

Project on Intergenerational Equity

Discussion Paper

March 2004

## DEMOGRAPHICS OF POPULATION AGEING IN HUNGARY

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### *Abstract*

*The paper deals with population ageing from demographic aspects. It is a general trend in human development. A new accelerated stage with shrinking labour force has commenced.*

*There is a redefinition of the young, working-age and old-age groups. Trends in schooling, postponement in family formation and childbearing are also connected with ageing in this respect.*

*The cohort ageing can also be defined. Here the basic inequality between the cohort and period burdens of support is presented and the main strategies for adjustment are outlined.*

*Roma and immigrant sub-populations modify the tempo of ageing in Hungary. Educational change is of great importance in coping with the challenges.*

*JEL classification: J1, J11*

*Keywords: Hungary, population ageing, long-term projections, pension*

It is clear that population ageing should be rated as one of the most important processes in developed countries and even world-wide. It is an unprecedented phenomenon in human history. According to UN population projections, by 2050 the number of persons aged 60 and over in the world will exceed the number of those aged under 15. By 1998, this historic turn had already taken place in the more developed regions.

Population ageing poses long-term challenges to society. It has major implications in the economic and social spheres, even in terms of political dimensions. Suffice it to mention the impact on economic growth, savings, investment and consumption, labour market, taxation, pensions, health care, living arrangements, housing etc. It should be emphasised that population ageing is expected to continue, even to accelerate in the next decades, indicating massively mounting challenges.

The paper consists of four topics concerning the ageing process in Hungary: (1) ageing and its determinants; (2) ageing and the changing age pyramid; (3) cohort ageing; (4) ageing and sub-populations. Short introduction into Hungarian pension reform is also presented.

### *What is population ageing?*

Population ageing from a demographic point of view is a natural process, generated by demographic transitions. Fall in fertility and mortality from their high levels in the pre-decline period to the recent low ones has brought about not only robust changes in population size, but also long-term transformation of the age-structure. This is called population ageing. Consequently, ageing is a basic process of population development in the 20<sup>th</sup>–21<sup>st</sup> centuries. In this light, ageing is not a demographic crisis -- quite to the contrary, it mirrors a general trend of human development aimed at achieving longevity and well-being.

The most documented feature of population ageing is the growing size of the elderly population and its increasing share of the total population. Other features include a rise in the average age of population, a decreasing proportion of children **and** increasing old age dependency ratio. When judged by these criteria, the ageing process is not a new demographic phenomenon in Hungary. In fact, population ageing in Hungary, as in other developed countries, began over a century ago, with the onset of transition in fertility and mortality from high to low levels. At the dawn of the 20th century, Hungary's population was very young in demographic terms. Nearly half of the population was below 20 years of age. Children outnumbered the elderly (those aged under 20 and 60 years and over, respectively) by 6 to 1 (see Table 1).

Table 1

## Age structure changes in Hungary, 1901–2050

Age group (years)	1901	1949	2001	2050
Population size (in 1000)				
Under 20	3078	3067	2360	1632
20-59	3263	5065	5761	4194
60+	514	1073	2079	2941
Total	6854	9205	10200	8767
Percentage distribution (%)				
Under 20	44,9	33,3	23,1	18,6
20-59	47,6	55,0	56,5	47,8
60+	7,5	11,7	20,4	33,6
Ratio of under 20 to 60+	6:1	3:1	1:1	1:2
Average age of population	27,0	31,5	37,2	44,0
Old age dependency ratio	0,15	0,20	0,28	0,59
Total dependency ratio	1,09	0,84	0,71	0,99

Source: Demographic Yearbook at HCSO (2001)

Between 1901 and 1949, the number of Hungarians aged 60 and over increased almost two-fold, from 514,000 to 1,073,000. Over the next 52 years, it has doubled again, reaching 2,079,000 in 2001. This increase was much faster than the rise of the number of those in working ages or the growth of the total population. The number of young people under 20 even decreased, mostly and sharply after the 1960s.

Population ageing means not only the rising number of older people, but also their growing proportions relative to the total population, and, obviously, the converse: the shrinking proportions of younger age groups. In Hungary, the proportion of those under 20 fell from 44.9 percent to 23.1 percent during the last century. Excess of young over the elderly has gradually disappeared. The ratio of people aged 60 and over increased from 7.5 percent to 20.4 percent.

The latest projections indicate that the population aged 60+ is expected to grow by about one million up to the middle of the century, to reach 2,941,000 by 2050. This is expected to make up 33.6 percent of the projected total population. Populous generations born in the 1950s and 1970s will accelerate the process when they enter the category of elderly people.

At present there are about as many elderly as children in Hungary, in the age groups 60+ and 0-19. By 2050, the number of the elderly is projected to be 80 percent over the number of children. The new phenomenon of shrinking labour force poses new challenges for the society. The share of those in working ages is expected to drop below 50 percent, while their number will fall to a pre-World War I level of only 4 million.

In Hungary, challenges of population ageing are strongly connected with the challenges posed by population decline. Population size has already decreased by 600

thousand since 1981. The decline is expected to continue and by 2050, there will be 8,767,000 inhabitants in Hungary, almost 1.5 million less than now.

Population decline and ageing are in strong correlation in Hungary. One can say that the smaller the population size, the more developed stage the ageing process will reach. It means that population decline is not a solution of undesirable effects of ageing.

Population ageing has a very strong impact in many domains since it changes the dependency ratio. It is a fundamental economic truth that ageing alters the burden of transfers from the employed to the dependent population. In Hungary, old age dependency ratio almost doubled in the 20<sup>th</sup> century and this will happen again in the next 50 years. Nevertheless, the next period shows an essential difference from the past with regards to total dependency. After a long period of low levels caused mainly by below-replacement fertility, Hungary will face a sharply increasing total dependency ratio.

These estimations draw on the baseline variant of the 2001-based population projections for Hungary, which cover the period to 2050. This variant assumes that during the projection period, the life expectancy at birth for males will increase from 68.2 years to 76.5 years and for females from 76.6 years to 82.6 years. As for international movements, there will be a net migration gain of 12,000 persons per year. Fertility also is assumed to increase to the medium level of 1.6 children per woman.

Past and projected time series of population figures underline that ageing even takes place within the group of older persons. The fastest growing age group in Hungary is the oldest of the old, those aged 85 years and older. Compared to 1901, its size is 14-fold now and it will be 34-fold by 2050 according to the projection (Table 2).

Table 2

Ageing of the elderly in Hungary, 1901-2050

Age group (years)	1901	1949	2001	2050
Population size (in 1000)				
60-64	210	380	534	600
65-74	223	499	928	1240
75-84	72	172	490	799
85+	9	22	126	302
Total	514	1073	2079	2941
Changes over time (1901=100)				
60-64	100	181	254	286
65-74	100	223	416	555
75-84	100	240	682	1111
85+	100	249	1426	3412
Total	100	209	404	572

Source: Projection database of HCSO DRI, 2003.

It is also clear that the working-age population is getting older. Even among young people under 20, the average age is now higher than it was in the past.

Population ageing is determined by the long-term joint effect of its determinants, fertility, mortality and migration. In Hungary, it was mostly the general trend of demographic transition that influenced the ageing process to the middle of the last century. Under the communist regime between 1950 and 1990 the mortality crises slowed down the ageing process, while the below-replacement fertility, combined with massive emigration flows, caused the process to accelerate. As a consequence, Hungary's population is rated to be very old in world-wide comparison at the present.

### *Ageing and the age pyramid*

Population ageing is a total transformation of the age pyramid. It is difficult to identify the various changes in view of the fluctuations in the underlying processes, but one can differentiate three main stages.

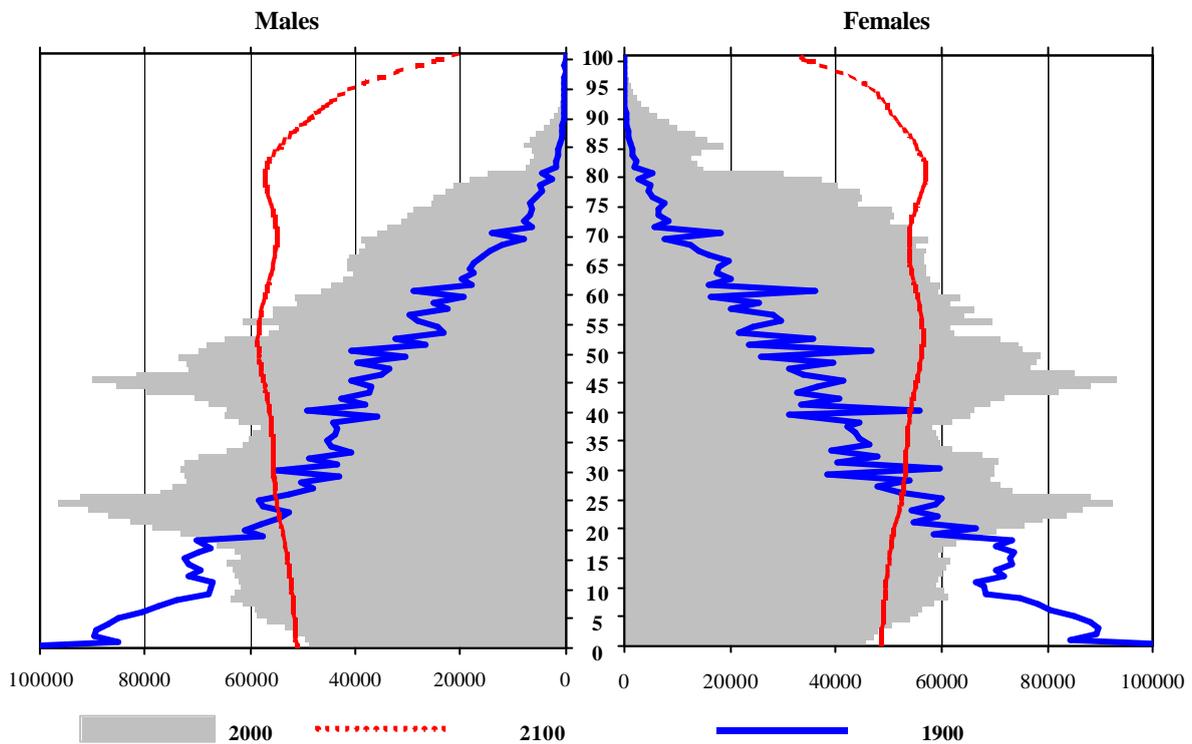
The age pyramid of Hungary at 1901 may characterise the initial age structure at the beginning of the first demographic transition, which in the developed countries generally took place in the 19<sup>th</sup> century. It presents a very young population. The age pyramid is shaped like a Christmas tree.

At the end of the first transition, which in Hungary was close to the end of the 20<sup>th</sup> century, the shape of the age pyramid changed. In this phase, the size and proportion of different age groups were far more balanced, disregarding the irregularities caused mainly by fluctuations in the birth rate. Another important feature of this age pyramid was that the share of those in the working-age group was still high and the overall dependency ratio was relatively low. Having said that, a very significant change took place in the young and old components of the dependency ratio. Whereas old-age dependency was on the rise, the level of young-age dependency declined. The ageing index gradually approached 1.

The third shift in the age pyramid is still ongoing. As old-age life expectancy continues to increase, dramatically raising the share of older persons, the proportion of those in working ages is decreasing, resulting in a steady growth in old-age dependency and overall dependency. Figure 1 shows how these different age pyramids developed in Hungary.

Figure 1

Age pyramid of the population of Hungary, 1900, 2000 and 2100



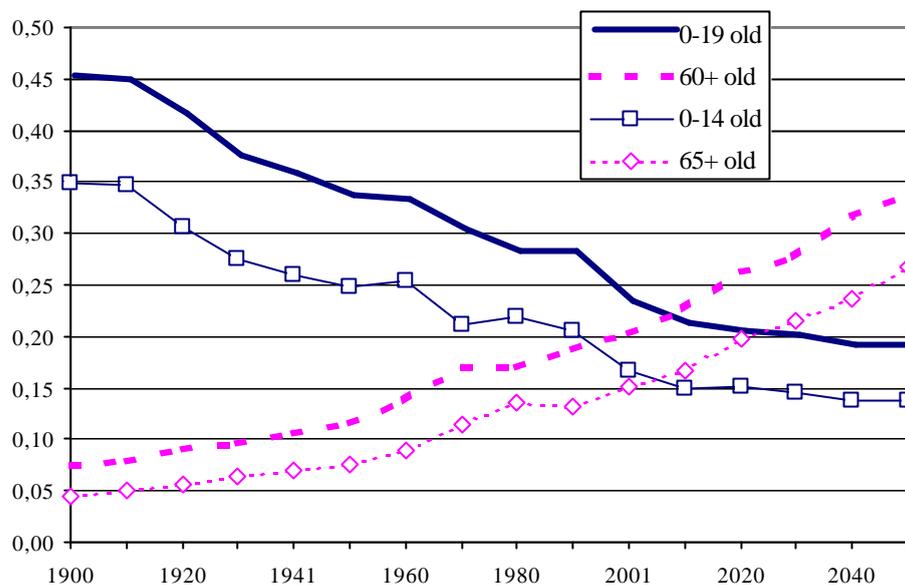
Source: Projection database of HCSO DRI, 2003

The age pyramid in 2100 is based on a scenario assuming total fertility rate 1.9 and life expectancy at birth of 100 years, as the highest value in this century. Although we cannot vouch for the reality of these assumptions, they are certainly not impossible.

The main implication of Figure 1 is that a fourth determinant of ageing should be taken into consideration, namely the redefinition of young, middle-aged and old age groups. Proportion of those aged 60+ was 8 percent in 1901, it is 20 percent now and it is expected to be 45 percent in the 2100 scenario. The situation among those under 20 is the opposite: their share decreases from 45 percent to well below 20 percent. It seems that whatever we set as the bottom limit of the elderly group and the upper limit of the young part of population, the share of the elderly will exceed the proportion of the young (see Figure 3).

Figure 3

Proportion of young and elderly population in Hungary



Source: Projection database of HCSO DRI, 2003

This time, historic turns in ageing process take place in Hungary even considering different groups of elderly and young population. The proportion of those aged 60 and over is already higher than the proportion of those under 15 and will reach the proportion of people under 20 in 2006. As for those aged 65 and over, their proportion will reach the ratio of children under 15 in 2005, those under 20 in 2020. Moreover, in 2050, there will be as many people over 75 as below 15, according to the baseline projection.

Not only the increasing share of the elderly involves the shifting of the bottom limit of the elderly group. What we see happening now is that the upper limit of the young age group is increasing, too. Trends such as prolonged education, leaving the parental home at an older age, late marriage, and increased age at childbearing, are all extending the age interval of youth. Increased longevity and expanded childhood force the society to redefine the burdens of the working age group.

All this implies that a process is ongoing, perhaps not for all, but for a growing number of people, in which they are extending their active lives, claiming and accepting older retirement ages and/or forms of gradual retirement. It is clear that policy efforts to stimulate labour force participation and to extend people's active lives can be one of the most productive among the means to coping with the process of population ageing.

## *Cohort ageing*

Population ageing is usually seen as a cross-sectional process. Its indicators (the proportion of older persons, average age, old-age dependency, ageing index etc.) refer to the population observed at certain points in time. However, ageing can be defined in terms of birth cohorts, too. If life expectancy increases, the proportion of time spent in old age by a given generation is extended. This may be referred to as a cohort analogue of population ageing, or simply cohort ageing.

One can characterise the extent of the cohort ageing using life tables. For precise calculations, cohort life tables are needed -- here we illustrate the process using period indicators. In Hungary, the share of those surviving until age 60 was 35 percent at the dawn of the 20<sup>th</sup> century. According to the mortality data, this ratio is 79 percent at the present and it is expected to be 90 percent by 2050. Changes in survival until age 80 are much more significant: 8 percent in 1901–1905, 35 percent now, it will be 55 percent in 2045–2049 (both sexes).

Table 3

Survival until older ages in the period life tables, Hungary, 1901–2049

Age group (years)	1901-1905	1951-1955	1996-2000	2046-2049
Number of male survivors until age				
50	43,944	79,308	85,178	94,017
60	34,875	68,762	69,958	86,603
70	21,629	49,401	47,871	71,574
80	7,586	22,212	22,496	43,481
Number of female survivors until age				
50	44,052	84,350	93,529	97,247
60	35,452	76,615	86,794	94,253
70	21,782	59,517	73,123	87,194
80	7,635	29,401	46,285	67,664
Number of survivors until age				
50	43,993	81,749	89,362	95,586
60	35,153	72,556	78,561	90,336
70	21,701	54,284	60,899	79,249
80	7,609	25,681	34,824	55,467

from 100,000 newborns of respective sexes according to the period life tables

Source: Projection database of HCSO DRI, 2003

How could the study of cohort ageing contribute to our topic, namely ageing and intergenerational equity? The answer is simple: if people spend more time in old age, generations will need more benefits to ‘manage’ longevity. If we approach the issue

from the perspective of successive generations, the phenomenon of ‘generalised sandwich generations’ emerges. Whilst there is a growing demand among the generation of parents for benefits designed to lengthen and improve their lives in old age, the generation of children need more loans to make their lives as productive and ‘transferable’ as possible in working ages in order to make transfers to their parents. Intergenerational solidarity could easily lose force in the process, corroding the foundations of society.

In the transition countries, as in Hungary, this situation is even more visible, because of the quick changes in almost every field. One can observe the schooling boom, an expansion toward secondary and higher levels of education. In 2001, among those aged 25–29, only 37 percent of males and 43 percent of females completed secondary education, while in 2021, this figure is projected to reach 72 and 84 percent, respectively. One can estimate that the length of the basic period for education will extend by 3 years at least. A high proportion of people in their 20s will not take part in the labour force. They will postpone job career, marriage and childbirth.

At the same time, mortality improvement has commenced in the region, especially in the countries joining the European Union. In Hungary, life expectancy at birth increased by 3-4 years in the second half of the last decade, mostly due to the decrease of mortality in older ages.

As a consequence of economic changes, there was a loss of 1.5 million jobs in the first half of the last decade. Therefore, a very significant share of people in working ages receives benefits from the disability or early retirement systems. About 10 percent of people aged between 20 and 60 are already retired. It means that beside the young and old portions of the population, a significant share of those in working ages belong to the group of economically non-active people. In other words, Hungary is a country with high support burden ratio. While there is a pressure for increased expenditures to the economically non-active population due to population ageing, with the current low participation rates, there are severe difficulties to ensure adequate contributions for social security programs.

Table 4

Support burden ratio, Hungary, 2001

Region	Ratio of economically non-active people to the economically actives
Central Hungary	1,29
Central Transdanubia	1,34
Western Transdanubia	1,27
Southern Transdanubia	1,59
Northern Hungary	1,73
Northern Great Plain	1,78
Southern Great Plain	1,59
Hungary total	1,48

Source: Regional projection database of HCSO DRI, 2003

According to Table 4, in 2001, the support burden ratio was 1.48 in Hungary. It means that there were 148 economically non-active persons for every 100 economically active ones. Regions show large variations of this average, ranging from 1.27 (Western Transdanubia) to 1.78 (Northern Great Plain).

Support burden ratio can be transformed into the amount of lifetime spent with or without a (paid) work. Let us start with the stationary population of the life table for both sexes and suppose that the young and elderly people are all dependent. Thus, the time spent in young and older ages is financed by the paid work in the working ages. In addition, time spent in working ages should also be divided into time with and without paid work. It can be done using the ratios of the active and non-active people in this age group. Finally we arrive at the very surprising result that under the recent circumstances in Hungary only 36 percent of the total lifetime is covered by paid work, therefore loans and savings should support the other 64 percent.

With regards to the age-components of the support burden ratio, one can estimate the young-age, working-age and old-age ratios, dividing the number of economically non-active people aged under 20, between 20 and 60, and at least 60 by the number of economically active ones. Table 5 shows the ratios in the actual population of Hungary (period support burden ratios) and the ratios estimated for the stationary population (cohort ratios).

Table 5

Period and cohort support burden ratios, Hungary, 2001

	Ratio
Period support burden ratios, 2001	
under 20	0,55
between 20 and 60	0,44
60 at least	0,49
total	1,48
Cohort support burden ratios, 2001*	
under 20	0,76
between 20 and 60	0,44
60 at least	0,57
total	1,76

\* Based on the life table 2001

Source: Author's calculation

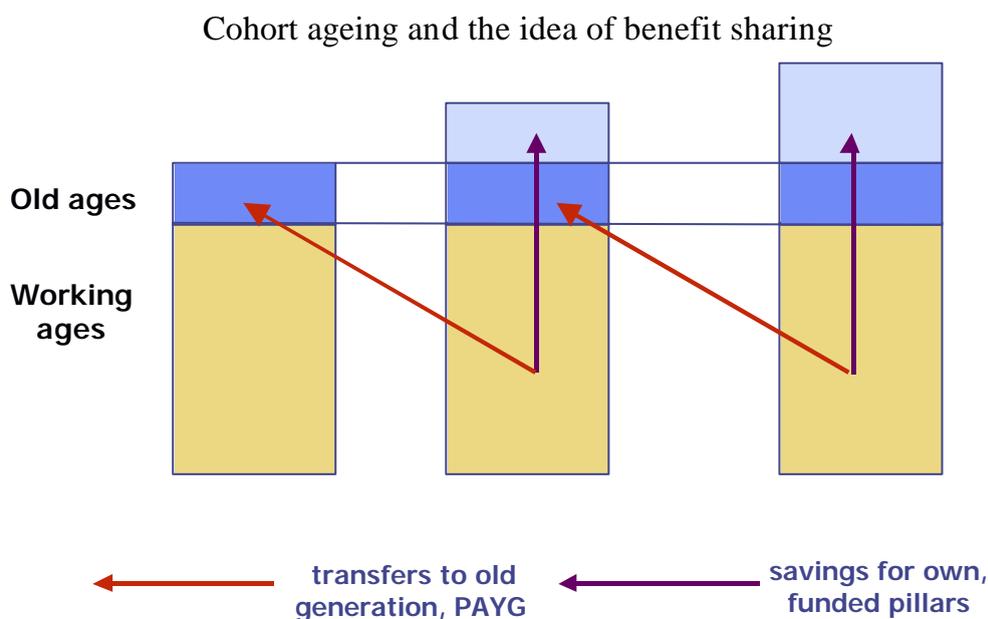
The table points out the difference between cohort and period ratios. Both the young-age and the old-age dependency are higher in the cohort view than in the actual population. In other words, there is a basic inequality between the cohort and period burden of support.

What can happen in the near future? If further low labour force participation is assumed, an accelerating ageing makes the period support burden grow, while higher life expectancies shift the cohort support burden. The former is estimated to reach 1.62 in 2020, the latter 1.87, compared to the values in 2001, which were 1.48 and 1.76, respectively.

Three main strategies can be outlined to decrease the difference between period and cohort support burden, and to achieve an overall decrease. A demographic strategy counterbalances the effect of the growing life span with fewer children and more migrants. A demographic-economic strategy increases labour force participation and redefines the old-age limit, promoting active ageing and raising the effective age for pension. An economic strategy can be based on progress in field of technology, productivity and human capital. It seems that for a sustainable development, a good combination of these strategies should be developed in Hungary.

One of the possible solutions for the financial problems of old-age programmes at a time of accelerating ageing is the idea of benefit sharing. Old-age support is based on a combination of guaranteed/contracted benefits for all generations in the form of intergenerational transfers and additional (mandatory and voluntary) individual savings. Note that we speak about multi-pillar systems in old-age programmes, but from demographic background.

Figure 4



Source: Author's illustration

## Ageing and sub-populations

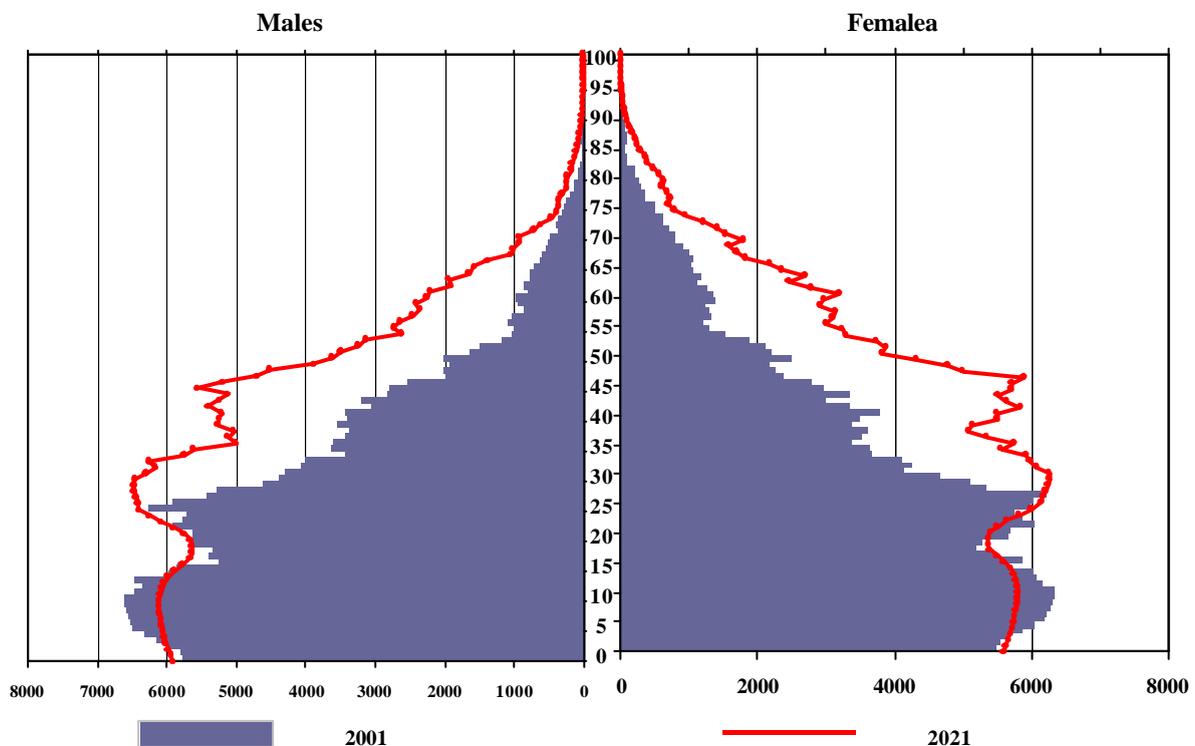
Population ageing influences not only age groups, but also sub-populations in general. Big differences among groups of society may exist in terms of the extent and tempo of ageing. In Hungary there are two special sub-populations slowing down ageing: the Roma and the immigrants.

### Roma population

A special challenge (and opportunity) is posed by Hungary's Roma (Gypsy) population. Currently this segment of Hungarian society is characterised by low employment rates, acute educational and training deficits, dramatic health problems and a serious problem of exclusion. Currently Romany employment rates are some 50 per cent lower than the national average, which could have significant consequences for overall labour supply in the future if they are not better integrated into the labour market.

Figure 4

Age-pyramid of the Roma population, 2001, 2021



Source: Projection database of HCSO DRI, 2003

The future of the Roma population is characterised by steady growth and gradual ageing. In contrast to the population as a whole, high birth rates among the Roma are predicted to cause their population to double by 2050, growing to 13 percent of all Hungarians and according to the estimations their share in the working-age population will rise from 5 to 16 percent by the middle of the century.

From the point of view of the demographic transition, the Roma sub-population is in the third stage of development. It means that the explosion period is over, and with slower growth, the ageing of the Roma population will develop quickly. Figure 4 shows the age pyramid of Roma population in 2001 and 2021.

### Immigrant population

To understand some of the historical roots of population movements crossing the borders of Hungary, we need to remember the fact that in countries surrounding it – in territories that had once belonged to Hungary – there is a sizeable population of ethnic Hungarians. The most populous ethnic community is in Romania (almost exclusively in Transylvania) whose number was registered by the census of 2002 at 1.4 million. There are 560,000 ethnic Hungarians living in Slovakia, nearly 300,000 in the Voivodina in the former Yugoslavia and 156,000 in the Sub-Carpathian region now in the Ukraine.

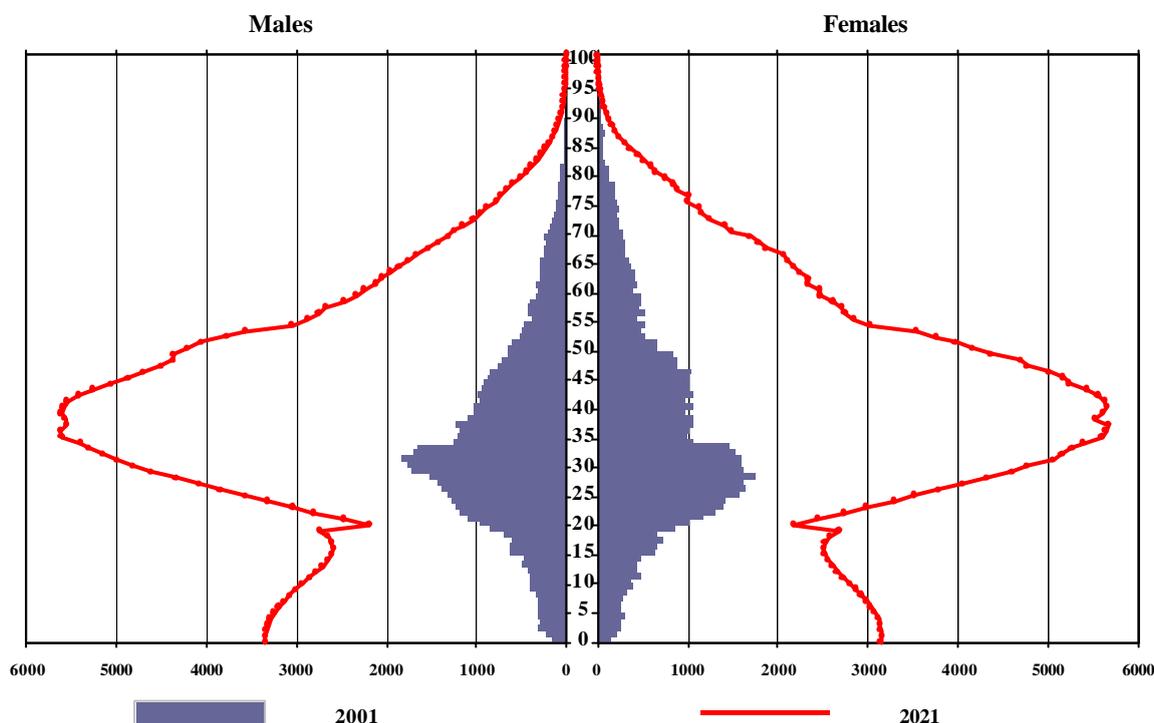
Due to the hardships brought on by her history in the 20<sup>th</sup> century, Hungary was characterised with negative net migration. This situation has changed at the end of the 1980s. During the last decade, about 200,000 more immigrants were received than the number of emigrants who left the country. In recent years, annual net foreign migration appeared to be around 18,000.

According to the 2001 population census, 110,000 foreigners reside in Hungary with long-term residence permits or an immigrant status. One can prepare population scenarios starting with this subgroup and calculate its future size and age distribution. It is called the immigrant population.

The size of immigrant population would increase from the recent 110,000 to 521,000 by 2021. It is not impossible considering the net migration of 200,000 during the last decade. Each segment of the sub-population will grow. The number of young will be 7 times higher than at present, the number of those in working ages and the elderly 4 and 6 times, respectively. The whole population will be very young (Figure 5).

Figure 5

Age pyramid of immigrant population 2001, 2021



Source: Projection database of HCSO DRI, 2003

### *Educational change and ageing*

At the end of the 1980s Hungary was characterised with a relatively low average level of education compared to other developed countries. One could estimate that at this time, about 40 percent of males and 25 percent of females completed apprentice school, 20-25 percent of males and 30-35 percent of females completed secondary education and an additional 10-15 percent graduated with a higher education diploma. The whole education structure was more characteristic of an industrial society than of a post-industrial one.

The changes that took place in Hungary during the transformation of the political system have greatly affected the education system and the need for higher education. In the academic year 2000/2001, the number of students in secondary education was 510,000, the number of those in higher education was 349,000. The figures for 1990/1991 were 360,000 and 102,000 respectively.

The education boom is a very positive phenomenon, which quickly transforms the educational structure of the Hungarian population. According to the projections by

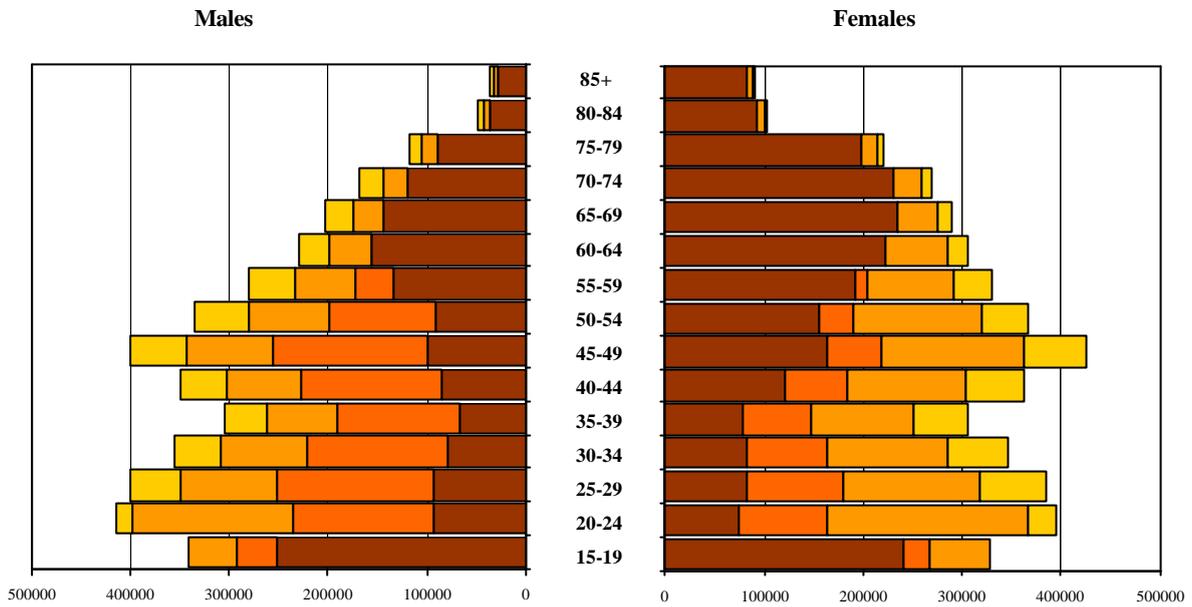
level of education, the number of secondary and higher-educated people will grow very significantly, while the number of people with primary education or less will decline. Fundamental changes will take place in the educational level distribution of older people too. Currently a big majority of the older population is low educated, in 2021 more than half of them will have a secondary school certificate of education. Figure 6 shows the recent age pyramid by level of education in 2001 and that estimated for 2021.

The educational change is of great importance concerning almost all areas of ageing. Higher educated people have increased chances for longevity. In Hungary, the difference between the life expectancies of 30-year-old males with higher and primary education is more than 10 years, for females, the difference is 2 years. It is not evident that an increase in the share of better-educated people will result in an automatic decrease in fertility, because a significant part of intellectuals has 3 or more children. The schooling boom shifts the age limit of the young population, postpones family formation and childbearing.

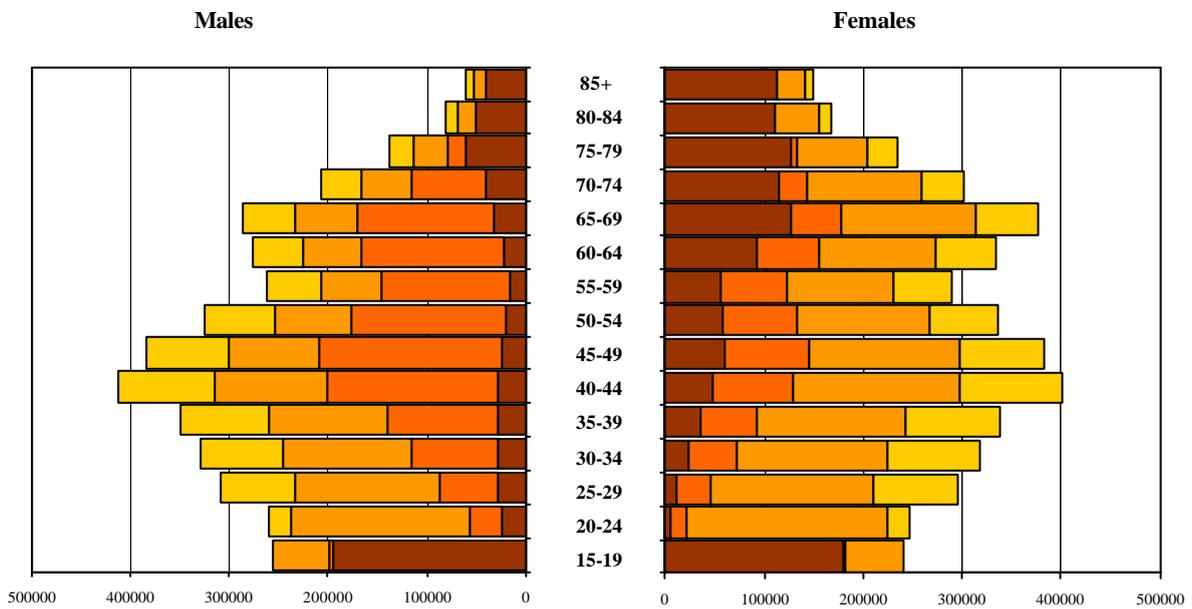
Educational change indicates higher participation rates. People with higher education are better able to cope with challenges on the labour market and have an easier time finding paid work than lower educated people. The whole issue deserves great attention in Hungary and in Central Europe general.

Figure 6

Age pyramid by level of education, 2001



Age pyramid by level of education, 2021



primary or less
  skilled
  second level
  third level

Source: Projection database of HCSO DRI, 2003

## *The Hungarian pension reform*

In Hungary, the pension problem started to become critical in the mid-1990s. The government faced the problem of a pension system that was becoming increasingly financially unsustainable. This was due to several developments:

- Population ageing reached an advanced stage; the share of 60+ exceeded 20 per cent
- Pension rights rocketed due to the full employment situation during the former regime
- The economic crisis and loss of millions of jobs boosted early retirement and the take-up of disability benefits
- A dramatic fall in labour force participation resulted in a large downturn in contributions
- The social support provided by the pension system began to exceed the limits of what was possible

In 1997, after heated discussions, five laws were passed in Hungary with a view to reforming the pension system. The main elements were:

- Keeping the PAYG system with defined benefits as a first pillar, with the intention of introducing individual accounts in the future
- Gradually increasing and harmonising the retirement age for males and females to 62 years
- Introducing a second mandatory pillar for new entrants into the labour market and providing at least 25 percent of defined benefits in the first pillar
- Introducing a voluntary third pillar
- Supporting the second and the third pillars through tax reductions
- Introducing an old-age social benefit for those who have accrued no rights to a pension or who do not receive a minimum pension.

Based on the experiences of the past six years, one can say that the Hungarian pension reforms have been successfully introduced. Private pension funds have been developed and a growing share of investments comes from these funds. Strong state control over the funds has been implemented. The rates of return have decreased over the past two years, but may have remained significant. One could summarise the effect of the first six years of Hungary's pension reforms by saying that "whilst they have not performed wonders, their achievements have not been bad".

Pension reform is a very important issue in the process of adjusting to the challenges of ageing. Unfortunately, there are several fields of the same importance concerning ageing: healthcare, long-term care, active ageing, labour force participation, formation of knowledge-based society, etc. The final conclusion of this paper is that ageing is a complex process, which is an integral part of population development on the one hand and involves severe adjustment problems on the other hand.

The fate of the millions of older people is a fundamental question in our societies. In my opinion, the Hungarian situation needs manifold influence of the processes, implementation of a great variety of means, and their integration into the population policy. For managing population ageing, all fields of science must add their own, well-elaborated solutions.

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