similar to those in the Integration scenario (S2), but improvements in life expectancy will be slightly better in the Alliance scenario (S3). In other word, the annual rate of change in life expectancy is expected to be somewhat higher than in the Integration scenario (S2). Main reason for this assumption is that western-type life styles and health behaviour will have less of a chance to be adopted due to the presence of a strong tradition of social control over how individuals behave. Thus, individualism will have far less of chance to develop so that adverse western-style life styles, such as food and life-style habits detrimental to health, will occur less than in the Integration scenario (S2). Overall, and contrary to the situation in the Integration scenario (S2), individuals will remain more embedded in their social group and receive more protection in situations of stress, ill-health and need.

To summarize, past net international migration flows are expected to change for most MED11 countries between 2015 and 2050. Up to 2030 numbers immigrants and returning will gradually start to outnumber emigrants so that after 2030 net international migration figures will have turned into positive ones. This is similar to the pattern of change assumed in the Integration scenario (S2) but the process unfolds at a lower level, numerically speaking, while by 2050 numbers immigrating/returning and numbers emigrating will cancel each other out. Fertility will decline too as in the Integration scenario (S2) but fertility levels remain at somewhat higher levels than in the Integration scenario (S2). Increases in life expectancies in MED11 countries though are expected to increase at a higher speed than in the Integration scenario (S2).

Stress scenario (S4) is a kind of doom-scenario whereby existing regional and international cooperation structures collapse leading to an even more rapid decline in total wealth than in the BAU scenario (S1). In this scenario, most of the MED11 countries are on course to bankruptcy and in EU countries things aren't going much better too. Factories, firms and small shops find it increasingly difficult to make profit and pay their staff. The mismatch between government expenditures and income becomes larger so that, eventually, governments need lay off staff. Unemployment rates increase, notably among youth and young adults, leading to political unrest and foreign investors becoming more hesitant to invest in MED11 countries. Eventually, political stability in the region is at stake and new conflicts arise that cannot adequately be dealt with by the governments and elite groups.

International migration. Households find it increasingly difficult to cope with the negative economic development and political insecurity. In spite of the restricted access to EU countries and Gulf States, many unemployed citizens, mainly men, choose to leave the country in search of work and income overseas to provide financial support to families and relatives back home. Many emigrants enter EU and Gulf State countries as illegal immigrants where they become exploited and have to live as

outcasts. As this will not go unnoticed by the media in the EU, the general attitude towards immigrants in the EU will become even more negative than it is today. In spite of the limited prospects many emigrants have abroad, poverty at home make that many people migrate to other countries. During the period 2010-2050 the Stress scenario (S4) foresees that annual net migration numbers will hover at very high negative numbers as emigrants by far outnumber immigrants and return migrants. Only a sub-group of well educated MED11 citizens find ways to overcome restrictive entry measures (e.g. EU, Gulf States, US, Far East) and, through internet contact, find attractive jobs and pay abroad (brain drain). These persons find employment because the ageing EU labour market provides openings to well-educated and skilled immigrants from outside the EU. In the Stress scenario (S4) the situation in MED11 countries has become such that emigrants do not want to return and do their utmost to reunite with their family by letting them immigrate too in destination countries. The (negative) net number of international migrants rise to all time high figures during the period 2010-2050.

Fertility. The deterioration of MED11 economies results in impoverishment of health services, including availability and access to family planning services. Having many children becomes even more of a burden in terms of costs and leading to fewer births in some families than desired. However, in other families fertility levels increases because access to family planning services decreases as costs (user fees) increase. In terms of underlying factors, negative economic growth is, generally speaking, detrimental to female labour force participation and wages resulting in more women staying at home, loosing decision making power and independence leading to higher number of children than anticipated. In a similar way, parents tend to invest less in educating their daughters if poverty strikes in the household leading to higher fertility rates. Overall, the Stress scenario (S4) foresees that the long term net effect of poor macro-economic and political performance is that fertility decline in some MED11 countries will come to a halt or even increases during the 2010-2050 period and that, at the aggregate level of the MED11 region, fertility settles at a level above replacement level fertility (i.e. TFR exceeds 2.1 children).

Mortality. The detrimental macro economic and political trend implies that health infrastructure increasingly becomes disrupted and dysfunctional. Furthermore, large scale emigration means that in certain places social group support systems break down and communities disintegrate leading to increased poverty levels in urban as well as rural areas. Deteriorating living conditions may result in higher infection rates and diseases prevalence among vulnerable groups, such as pregnant women and children. At the macro-level this development may translate into higher maternal mortality rates and higher childhood mortality rates, leading to life-expectancies that increase less or even decrease. However, in times of stress, people flock together and provide support to each other. In MED11 countries this situation is expected to provide an impetus and revival of existing social support systems among members of the same descent group, clans, neighbourhoods, etc., which will have positive effect on mortality rates in vulnerable groups. The Stress scenario (S4) foresees that the net effect of these expectations is that life expectancies, at the level of the nation, will still increase, but at a much slower pace than in the other three scenarios.

To summarize, the Stress scenario (S4) is an economic and political stress scenario making many people deciding that emigration is the sole solution to cope with poverty so that net numbers of international migrants rise to all time highs. from and low immigration into MED11 countries. The scenario expects that, at the regional level, fertility rates will still decline but at a much slower pace, settling at above replacement level fertility (i.e. TFR exceeds 2.1). This scenario expects that fertility decline in some countries may even come to a halt or is reversed. Regarding improvements in life expectancy this scenario expects that, on balance, health and mortality conditions will still improve leading to gains in life expectancy that are relatively small as compared to expected gains in the other three scenarios.

Table 2 summarizes how demographic behaviour is believed to respond to different assumptions about macro-economic and political developments during the period 2010-2050.

Table 2 : Summary of *qualitative* projection assumptions for MED11 countries 2010-2050.

	BAU scenario (S1)	Integration scenario (S2)	Alliance scenario (S3)	Stress scenario (S4)
Migration	Observed levels of net migration in 2005-2010 remain constant for 2010-2050 period, except for particular countries affected by political and social upheaval and political change (Tunisia, Egypt, Lybia, Syria). No major changes in refugee stocks (e.g. Jordan).	Negative net migration turns into positive net migration numbers. Initially, emigration increases before economic growth in MEDPRO countries takes off, leading to increased income opportunities at home, resulting in less people emigrating and more people, once emigrated, returning. MEDPRO countries increasingly attract immigrants from other countries than EU and MEDPRO countries.	It takes time for the internal MED11 market to develop. Emigration in most countries therefore will continue to outnumber immigration and return migration for some time. Then, prosperity increases as income earning options increase leading to declines in people emigrating and increases in return migration, eventually leading to lower numbers of emigrants and immigrants, and numbers cancelling each other out.	Deteriorating living conditions and even higher unemployment rates than in S1 lead to increases in emigration and decreases in immigration, leading to high and negative net numbers of migration each year. Numbers will eventually approach the historical heights since 1950 and remain at that level.
Fertility	Decline continues, and eventually settles at replacement level. No significant behavioral changes.	Declining of fertility below replacement level to EU levels, due to increased intercultural contact fertility attitudes, preferences behavior becomes similar to that of EU women (and men).	Decline less rapid than in S2 Tradition of high fertility aspirations remain, but compete with increased demand for women in workforce.	Net effect is increased fertility. Tradition of large family size preferences remain, female labor force participation declines as well as women's decision making power regarding family size issues.
Mortality	Trend in levelling-off of increases in life expectancy continues. No behavioral changes in health seeking and health care behavior.	Further increase in indicators of health and life expectancy due to improvements in availability and acces to health services, leading to (e.g.) declining Infant, child and maternal mortality rates.	Individualism and unhealthy western life-styles/diets less than in S2. Persons are better 'protected' due to survival of the traditional strong family ties, -care and -responsibilities, leading to higher health status and life expectancy than in S2.	Disruption of health care infrastructure, breakdown of social support systems and groups as many people emigrate, notably in rural areas, increase of infection rates, leading to lower health status, notably among children en pregnant women.

¹ United Nations (UN), (1992), Preparing Migration Data for Subnational Population Projections, pp41-44. New York. 1992.

Quantitative population scenarios

To actually make scenario projections we used the base-year (2010) population, by age and by sex, of MED11 country as published by the United Nations Population Division. These data are based on most recent census data of MED11 countries and they have been corrected, if and when needed, in a systematic manner to deal with various types of flaws in the raw census data. Below, we elaborate on how we quantified the above story lines about demographic response to future contextual changes. Table 3 presents a summary of the quantitative assumptions on international migration, fertility and mortality.

International migration. On the basis of data obtained from national statistical offices, the United Nations Population Division formulated assumptions on future migration flows (UN, 2011a). These assumptions are formulated in terms of net international migration numbers, that is, the balance of the total number of persons immigrating and emigrating. Figures are presented in Annex 2, Table A2.2, second column. The UN medium variant population projection assumes that international migration for the period 2010-2050 remains constant at fixed 2010-2015 levels for each MED11 country.

For our scenario projections, in particular for the BAU-scenario (S1), we slightly adapted the UN medium variant projection international migration assumption figures for some countries to better reflect the consequences of recent political upheavals. For instance, the political situation in Syria, as of April 2012 is that thousands of Syrians have fled to neighbouring countries, such as Turkey and Lebanon. We assume that the net international migration numbers for the 2010-2015 period has a higher negative figure, i.e. -35,000 instead of -10,000 per annum, and for the 2015-2020 period -16,000 instead of -10,000 per annum. Also, the situation in Libya resulted in large numbers of refugees to Egypt, Tunisia and Italy, including Egyptian guest-workers in Libya who, probably temporarily, returned to Egypt. We assume though that these exceptional flows will come to a halt within the time-frame of the first projection period (2010-2015), see Table A2.2. Table 3, below, summarizes how we think the qualitative story-lines regarding expected international migration trends should be quantified. In Table A2.2 in Annex 2 we presents the actual numbers (average per year for each 5 year projection period) that we assumed in our projections.

The overall general strategy was to adopt for the BAU scenario (S1) the UN Medium Variant projection assumptions regarding international migration (with slight adaptations, see above). In the Integration scenario (S2), we expect for most countries that emigration will continue to be much larger than immigration in the first projection period up to 2030 as the opening up of Europe for MED11 inhabitants will first pull people to Europe as the MED11 economies have not yet started to generate sufficient employment. As time goes by, and economies grow, emigration will diminish and return migration will increase, including immigrants from other countries on the African continent. This will eventually lead to positive net migration numbers after 2030 (emigration being outnumbered by immigration). A similar process is assumed to take place in the Alliance scenario (S3), but levels are assumed to be lower and numbers emigrating and immigrating are assumed to be in balance (net migration=0) by 2050. For the Stress scenario (S4) we assume that emigration reaches constant high levels for the whole of the period 2010-2050 while immigration and return migration remains low, leading to historically high net migration numbers. The historical high figure was derived from the highest figure observed during the period 1950-2010 (see Annex 2, Table A2.2, column 2, highest figure). Examples of historical highs are net migration numbers of countries during the time of decolonization in the early 1960s, such as in Algeria (-128,000 per year during the 1960-1965 period), and Tunisia when many emigrated to France shortly before independence (-45,000 per year during the 1960-1965 period), or at the time of regional wars, such as in Lebanon (Beirut) (-57,000 per year during the 1975-1980 period), or at the time that many Egyptian guest labour workers moved to European countries in the early 1990s (-222,000 per year during the 1990-1995 period).

When making population projections net migration numbers are needed also by age and by sex. However, as international migration statistics are generally of poor quality, notably regarding the emigration component, such data are rarely available (e.g. Neto, 2009). Common practice is to use

model age-schedules of migrants (by sex), such as those published in UN (1992) and by Rogers and Castro (1981) (also see Preston et al., 2001). We used the Rogers and Castro models to allocate the total net numbers of migrants in Table A2.2 to age-groups by sex.

Fertility and Mortality. We examined past trends in levels of fertility (TFR) of MED11 countries, of the Arab countries as a whole and of the EU countries (e.g. Figure 2, Table A1.1 in Annex 1). The current average level of fertility in the EU countries is about 1.5 children. This is way below replacement level fertility of 2.1 children. This means that numbers of mothers are not replaced by equal numbers of daughters who will become mothers too and survive to at least age 49. Such loss of reproductive capacity will eventually lead to declining and ageing populations. The Integration scenario (S2) was taken as our reference point for the formulation of fertility assumptions for the other scenarios because we expect that in the Integration scenario (S2) reproductive behaviour in MED11 countries will eventually (by 2050) resemble current average levels in the EU. So we expect that by 2050, MED11 countries as a whole will have a TFR of 1.5. As we argued in section 3, the Alliance scenario (S3) will also lead to further declines in fertility but the decline will be less steep than in the Integration scenario (S2) so that we expect that the average TFR of MED11 countries will not decline below 1.8 children during the period 2045-2050. We expect that in the BAU scenario (S1) past fertility trends will continue but that it will halt, on average, at about replacement level fertility (2.1 children). For the scenario sketching the least favourable future, the stress scenario (S4), we expect that the fertility decline will be least steep and that the average of MED11 fertility rates will have settled at 2.4 children by 2050. The expected values of the TFR by 2050 in the different scenarios thus differ by 0.3 live births (see Annex 2, Table A2.1).

Regarding expected changes in mortality rates, we argued in the previous section that the Alliance scenario (S3) may probably lead to the highest rate of improvement in health and mortality conditions. After analysing historical data on mortality (150 year period) Oeppen and Vaupel (2010) found that the highest average annual rate of change in life expectancy observed in human populations was a 2.5 years gain in life expectancy per decade (i.e. $\alpha = 0.25$ life expectancy years per year). Therefore, in the Alliance scenario (S3), the most favourable one, we assume that life expectancy will increase by that rate of change. For the Integration scenario (S2), the second best scenario in terms of expected improvements in life expectancy, we assumed a rate of change that is 75% of the rate of change assumed in the Alliance scenario (S3), while the rates of change for scenarios 1 and 4 were taken as 50% and 25% of the rate of change in the Alliance scenario (S3), respectively. This is shown in Annex 2, Table A2.1.

In addition to the above assumptions about *average levels* of fertility and life expectancy at the level of the MED11 region, we also specified assumptions about *level-differences between MED11 countries*. In the BAU- and Stress scenarios and we assume that, as time goes by, *relative differences between countries* are consolidated in terms of country-specific fertility rates (TFR), but the average TFR of all MED11 countries is expected to change to the level of a target value of TFR, representing the average TFR of all MED11 countries for the period 2045-2050. Similarly, differences between countries in terms of mortality rates (life expectancies) are assumed to remain unchanged. This is accomplished by ensuring that differences in country-specific rates of change over time change in such a way that, by 2045-2050, the average of country-specific rates of change equals a pre-specified rate of change for the region as a whole.

The Integration and Alliance scenarios are *convergence scenarios* (Table 3, below) in the sense that they assume that differences between country-specific fertility rates disappear over time and that fertility rates of all countries resemble, by 2045-2050, one particular average fertility rate. In a similar way, mortality rates are expected to converge over time to the same pre-specified target value of the life expectancy at birth, $e(0)$, for the region as a whole. That pre-specified target value results from specifying the above mentioned rate of change for the period 2010-2050

For the sake of simplicity we assume that changes in TFR and Life expectancies over time are linear.

Table 3: Summary of *quantitative* projection assumptions for MED11 countries 2010-2050.

Model variables		BAU scenario (S1) Diversity maintained	Integration scenario (S2) Convergence	Alliance scenario (S3) Convergence	Stress scenario (S4) Diversity maintained
Population	Age distribution, by sex	UNPOPDIV 2010 base year	UNPOPDIV 2010 base year	UNPOPDIV 2010 base year	UNPOPDIV 2010 base year
Migration	Net migration (numbers), by sex	Net numbers as per UN 2010-50 projections, by cntry, slightly adapted for 2010-15 due to political changes in the region	2010-15=S1 level 2010-15 2015-20=2 x S1 level 2015-20 2020-30=back to 2010-15 level 2030-50=from 2010 level to highest (absolute) NM number since 1950	2010-15=S1 level 2010-15 2015-20=S1 level 2015-20 2020-30=back to half of 2010-15 level 2030-50=back to 0	2010-15=S1 level 2010-15 2015-2050= 2045-50 value of S2=constant for all 5-year projection periods, but with opposite sign (-)
	Mode of change	constant	linear	linear	constant
	Age pattern of migration (ASN _M), by sex ¹	Model Western Standard UN (1992, page 41)	Model Western Standard UN (1992, page 41)	Model Western Standard UN (1992, page 41)	Model Western Standard UN (1992, page 41)
Fertility	Total Fertility Rate (TFR)	TFR 2010 level to TFR= 2.1 (2050)	TFR 2010 level to TFR=1.5 (2050)	TFR 2010 level to TFR=1.8 (2050)	TFR 2010 level to TFR=2.4 (2050)
	Mode of TFR change	linear	linear	linear	linear
	Age pattern of fertility (ASFR)	UN 2010-2050 medium variant	UN 2010-2050 medium variant	UN 2010-2050 medium variant	UN 2010-2050 medium variant
Mortality	Life expectancy at Birth e(0), by sex	0.1250 life expectancy years increase per calendar year	0.1825 life expectancy years increase per calendar year	0.2500 life expecancy years increase per calendar year	0.0625 life expectancy years increase per calendar year
	Mode of e(0) change	linear	linear	linear	linear
	Age pattern of mortality (ASDR), by sex	Constant WHO 2008 age pattern of mortality, by cntry	Constant WHO 2008 age pattern of mortality, by cntry	Constant WHO 2008 age pattern of mortality, by cntry	Constant WHO 2008 age pattern of mortality, by cntry

¹ United Nations (UN), (1992), Preparing Migration Data for Subnational Population Projections, pp41-44. New York. 1992.

Table 4 below summarizes how assumptions about determinants of population change of MEDPRO population scenarios compare to those underlying the United Nations Medium Variant (UNMV) projection. For instance, the table shows that the BAU-scenario (S1) differs from the United Nations Medium Variant projections in that the former generally assumes a higher target fertility rate for the period 2045-2050 than the latter. This is the reverse with respect to mortality rates while the (net) international migration assumption is about the same. The Stress scenario (S4) assumes an even higher target fertility rate in the 2045-2050 period as compared to the UN Medium Variant projection. Table A2.1 in Annex 2 presents differences in more detail.

Table 4. MEDPRO scenarios assumptions compared to UNMV projection assumptions.

	MEDPRO scenarios vs. UN Medium Variant Projection		
	Fertility (TFR)	Mortality (Life expectancy at birth)	(Net) number of international migrants
BAU scenario (S1)	+	-	≈
Integration (S2)	-	+	++
Alliance (S3)	≈	++	+
Stress (S4)	++	--	--

Results

Table 5 and Figure 4 summarize results of scenario projections. Depending on the scenario, that the total population of the MED11 countries will increase from about 280 million to a number between 395 million (the Stress scenario (S4)) and 426 million (the Alliance scenario (S3)) during the period 2045-2050. EU27 country populations are expected to grow from about 500 to 525 million people in that same period. In the coming 10 years, the population in the MED11 region is expected to grow with a number somewhere in between the extremes of the four scenarios, that is, 39 million (the Stress scenario (S4)) and 43 million (the Alliance scenario (S3)). Furthermore, despite differences in scenario assumptions, results of some scenario projections do not differ much, notably results of the BAU scenario (S1) and Alliance scenario (S3).

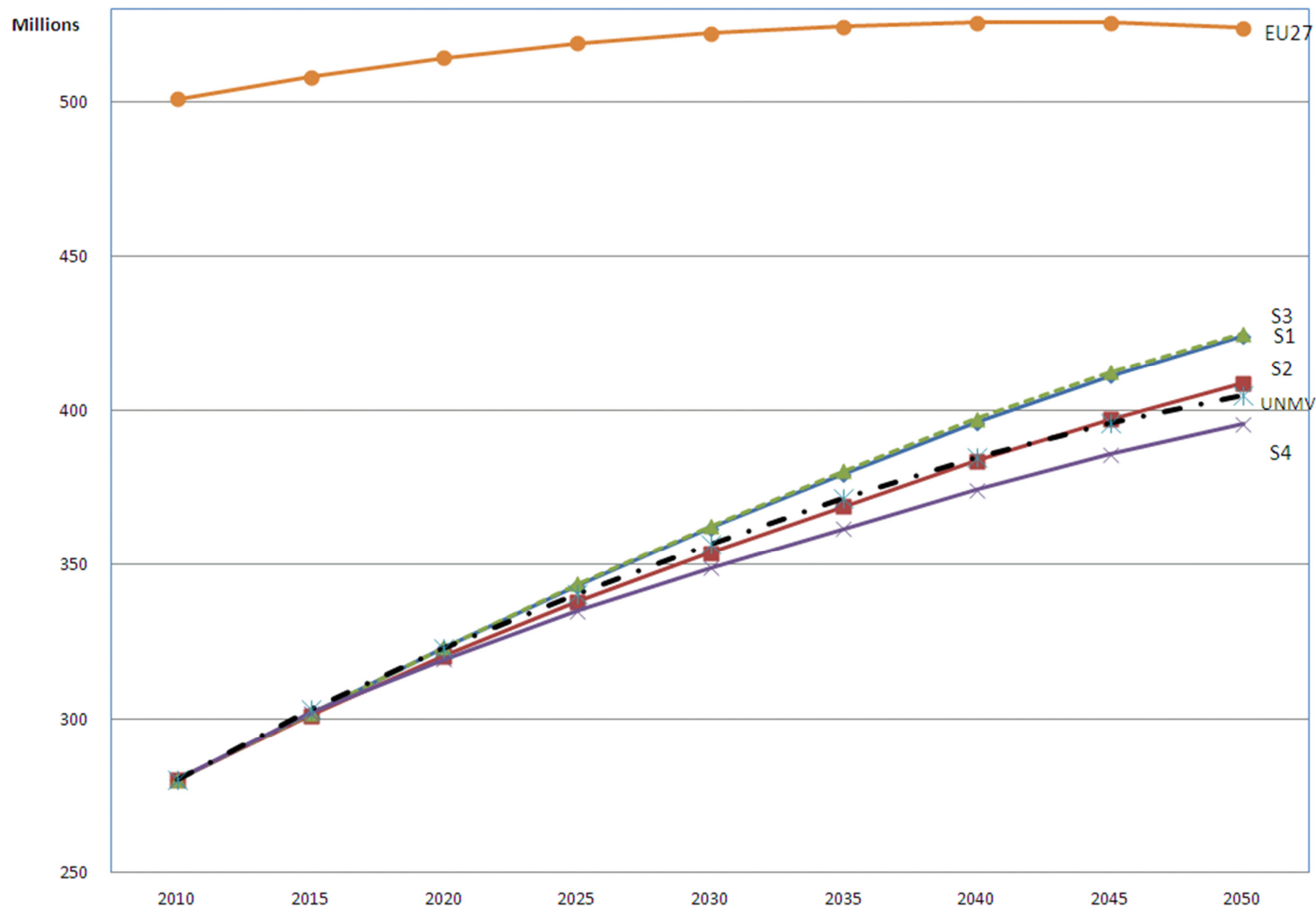
Table 5 shows that MED11 countries differ markedly in population size and population growth rates and that growth is predominantly determined by growth in the largest two countries, Egypt and Turkey. There, in 2010, lived 81.1 and 72.8 million people, respectively, comprising about 55% of the population in the MED11 region. At the level of the region, the effect of the assumptions of the Alliance scenario (S3) lead to the highest gain in population growth, while at the level of the country, different scenarios lead highest population growth. For instance, in the case of Lebanon it is the Integration scenario (S2) leading to highest population growth while for Libya and the Occupied Palestinian Territory it is the BAU scenario (S1).

Expected population growth in Egypt is the highest of the region. Depending on the scenario, Egypt's population will increase between 2010 and 2050 with a number between 44 and 53 million persons. Stress-scenario 4 has the severest effects on population growth in Lebanon. Lebanon currently has already a low and below replacement fertility level (TFR about 1.8 in 2005). Although fertility in Lebanon is expected to increase to replacement level fertility during the period 2010-2050, the effect of large scale emigration in the Stress scenario (S4) will more than cancel the increase in births leading to an envisioned decline of the population from 4.2 million in 2010 to about 2.8 million during the 2045-2050 period.

Table 5 Summary of MEDPRO scenario projections for MED11 countries and results of UN medium variant projections 2010-2100, in millions.

	2010	2020					2030					2050				
		S1	S2	S3	S4	UN	S1	S2	S3	S4	UN	S1	S2	S3	S4	UN
Algeria	35,5	41,0	40,6	41,0	40,6	40,6	45,3	44,3	45,4	43,8	44,0	51,6	50,3	52,3	48,1	48,2
Egypt	81,1	95,9	94,9	95,8	95,2	95,7	109,3	106,6	109,3	107,3	108,0	133,5	125,7	132,2	130,7	126,9
Israel	7,4	8,5	8,6	8,5	8,0	8,9	9,6	10,3	9,9	7,9	10,2	11,7	13,4	11,8	7,2	12,7
Jordan	6,2	7,7	7,5	7,6	7,3	7,4	9,2	8,8	9,1	8,0	8,5	12,0	11,9	11,7	9,0	10,1
Lebanon	4,2	4,6	4,8	4,8	4,4	4,6	4,9	5,6	5,4	4,0	4,8	5,0	7,1	6,1	2,8	4,9
Libya	6,4	7,2	7,1	7,2	6,9	7,1	8,0	7,3	7,8	7,0	7,9	9,7	8,6	8,9	6,9	9,1
Morocco	31,9	35,6	35,0	35,7	35,4	35,5	38,7	37,1	39,0	37,9	38,0	42,7	41,5	44,3	40,5	40,6
O.P.T.	4,0	5,5	5,4	5,5	5,2	5,3	7,2	6,8	7,0	6,2	6,8	10,8	9,9	9,8	8,5	9,8
Syria	20,4	24,8	24,5	24,7	24,4	24,3	29,7	28,4	29,2	28,2	28,2	38,4	35,1	36,4	35,1	34,0
Tunisia	10,5	11,5	11,5	11,5	11,3	11,7	12,3	12,0	12,4	11,7	12,4	13,2	13,0	13,4	11,6	13,2
Turkey	72,8	80,9	80,6	81,1	80,7	81,8	87,7	86,6	88,3	87,0	88,1	96,1	92,5	98,4	95,3	95,6
Total	280,4	323,3	320,6	323,5	319,5	322,8	362,0	353,9	362,8	348,9	356,9	424,5	409,0	425,2	395,8	405,2

Figure 4. MEDPRO scenario projections (S1-S4), UN Medium Variant projection, and EUROSTAT EU27 projection



Israel is the only other country for which population size will also decline in the Stress scenario (S4), as a result of the assumed large levels of outmigration relative to immigration, among others (Annex 2, Table A2.1 and A2.2).

Figure 5 illustrates how the actual population age structure in 2010 is expected to change in MED11 countries. The age-pyramids of 2010 show that MED11 countries are quite different and reflect populations in different stages of demographic transition (timing and speed of decline of fertility and mortality rates). The 'pyramid' shapes of various countries show that intrinsic population growth potential is large (i.e. population momentum), notably in Palestine (O.P.T) and Egypt where sizes of youngest cohorts are relatively large. Even if future fertility rates in these youngest cohorts are much lower than today's the sheer size of the cohorts will lead then large numbers of births.

The scenario estimates presented in Figure 5 also show that numbers in the age-group 15-64, the working age population, are expected to grow between 2010 and 2050. This increase in the working age population, also known as demographic dividend, is a potentially positive development for GDP growth provided that the economic conditions are such that working-age population growth is matched by increases in productive employment and by enhancements in educational attainment and occupational skills. However, if BAU or Stress scenarios unfold the growth of the working age population a mismatch will emerge leading to increases in unemployment figures. Development prospects of youth and young adults 10-29 is of particular importance as their educational attainment and occupational skills will shape the economic future of MED11 countries.

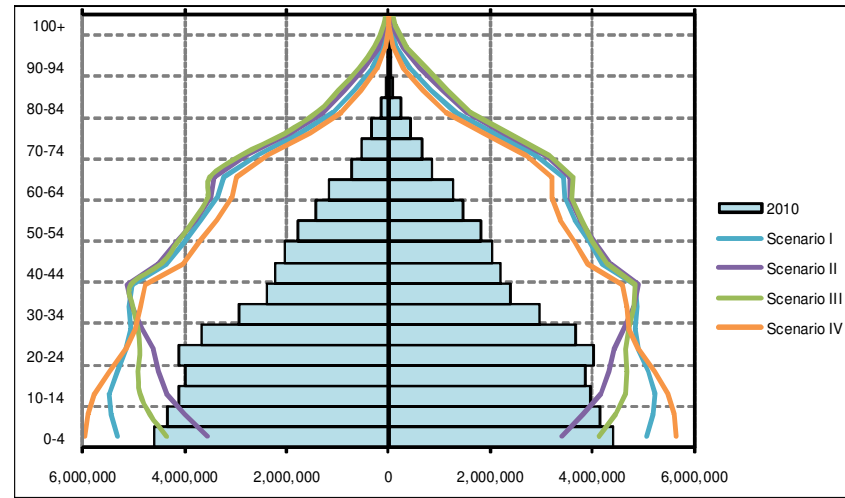
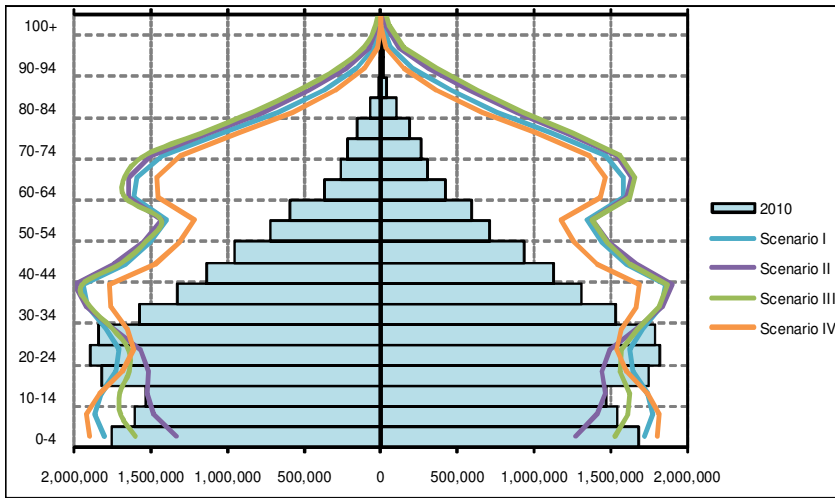
Table 6: Population size estimates for the 10-29 year old age group by scenario-type and by UNMV (in millions)

	2010	2030					2050				
		S1	S2	S3	S4	UN	S1	S2	S3	S4	UN
Algeria	13,9	14,2	13,8	14,1	13,8	13,0	13,8	12,4	13,2	13,2	10,5
Egypt	31,4	37,5	36,5	37,2	37,0	35,2	41,1	35,8	38,3	41,7	33,7
Israel	2,3	3,0	3,2	3,1	2,5	3,0	3,3	3,8	3,3	2,1	3,3
Jordan	2,6	3,4	3,3	3,3	3,0	3,0	3,9	3,6	3,6	3,1	2,8
Lebanon	1,5	1,3	1,6	1,5	1,1	1,2	1,2	1,8	1,5	0,6	1,0
Libya	2,4	2,7	2,5	2,6	2,4	2,7	2,7	2,2	2,3	1,9	2,1
Morocco	12,2	12,1	11,6	12,1	11,9	11,4	11,7	10,5	11,4	11,5	9,5
O.P.T.	1,7	2,8	2,7	2,8	2,5	2,6	4,0	3,5	3,5	3,3	3,4
Syria	8,3	10,5	10,1	10,3	10,1	9,6	12,2	10,6	11,1	11,6	9,3
Tunisia	3,8	3,5	3,4	3,5	3,3	3,3	3,2	3,0	3,1	2,9	2,8
Turkey	26,0	25,8	25,3	25,7	25,7	24,7	25,3	22,4	24,5	26,3	21,3
MED11	106,2	116,9	114,0	116,1	113,4	109,7	122,6	109,7	115,8	118,3	99,6

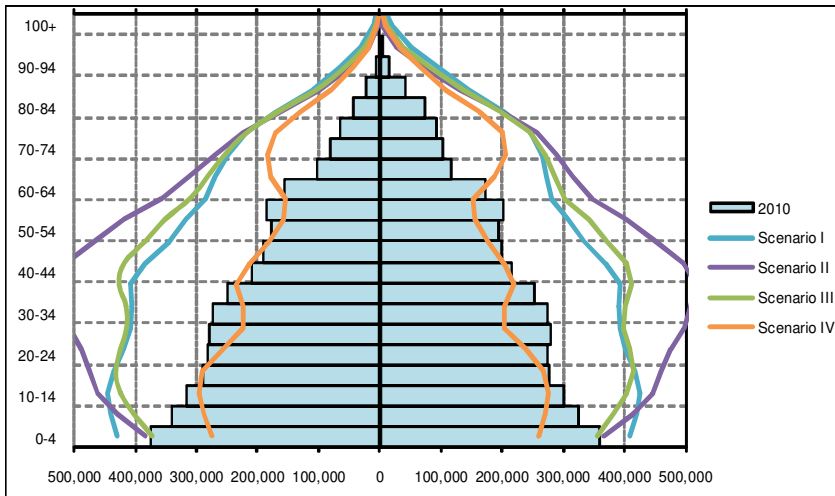
Table 6 shows that MED11 countries differ markedly regarding growth of numbers in the age range 10-29. In combination with the results presented in Table 5, it can be deduced that in 2010 this population group constitutes a sizeable proportion the population in MED11 countries, that is, between 36% (Lebanon) and 42% (Jordan). Table 2 results show that MED11 countries can be grouped in three main categories: (1) countries where numbers in the age group 10-29 grow continuously between 2010-2050 (e.g. O.P.T., Israel, Egypt); (2) countries where numbers will grow until 2030 and decline between 2030-2050 (e.g. Algeria, Jordan, Libya); (3) countries where numbers will decline continuously between 2010-2050 (e.g. Morocco, Turkey).

Last but not least, the scenario results (Figure 5) show that the age group 65+ is expected to grow considerably in various countries. First signs of ageing populations are clearly illustrated by the age pyramids of Algeria, Lebanon, Tunisia, and Turkey.

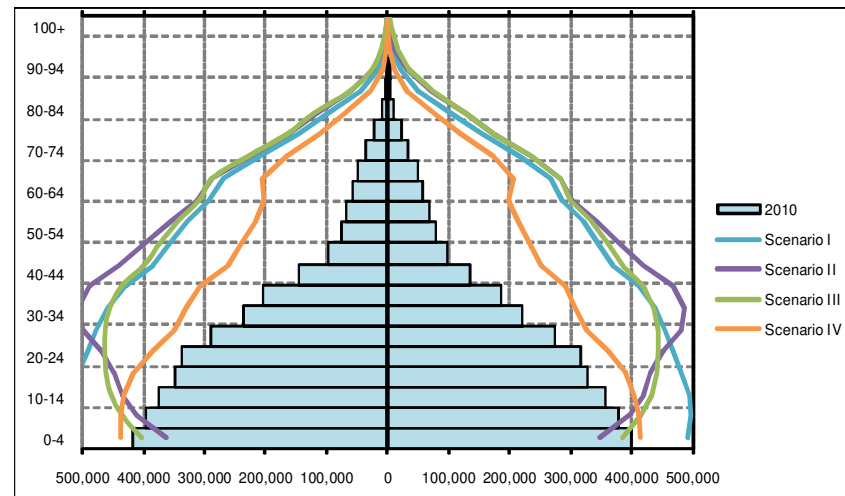
Figure 5. Changes in population size and structure between 2010 and 2050, under four different scenarios
 Algeria (2010 and 2050)
 Egypt (2010 and 2050)



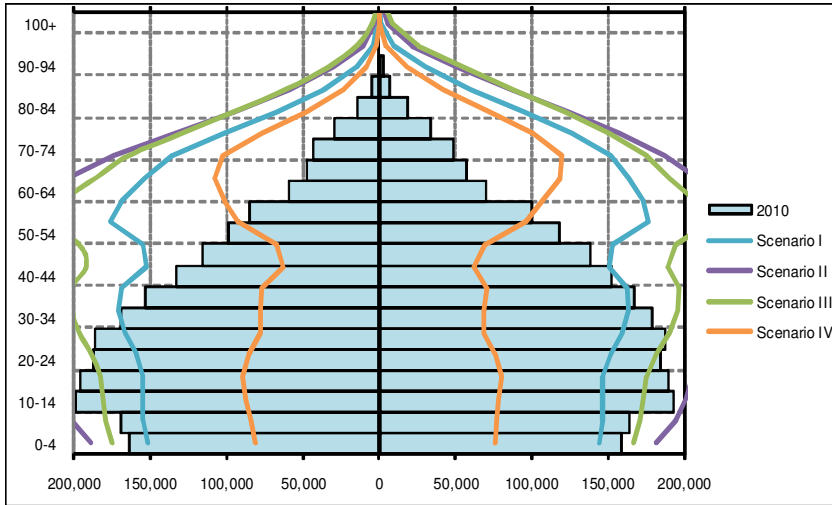
Israel (2010 and 2050)



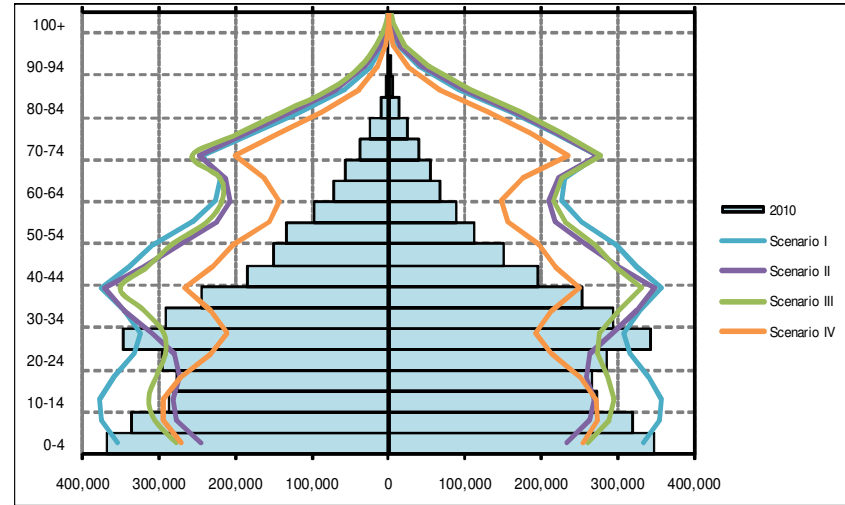
Jordan (2010 and 2050)



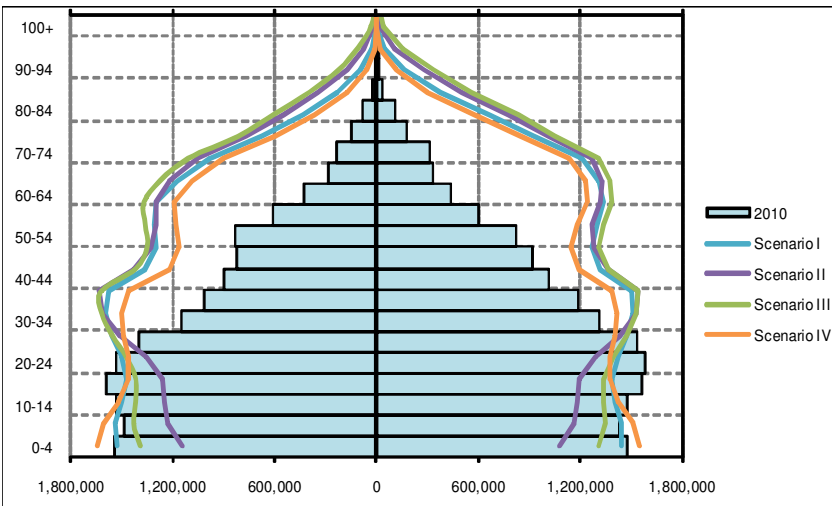
Lebanon (2010 and 2050)



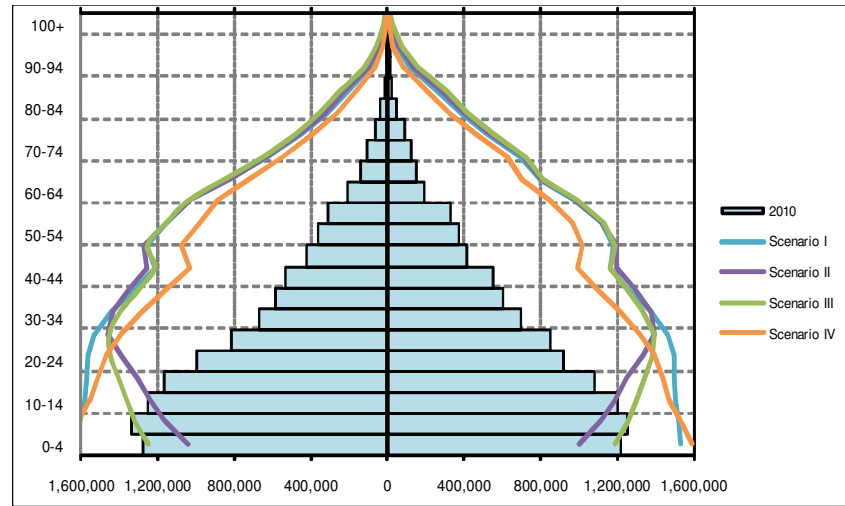
Lybia (2010 and 2050)



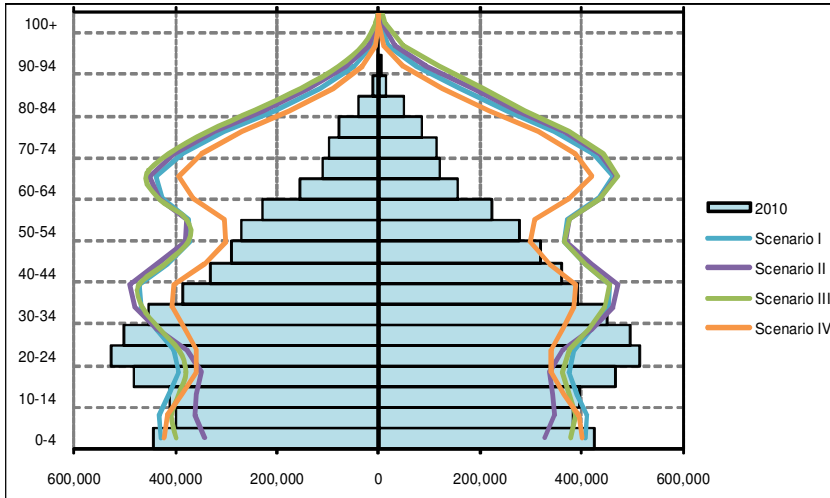
Morocco (2010 and 2050)



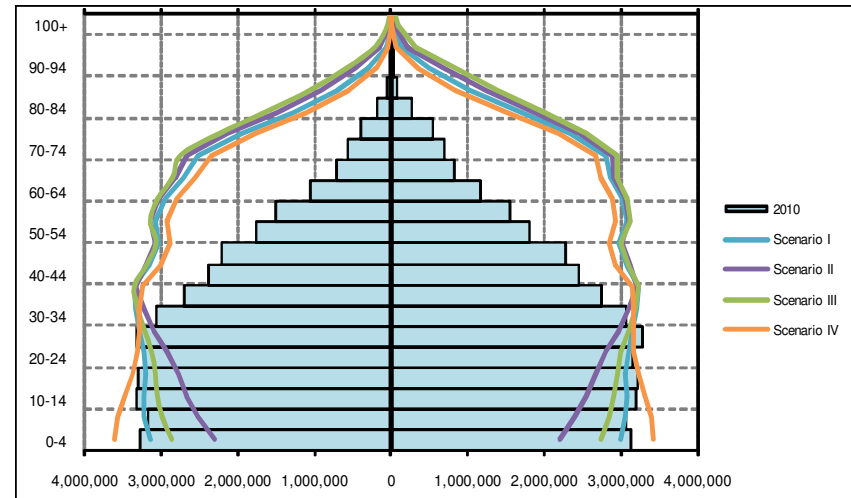
Syria (2010 and 2050)



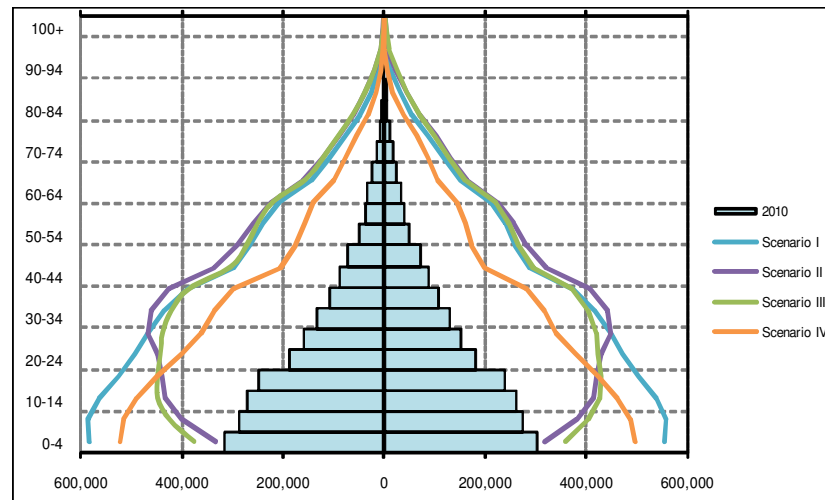
Tunisia (2010 and 2050)



Turkey (2010 and 2050)



Occupied Palestinian Territory (West Bank and Gaza) (2010 and 2050)



6. Discussion

Objectives of this paper are to describe the design and analysis of population scenarios for MED11 countries, reflect on some implications of the results, and compare the population scenarios with projections of the United Nations.

Results show that in spite of declines in population growth rates in MED11 countries, populations in MED11 countries are still growing and far more rapidly than populations of EU countries. During the 2010-2050 period populations in these EU neighbourhood countries are expected to grow considerably, from about 280 million to a figure between 395 and 426 million. Populations in EU27 countries though are only expected to grow from about 500 to 525 million people.

We found that the margins between lowest and highest scenarios estimates for MED11 countries are not so large, in particular in the short term. For instance, the (largest) difference in 2020 is between estimates of the BAU scenario (323.3 million) and the Stress scenario (319.5 million), which is 3.8 million or about 1% only. This is not surprising because much of the population growth in these countries is already embedded in the current shape of the population age and sex distribution (i.e. called population momentum). In the long term, population estimates are much more influenced by differences in scenario assumptions. However, differences between scenario estimates of total populations may still turn out to be relatively small if effects of specific fertility and mortality scenarios appear to cancel out. For instance, in the Alliance scenario (S3), the rapid increase in life expectancy causes rapid population growth but this is partially offset by the population growth reducing effect of fertility decline. This is why results of the BAU and Alliance scenarios are small. Another finding is that the rather widely different scenario assumptions regarding net numbers of international migrants turned out to have little overall impact on expected population size changes because net migration numbers tend to be small relative to total population size, notably in the largest countries Turkey and Egypt.

All population scenarios show that MED11 countries, except Morocco, Tunisia and Turkey, have to come to terms with expected growing numbers of youth and young adults in the age range 10-29 year old during the period 2010-2030. With persons in this age range the social, economic and political landscape of future MED11 economies are shaped so that governments and the private sector should create the proper conditions for increased access of this group to high quality education, occupational skills and employment. In case of the BAU and stress scenarios the expected economic conditions are not favourable and will increase emigration pressure for this population group, for instance in the direction of EU countries. Although EU countries face shrinking populations, notably in the working-ages, current economic conditions and prospects of EU countries are not such that EU countries will be happy to open up their borders for unemployed MED11 young adults to compensate their demographic shortages. Should the Integration or Alliance scenarios unfold, the future for this group will be much better and it may even lead well-educated pioneering children of MED11 country emigrants, born in countries of destination, to migrate to the home-land of their parents to explore possibilities for a future over there. This kind of migration flow has already been observed among enterprising and well-educated children of Turkish emigrants, born in Germany and The Netherlands, who try to make a living in the currently booming Turkish economy.

Another emerging issue in MED11 countries is that ageing becomes a serious issue in some countries (e.g. Algeria, Tunisia, Turkey, Lebanon) during the period 2030-2050 (Figure 5). This means that the health system has to be transformed to be able to provide health care in the domains of typical old-age diseases and life-style related diseases (e.g. diabetes) and degenerative diseases (forms of cancer). Currently, most health systems in MED11 countries are designed to cater for, mostly, infectious and other preventable diseases, with a focus on children and mothers. Yet another issue is that growing numbers of elderly require that their income and old-age support must somehow be ensured. In the wake of modernisation and individualisation of MED11 societies this will challenge existing pension systems and traditional familial and community support systems.

We compared MEDPRO population scenario estimates with those of the UN Medium Variant projection (UNMV). We found that, at the regional level, UNMV estimates resemble the MEDPRO Alliance scenario estimates. However, at the country level, UNMV estimates resemble, depending on the country, results of different MEDPRO population scenarios. Also, UNMV estimates for particular age-groups resemble, depending on the age-group, results of different MEDPRO scenarios. Therefore, UNMV may not substitute for any particular MEDPRO population scenario. At the most, results of UNMV projections (low, medium, high) and MEDPRO scenarios are complimentary. Computationally both use the cohort component projection method, but there are some important differences in approach. Contrary to MEDPRO scenarios, the UNMV projection horizon is the year 2100 which has some consequences regarding the assumed speed of decline of fertility to replacement level fertility, among others. More fundamental is that UNMV projections assume that rates of fertility, mortality and international migration develop independently over time. The processes are thought to be independent and are therefore modelled independently, using time-series regression methods, Bayes estimation methods, or current levels are assumed to remain unchanged in future (e.g. regarding net international migration). UNMV projections also do not comprise of behavioural equations linking the underlying economic development assumption (i.e. demographic transition due to 'western-type' economic development and modernisation) to indicators of demographic change. UNMV projections assume that future fertility and mortality rates of Arab/MED11 countries will follow the historical pattern of change observed in western and 'westernized' countries. Although western-life styles are clearly emerging in the Arab world it remains to be seen if structural economic factors triggering transition of birth- and death rates in western(ized) countries will trigger to the same extent demographic transition in the Arab world. Although several countries in the Arab world experienced major economic development fertility rates in some have remained relatively high or declined much less rapidly than 'expected'. This is because also other important factors and preconditions to demographic transition are at play, notably in the Arab world. Demographic transition also requires adaptation of existing gender systems (gender roles, attitudes towards gender equity) as well as the norms and values system (ideational factors).

The scenarios were developed at a time that populations in a number of countries in the Arab region (Tunisia, Egypt, Libya, Syria, Yemen) are going through a major transition period in their fight for political freedom, democratization and breaking-up with traditions of dictatorship. To date, the outcome is yet unknown. We made the assumption that by 2015 the situation would have returned to normal, i.e. the situation shortly before the Arab Spring. We therefore did not include a population scenario that is associated with an outcome of Arab spring events that leads to a firm installation of conservative and anti-western Islamist governments in MED11 countries, akin to the situation in Iran. This is partly due to the fact that population scenarios are a function of the four development scenarios of which the two pillars are 'degree of economic development' and 'extent of cooperation with the EU'. Consequently, demographic response and population scenario assumptions were primarily driven by underlying economic and political factors. Can the results of our population scenarios encompass a population growth trajectory associated with societies that are governed by such traditional governments? We think the answer is affirmative because installation of conservative Islamic governments may not necessarily lead to, for example, a permanent rise in fertility and mortality rates, or large scale emigration for that matter. The first and foremost force at work is 'population momentum' resulting in population growth during the 2010-2030 period that is more or less insensitive to sudden changes in rates of demographic indicators. After 2030 the latter may indeed start playing a role, but there is evidence in the region that instalment of a conservative Islamist government does not necessarily lead to major changes in current trends in fertility and mortality rates. As we know Iran underwent a major political reorientation in 1979 with installation of the Islamic regime of Khomeini. Before 1979, the mean number of children (TFR) per woman between 1960 and 1979 declined only modestly from 6.8 to 6.0 children. Since 1979, fertility rates though continued to decline to about 1.9, below replacement level. Furthermore, between 1960 en 1979, life expectancy increased from 45 to 55 years, then dipped to 50 years during the first couple of years after the start of the revolution, but then almost linearly increased to about 72 years by 2010. It may be argued that mainly Shiite Iran may not be a good example for the mostly Sunni populations of MED11 countries,

but even in a core-area of Sunni Islamists, Saudi Arabia, fertility rates have declined significantly in the past decades from more than 7 children per woman before 1978 to 2.8 children in 2010. Conversely, life expectancy has increased from about 45 years in 1960 to about 74 years in 2010 (World Bank, 2012). Overall, the influence that governments may have on demographic behaviour of individuals should not be overestimated. There is ample evidence in the context of Sub-Saharan Africa that measures taken by governments promoting use of modern family planning methods have failed, because household and individual-level factors were perceived as more important by persons, such as wealth status and -expectation of households, issues of gender equity and gender roles, perceived costs-benefits of children, etc.. This makes us believe that the future path of population growth of MED11 countries with traditional anti-western governments, screened and supervised by religious leaders, will continue to develop between the margins indicated by estimates of the S3 and S4 scenarios for the period 2010-2050 (Figure 4, Table 5).

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References

- Boyle, P.J., K. Halfacree and V. Robinson (1998), *Exploring contemporary migration. Chapter 2: defining and measuring migration*. Addison-Wesley. ISBN 0582 251 613.
- ICBS. 2012. Population, by Population Group. *Monthly Bulletin of Statistics*. Israel Central Bureau of Statistics. 7 February 2012. Retrieved 19 March 2012.
- HUIPS. 2009. Turkey Demographic and Health Survey (TDHS) 2008. Hacettepe University Institute of Population Studies (HUIPS), Ministry of Health General Directorate of Mother and Child Health and Family Planning, State Planning Organization and European Union. Ankara, Turkey.
- Neto, F. 2009. International migration challenges in the ESCWA region. Regional Workshop on International Migration Statistics, Cairo, Egypt, 30 June - 3 July 2009.
- Oeppen, J. and J.W. Vaupel (2010), Broken Limits to Life Expectancy, *Science*. 296: 5570: pp. 1029 – 1031. <http://www.sciencemag.org/content/296/5570/1029.short>
- Preston, S. H., Heuveline, P. and M. Guillot (2001) *Demography: Measuring and Modeling Population Processes*, Oxford: Blackwell Publishers.
- Rogers, A. and L.J. Castro (1981). *Model Migration Schedules*. Research Report 81-20. International Institute for Applied Systems Analysis. Laxenberg, Austria
- Sessa, C. (2011). *Technical report on qualitative scenarios of cooperation and development in the Euro-Mediterranean Region. MEDPRO D9.1*. Istituto di Study per l'Integrazione dei Sistemi. Rome.
- United Nations (1992), Preparing Migration Data for Sub-national Population Projections. ST/ESA/SER.A/127.
- United Nations (2011a). *World Population Prospects: The 2010 Revision*. Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat. <http://esa.un.org/unpd/wpp/index.htm>, date of last access 18-05-2011.
- United Nations (2011b). *United Nations Global Migration Database v.0.3.6*. <http://esa.un.org/unmigration/index.aspx>, date of last access 07-06-2011.
- United Nations (2011c). *Assumptions Underlying the 2010 Revision*. Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat. http://esa.un.org/unpd/wpp/Documentation/pdf/WPP2010_ASSUMPTIONS_AND_VARIANTS.pdf, date of last access 22-04-2012.
- United Nations (2012). Data online. United Nations Department of Economic and Social Affairs. New York. <http://www.un.org/esa/population/>, date of last access 31-05-2012
- World Health Organisation (WHO), (2011), *Health statistics and health information systems*. World Health Statistics 2011, http://www.who.int/healthinfo/statistics/mortality_life_tables/en/, date of last access 20-06-2011.

Annex 1. Trends in demographic indicators

Table A1.1 Trends in Population size in MED11 countries, Arab world, EU (World Bank, 2010)

Country Name	1960	1990	2000	2009
Arab World	96.5	232.2	291.7	351.2
EU	404.1	471.3	481.4	498.6
Algeria	10.8	25.3	30.5	34.9
Egypt	27.8	57.8	70.2	83.0
Israel	2.1	4.7	6.3	7.4
Jordan	0.8	3.2	4.8	6.0
Lebanon	1.9	3.0	3.8	4.2
Libya	1.3	4.4	5.3	6.4
Morocco	11.6	24.8	28.8	32.0
Syria	4.6	12.7	16.5	21.1
Tunisia	4.2	8.2	9.6	10.4
Turkey	28.2	56.1	66.5	74.8
West Bank and Gaza	0.0	2.0	3.0	4.0
MED11	93.5	202.0	245.3	284.3
MED11 as % of Arab World	97%	87%	84%	81%

Table A1.2 Trends in *Total Fertility Rates* in MED11 countries, Arab world, EU (World Bank, 2010)

	1990	1992	1994	1996	1998	2000	2002	2004	2006	2008	2008-1990
Arab World	5,1	4,8	4,5	4,3	4,0	3,8	3,6	3,5	3,4	3,3	1,9
EU	1,6	1,6	1,5	1,4	1,4	1,5	1,4	1,5	1,5	1,6	0,1
Algeria	4,7	4,2	3,7	3,2	2,8	2,6	2,5	2,5	2,4	2,4	2,4
Egypt	4,6	4,1	3,7	3,6	3,4	3,3	3,2	3,1	3,0	2,9	1,7
Israel	2,8	2,7	2,9	2,9	3,0	3,0	2,9	2,9	2,9	3,0	-0,1
Jordan	5,5	5,2	4,9	4,6	4,2	3,9	3,6	3,6	3,6	3,5	2,0
Lebanon	3,1	3,0	2,9	2,8	2,6	2,4	2,2	2,0	1,9	1,8	1,3
Libya	4,8	4,3	3,8	3,5	3,3	3,2	3,1	2,9	2,8	2,7	2,1
Morocco	4,0	3,7	3,4	3,2	2,9	2,7	2,6	2,5	2,4	2,4	1,7
Syria	5,5	5,0	4,5	4,2	4,0	3,8	3,7	3,5	3,4	3,2	2,3
Tunisia	3,5	3,2	2,9	2,5	2,2	2,1	2,0	2,0	2,0	2,1	1,4
Turkey	3,1	2,9	2,8	2,7	2,5	2,4	2,3	2,2	2,1	2,1	0,9
West Bank,Gaza	6,4	6,4	6,3	6,2	6,0	5,8	5,7	5,5	5,3	5,0	1,4

Table A1.3 Trends in *life expectancies at birth* (both sexes combined) in MED11 countries, Arab world and EU (World Bank, 2010)

	1990	1992	1994	1996	1998	2000	2002	2004	2006	2008	2008-1990
Arab World	62,8	63,6	64,6	65,6	66,4	67,0	67,5	67,9	68,2	68,7	4,6
EU	74,9	75,3	75,7	76,1	76,6	77,2	77,6	78,1	78,9	79,5	5,3
Algeria	67,1	67,7	68,2	68,7	69,3	70,0	70,7	71,4	71,9	72,4	7,2
Egypt	62,9	64,0	65,2	66,4	67,4	68,2	68,8	69,3	69,7	70,1	4,4
Israel	76,6	76,5	77,4	78,1	78,1	79,0	79,5	80,1	80,3	81,0	5,7
Jordan	67,0	67,9	68,6	69,4	70,0	70,6	71,2	71,7	72,2	72,7	3,4
Lebanon	68,7	69,2	69,6	70,0	70,3	70,6	71,0	71,3	71,7	72,0	6,2
Libya	68,1	69,1	70,1	71,1	71,9	72,5	73,0	73,4	73,9	74,3	7,1
Morocco	64,1	65,2	66,2	67,0	67,9	68,7	69,4	70,1	70,7	71,3	6,0
Syria	68,2	69,2	70,1	70,9	71,7	72,3	72,9	73,4	73,8	74,2	4,0
Tunisia	70,3	70,8	71,0	71,6	72,1	72,6	73,0	73,3	73,9	74,3	7,3
Turkey	64,6	65,8	67,0	68,1	69,1	70,0	70,7	71,2	71,6	71,9	5,0
West Bank, Gaza	68,5	69,4	70,2	70,7	71,2	71,7	72,2	72,6	73,1	73,5	5,6

Note: Differences between life expectancies of women and men are in the range of +3.2 (Lebanon) and +7.7 (Egypt). In the scenario projections, male and female populations are projected independently, using life tables for men and women separately.

Table A1.4 Trends in *underfive mortality rates* (both sexes) in MED11 countries, Arab world and EU (World Bank, 2010)

Country Name	1990	1995	2000	2005	2006	2007	2008	2009
Arab World	84	73	64	56	54	53	52	50
European Union	12	9	7	6	6	5	5	5
Algeria	61	55	46	38	36	35	34	32
Egypt, Arab Rep.	90	65	47	30	28	25	23	21
Israel	11	9	7	6	5	5	5	4
Jordan	39	33	30	27	27	26	26	25
Lebanon	40	35	24	17	15	14	13	12
Libya	36	30	25	21	21	20	19	19
Morocco	89	68	55	45	43	41	39	38
Syrian Arab Republic	36	27	22	18	18	17	17	16
Tunisia	50	36	27	23	23	22	21	21
Turkey	84	62	42	28	26	24	22	20
West Bank and Gaza	43	33	30	30	30	30	30	30

Annex 2. Quantitative scenario assumptions

Table A2.1 Four sets of fertility and mortality scenario assumptions for the period 2010-2050.

BAU-scenario (S1)	Fertility (TFR)			Mortality (life expectancy at birth, e(0))				UNPD MV	
	baseline (2005-10)	target (2045-50)	UNPD MV target (2045-50)	men $\alpha=0.1250$		women $\alpha=0.1250$		men target (2045-50)	women target (2045-50)
				baseline (2005-10)	target (2045-50)	current (2005-10)	target (2045-50)		
Tunisia	2,04	1,91	1,72	71,90	76,90	76,00	81,00	77,53	82,05
Morocco	2,38	2,00	1,65	69,00	74,00	73,40	78,40	76,17	80,83
Algeria	2,38	2,00	1,66	70,90	75,90	73,70	78,70	77,12	80,90
Libya	2,72	2,09	1,61	71,70	76,70	76,90	81,90	77,65	82,56
Egypt	2,85	2,13	1,88	70,50	75,50	74,30	79,30	76,93	81,18
Jordan	3,27	2,24	1,76	71,70	76,70	74,30	79,30	76,71	80,29
Palestine	4,65	2,61	2,65	70,60	75,60	73,80	78,80	76,55	80,34
Israel	2,91	2,14	2,27	78,40	83,40	82,90	87,90	83,76	88,81
Lebanon	1,86	1,86	1,64	69,90	74,90	74,20	79,20	76,36	80,84
Syria	3,10	2,19	1,74	73,90	78,90	76,90	81,90	78,84	82,47
Turkey	2,15	1,94	1,69	70,70	75,70	75,30	80,30	77,15	81,71
average	2,76	2,10	1,84	71,75	76,75	75,61	80,61	77,71	82,00
max-min	2,79	0,74	1,04	9,40	9,40	9,50	9,50	7,59	8,52

note: α = annual rate of change in e(0)

Integration scenario (S2)	Fertility (TFR)			Mortality (life expectancy at birth, e(0))				UNPD MV	
	baseline (2005-10)	target (2045-50)	UNPD MV target (2045-50)	men $\alpha=0.1875$		women $\alpha=0.1875$		men target (2045-50)	women target (2045-50)
				baseline (2005-10)	target (2045-50)	current (2005)	target (2045-50)		
Tunisia	2,04	1,50	1,72	71,90	79,25	76,00	83,11	77,53	82,05
Morocco	2,38	1,50	1,65	69,00	79,25	73,40	83,11	76,17	80,83
Algeria	2,38	1,50	1,66	70,90	79,25	73,70	83,11	77,12	80,90
Libya	2,72	1,50	1,61	71,70	79,25	76,90	83,11	77,65	82,56
Egypt	2,85	1,50	1,88	70,50	79,25	74,30	83,11	76,93	81,18
Jordan	3,27	1,50	1,76	71,70	79,25	74,30	83,11	76,71	80,29
Palestine	4,65	1,50	2,65	70,60	79,25	73,80	83,11	76,55	80,34
Israel	2,91	1,50	2,27	78,40	79,25	82,90	83,11	83,76	88,81
Lebanon	1,86	1,50	1,64	69,90	79,25	74,20	83,11	76,36	80,84
Syria	3,10	1,50	1,74	73,90	79,25	76,90	83,11	78,84	82,47
Turkey	2,15	1,50	1,69	70,70	79,25	75,30	83,11	77,15	81,71
average	2,76	1,50	1,84	71,75	79,25	75,61	83,11	77,71	82,00
max-min	2,79	0,00	1,04	9,40	0,00	9,50	0,00	7,59	8,52

note: α = annual rate of change in e(0)

Table A2.1 (continued)

Alliance scenario (S3)	Fertility (TFR)			Mortality (life expectancy at birth, e(0))				UNPD MV	
	baseline (2005-10)	target (2045-50)		men $\alpha=0.2500$		women $\alpha=0.2500$		men	women
				baseline (2005-10)	target (2045-50)	current (2005)	target (2045-50)	target (2045-50)	target (2045-50)
Tunisia	2,04	1,80	1,72	71,90	81,75	76,00	85,61	77,53	82,05
Morocco	2,38	1,80	1,65	69,00	81,75	73,40	85,61	76,17	80,83
Algeria	2,38	1,80	1,66	70,90	81,75	73,70	85,61	77,12	80,90
Libya	2,72	1,80	1,61	71,70	81,75	76,90	85,61	77,65	82,56
Egypt	2,85	1,80	1,88	70,50	81,75	74,30	85,61	76,93	81,18
Jordan	3,27	1,80	1,76	71,70	81,75	74,30	85,61	76,71	80,29
Palestine	4,65	1,80	2,65	70,60	81,75	73,80	85,61	76,55	80,34
Israel	2,91	1,80	2,27	78,40	81,75	82,90	85,61	83,76	88,81
Lebanon	1,86	1,80	1,64	69,90	81,75	74,20	85,61	76,36	80,84
Syria	3,10	1,80	1,74	73,90	81,75	76,90	85,61	78,84	82,47
Turkey	2,15	1,80	1,69	70,70	81,75	75,30	85,61	77,15	81,71
average	2,76	1,80	1,84	71,75	81,75	75,61	85,61	77,71	82,00
max-min	2,79	0,00	1,04	9,40	0,00	9,50	0,00	7,59	8,52

note: α = annual rate of change in e(0)

Stress scenario (S4)	Fertility (TFR)			Mortality (life expectancy at birth, e(0))				UNPD MV	
	baseline (2005-10)	target (2045-50)		men $\alpha=0.0625$		women $\alpha=0.0625$		men	women
				baseline (2005-10)	target (2045-50)	current (2005)	target (2045-50)	target (2045-50)	target (2045-50)
Tunisia	2,04	2,18	1,72	71,90	74,40	76,00	78,50	77,53	82,05
Morocco	2,38	2,29	1,65	69,00	71,50	73,40	75,90	76,17	80,83
Algeria	2,38	2,29	1,66	70,90	73,40	73,70	76,20	77,12	80,90
Libya	2,72	2,39	1,61	71,70	74,20	76,90	79,40	77,65	82,56
Egypt	2,85	2,43	1,88	70,50	73,00	74,30	76,80	76,93	81,18
Jordan	3,27	2,56	1,76	71,70	74,20	74,30	76,80	76,71	80,29
Palestine	4,65	2,98	2,65	70,60	73,10	73,80	76,30	76,55	80,34
Israel	2,91	2,45	2,27	78,40	80,90	82,90	85,40	83,76	88,81
Lebanon	1,86	2,13	1,64	69,90	72,40	74,20	76,70	76,36	80,84
Syria	3,10	2,51	1,74	73,90	76,40	76,90	79,40	78,84	82,47
Turkey	2,15	2,22	1,69	70,70	73,20	75,30	77,80	77,15	81,71
average	2,76	2,40	1,84	71,75	74,25	75,61	78,11	77,71	82,00
max-min	2,79	0,85	1,04	9,40	9,40	9,50	9,50	7,59	8,52

note: α = annual rate of change in e(0)

Table A2.2 International Migration Assumptions

Algeria (net international migration x1000)

Period	UN Medium variant	S1	S2	S3	S4
1950-1955	-58	-58	-58	-58	-58
1955-1960	-87	-87	-87	-87	-87
1960-1965	-128	-128	-128	-128	-128
1965-1970	-40	-40	-40	-40	-40
1970-1975	-31	-31	-31	-31	-31
1975-1980	1	1	1	1	1
1980-1985	17	17	17	17	17
1985-1990	-14	-14	-14	-14	-14
1990-1995	-10	-10	-10	-10	-10
1995-2000	-28	-28	-28	-28	-28
2000-2005	-28	-28	-28	-28	-28
2005-2010	-28	-28	-28	-28	-28
2010-2015	-28	-28	-28	-28	-28
2015-2020	-28	-28	-56	-28	-128
2020-2025	-18	-18	-42	-21	-128
2025-2030	-18	-18	-28	-14.0	-128
2030-2035	-16	-16	11	-10.5	-128
2035-2040	-16	-16	50	-7.0	-128
2040-2045	-16	-16	89	-3.5	-128
2045-2050	-16	-16	128	0	-128

Egypt (net international migration x1000)

Period	UN Medium variant	S1	S2	S3	S4
1950-1955	-10	-10	-10	-10	-10
1955-1960	-10	-10	-10	-10	-10
1960-1965	-10	-10	-10	-10	-10
1965-1970	-48	-48	-48	-48	-48
1970-1975	-125	-125	-125	-125	-125
1975-1980	-170	-170	-170	-170	-170
1980-1985	-139	-139	-139	-139	-139
1985-1990	-130	-130	-130	-130	-130
1990-1995	-222	-222	-222	-222	-222
1995-2000	-189	-189	-189	-189	-189
2000-2005	-74	-74	-74	-74	-74
2005-2010	-69	-69	-69	-69	-69
2010-2015	-43	-43	-43	-43	-43
2015-2020	-53	-53	-106	-53	-222
2020-2025	-53	-53	-75	-37	-222
2025-2030	-53	-53	-43	-21.5	-222
2030-2035	-53	-53	23.25	-16.1	-222
2035-2040	-53	-53	89.5	-10.8	-222
2040-2045	-53	-53	155.75	-5.4	-222
2045-2050	-53	-53	222	0	-222

Israel (net international migration x1000)

Period	UN Medium variant	S1	S2	S3	S4
1950-1955	52	52	52	52	52
1955-1960	34	34	34	34	34
1960-1965	42	42	42	42	42
1965-1970	14	14	14	14	14
1970-1975	33	33	33	33	33
1975-1980	13	13	13	13	13
1980-1985	1	1	1	1	1
1985-1990	13	13	13	13	13
1990-1995	91	91	91	91	91
1995-2000	49	49	49	49	49
2000-2005	21	21	21	21	21
2005-2010	55	55	55	55	55
2010-2015	12	12	12	12	12
2015-2020	7	7	38	19	-91
2020-2025	7	7	65	32	-91
2025-2030	7	7	91	45.5	-91
2030-2035	7	7	91	34.1	-91
2035-2040	7	7	91	22.8	-91
2040-2045	7	7	91	11.4	-91
2045-2050	7	7	91	0	-91

Jordan (net international migration x1000)

Period	UN Medium variant	S1	S2	S3	S4
1950-1955	25	25	25	25	25
1955-1960	24	24	24	24	24
1960-1965	7	7	7	7	7
1965-1970	51	51	51	51	51
1970-1975	-6	-6	-6	-6	-6
1975-1980	-16	-16	-16	-16	-16
1980-1985	16	16	16	16	16
1985-1990	24	24	24	24	24
1990-1995	80	80	80	80	80
1995-2000	-38	-38	-38	-38	-38
2000-2005	-19	-19	-19	-19	-19
2005-2010	41	41	41	41	41
2010-2015	-6	-6	-6	-6	-6
2015-2020	-10	-10	-20	-10	-80
2020-2025	-10	-10	-13	-7	-80
2025-2030	-10	-10	-6	-3.0	-80
2030-2035	-10	-10	15.5	-2.3	-80
2035-2040	-10	-10	37	-1.5	-80
2040-2045	-10	-10	58.5	-0.8	-80
2045-2050	-10	-10	80	0	-80

Lebanon (net international migration x1000)

Period	UN Medium variant	S1	S2	S3	S4
1950-1955	0	0	0	0	0
1955-1960	8	8	8	8	8
1960-1965	4	4	4	4	4
1965-1970	-7	-7	-7	-7	-7
1970-1975	-2	-2	-2	-2	-2
1975-1980	-57	-57	-57	-57	-57
1980-1985	-44	-44	-44	-44	-44
1985-1990	-44	-44	-44	-44	-44
1990-1995	46	46	46	46	46
1995-2000	0	0	0	0	0
2000-2005	20	20	20	20	20
2005-2010	-3	-3	-3	-3	-3
2010-2015	-3	20	20	20	20
2015-2020	-4	-4	32	16	-57
2020-2025	-4	-4	45	22	-57
2025-2030	-4	-4	57	28.5	-57
2030-2035	-4	-4	57	21.4	-57
2035-2040	-4	-4	57	14.3	-57
2040-2045	-4	-4	57	7.1	-57
2045-2050	-4	-4	57	0	-57

Libya (net international migration x1000)

Period	UN Medium variant	S1	S2	S3	S4
1950-1955	-8	-8	-8	-8	-8
1955-1960	9	9	9	9	9
1960-1965	9	9	9	9	9
1965-1970	15	15	15	15	15
1970-1975	18	18	18	18	18
1975-1980	24	24	24	24	24
1980-1985	37	37	37	37	37
1985-1990	-4	-4	-4	-4	-4
1990-1995	-4	-4	-4	-4	-4
1995-2000	-4	-4	-4	-4	-4
2000-2005	-4	-4	-4	-4	-4
2005-2010	-4	-4	-4	-4	-4
2010-2015	-64	-64	-64	-64	-64
2015-2020	-2	-2	-4	-2	-64
2020-2025	-2	-2	-34	-17	-64
2025-2030	-2	-2	-64	-32.0	-64
2030-2035	-1	-1	-32	-24.0	-64
2035-2040	-1	-1	0	-16.0	-64
2040-2045	-1	-1	32	-8.0	-64
2045-2050	-1	-1	64	0	-64

Morocco (net international migration x1000)

Period	UN Medium variant	S1	S2	S3	S4
1950-1955	0	0	0	0	0
1955-1960	-3	-3	-3	-3	-3
1960-1965	-41	-41	-41	-41	-41
1965-1970	-44	-44	-44	-44	-44
1970-1975	-89	-89	-89	-89	-89
1975-1980	-34	-34	-34	-34	-34
1980-1985	-10	-10	-10	-10	-10
1985-1990	-50	-50	-50	-50	-50
1990-1995	-90	-90	-90	-90	-90
1995-2000	-100	-100	-100	-100	-100
2000-2005	-123	-123	-123	-123	-123
2005-2010	-135	-135	-135	-135	-135
2010-2015	-99	-99	-99	-99	-99
2015-2020	-87	-87	-174	-87	-135
2020-2025	-71	-71	-137	-68	-135
2025-2030	-54	-54	-99	-49.5	-135
2030-2035	-54	-54	-40.5	-37.1	-135
2035-2040	-54	-54	18	-24.8	-135
2040-2045	-54	-54	76.5	-12.4	-135
2045-2050	-54	-54	135	0	-135

Syria (net international migration x1000)

Period	UN Medium variant	S1	S2	S3	S4
1950-1955	-14	-14	-14	-14	-14
1955-1960	-3	-3	-3	-3	-3
1960-1965	-3	-3	-3	-3	-3
1965-1970	-3	-3	-3	-3	-3
1970-1975	-16	-16	-16	-16	-16
1975-1980	-32	-32	-32	-32	-32
1980-1985	-17	-17	-17	-17	-17
1985-1990	-29	-29	-29	-29	-29
1990-1995	-14	-14	-14	-14	-14
1995-2000	-26	-26	-26	-26	-26
2000-2005	110	110	110	110	110
2005-2010	-11	-11	-11	-11	-11
2010-2015	-35	-35	-35	-35	-35
2015-2020	-16	-16	-32	-16	-110
2020-2025	-10	-10	-34	-17	-110
2025-2030	-10	-10	-35	-17.5	-110
2030-2035	-10	-10	1.25	-13.1	-110
2035-2040	-10	-10	37.5	-8.8	-110
2040-2045	-10	-10	73.75	-4.4	-110
2045-2050	-10	-10	110	0	-110

Tunisia (net international migration x1000)

Period	UN Medium variant	S1	S2	S3	S4
1950-1955	-22	-22	-22	-22	-22
1955-1960	-35	-35	-35	-35	-35
1960-1965	-45	-45	-45	-45	-45
1965-1970	-29	-29	-29	-29	-29
1970-1975	-26	-26	-26	-26	-26
1975-1980	-3	-3	-3	-3	-3
1980-1985	-5	-5	-5	-5	-5
1985-1990	-5	-5	-5	-5	-5
1990-1995	-9	-9	-9	-9	-9
1995-2000	-11	-11	-11	-11	-11
2000-2005	-16	-16	-16	-16	-16
2005-2010	-4	-4	-4	-4	-4
2010-2015	-4	-16	-16	-16	-16
2015-2020	-4	-4	-8	-4	-45
2020-2025	-4	-4	-12	-6	-45
2025-2030	-4	-4	-16	-8.0	-45
2030-2035	-4	-4	-0.75	-6.0	-45
2035-2040	-4	-4	14.5	-4.0	-45
2040-2045	-4	-4	29.75	-2.0	-45
2045-2050	-4	-4	45	0	-45

Turkey (net international migration x1000)

Period	UN Medium variant	S1	S2	S3	S4
1950-1955	-8	-8	-8	-8	-8
1955-1960	-37	-37	-37	-37	-37
1960-1965	-64	-64	-64	-64	-64
1965-1970	-67	-67	-67	-67	-67
1970-1975	-63	-63	-63	-63	-63
1975-1980	-74	-74	-74	-74	-74
1980-1985	-16	-16	-16	-16	-16
1985-1990	-30	-30	-30	-30	-30
1990-1995	-40	-40	-40	-40	-40
1995-2000	-30	-30	-30	-30	-30
2000-2005	-20	-20	-20	-20	-20
2005-2010	-10	-10	-10	-10	-10
2010-2015	-5	-5	-5	-5	-5
2015-2020	-2	-2	-4	-2	-74
2020-2025	-1	-1	-5	-2	-74
2025-2030	0	0	-5	-2.5	-74
2030-2035	0	0	14.75	7.4	-74
2035-2040	0	0	34.5	17.3	-74
2040-2045	0	0	54.25	27.1	-74
2045-2050	0	0	74	0	-74

Occupied Palestinian Territory

(West Bank and Gaza) (net international migration x1000)

Period	UN Medium variant	S1	S2	S3	S4
1950-1955	-14	-14	-14	-14	-14
1955-1960	-14	-14	-14	-14	-14
1960-1965	-16	-16	-16	-16	-16
1965-1970	-57	-57	-57	-57	-57
1970-1975	-6	-6	-6	-6	-6
1975-1980	-17	-17	-17	-17	-17
1980-1985	-12	-12	-12	-12	-12
1985-1990	-8	-8	-8	-8	-8
1990-1995	7	7	7	7	7
1995-2000	14	14	14	14	14
2000-2005	-38	-38	-38	-38	-38
2005-2010	-18	-18	-18	-18	-18
2010-2015	-4	-4	-4	-4	-4
2015-2020	-4	-4	-8	-4	-57
2020-2025	-4	-4	-6	-3	-57
2025-2030	-4	-4	-4	-2.0	-57
2030-2035	-5	-5	11.25	-1.5	-57
2035-2040	-5	-5	26.5	-1.0	-57
2040-2045	-5	-5	41.75	-0.5	-57
2045-2050	-5	-5	57	0	-57