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## SOME CONSEQUENCES OF CHANGES IN FEMALES' PROCREATIVE BEHAVIOUR

**ABSTRACT.** Changes in females' procreative behaviour may produce different socio-economic consequences. The article examines possible changes in the structure of Poland's population that might take place if given fertility level and a specific fertility model maintained in a longer time. The main result of women's decisions to have a child (usually one) at older age is medical problems, as female fertility is declining with their ageing, the probability of offspring's genetic defects is increasing, the multiple pregnancy risk is higher and sometimes the pregnancy itself is riskier. All this lessens the procreative potential and inflates medical costs involved in the pregnancy period, childbirth and the following care of a child.

**KEY WORDS:** Fertility, procreative behaviour, population, demography.

The fertility decline below a level ensuring a simple reproduction of generations that has been observed in Poland and other European countries gives rise to questions about the causes and consequences of variations in females' procreative behaviour. The article attempts to describe more in detail the impacts of persisting low fertility on the age structure of population, as well as the possible socio-economic effects of variations in procreation.

In the recent years TFR (Total Fertility Rate) has declined in Poland to become one of the lowest rates worldwide (1.222 in 2003). In 2003, the rate was over 40% below the level necessary for the generation of parents to be replaced by an equally sizeable generation of children [RRL, 2004: 8]. In addition to declining fertility, the procreative behaviour of Polish women shows a different fertility model. In the 1980s, and even still in the 1990s, the highest

fertility characterized women aged 20-24 years, in 2003 the age group 25-29 years came ahead. In towns, women aged 30-34 years were almost as fertile as the 20-24 year olds. In 2003, the average mother's age was 27.3 years and women's age at first birth was 24.8 years [RRL, 2004: 15]. Half of Polish females who delivered their first child then were at least 24 years old, every fourth was 27 years old, and one in ten was aged 30 years and older. Three percent of the first-time mothers were over 40 years old. In towns, the rates were higher than in rural areas [GUS, 2004].

Such changes are a common European phenomenon. In Western Europe, fertility declined deeply as early as the 1980s. By pursuing active family-oriented policies, etc., some western European countries have managed to stabilize fertility, or even to increase it. However, nowhere in Europe the fertility level is high enough today to ensure that the present numbers of populations will continue in the long term (Ireland has the highest TFR – its 2002 value was 2.0). Besides, the fertility model is changing across Europe, because people postpone their procreative decisions.

### THE INFLUENCE OF FERTILITY CHANGES ON POPULATION'S AGE STRUCTURE

Changes in females' procreative behaviour and the accompanying variations in population's age structure may produce different socio-economic consequences. This section of the article examines possible changes in the structure of Poland's population that might take place if given fertility level and a specific fertility model maintained in a longer time. The point of departure for the analysis is population's structure by age and sex at the time of the National Census of Population 2002 (NCP) and age-specific constant level of mortality – the probability of men and women's deaths as of 2004 [GUS, 2005b: 45-48]. To compare the impacts of a specific prolonged fertility level, several variants characterizing selected European countries between 2000 and 2005 and identified by the UN fertility model estimates were chosen (see Fig. 1):

- variant A – low fertility – TFR 1.26, a fertility model similar to that observed in Poland today;
- variant B – TFR – 1.47, a fertility model similar to that observed in Portugal today;
- variant C – TFR – 1.64, a fertility model similar to that observed in Sweden today;
- variant D – TFR – 1.79, a fertility model similar to that observed in Norway today;
- variant E – TFR – 1.87, a fertility model similar to that observed in France today;

– variant F – TFR – 1.94, a fertility model similar to that observed in Ireland today.

Estimates of changes in the age structure are set against Poland's situation in 2002, Poland's population forecast for the years 2003-2030 developed by the GUS (Central Statistical Office) [2005a] (1) and two variants of a UN forecast [2005] – medium and constant mortality levels.

Variants A, F and B-E differ because of the level of TFR and the fertility model. Variant A includes a fertility model found in the Central and Eastern European countries, where the highest fertility belongs to the age group 25-29 years, followed by two other groups: 20-24 and 30-34 years. Variants B-E indicate a relatively high fertility among women aged 25-29 and 30-34 years. In variant F, the intensity of births is the strongest in the age group 30-34 years and strong in the age group 25-29 years. None of the variants ensures simple reproduction of generations in the long term.

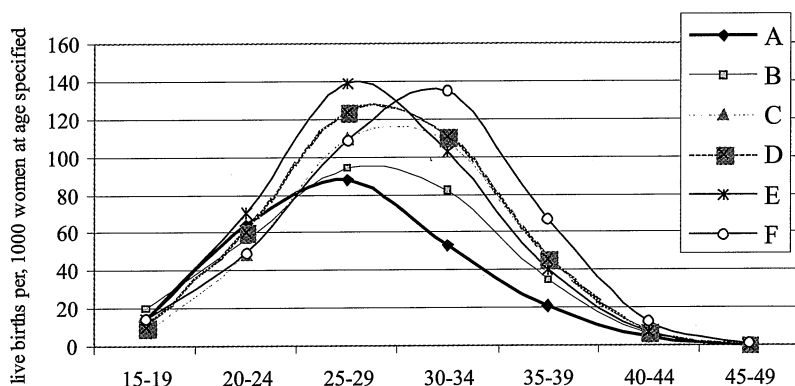


Fig. 1. Distribution of fertility rates by variant  
Source: developed by the author

According to assumptions taken in the most recent GUS forecast [2004, 2005a], Poland's population is expected to decrease to 35.7 million persons in 2030, i.e. by 2.5 million compared with the present 38.2 millions (NSP 2002). The medium variant of the UN forecast [2005] indicates that the decrease would not be that large (owing to the assumed more favourable course of changes in the procreative behaviour) and in 2030 Poland would have a population of 36.7 million people. For unchanged mortality and constant fertility level, the decrease would range from 5 to 7.7 million people, depending on the fertility variant. In other words, favourable changes in mortality may considerably decelerate the decline in Poland's population (Fig. 2).

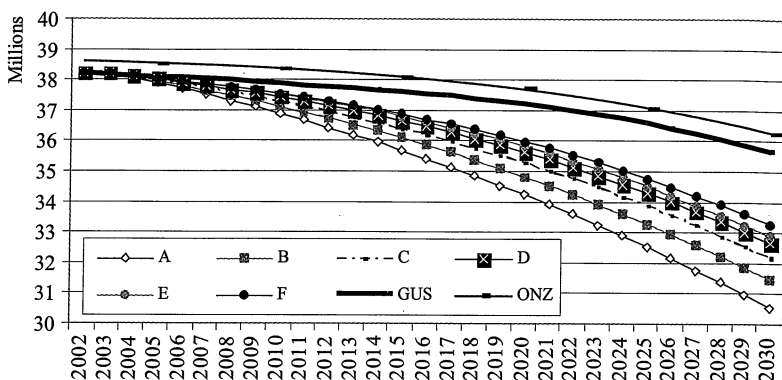


Fig. 2. Poland's population to the year 2030 in variants A-F, GUS forecast and UN forecast (medium variant)

Source: developed by the author

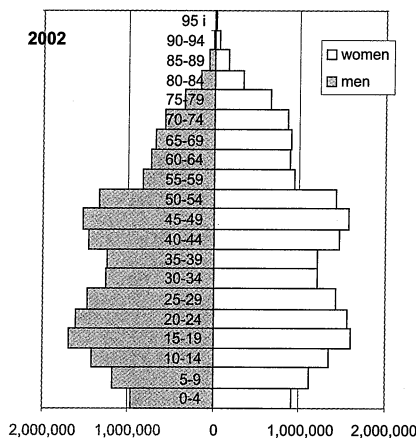
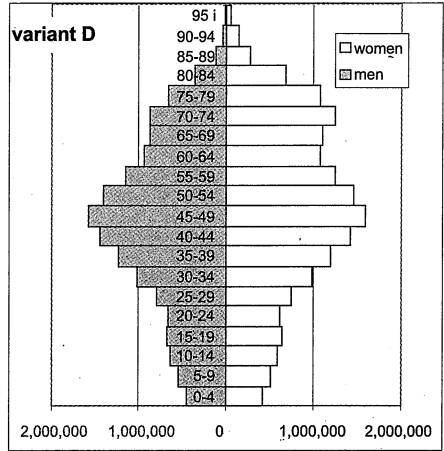
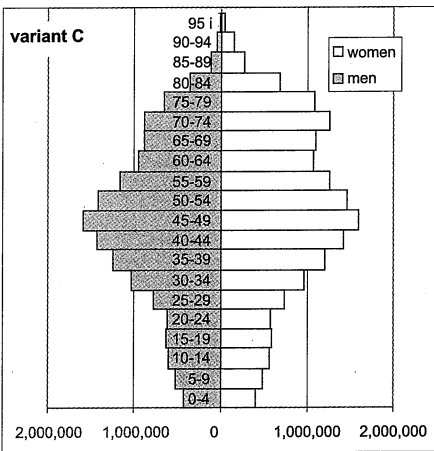
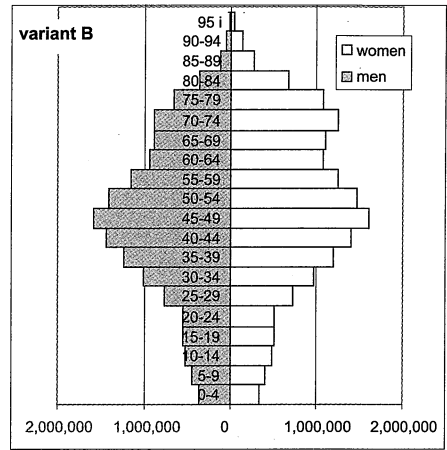
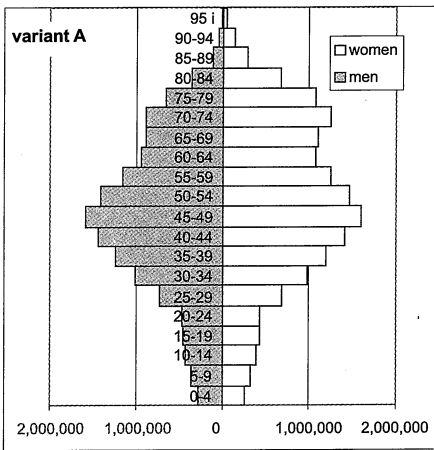


Fig. 3. Structure of Poland's population by sex and age according to NCP 2002

Source: developed by the author based on GUS data

If a given fertility level persisted, then it would affect not only the number of Poland's population, but also its age structure (see Fig. 3 and 4). Within less than 30 years, a modification of the present structure of population caused exclusively by different females' procreative behaviour would directly influence only persons aged 0-30 years, but indirectly it would impact the shares of all age categories. Persisting low fertility would make the age group 0-19 years shrink from today's over 10 million people to 3-5 millions (variants A-F). The GUS forecast predicts the group to number 6 million people. A similar result is produced by the constant mortality variant of the UN forecast. The most favourable estimates – i.e. the UN forecast – suggest that the group would decre-

ase to 6.6 million people. In the case of variants A-F, variations in the absolute number of the age group 20-64 years would involve only the youngest persons, hence the whole group does not show considerable differences: it ranges from 20.1 million in variant A to 20.7 million in F. Consequently, the group would be smaller by 2.5-3 million people. Because advantageous mortality changes would absorb the effects of different procreative behaviour – even under expanding migration – the group would shrink to 21.2 millions according to GUS forecast, or to 22 millions in the UN forecast. In the same period, the number of persons aged 65 years and older would grow from today's 4.9 million to 8.6 million in the GUS forecast, with a 0.9 million increase being attributed to the expected mortality changes (with the present mortality rates the group would amount to 7.5 million people, and according to UN's constant mortality variant to 7.9 millions) (Fig. 5).



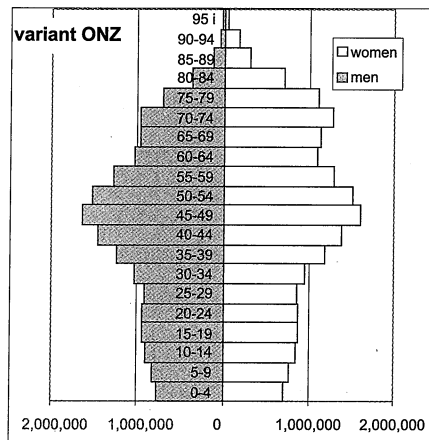
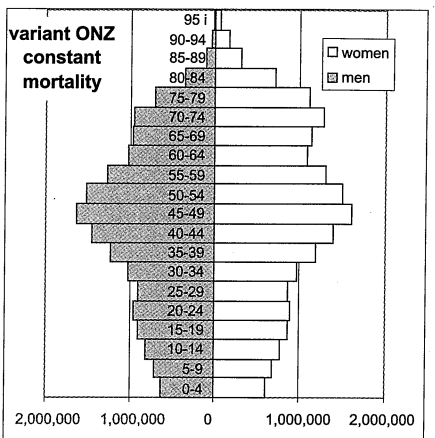
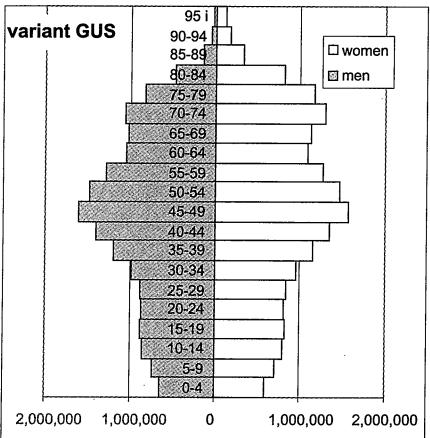
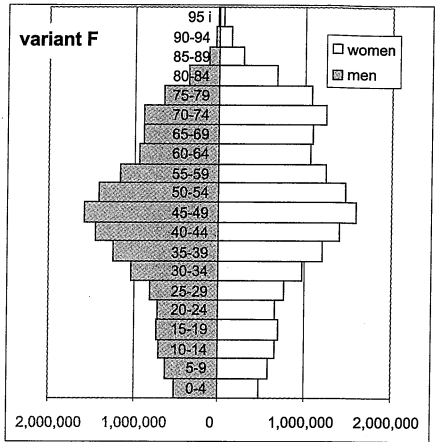
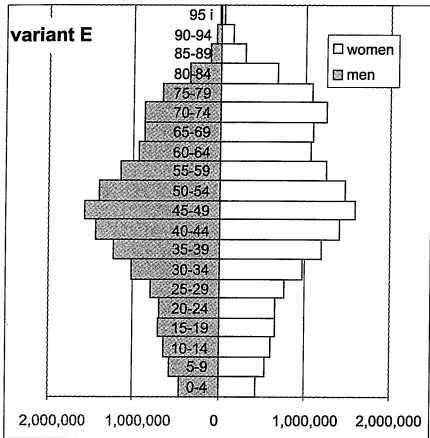


Fig. 4. Structure of Poland's population by sex and age in 2030 in variants A-F, GUS and UN forecasts (medium variant and constant mortality variant)

Source: developed by the author based on GUS 2005; UN 2005

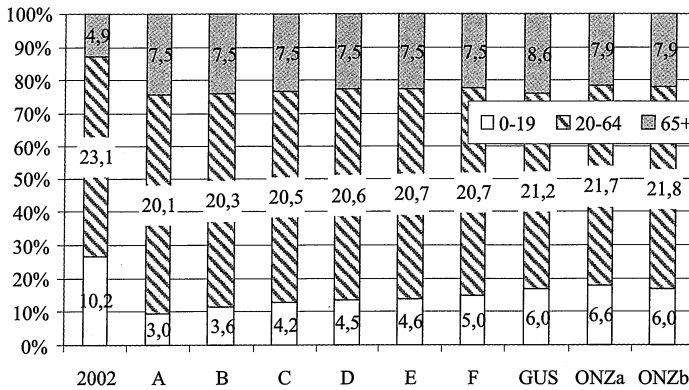


Fig. 5. Age structure of population by NCP 2002 data and in 2030 – variants A-F, GUS forecast and UN (forecast a – medium variant, b – constant mortality variant)

Source: developed by the author based on GUS 2005; UN 2005

Smaller age groups 0-19 and 20-64 years would affect the overall age structure of population. The proportion of persons aged 0-19 years would decline from today's 26.7% to 10-15% (variants A-F). GUS and UN forecasts predict the share to be 17-18%. GUS estimates suggest that persons aged 20-64 years will make up 59.2% of Poland's population (59.9% in the UN forecast). Assuming no mortality changes, persisting low fertility would increase the age group's share to 62.3-65.7% (variants F-A). Noteworthy, over half of the group members would be older than 45 years of age (now 40.1%). In the same time, the proportion of persons aged 65 years and over may almost double (in variant A they make up 24% and 21.8% in the GUS forecast). Therefore, ageing would affect not only the overall structure of Poland's population, but also its individual components.

Variations in the number and structure of population can impact the labour market, the market of goods and services, etc., as well as the efficiency of the pension and social insurance systems. A special source of social fears is the labour market and the stability of the pension system.

Labour force understood as the number of the working-age population is expected to decrease after the year 2015, regardless of the course of procreation. According to the GUS forecast, the working-age population is going to lose around 3 million people by the year 2030. The actual supply of labour, however, does not result exclusively from the available number of the working-age persons – it is verified by their occupational activity. The growing educational aspirations forced by the labour market demands can be expected to lessen the occupational activity of young persons, whereas the new pension system – discussed in the next sections – will probably spur the economic activity of

older persons. Considering that the economically active population in Poland totals almost 17 million people (including 3 million of the unemployed) it is likely that the demand for labour can be satisfied by Poland's own resources. The aforementioned age structure variations may therefore improve the labour market, provided that its condition is not determined by a structural mismatch (2) and individual age groups do not adjust their occupational activity (mainly older persons). It should be noted, however, that over the next twenty or thirty years the share of persons of immobility age in the working age population will increase. Such persons have more problems with complying with new requirements and fewer of them are willing to take retraining, which may affect the future labour market.

Changes in the age structure are also predicted to increase the economic burden carried by the economically active. GUS estimates indicate over 405 persons aged 65 years and older per a 1,000 of population aged 20-64 years, i.e. almost twice as many as today (210 in 2002.). For unimproved mortality rates and a constant TFR, the number would be around 370. The total burden of groups aged 0-19 years and 65 years and older imposed on 20-64 year olds would become heavier, but only because of the growing number of persons who turned 65. In 1999, Poland reformed her pension system, but the transition from funds redistribution to a capital-based system using actuarial calculations (3) takes time and the "old" system will continue to pay out pensions for the next several tens of years. As a result, fears are building up, whether the shrinking group of working persons will be able to handle the burden. The unfavourable ratio of the working-age population to the retirement age population (from the pension system standpoint) will very probably be alleviated by raising the retirement age limit. Because the new pension system relates the amounts due to years worked and the value of contributed fees, a voluntary extension of the economic activity period can be expected. A case in point is countries that applied such a system of incentives encouraging workers to stay in the labour force, also beyond the regular retirement age (4) (i.e. Spain, Finland, Greece) [Szukalski, 1999: 71]. The described modifications are important, because just like improved availability of the pension system measures reduced the economic activity of older persons [Szukalski, 1998, 1999], the pension system reform may, although it does not have to, influence the intensity and length of economic activity.

The labour market is not the only area impacted by the changing age structure. Different sizes and proportions of individual population groups may affect the functioning of the goods and services market. Education (kindergartens and elementary schools, lower and higher secondary schools) will be the first to suffer from the declining number of children. As a result, successive schools will close, or the numbers of schoolchildren in the classes will be reduced. At the same time, the process of ageing will trigger a growing de-



mand for medical services (e.g. doctor's care and nursing services, rehabilitation, physiotherapy, pharmaceuticals), but also for popular entertainment and recreation, or broadly understood recreation (language courses, workshops, physical activity classes, fine arts and plastic arts courses). Considering the expanding number of older persons who consume goods and services, the market will have to adjust itself to what the group of people needs and to comply with its specificity.

One social challenge will be taking care of the larger and larger group of the oldest persons. The number of persons older than 80 years of age is predicted to increase from 828,000 to around 2.1 million (400,000 are attributed to lower mortality) and those older than 95 years may grow almost eightfold – from 17,300 to 136,900 (if mortality does not change, the growth will be 38,400). Because of the group's relatively low fertility, many seniors will supposedly have no close relatives to take care of them.

### SOME CONSEQUENCES OF LATE CHILDBEARING AGE

In Poland, late childbearing has been rare so far, particularly regarding first births. In 2003, mothers aged 35 years and older accounted for only 2% of first births (31,500), and for all births the rate was 8.9%. One thousand women aged 35-39 years gave birth to 21 children and in the age group 40-44 years only 5. Yet, the age at birth is postponed more and more often.

Why is late maternity stirring social fears? The main reason is the general knowledge of the relationship between mother's age and the probability of newborn's genetic defects, a riskier course of pregnancy, or lower fertility in medical terms.

Statistics provide evidence of a correlation between mother's age and newborn's weight. Analyzing the share of newborns with low body weight (below 2,500 g) by mother's age, we find that it is the lowest for mothers aged 25-29 years (less than 20% – see Table 1) and increases with their age. Interestingly, the rate is higher for mothers aged 20-24 years than for those aged 30-34 years, and among mothers younger than 19 years, it is higher than in the age group 35-39 years. Similar relationships can be found when the low body weight limit is set at 2,000 g. It is therefore a natural question to ask, whether the age 20-24 years is the most proper age for having children from a medical standpoint. Even though statistical data seems to challenge the opinion it has to be borne in mind that older women are probably more aware of their pregnancy-related needs and have a better medical care, which altogether may translate into lower proportions of underweight newborns than among mothers aged 20-24 years.

Table 1. Shares of low birth weight children (%) by mother's age

MOTHER'S AGE / BIRTH WEIGHT	BELOW 2500 G		BELOW 2000 G	
	2002	2003	2002	2003
19 years and younger	27.9	27.5	8.1	7.9
20-24	22.1	22.2	5.8	5.9
25-29	19.5	19.6	5.3	5.3
30-34	20.5	20.3	6.5	6.2
35-39	24.1	24.6	9.2	9.3
40-44	29.0	30.5	12.6	13.1
45-49	32.2	34.6	13.1	17.3

*Source:* developed by the author based on Rocznik Demograficzny 2003 and 2004

The literature of the subject indicates that the older mother's age at birth, the higher risk of a multiple pregnancy. An analysis of birth statistics gathered for years 2002 and 2003 confirms this statement (lower rates of twin births for mothers aged 40-44 years may result from the generally low number of births in the age group, which prevents the formulation of statistical regularities (Tab. 2).

Table 2. Percentages of twin births among all births (%)

MOTHER'S AGE	2002	2003
19 years and younger	2.74	2.03
20-24	3.11	3.18
25-29	4.32	4.23
30-34	5.82	5.35
35-39	5.83	5.77
40-44	3.33	4.73

*Source:* developed by the author based on Rocznik Demograficzny 2003 and 2004

The growing probability of a multiple pregnancy at older age is quite important, as it exposes both the child and mother to a higher risk of health problems, during gestation and afterwards. Newborns from multiple pregnancies are more frequent to be delivered prematurely and underweight. The proportion of still-born infants is also higher for such pregnancies (see Tab. 3).

Older women run a higher risk of hypertension, obesity or circulatory system diseases. Besides, late pregnancies make it more probable that the child will have some chromosomal defects, such as Down syndrome (Tab. 4) [Kurczuk-Powolny, 2004].

Table 3. Shares of low birth weight children and shares of stillborns in single and multiple births

BIRTH	2002			2003		
	BELOW 2500 g	BELOW 2000 g	STILLBORN	BELOW 2500 g	BELOW 2000 g	STILLBORN
single	5.3	2.0	0.5	5.25	2.0	0.5
twin	51.9	21.3	1.4	52.5	21.3	1.5
triple and more	95.0	65.6	2.4	93.4	67.8	2.4

Source: developed by the author based on Rocznik Demograficzny 2003 and 2004

Table 4. Mother's age at childbirth and the risk of child's chromosomal defects

AGE	RISK
20	1: 1340
25	1: 1185
30	1: 800
35	1: 335
40	1: 100

Source: Kurczuk-Powolny, 2004

Postponed maternity may add to lower fertility and increase costs involved in the medical care of pregnant women and their children, but it may also bring about a stronger concern for child's health and development and ensure a better care. The most recent research provides evidence that late childbearing can be advantageous for mother's health, as it reduces the risk of ovarian carcinoma (5) [medNEWS, 2005].

## FINAL REMARKS

Changes in the female procreative behaviour found in all European countries can produce a variety of consequences. The declining fertility will certainly modify the age structure of population. The secondary effect of the changes will be the ageing of societies, resulting in a heavier burden of the retirement age population imposed on the labour force members, changes in the labour market and destabilized pension systems. The demographic processes can also be expected to remodel the market of goods and services that will switch its focus from the shrinking group of children to the needs of older persons. The main result of women's decisions to have a child (usually one) at older age is medical problems, as female fertility is declining with their ageing, the probability of offspring's genetic defects is increasing, the multiple pregnancy risk is higher and sometimes the pregnancy itself is riskier. All this lessens the procre-

ative potential and inflates medical costs involved in the pregnancy period, child-birth and the following care of a child. From the social standpoint though late maternity can boost the expenditures that the parents are ready to incur to raise and educate their child.

Discussing the socio-demographic consequences of variations in females' procreative behaviour, we mainly concentrate on their negative dimension, but the variations have their positive aspects as well. Should, however, the public focus its attention on the downside of the observed process, then we can expect that both citizens and authorities will adjust their attitude to procreation.

## NOTES

- (1) The forecast assumes a further fertility decline to around 1.1 child per woman in 2010 and its small increase to ca 1.2 in the years 2010-2020, falling mortality and stronger international migration [GUS, 2004: 8-12].
- (2) Structural unemployment arises from a gap between the structure of labor supply and demand in terms of qualifications, occupations and regions. Other reasons for its existence are unequal economic growth, shortage of capital, asymmetrically distributed production resources in an economy, technological progress, international division of labor, etc. [*Słownik ekonomiczno-prawny*, 2005].
- (3) In the system, the amount of a pension due is related to the value of accumulated fees and the pension-drawing period; in other words, the system takes into consideration the level of wages, the period of earning income and the age at retirement.
- (4) A regular retirement age is one, when an individual becomes fully entitled to a pension (otherwise, a statutory retirement age [Urbaniak, 1998: 92]
- (5) In the "Lancet" magazine, a group of researchers from the Swedish Karolinska Institutet presented findings of their research aimed to identify the relationship between a woman's age at conception and the risk of ovarian carcinoma. The results confirmed earlier hypotheses that the more children a woman has, the lower risk of ovarian carcinoma. But when a woman plans to have one child only, then it is healthier for her to have it late. It was found that every five years of postponed first pregnancy decreases the risk of ovarian carcinoma by 10% [medNEWS, 2005].

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