

Secular Changes in Education, Urban-rural Living, Menarche and Abortion Rates in Perinatal Population

Hrvojka Soljačić Vraneš¹, Zdenko Kraljević¹, Zoran Vraneš², Vesna Gall¹, Ante Vuković¹, Krunoslav Kuna¹ and Igor Filipčić³

¹ University of Zagreb, »Sestre milosrdnice« University Hospital Center, Department of Gynecology and Obstetrics, Zagreb, Croatia

² Croatian Institute for Health Insurance, Zagreb, Croatia

³ University of Zagreb, University Hospital Centre Zagreb, Department of Psychiatry, Zagreb, Croatia

ABSTRACT

Over a 25-year period we examined the anthropological characteristics of mothers and their partners, such as the place of living: urban vs. rural, the degree of education, parity, the time of menarche, and the frequency of intentional abortions. We examined 2 414 mothers and their partners in four periods of time extending from 1985 to 2009 in order to establish changes in the said anthropological characteristics over a period of 25 years. The degree of education of mothers and their partners is on the rise. In the period from 1985 to 1994, the percentage of mothers from the country was on the rise. Women with less education have on average more children, and those with better education the least children. Women from rural areas have on average more children than women from urban areas. The time of menarche dropped by 9 months over the period of 25 years. Girls from urban areas have their first menstrual cycle earlier. Women with higher professional qualifications had their first period earlier. The number of intentional abortions over the 25-year period dropped.

Key words: secular changes, education, urban vs. rural living, menarche, abortion rate

Introduction

Growing industrial development and standards, and new dietary (nutritional) habits, sports and computerisation resulted in certain documented changes in the human physique, such as positive growth changes in height and weight.

Unfortunately, as certain advantages (such as the improvement of dietary, residential and health-related conditions) are still not equally present throughout the world, a higher growth in height was observed in developed countries^{1–3}. Maybe not as pronounced, but still significant differences can also be observed in view of different socioeconomic circumstances. Better quality nutrition in families with higher income may lead to better physical development.

Development of sexual and reproductive maturity, that is, puberty, is affected by some secular changes, as well. The onset of puberty is affected by genetics, but also certain psychological factors and living conditions (the climate, diet, health).

In parallel with the growth of man in height and mass, changes were also detected in the onset of menarche (a girl's first menstrual cycle), and it seems that in developed countries the menarche, and the resulting sexual maturity set in earlier⁴. Differences in terms of race were also observed, and in America it was established that in a 30-year period (from 1960 to 1990) the average age when white girls have their first period dropped by around 3 months, where in black girls it dropped by around 5.5 months⁵.

Certain changes in anthropological characteristics are to be expected as the result of growing standards, observable in Croatia all the time, especially in the period after the war (this study includes a group from the war years, 1992–1994), just like in the developed world. It had to be established whether the changes, if any, relate only to height, weight, BMI, weight gain during pregnancy, lifestyle (marital status, education, place of living).

Over a 25-year period, the anthropological characteristics of new mothers and their partners were examined, such as the place of living, degree of education, parity, time

of menarche, and the frequency of intentional abortions in the population. The education of fathers was examined, and the age difference between mothers and fathers. The anthropological characteristics were examined with the aim of comparing the characteristics in practically two generations, and to establish whether there are statistically significant differences in particular anthropological characteristics over the reporting period. Interaction between certain factors was also examined with a view to establishing reasons for a higher incidence of certain factors in particular groups. Statistical methods were used to establish whether there is a significance of certain changes over time, that is, in the interaction of individual factors.

Materials and Methods

This study included 2 414 mothers and their partners. The women included in the study had given birth in the »Sestre Milosrdnice« University Hospital Centre in the past 25 years.

The pregnant women were distributed into four groups in view of the study periods: the period including 550 women who gave birth in the period from 1985 to 1986, the period from 1992 to 1994, which included 564 women, the period with 570 mothers from 2000 to 2002, and 730 women in the period from 2007 to 2009. The study was randomised, that is, the data were collected by randomly collecting the medical histories of healthy mothers with single pregnancies. The mothers were classified according to the place of living, that is, urban *vs.* rural settings. In view of their education, the mothers and their partners were divided into three groups, that is, those with post-secondary school and university qualifications, secondary school qualifications and low professional qualifications. Depending on the number of their previous successful pregnancies, their parity was also established. They were asked about the onset of their first period, and the number of artificial abortions, if any.

Statistical methods – a description of the statistical processing of the results

In terms of the statistical processing of the results, to test the significance of differences between several groups of results, a nonparametric chi-square test was used when the results were expressed in frequencies. In the case of testing the significance of differences between the arithmetic means of several groups of results, we used the parametric test of one-way or two-way analysis of variance. After the analysis of variance, we made further post hoc tests, such as Tukey’s HSD and Scheffe’s tests to establish between which groups of results there is a significant difference.

Results

The percentage of mothers having secondary school qualifications did not change during the periods in ques-

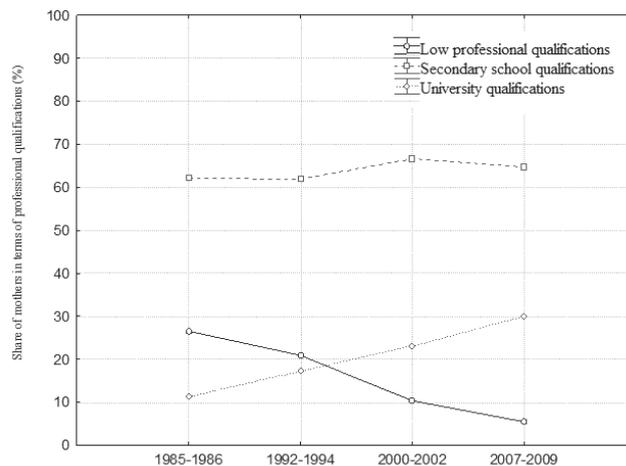


Fig.1. Education of mothers in terms of the periods of research.

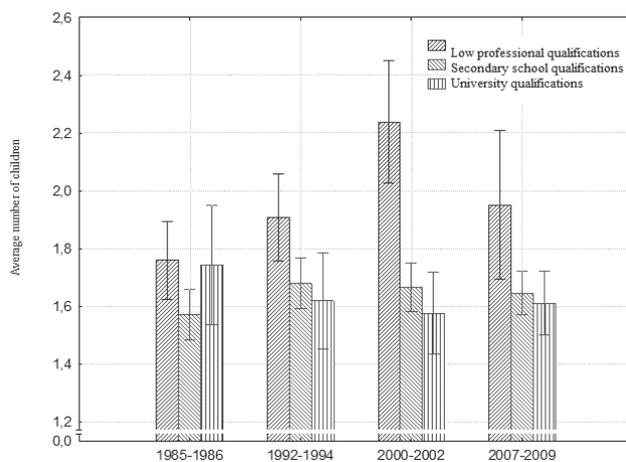


Fig. 2. Average number of children in terms of the professional qualifications of their mothers and in terms of the period of research.

tion, but there was a significant drop in the percentage of mothers with low professional qualifications, and a rise in the percentage of mothers having university qualifications (Figure1).

The percentage of mothers from rural areas rose significantly in the period from 1985–1986 to 1992–1994, and afterwards it did not change.

Although the chi-square is significant, additional analyses showed that the percentage of first-time, second-time and third-time mothers and those having had multiple births does not differ significantly in terms of the different periods of research.

Women with lower professional qualifications on average have more children, and that is most pronounced for the period 2000–2002 (Figure 2).

Women with higher professional qualifications have fewer children. In the group of women with post-secondary

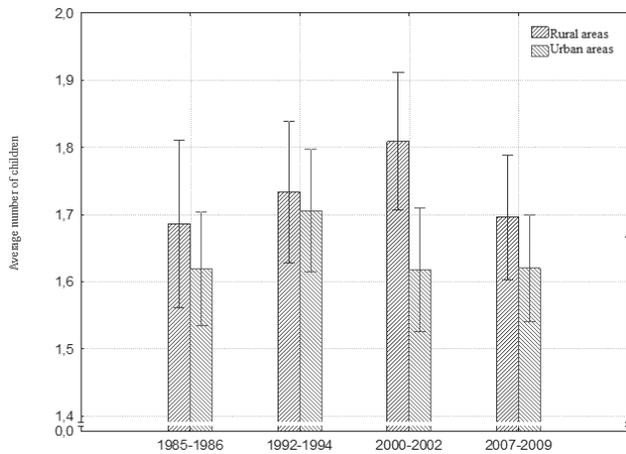


Fig. 3. Average number of children in terms of the place of living of the mother and in terms of the period of research.

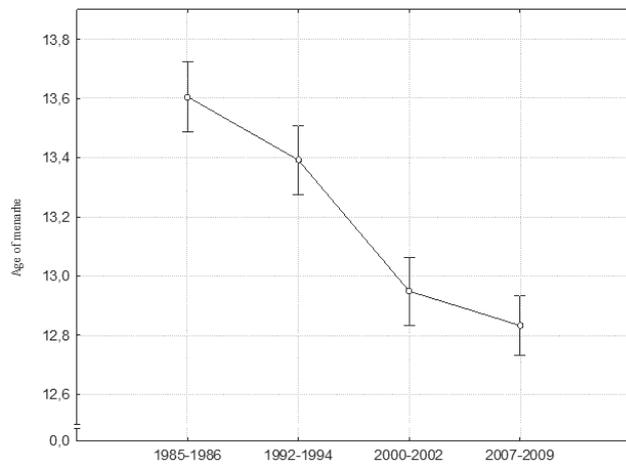


Fig. 4. Age of menarche in terms of different periods.

school and university qualifications the share of first-time mothers is 51%, second-time mothers 39%, and those giving birth for a third time or more 10%. The share of women having secondary school qualifications birthing for the first time is 50%, the second time 39%, and the third time 11%. In terms of women with low professional qualifications, the share of first-time mothers is 44%, second-time mothers 44%, and third-time mothers and those having had multiple pregnancies 21%.

Women who live in the country have on average significantly more children (Figure 3).

The age of the first menstrual cycle differs significantly in terms of the periods examined, that is, the age of menarche dropped by 9 months in the period 2007–2009 in comparison to the period 1985–1986 (Figure 4).

There is a significant difference in the time of menarche in view of the place of living and in view of the period of research, so that on average women who live in

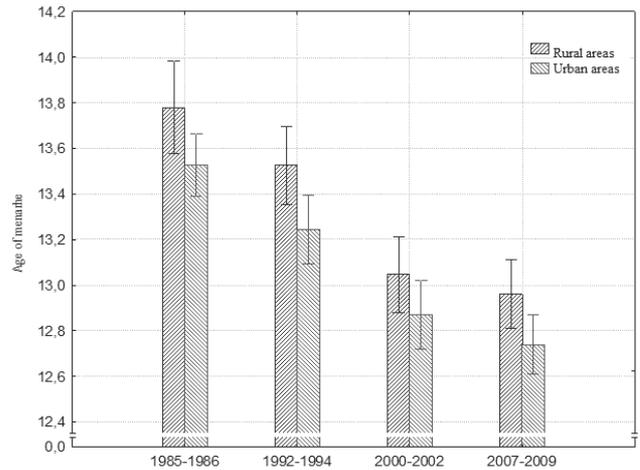


Fig. 5. Time of menarche in terms of the place of living of the mother and in terms of the period of research.

urban areas get their first period 2 to 3 months earlier, and women who gave birth in the period from 2007–2009 got their first period 9 to 10 months earlier than women who gave birth in the period from 1985 to 1986 (Figure 5).

Women with higher professional qualifications who gave birth in a later period got their first period significantly earlier (Figure 6).

The number of artificial abortions dropped significantly. The number of artificial abortions does not differ significantly between the periods 1985–1986 and 1992–1994, but it dropped significantly in the later periods (Figure 7).

The percentage of fathers with secondary school qualifications did not change over the periods concerned, but there was a significant drop in the percentage of fathers with low professional qualifications, and an increase in fathers with university qualifications.

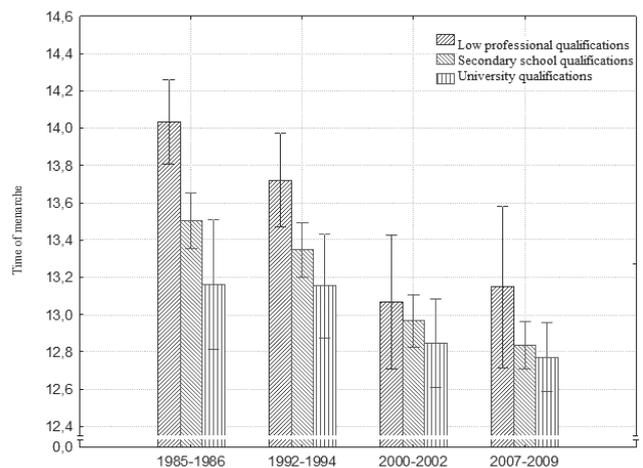


Fig. 6. Time of menarche in terms of the degree of education of the mother and in terms of the period of research.

Discussion

Over the past decades, greater height and weight of women in Croatia were noted³.

In terms of education, an excellent trend amongst Croatian women was recorded in his study, leading to a statistically significant rise in the percentage of women with post-secondary school and university qualifications, and a drop in the percentage of those with low professional qualifications during the periods examined. The percentage of mothers having secondary school qualifications did not change significantly over time. Similar trends of the progression of education were also noted in developed countries⁶.

The percentage of mothers living in the country grew around Zagreb during the war, which might be explained by the arrival of refugees and displaced persons from other parts of Croatia. In the world there is mostly an increase in the share of urban population^{7,8}.

Over the 25-year period of study, the share of women giving birth for the first, second, third time or those having had multiple pregnancies did not change significantly, although there was a noted trend of increase in the share of first-time mothers, which might indicate the trend of smaller families, that is, fewer children per family. The trend of smaller families and fewer children is also noted elsewhere in the developed world⁹. Such changes are probably related to the modern way of life where parents mostly live alone with their children, where mothers mostly have jobs, and also have to take care of the family. Having more children is in a way becoming complicated, because of further care for the children.

In our study there was a statistically significant difference in the number of children in terms of professional qualifications. Women with low professional qualifications on average have more children than those with high professional qualifications. It is well-noted in published works that women with more education tend to delay motherhood and to have fewer and fewer children¹⁰.

The reasons on the one hand are the delay of motherhood and during such time the potential development of certain diseases that affect fertility, and on the other the growingly frequent lack of desire in the developed world to have children. In the past, such standpoints were practically unimaginable, because one of the primary duties of a woman was to give birth, while now the interests of women are aimed, particularly in the group of better educated women, at growingly challenging jobs where children are only in the way.

According to English authors¹¹, women who make the decision not to have children at all are more frequently better educated, well paid at their jobs, live in towns, they get married and divorced more frequently than persons with children, and are usually not religious.

Regardless of education, certain authors established that in terms of intelligence, there is no difference in the quotient and the number of children certain people have¹².

Considering that the number of children is statistically significantly lower in women with better education

both across the world and in this study, it is not surprising that first-time mothers are the most prevalent in the group of women with post-secondary school and university qualifications. In the group of women with low professional qualifications, the share of three-time mothers and mothers having had multiple pregnancies is significantly greater than in women with secondary school and post-secondary school qualifications.

Our study showed that women who live in the country on average have statistically significantly more children than those living in urban settings. Such findings are probably the result of the fact that people in the country more frequently live in houses, and not in small flats, and that such households not infrequently include several generations, so that taking care of children is also better distributed and simpler.

There is another significant female characteristic that changed over the 25 years of research. There was a statistically significant drop in the time of menarche. Women who were examined in the period 2007–2009 had their first menstrual cycle 9 months before women examined in the period 1985–1986. Other published authors^{5,13} also noted a similar trend, that is, an ever earlier time of menarche over the past decades.

Women living in rural settings got their first period, on average, 2 to 3 months later than women living in urban settings. The said difference is present in all periods included in our study. Portuguese authors¹⁴ published similar observations.

There was a statistically significant difference in the time of menarche where mothers having post-secondary school or university qualifications got their first period earlier than those with lower professional qualifications. That might be explained by the fact that women with better education lived in better socioeconomic circumstances during their childhood, and thus lived in conditions to receive higher education. Certain published authors state that girls who live in better socioeconomic conditions have

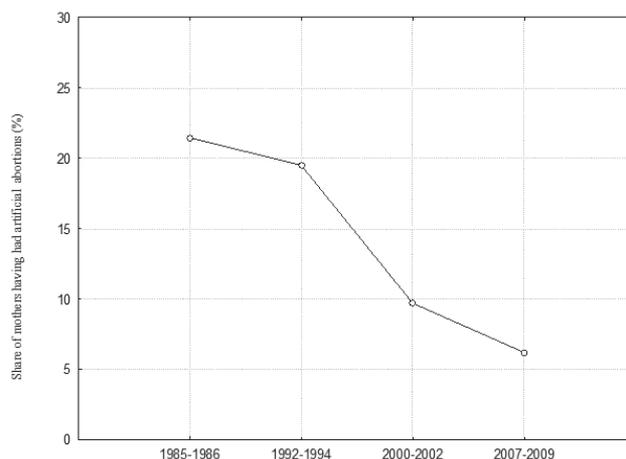


Fig. 7. The share of mothers having one or more artificial abortions in their medical history in terms of the different periods of research.

their first menstrual cycle earlier than those living in poorer conditions¹⁵.

Furthermore, based on the mothers' medical history it can be concluded that there is a statistical significance in the decreasing number of artificial abortions from the period 1985–1986 to this day. Thanks to easier access to information, informatisation and mass media, general

knowledge of the population about sexuality is getting better and better. Access to gynaecologists and contraception is easy in primary health care, and the methods of contraception are getting better, more available and less harmful, which results in a decreasing number of unwanted pregnancies. Other published authors also recorded a decrease in the number of intentional abortions^{16,17}.

REFERENCES

- JURESA V, MUSIL V, TILJAK MK, Coll Antropol, 36 (2012) 47.
- TOSELLI S, VENTRELLA AR, FRANZAROLI G, BRASILI P, Coll Antropol, 30 (2006) 65.
- SOLJAČIĆ VRANEŠ H, GALL V, JUKIĆ M, VRANEŠ Z, Coll Antropol, 36 (2012) 549.
- VEČEK N, VEČEK A, ZAJC PETRANOVIĆ M, TOMAS Z, ARCH-VEČEK B, SKARIĆ-JURIĆ T, MILIČIĆ J, Eur J Obstet Gynecol Reprod Biol, 160 (2012) 51.
- HIMES JH, Mol Cell Endocrinol, 254 (2006) 13.
- PIGEYRE M, DAUCHET L, SIMON C, BONGARD V, BINGHAM A, ARVEILER D, RUIDAVETS JB, WAGNER A, FERRIERS J, AMOUYEL P, DAL-LONGVILLE J, Prev Med, 52 (2011) 305.
- AIROL E, GETAZ L, STOLL B, CHAPPUIS F, LOUTAN L, Lancet Infect Dis, 11 (2011) 131.
- GONG P, LIANG S, CARLTON EJ, JIANG Q, WU J, WANG L, REMAIS JV, Lancet, 379 (2012) 843.
- MARITONI GG, FILHO AA, J Pediatr (Rio J), 76 (2000) 55.
- FRANCIS HH, IPPF Med Bull, 19 (1985) 3.
- INTERNATIONAL PLANNED PARENTHOOD FEDERATION IPPF EUROPE REGION, IPPF Eur Reg Inf, (1982) 24.
- NYSTROM S, BYGREN LO, VINING DR JR, Scand J Soc Med, 19 (1991) 187.
- KHANNA G, KAPOOR S, Coll Antropol, 28 (2004) 571.
- PADEZ C, Am J Hum Biol, 15 (2003) 415.
- WRONKA I, PAWLINSKA-CHMARA R, Ann Hum Biol, 32 (2005) 630.
- SALAKOS N, BAKALIANOU K, GREGORIOU O, IAVAZZO C, PALTOGLOU G, CRE-ATSAS G, Clin Exp Obstet Gynecol, 35 (2008) 279.
- JONES RK, KOST K, SINGH S, HENSHAW SK, FINER LB, Clin Obstet Gynecol, 52 (2009) 119.

H. Soljačić Vraneš

University of Zagreb, »Sestre milosrdnice« University Hospital Center, Department of Gynecology and Obstetrics, Vinogradska 29, 10000 Zagreb, Croatia
e-mail: hsoljadicvraneš@hotmail.com

SEKULARNE PROMJENE U EDUKACIJI, MJESTU STANOVANJA, MENARHI I UČESTALOSTI NAMJERNIH POBAČAJA U PERINATALNOJ POPULACIJI

SAŽETAK

U razdoblju od 25 godina ispitana su antropološka obilježja roditelja i njihovih partnera, kao što su mjesto stanovanja: gradska ili seoska sredina, stupanj naobrazbe, paritet, vrijeme pojavljivanja prve menstruacije, te učestalost namjerno izazvanih pobačaja. Ispitane su 2414 roditelje i njihovi partneri u četiri vremenska perioda od 1985. g. do 2009. g. s ciljem da se ustanove promjene spomenutih antropoloških obilježja kroz četvrtinu stoljeća. Obrazovanje roditelja i njihovih partnera raste. U periodu od 1985. g. do 1994. g. raste postotak roditelja sa sela. Niže obrazovane žene imaju prosječno više djece, a više obrazovane najmanje. Žene sa sela imaju u prosjeku više djece nego one iz grada. Dob prve menstruacije se u 25 godina smanjila za 9 mjeseci. Menarha se javlja ranije kod gradskih djevojaka. Žene s višom stručnom spremom su imale menarhu ranije. Broj namjerno izazvanih pobačaja je u 25 godina pao.