

Mastering Demographic Change in Europe – 8 European Academies' Statement

Preamble

The population of Europe¹ is changing significantly: it is growing older than it has ever before and it is ahead of other continents in that regard, in most European countries the total period fertility rate has fallen well below two children. The population in some countries has started to decline while in others migration is compensating low fertility. Thus, besides a lengthening life span and reduced child bearing, demographic change in the EU is characterized by increasing migration within Europe, and also by more immigrants from outside of Europe entering European Union member states. Such changes in the composition of the EU population, in particular when considered jointly with other global changes such as climate change or potential shortage in natural resources, pose challenges for the wellbeing of individuals, communities and societies. Against this background, environmental, economic and social sustainability have gained increasing importance for the welfare of Europe. The resources of this planet are finite, and at the same time societal institutions are in need of transformation such that they provide for longer healthy and productive² lives.

Policies informed by a clear understanding of the sources and likely directions of demographic change as well as the changes in the ageing process across historical time are required to achieve these goals. As National Academies of Science, we consider it one of our tasks to contribute to well-informed policymaking. We are convinced that European citizens need the support of their EU institutions besides their national governments to plan and manage their longer lives, to maintain productivity and quality of life beyond economic employment, and to consume in a sustainable manner.

Eight European Academies of Science have assembled for this Statement pooling their knowledge on demographic change and its causes and consequences, building on scientific work as well as prior national statements of individual Academies.³ We seek to highlight areas and steps of priority for mastering demographic change, and we

¹ "Europe" refers to the 28 European member states.

² "Productive" as used in this text refers to productivity in the labour force as well as in civil society and in domestic settings.

³ We thank Prof. Dr. Henri Leridon, Director emeritus of INED (Institute National d'Études Démographiques) for his very valuable contributions in the course of the development of the Statement.

should like to contribute to creating a Europe that makes the most of its resources to the benefit of all. The following considerations and recommendations have taken into account that the European Union had identified demographic change as a priority requiring social policy change in 2006⁴ and since then many initiatives in the areas of life-long learning, health and labour force participation have been under way.

1. Demographic Change in Europe: Background and Framework

1.1. Europe's Population and Global Demographics

The regions of the world are currently at different stages of the demographic transitions. The Less and Least Developed Regions countries which tend to still have significantly higher fertility rates will account for almost all of the population growth until 2050. The current prediction suggests that the world population will be over 9 billion by the middle of the century, and that increase will likely level off during the second half of the century. By 2050 Asia will comprise more than half of the world population, Africa is projected to double in size and thereby reach around 20%, while the current EU 28, standing at slightly above 500 million people has a plausible range from shrinking to around 460 or growing up to around 550 million, mostly depending on future migration and fertility patterns.⁵ These changes along with economic differentials will create pressures for international migration and affect the geopolitical landscape.

Not only population size, but also *density*, *spatial distribution* and *age composition* will significantly change in the 21st century. The spatial concentration of global human population will grow continuously and rapidly, as an increasing share live in cities and other urban areas, projected to reach two thirds by 2050.⁶ The *age composition* of populations around the world will also change as median ages rise, and there is a compositional shift from younger to older people. These population changes are occurring across countries within very different institutional and socioeconomic settings.

Within the EU, fertility and mortality levels, migration flows and population distribution vary significantly between and within countries. For example, Eastern Europe, such as Bulgaria and Romania, is and probably will be most affected by population shrinkage because of relatively higher mortality, lower fertility and emigration. However, in many countries such as the UK and France, the population is still growing due to a combination of relatively high immigration and fertility. Common to all European

⁴ The demographic future of Europe – from challenge to opportunity. Communication from the Commission, Brussels, 12.10.2006, COM (2006) 571 final.

⁵ Figures are based on calculations in Lutz, W., Butz, W.P. & KC, S. (eds), *World Population and Human Capital in the 21st Century*, forthcoming, Oxford University Press.

⁶ All international figures come from the UN unless otherwise stated.

countries,⁷ albeit with differing temporal dynamics, are rising life expectancies and a changing age composition of the population.

1.2. Systemic and Dynamic Character of Demographic Change

Population shrinkage in times of peace, good health and prosperity is unprecedented in human history, as is the rapid increase in average life expectancy in particular beyond age 65. Therefore there is no empirical evidence base yet about the likely consequences. This calls for strengthened scientific investigation. Clearly such fundamental changes require institutional, political, economic, and cultural adaptation. In particular areas such as work, family, education, health, the economy, infrastructures and regional development, civil society, and cultural change are involved. Causes as well as consequences of demographic change cannot be unfolded or understood without taking into account recent trends in all of these domains as well as their interaction. Any policy aiming at influencing the size, composition, density, or distribution of the population, or, at making the most of such changes and reducing negative consequences, needs to tackle not just one policy area. Longer employment requires good health and lifelong learning; learning is stimulated by appropriate work conditions; health and higher employment rates among parents require a supportive community infrastructure and so on.

Ageing is to be considered both as a population process, and as a process of individual lifespan development. Both levels need to be addressed. The ageing process is in flux. Projections into the future on the population as well as the individual level are to take such historical changes into account. For instance, projecting the demand for dementia care in 20 years needs to factor in the cohort change in the prevalence of dementia, which seems to be declining.⁸

Conventional social planning as well as the assessment of the productivity of nation states is heavily dependent on chronological age which does not reflect such cohort changes. Conventional indices such as the dependency ratio may serve as a prototypical example. We suggest that a first step beyond conventional indicators might be to select a set of complementary change-sensitive indicators to cover central dimensions of productivity, well-being and sustainability such as the following ones:⁹

- Healthy life expectancy at birth and at 65 years.

⁷ See however, the currently falling life expectancy in Lithuania for the low educated (cf. p. 8 of this Statement).

⁸ E.g., see Matthews, F.E. et al. (2013). *A Two-Decade Comparison of Prevalence of Dementia in Individuals aged 65 Years and Older from Three Geographical Regions of England: Results of the Cognitive Function and Ageing Study I and II*. *Lancet* 382 (9902), pp. 1405-1412.

⁹ In 2007, Eurostat has produced a set of more than 100 such indices.

- Total employment rate, employment rate beyond 50 years.
- Years of schooling and level of adult skills.
- Total number of hours of volunteering activity and family care.
- Amount of political and social participation.
- Access to open and clean space.

These indicators need to be broken down by age, gender, socioeconomic status as well as ethnicity/migrant status to be informative about potential disparities.

1.3. Socio-Economic Development with Less Material Consumption

Population change in the 21st century is to be placed in the context of consumption and environmental protection within Europe as well as around the world. Economic and social systems need to be reorganized in a way which does not depend on continued increases in non-renewable material consumption. Europe may take its population changes also as a starting point towards furthering investment in non-material, high quality growth.¹⁰

Consumption is critical to facilitate human development and contributes positively when it enlarges the capabilities of individuals without adversely affecting the wellbeing of others, supports inter-generational fairness, respects the carrying capacity of the planet, and encourages the emergence of lively and creative communities. However, *material* consumption¹¹ beyond a certain basic level does not necessarily lead to a better quality of life, and is not always necessary for advances in human development.

2. Policy Challenges for Europe

The challenge for Europe is to ensure high quality longer lives for all people, which requires good health, sustained individual productivity and societal participation, as well as a preserved and supportive environment.

2.1. Adapting to Low Fertility/ Long Lives/ Highly Diverse Societies

Low Fertility and its Potential

Europe has experienced low levels of childbearing for several decades. Despite many efforts to clarify the causal mechanisms underlying fertility trends as of yet there is no comprehensive explanation. The desire to have children and even more so its fulfillment is based on biological, medical, psychological, cultural, social, and economic reasons that vary between individuals, countries and historical era. Any one-dimensional explanation falls short of the phenomenon.

¹⁰ Royal Society: People and the Planet, 2013.

¹¹ Material consumption refers to the direct usage of material resources and as such is part of economic consumption (Royal Society: People and the Planet, 2013, p. 47).

In particular, having children is a long-term commitment that many young people undertake only when the three primary conditions for successful parenthood, that is, time, financial resources and infrastructure, are in place. More specifically such conditions are: high quality kindergartens and primary schools, parental leave, housing allowances as well as direct cash benefits supporting the child, a positive assessment of future economic security, and the continued opportunity to participate in society.¹² These resources are particularly important for women who aspire to participate fully in society as workers and mothers. Societies need to recognize differences in fertility behaviour and individual goals of productivity. European citizens should have a fair chance to choose between different lives, with or without children. Low fertility at current average European levels is not necessarily detrimental to either societal or individual development. In particular in Western Europe over the past decades migration gains and increases in life expectancy have resulted in continued population growth despite below replacement level fertility. In contrast, persisting low fertility in Eastern Europe in combination with emigration poses some concerns about the demographic prospects of that region. In general, however, possible gains in productivity per capita need to be taken into account when consequences of low fertility are discussed.

Long Lives Provide New Opportunities

Over the last hundred years we have gained 30 years in average life expectancy and an increasing proportion of these added years are healthy years; a reorganization of traditional life course structures is required in order to make use of the potential of longer lives. The segmentation of life into set stages of education, work and retirement should be enabled to become more fluid. This transformation will allow longer contributory lives and also support an enhanced work-life balance. The increase in healthy life years is reflected in improved physical and cognitive performance levels of old and even very old adults as compared to previous generations.¹³ Healthy adults who have experienced continuous learning, regular changes in work-related activity, and a healthy life style, are able to remain productive for longer.¹⁴ More people also reach very old age, which requires attention and innovation in the fields of care and the forms of living for the last phase of life. States of dependency deserve the same amount of attention and support at any given point in the life span.

¹² For more extensive treatment see Berlin-Brandenburg Academy of Sciences and Humanities/ National Academy of Sciences Leopoldina (2012): *A Future with Children*.

¹³ E.g., Christensen, K. et al. (2013). *Physical and Cognitive Functioning of People Older than 90 Years: A Comparison of Two Danish Cohorts Born 10 Years Apart*. *Lancet* 382 (9903), pp. 1507-1513.

¹⁴ For details see National Academy of Sciences Leopoldina /acatech – National Academy of Science and Engineering (2009): *More Years, More Life*.

The probability of a high healthy life expectancy is unequally distributed. Besides biological differences, it is primarily unequal access to health services and education, and differing working and living conditions that are causing both social and regional demographic inequalities across Europe.

Making Use of Increased Demographic Diversity

Europe's population is characterized by large differences between countries in terms of age, gender, and ethnicity. It plays out in the education system, the labour force and society at large and refers to at least four sources: (i) more older adults, (ii) more women, (iii) more intra-European migrants, (iv) more non-European migrants. In a number of European countries, policymakers have reacted to shortages in labour supply by encouraging immigration. In addition, various historical, cultural, political and economic factors have led to a growing influx of immigrants into many European countries during the last few decades. This has resulted in more diverse, multicultural societies and poses challenges in terms of integration.

Despite this challenge, higher demographic diversity in terms of age, gender, and ethnicity, has the potential to give rise to high innovation. With a considerable part of the population having a different ethnic, religious and linguistic background, a diversity-oriented integration policy is needed to make productive use of the changing population composition and to reduce potentially adverse outcomes. The education system and the local labour markets are two areas of political priority, which in most countries have hitherto not been sufficiently adapted to these changes.

2.2. Raising Investments in Education throughout the Life Course and across the Population

In a globalizing world, an economy that is increasingly technology based, and with the rate of technological change on an accelerating track, the cognitive resources of societies will be a key factor in international competitiveness and hence for maintaining the wealth of European economies. One important way to develop and maintain these cognitive resources throughout longer lives is enhanced learning from early childhood to old age. It must be recognized that cognitive development starts well before school age, can be enhanced by high quality formal education and requires continuous investments throughout the life course. In addition to recognizing the general importance of early as well as lifelong learning, certain subgroups require special investment. In particular these include children in socially, economically and linguistically disadvantaged families and those experiencing family disruption and/or complex family arrangements, low qualified adults, or women reentering the labour market.¹⁵

¹⁵ cf. More Years, More Life (2009).

In some European countries such as Sweden, governments strongly support life-long learning, while others, such as Switzerland require businesses to invest in training. European guidelines might want to focus on lowering learning thresholds and creating incentives for individuals to engage in lifelong learning. There is a need for countries to debate the respective responsibilities of governments, employers and individuals in financing such training.

Education across the life course requires a re-organization of work lives. European countries and businesses are well advised to create conditions (e.g., social security, company networks, and focused adult education) for timely alternation between work, training, family care or other private obligations, and leisure. Conditions that make it easier for both women and men to combine work with learning, as well as family life and the fulfillment of personal goals, will make Europe more attractive also for highly skilled immigration. Given that the acquisition of skills throughout the working life is certified in a comparable fashion across the EU and social security entitlements are made portable, labour mobility will be facilitated.

2.3. Enabling Longer Work Lives for All

From a macroeconomic perspective, increased participation of older people in gainful employment is essential for future prosperity in the European Union. From an individual's perspective, gainful employment is central to social participation and important for the maintenance of well being. There is early evidence showing that longer participation in replenishing rather than depleting labour environments has a positive effect on health and well-being in later life. This not only means recruiting older employees and retaining them longer. It also involves enabling employees to link gainful employment and periods of leave with one another over a longer work life. Various measures can be taken to reach this goal: (i) Enhancing the competitiveness of older people in the labour market through lifelong learning; a work organization that is conducive to learning and health; as well as a staff and wage policy that makes employment of older employees attractive for companies. Also, facilitating a flexibly staggered process and fluid transition (instead of an abrupt shift) toward retirement is helpful. Here, part-time work agreements could be linked to partial pensions. However, the precondition is that the partial pensions are calculated in a manner that they are cost-neutral regarding pension insurance. Such a policy must not be abused to subsidize a low-wage sector that exerts pressure on full-employment salaries. (ii) Making it easier to take up so-called "second careers" in new fields of work or new branches: Regulations on the certification of skills acquired during working life could help to make a new start or to shift to a new branch. (iii) Replacing steep seniority wages with pay-for-performance components and agreements on repayment clauses if the employer invests in further education of employees. (iv) Raising retirement age while simulta-

neously raising investment in further education, enabling lateral careers; improving coordination of skills and workplace requirements, health management, acceptance of a fixed retirement age as a calculation basis for pension levels, etc.

Advances in occupational health knowledge should be used to redesign work environments (physical, cognitive, and psychosocial) for longer work lives. European standards should be developed to monitor employees' competencies and health profile. Work organization and job characteristics should be monitored with regard to their cumulative health risks (physical, mental, and cognitive) or their health promoting character. It should become a standard practice for companies to determine the optimal time point at which a given occupational task is changed prior to losses in productivity and health inflictions. Adoption of new occupational tasks needs to be preceded by the appropriate training measures.

The European Union has brought substantial impetus for the member states to address age discrimination. Creating favorable taxation for working past retirement age, and fostering the raise of the retirement age in Europe are cornerstones to raising the labour market participation of older people and promoting the health of older adults. More well-controlled research also within companies is needed to investigate the specific effect of work biographies on old-age outcomes.

2.4. Increasing Labour Mobility

Labour mobility will be crucial – both international and within Europe. Europe needs portable pensions, qualifications, social security and health care if it is to support the increasing mobility of skills that will be required. As the proportion of dual-earner households increases, it is highly important to support couples and families with their mobility. Couples are still more likely to move for the man's than the woman's job, and partnered men more often gain, while partnered women more often lose (employment, wages) from a joint move. Further, women's choices of occupation from the start appear to be influenced by portability that in turn is associated with lower wages and job security. Mobility also poses challenges for the investments in children and calls for more adaptive procedures of relocating within Europe. It is an urgent task for the member states to develop and implement feasible and non-complex structures for a family-oriented European mobility. Staying productive with fewer people necessitates the restructuring of societal institutions and geographic redistribution, which may entail disadvantages at the level of individual communities and regions.

2.5. Family Life-Course Structures

Dramatic changes in the nature, timing and stability of partnerships as well as the transition to parenthood have produced an increasingly diverse and complex set of family and household arrangements. Of particular interest are complexities introduced

by cohabiting versus marital partnerships, as well as couples who “live apart together”; separation, divorce, single parenthood and shared custody; re-partnering and stepfamilies; and same-sex partnerships. Increasing international and European migration leads to family structures with family members, especially partners, separated across borders. Some of these complex family arrangements are associated with economic insecurity and poverty, placing a double burden on partners, parents, and children. Moreover, due to the combination of low fertility and rising life expectancy both verticalisation and slimming of kinship networks considerably change interrelations between and within generations.

Related to but distinct from the demographic aspects of changing family life courses and household structures are shifts in the contributions of men and women to family wellbeing. Women’s increasing labour force participation and men’s slowly increasing engagement in family work and child care are altering the needs of families and households. The male breadwinner model is gradually losing its dominance in most countries, replaced first by women’s taking on a second shift of family work after the paid workday, and in a few countries a more equal arrangement of dual-earner/dual-carer. Under rising uncertainties in the labour market and destabilisation of professional careers the dual earner model might be considered as a strategy against risks of welfare deterioration due to one partner’s unemployment. In addition, women’s labour force participation has gained new importance in the context of destabilized family patterns.

These deep transformations of families and households are observed across European countries along with noticeable differences in their timing and intensity, determining diverse patterns of family life in Europe. The term “convergence to diversity”¹⁶ seems to describe adequately these common trends and persistent diversity in family change in Europe, strongly embedded in national cultures and traditions as well as economic development and institutional settings.

Social policies can alleviate the economic distress of those experiencing disruption and complexity, and are also important for both women and men to have equal opportunities to raise children and serve as breadwinners for their families. In many countries, policies continue to favour the traditional family life course of marriage, children, gender specialization, and life-long partnerships. Policies need to be designed in flexible ways to meet the needs of those in different family configurations at any given point

¹⁶ Boh K. (1989). *European family life patterns – A reappraisal*, [in:] K. Boh, M. Bak, C. Clason, M. Pankratova, J. Qvortrup, G. B. Sgritta & K. Waerness (eds), *Changing Patterns of European Family Life: A Comparative Analysis of 14 European Countries* (pp. 265-298), London: Routledge. Daly, M. (2005). *Changing family life in Europe: Significance for state and society*. *European Societies*, 7(3), pp. 379-398.

in time and any given stage of their life course as well as changes in family configurations across the individual life course. Reconciliation of family obligations and labour market demands over the life course must receive particular attention, as recommended increases in women's employment and longer stay in the labour market of both men and women are required to make better use of shrinking labour resources. The redistribution of work and care between men and women as well as between families, the state and the market must be taken into account in reshaping social policy.

2.6. Improving the Integration of (Im)Migrants

In the last decades a considerable numbers of immigrants have moved into Europe and increasing amounts of migration between European Member States has taken place as well. Migration within Europe has primarily been labour and education migration. Immigrants have entered for different reasons. Some have come due to more attractive European labour markets, others have been refugees and some have come because of family reunification. Their educational level and their qualifications are mixed.

Many European countries have found it difficult to integrate migrants into national education systems, labour markets, and health care. The causes for these problems are many. Some of the (im)migrants' qualifications do not match the needs of the respective European labour market; others encounter difficulties in getting their educational and occupational degrees accepted and some are discriminated against for other reasons.

Immigration can only have positive effects on the innovation capacity and the productivity of Europe if integration is facilitated. This is not a simple process; even the integration of 2nd and 3rd generation immigrants is not easy for many groups in many European countries. In particular, the integration of 2nd generation immigrants has been shown to have crucial implications for succeeding generations.¹⁷ Big challenges arise from refugees or migration for family reunification. It seems that Europe as a rich continent does have an obligation to take care of some of the world's weakest and most oppressed individuals. It is, however, important that the European countries agree on a fair (and a geographical) distribution of the cost. It is also important to coordinate the labour market institutions and rules for social benefits in the different EU countries as they apply to immigrants. In times of demographic change, Europe is well advised to establish an immigration and integration policy that makes immigration a source for innovation and growth and not a source for ethnic conflicts and tensions among the European Member States. In particular, the conditions in schools and on the labour

¹⁷ M. Crul, J. Schneider & F. Lelie (eds) (2012), *The European Second Generation Compared: Does the Integration Context Matter?* IMISCOE Research. Amsterdam: Amsterdam University Press.

market, regarding citizenship regulations and welfare policies are of fundamental importance in terms of improving integration.¹⁸

2.7. Health as an Indispensable Precondition

Human development is not determined by biology but ensues from the continuous interaction between biological, socio-cultural, and personal influences. What has played to our advantage in terms of expanded lives, however, may well bring unwanted health risks if lives are not structured in health-supportive way. In old age, the differences between age peers can be so great that a 70-year old may perform just as well as a 50-year old, but equally, a 70-year old may look and feel just like a 90-year old. Feeling well encompasses not only physical health but also cognitive functioning and mental health. Health promotion, not only prevention of illness, is essential and effective at all ages and especially in old age. Of course the same is true for rehabilitative measures.

In this vein, the European region has seen remarkable health gains in those populations that have experienced progressive improvements in the conditions of life, but significant inequalities persist between and within countries.¹⁹ For example, life expectancy differences between countries in the European Union are up to 12 years for men (Sweden-Lithuania) and 8 years for women (Spain-Bulgaria). Within countries life expectancy differences between high- and low-educated persons are typically 5 years or more. Preconditions for a healthy life include investments in education and in social inclusion especially of children and young adults, as well as investments in active participation, especially within the labour market.

A healthy diet, physical exercise, and non-smoking (and protection against second-hand smoking) are the pillars of prevention and health promotion. Therefore everything ought to be done on the individual and the societal level to facilitate improved dietary habits, increased physical activity and further reduced smoking. Years of public health activities targeting lifestyles (e.g., physical activity, diet), however, have demonstrated that in order to reach across the whole population classical public health measures need to be complemented by so-called embedded interventions that support individuals' self-regulation without requiring knowledge and/or attentional resources (e.g., behavioural feedback, architectural changes, legal regulations, financial incentives).

Banning smoking in public spaces has produced impressive health gains across Europe. Some European member states have also passed laws that influence the healthiness of processed foods as well as informing consumers about the amount of

¹⁸ See Footnote 13.

¹⁹ See also WHO European Region and University College London (2013). Review of social determinants and the health divide in the WHO European region: Final report. Copenhagen: WHO.

calories contained in fast food meals or meals served at cafeterias. Regulating the quality of food served and sold in school environments has also become a practice in some of the EU member states. Such embedded interventions have been shown to be effective independently of socioeconomic background but may also raise questions about the individual's freedom of action. It then becomes an ethical discussion and the maintenance of a balance between the wellbeing of the individual and the collective must be considered.

2.8. High-Quality Monitoring and Data Bases for Reliable Projections

Vast amounts of individual-level demographic data are collected by government agencies and maintained in administrative registers that can be connected over time and have the potential to dramatically increase knowledge about the determinants and consequences of demographic change. The Nordic countries have the most extensive data registers and have also made the most progress in utilizing combined register data on individuals to generate high quality population projections and path-breaking research on demographic change. Many countries are restricted by law from combining data across different registers in order to protect individuals. The social and economic benefits of individual-level administrative data as a basis for research can be achieved with new solutions for data security and anonymization. Increased use of such data is essential for monitoring and understanding demographic change as well as policy effects.

More in-depth data must also be generated through surveys. Building comparative surveys (including retrospective data) across European countries is an important task. Individuals' behaviors can be more accurately described and explained by means of longitudinal cohort-comparative surveys (i.e., following individuals of different cohorts across decades). However promoting the synchronization of cohorts across European countries can be quite difficult because national traditions, experiences, and funding sources are quite different. A more flexible approach has been recommended:²⁰

- Building a core database platform, setting data harmonization rules and access guidelines, exchanging methodology and expertise. This should result in more efficient use of existing and newly established cohorts;
- Including new cohorts that cover groups of European population that are often underrepresented;
- Continuing the follow-up of existing European cohorts, which is often made difficult by a system of grants limited to 3-4 years;
- Combining data from birth cohorts, routine registries, and other data sources.

²⁰ CHICOS (2013): Developing a Child Cohort Strategy for Europe; http://www.chicosproject.eu/assets/181/CHICOS_strategic_report_20130712.pdf (for birth cohorts, but this also valid for other cohorts).

3. Development without Quantitative Growth

People live within both a finite planetary system and local eco-systems. Demographic changes influence, and are in turn influenced by, environmental changes. Changes in the size, density, distribution and age composition of the global population has been placing huge strains on the earth's natural resources. In particular consumption of material resources has increased significantly over the past decades. In this context, reduced population size could help alleviate strained natural resources.

The Human Development Index is increasingly being used alongside GDP as a measure of economic progress. The index includes GDP, life expectancy at birth and literacy. Several European countries, such as the UK, Belgium and Italy, have also developed national indices of "well-being". While well-being is expressed and experienced in context and is situation dependent, the common ground between these efforts is an understanding that basic needs are met, individuals have a sense of purpose and feel able to achieve personal goals and participate in society. In addition, these outcomes may all be achieved without over-consumption of material resources.

The well-being of the European populations will be enhanced through supporting education, health, productivity, social relations and participation as well as family life. However the provision of goods and services to enable this must not rely on increased material consumption of the planet's natural resources. This will be important as it is being increasingly recognised that countries within Developed regions, such as Europe, may have to reduce their material consumption of natural resources, to enable increased material consumption by the less and least developed countries as they demographically and economically grow and increase the standard of living of their populations to that enjoyed in the developed world.

Recommendations

Preamble

Population shrinkage in times of peace, good health and prosperity is unprecedented in human history, as is the rapid increase in average life expectancy. The likely reduction of the European population, unless compensated by immigration, raises new challenges to policy makers.

At the same time, the how and how much of natural resources used as the material basis for the lifestyle of the more developed countries have brought a hitherto unknown endangering of the earth and its climate, with direct negative impact on human lives.

Paradigm Shift and Better Data

- 1) Population changes together with the management of natural resources necessitate a systemic and a life-course approach to policy making. In particular, the policy areas of health, education, employment, and physical living conditions and how they play out over historical time and across the life course need to be considered in a more integrated fashion.
- 2) European policies in times of massive demographic change will need to find ways to reduce material consumption while at the same time promoting high quality education, health, and living conditions across the whole Union.
- 3) Population and resource dynamics require the development of additional indicators in order to improve social planning and the assessment of a population's productivity. Such indicators need to be sensitive to cohort changes in the ageing process, in particular to observed increases in physical and cognitive performance of older adults from cohort to cohort that seriously compromise the validity of chronological age as a marker of capacity or performance.
- 4) Large-scale Europe-wide longitudinal cohort-comparative surveys covering central domains of human functioning while insuring data security are indispensable to support well-informed social planning. Inferences that are based on data from past cohorts run the risk of misinforming policy decisions.

Life-course Policies are Needed

- 5) Systematic differences both between European countries, and between socio-economic groups, between women and men within countries, that relate to living circumstances relevant for the maintenance and promotion of health and productivity need to be diminished. As access to education and health services, as well as faci-

litative learning, working and living conditions is the primary source of such inequality, European policies need to aim at reducing inequalities in these four areas.

- 6) Longer working lives, promoted by the macroeconomic need to retain people longer in the labour market and by better individual health and performance levels, demand new flexible life course patterns. Policies should provide the institutional basis supportive of more frequent movement between learning, working, and private/family life.
- 7) Labour mobility poses challenges for family lives and social relations in general that in turn are at the basis of social capital formation and well-being. European policies should both support mobility and facilitate the employment of parents as well as couples.
- 8) The increasing complexity of family forms, both at a given point in time and across the life course, requires flexible social policies. Reconciliation of family obligations and labour market demands must receive particular attention, as well as the redistribution of work and care between men and women, and between families, the state and the market.

Health in Times of Demographic Change

- 9) In times of longer lives, the health systems of Europe need to complement the prevention of and therapy for ill-health by a concerted orientation towards expanding health-related resources at all ages. "Embedded interventions" such as legal and financial incentives and regulations, as well as architectural design, and immediate behavioural feedback are known to be helpful in this regard.

Less can be More: Education and Work

- 10) Cognitive resources, not numerical head counts, are the key for Europe's competitiveness and its chances for maintaining its wealth. Policy should take advantage of lower fertility rates by investing more in each person and being in a better position to more carefully employ scarce material resources.
- 11) Higher demographic diversity (age, gender, and ethnicity) has the potential of playing out favourably. However, the productive and innovation potential of increased diversity in European member states requires a thoughtful integration policy, particularly in the education system and the labour market.
- 12) European standards for the design of working environments, careers and training need to be established based on criteria that aim to minimize physical and mental exertion in the workplace, and that also help employees to change jobs before their productivity and health are compromised.

- 13) Retaining older people and women in the labour force and integrating migrants calls for higher investments for continued training, for "second careers" in new areas, and for maintaining general productivity. Related policies need to take into account rapidly changing working requirements, higher retirement ages and greater need to combine work and retirement in a flexible manner.
- 14) Similarly, heightened occupational mobility across Europe meets both the demands of the economy for skilled labour, and of individuals to fulfill opportunities for personal and professional development. Portable retirement and social security benefits and qualifications are a precondition that needs to be promoted by European policy making.

**List of Academies Signing the Joint Statement
and of their Representatives**

(incl. previously published Recommendations/Statements/Reports)

Austrian Academy of Sciences

Wolfgang Lutz

Finnish Academy of Science and Letters

Jorma Sipilä

German National Academy of Sciences Leopoldina

(More Years, More Life; Future with Children)

Ursula M. Staudinger

Polish Academy of Sciences

Irena E. Kotowska

Royal Danish Academy of Sciences and Letters

Niels Kærgård

Royal Society

(People and the Planet)

Sarah Harper

Royal Swedish Academy of Sciences

(Nutrition and Ageing)

Elizabeth Thomson

Swiss Academies of Arts and Sciences

(Generationen – Generationenbeziehungen – Generationenpolitik)

Markus Zürcher

**Mastering Demographic Change in Europe
– 8 European Academies' Statement**

Low fertility rates, an ageing population and increased migration within Europe define a current and future population developments. The joint statement of academies of science from eight countries (Austria, Denmark, Finland, Germany, Poland, Sweden, Switzerland, United Kingdom) calls for an adequate response to demographic change by policy makers at the European and country levels in the context of climate change and shortages in natural resources. The document defines main policy challenges to social development and economic growth, in particular to employment, health, education, living conditions and quality of life, and formulates some recommendations concerning appropriate policy responses. Policymaking should be based on a systematic and life-course approach and provide institutional settings supportive for flexible life-course patterns (more frequent moves between learning, working and private/family life). Moreover, well-informed policy should be based on monitoring and research, which require high-quality data.

Key words: population reproduction, demographic structures, policy challenges, life-course

