

Regional Characteristics of Population Reproduction in the Republic of Croatia

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This work deals with the biological reproduction of the population of the Republic of Croatia. It encompasses the period from 1857 to 1994, while the focus of study is on the modern (1971-1990) regional characteristics of reproduction (on the county level). The problem is also considered from the aspect of "settlement type". It was established that all regions (counties) have reproduction indicators with values below the level necessary for simple population replacement.

Key Words: population reproduction, spatial differentiation, demographic development, counties, Croatia

Regionalne značajke reprodukcije stanovništva Republike Hrvatske.

U radu je razmatrana biološka reprodukcija stanovništva Republike Hrvatske. Obuhvaćeno je razdoblje 1857-1994, a težište razmatranja je na suvremenim (1971-1990) regionalnim značajkama reprodukcije (na razini županije). Problem je obraden i s gledišta "tipa naselja" boravka. Ustanovljeno je da sve regije (županije) imaju pokazatelje reprodukcije ispod razine nužne za jednostavno obnavljanje stanovništva.

Ključne riječi: Reprodukcija stanovništva, prostorno diferenciranje, demografski razvitak, županije, Hrvatska.

INTRODUCTION

Population reproduction is a fundamental demographic theme, which by its essential characteristics is ideally interdisciplinary. A corresponding place is also assumed by geographic population studies, particularly when considered from the spatial aspect.

The term (biological) population reproduction means population renewal, or the renewal of a given generation within a population, in which both fertility and mortality play a role (A. Wertheimer-Baletić, 1982:178). In this, fertility is normally the principal dynamic variable. Of course, this does not mean that a population renews itself exclusively by biological impulse. Reproduction develops under specific social circumstances that influence vital events: marriages and births. When it is a matter of a

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population in which migrations (internal and external) have a significant role in overall demographic development, such as Croatia's, the interaction between natural and mechanical population movement has great importance. The interaction of their components becomes fully apparent on the regional level, causing spatial differentiation in demographic processes, among which population reproduction assumes an important place.

It can be hypothesized with certainty that in the case of the Republic of Croatia there are regional differences in population reproduction. This hypothesis was verified, and the findings on the dynamics of the possible range of spatial differences are presented.

In Croatian scientific literature (not only geographic), there are very few works on population reproduction, which runs contrary to the social significance of this problem. Those few works that do exist deal with the general aspects and problems of the reproduction of the Croatian population (see A. Wertheimer-Baletić, 1985 & 1986). Croatia was encompassed in the study of the demographic characteristics of the former state, but reproduction was only occasionally considered, and this generally in research on fertility.

An area of particular neglect is the insufficiently researched spatial aspect of reproduction. Spatial differential analyses generally encompassed general demographic features, population density and structures, etc. (see M. Friganović, 1984 & 1992; J. Gelo, 1987; I. Nejašmić, 1991). Works that dealt with the spatial aspects of natural demographic transition or just fertility were the closest to this topic. In these works, municipalities or groups of municipalities are the basic spatial units (see M. Friganović, 1970), while some are based on even older forms of administrative and territorial organization (see S. Vuletić, 1964 & 1965). Furthermore, research on the demographic features from the point of view of residential "settlement type" (see M. Friganović, 1985; I. Nejašmić, 1986 & 1996) also have spatial characteristics. Despite all of this, the fact remains that there is only one work that deals with the reproduction aspects of the Croatian population from the regional point of view (I. Klauzer, 1961), and this only partially, since the "regions" used consist exclusively of three historical provinces.

Thus, there are no works that deal with the modern reproduction features of the Croatian population on the regional level, nor, obviously, on the level of county organization. Therefore, filling in these gaps is the primary task of this work, while its objective is to contribute to the scientific study of reproduction and to a more thorough understanding of the population development of Croatia.

METHODOLOGICAL EXPLANATIONS

This work is based on an analysis of data from official demographic statistics, even though these do not provide "complete" indicators. That is to say that at the county level there are no fertility and reproduction indicators (for some years these are even lacking for the overall population), so that they had to be calculated on the basis of the only available data: the number of live births and the number of women of childbearing age.

The study of regional features encompasses three years: the census years of 1971 and 1981, and pre-census 1990, while the number of live births is taken from two-year averages (thus, 1970 and 1971, 1980 and 1981 and 1989 and 1990). However, for 1990 only, there is data on the number of live births per county (*Statistički ljetopis hrvatskih županija 1993*, Zagreb: DZS (State Bureau of Statistics), 1994); for other years it was necessary to "manually" add up the appropriate data on settlements and municipalities.

The fact there are no so-called fertility tables (of age-specific fertility rates) also influenced the calculation of reproduction indicators. The indicators thus derived are approximate (estimated), and they were obtained in the following manner:

1. The **gross reproduction rate** shows the average number of girls that will be born to a newborn girl during the course of her childbearing years, provided that fertility remains the same as it was during the generation of women in the year under observation, and that not one of those female children dies before the end of her childbearing years, i.e. before reaching the age of 50. This was calculated with the help of the general fertility rate, which was in turn derived from the following formula: $f = (N/P_{f(15-49)} \cdot 1000)$. The general fertility rate should be multiplied by the proportion of female births out of the total number of children born (for 1971 it was .481; for 1981 it was .484; for 1991 it was .485). The estimated fertility rate for women alone is thus obtained, i.e. the number of female births on average by 1,000 women in one year. The number of female births during the 35 childbearing years will be calculated so that the fertility rate for female children is multiplied by 35 (years) and the results is then divided by 1,000 (V. Serdar, 1953: 123–124). The approximate gross reproduction rate was thus obtained (R'_B).

2. The **net reproduction rate** shows the intensity of the real reproduction of the female population, as it incorporates the female mortality from birth before age fifty (i.e. the end of their childbearing years). Namely, it shows the extent to which each woman reproduces herself in the given fertility and mortality conditions. If the rate is 1.0, this means that each female child that is born will give birth to one female child during her childbearing years. This indicates the simple reproduction of the female population; less than 1.0 means a decline, while greater than 1.0 means an increase in the population. The net rate is calculated by the equation $R_0 = R'^2_B \cdot A_{p(15-49)}$, where $A_{p(15-49)}$ is the mean probability that female children will reach 15 to 49 years of age; it is calculated by dividing the number of the female population in the 15–49 age period (composing the so-called mortality table) by 35 and dividing this quotient by 100,000 (D. Breznik, 1977:174). For Croatia the following mean probabilities of survival were obtained: .95147 for 1970–1972; .96423 for 1980–1982; .97933 for 1988–1990. Since there are no mortality tables for the county level, these are the mean probabilities for the entire population used for the calculation of individual net reproduction rates.

3. The **total fertility rate** indicates the probable average number of children born per woman in a given generation, under the assumption that all experience the age-specific fertility rates of a specified fertility schedule. A good approximation is the average number of children in a family (A. Wertheimer-Baletić, 1982:157). It is calculated as the total (cumulative rate) of all age-specific fertility rates in the 15 to 49 age bracket. However, since the counties lack fertility tables, the sought-after indicator can be calculated so that the gross rate (R'_B) is divided by the share of female children out of the total number of children (D. Breznik, 1977:176). The estimated total fertility

rate (TFR') is thus obtained; a value of 2.15 ensures simple reproduction. Since all women in the childbearing years do not participate in reproduction, ensuring simple reproduction requires that each woman who participates in reproduction give birth to 2.35 children.

The study of reproduction characteristics according to residential "settlement type" is not based on the official categories (by which Croatia has sixty-nine cities). Rather, the professional criteria for urban characteristics were employed (according the M. Vresk's model, 1982-83:40). Thus for 1991 a group of 122 urban settlements was derived, and divided into two sub-groups: a) county seats and b) other cities and towns. The third group, "other settlements" (a total of 6,572) in large part consists of rural settlements in the traditional sense and several hundred intermediary settlements, with both urban and rural attributes. The most demanding aspect was the consolidation of data on live births. Namely, for natural trends there are no group data characterized by "settlement type". The data for individual settlements were published in so-called table-graphs and all consolidated data requires "manual" addition. The same had to be done in determining the number of women in their childbearing years according to residential "settlement type" for 1991, i.e. make use of data for individual settlements.

The difficulties in forming a data base are most probably the principal reason for the insufficient number of spatially differential and reliable demographic analyses.

FERTILITY AND POPULATION REPRODUCTION IN CROATIA 1857-1994

In considering the contemporary state of affairs, previous events and aspects should be taken into consideration, as demographic processes, by their essential characteristics, are of a long-term nature. A retroactive review encompasses the period from 1857 to 1994, while census years were taken into consideration (with the exception of 1990 and 1994). Namely, the study of fertility and reproduction requires data that is not exclusively derived from censuses.

Considerable changes in the natural demographic transition of Croatia's population occurred during the period under observation. The long-term traditional demographic reproduction system ended, and then during the 1880s a major demographic change commenced (i.e. the modernization of the reproduction system), so that by the beginning of the 1980s a post-transition stage began which normally corresponds to that of a post-industrial society (C. Westoff, 1983). In this, an essential particularity is the modern development of Croatia's population. The effects of previous events (epidemics, wars, constant emigration), along with the dynamic postwar industrialization, urbanization and migrations, disturbed and then considerably accelerated the "normal" flow of demographic development. Thus, in Croatia's case it is a matter of a unique quasi post-transition caused by specific factors (A. Wertheimer-Baletić, 1992:241).

Without embarking on a deeper analysis of the factors of accelerated demographic transition, it can be established that the latter has led to a sharp decline in fertility, gross and net reproduction rates and total fertility rates (Table 1). All indicators for 1994 have half the value of the corresponding indicators from 1948. This obvious decline in the vital potential is one of the principal features of the unfavorable demographic picture of the Republic of Croatia. Table 1 presents a more detailed picture.

Table 1: Fertility and Reproduction Indicators of the Population of the Republic of Croatia, 1857–1994 (current territorial extent)

| Year | General fertility rate (female - f) | Total fertility rate (TFR) | Gross reproduction rate (R _g) | Net reproduction rate (R _n)* |
|---------|-------------------------------------|----------------------------|---|--|
| | 1 | 2 | 3 | 4 |
| 1857 | 163.9 | 5.74 | 2.79 | 1.34 |
| 1869 | 165.6 | 5.79 | 2.89 | - |
| 1880 | 162.4 | 5.68 | 2.77 | 1.40 |
| 1890 | 172.6 | 6.04 | 2.95 | - |
| 1900 | 160.3 | 5.61 | 2.73 | - |
| 1910 | 154.9 | 5.42 | 2.67 | 1.38 |
| 1931 | 116.2 | 4.07 | 1.98 | 1.17 |
| 1948 | 84.7 | 2.96 | 1.43 | 1.20 |
| 1953 | 82.2 | 2.65** | 1.29 | 1.09 |
| 1961 | 68.4 | 2.15** | 1.05 | .90 |
| 1971 | 55.1 | 1.96** | .94 | .87 |
| 1981 | 58.1 | 1.92 | .93 | .90 |
| 1990 | 47.6 | 1.63 | .79 | .77 |
| 1994*** | 43.0 | 1.5 | .73 | .71 |

* There are no data on the net reproduction rate for the 1857–1948 period as there are no mortality tables; the data presented for the five census years are approximations according to: J. Gelo, 1987:178.

** Calculated by the author by tallying age-specific fertility rates.

*** According to still unpublished data from the State Bureau of Statistics, the TFR for 1994 is 1.5; from this piece of data, the author calculated the other indicators using the aforementioned procedure.

Source: For the 1857–1948 period, I. Klauzer, 1961; for 1953 and 1961, *Demografska statistika* (SZS/Federal Bureau of Statistics/, 1964); for 1971, *Demografska statistika 1980*. (SZS, 1989); for 1981, *Demografska statistika 1989*. (SZS, 1991); for 1990, *Radni material* (DZS/State Bureau of Statistics/, 1995).

The net reproduction rate, as an indicator of the reproduction of the female population, fell below the border level for simple reproduction in 1961 (.90; according to some sources this rate was already below 1.0 in 1958). This means that in Croatia the female population (the agent of reproduction) has not been renewing itself for three and half decades, i.e. reproductive depopulation is occurring (A. Wertheimer-Baletić, 1992:241). After a short period of stabilization at the beginning of the 1980s, caused by an "echo effect" (a strong generation of women; born during a compensation period), there was a sharp decline in the net reproduction rate, which was .77 in 1990. According to still unpublished data, this rate was .71 in 1994. The accelerated decline in the rate is above all a result of long-term negative demographic transition, while it is also partially due to the war against Croatia (the war was like "pouring salt on a deep demographic wound").

In accordance with this, the reproduction of the population in Croatia is characterized by the low level of the gross and net reproduction rates and their tendency to decline in the long term, as well as the weakening influence of the mortality of women in their childbearing years on the reproduction of the population (this can be seen in the reduced differences between gross and net reproduction rates).

The net reproduction rate can also (with some reservations) be considered an indicator of future changes in the total number of inhabitants (expressed as a percentage to the extent that the rate is greater of lesser than 1.0). In a concrete situation, the

net rate of .77 means that the number of inhabitants of Croatia will decline by 23 percent in one generation (around 30 years, thus by 2020), provided that fertility rates remain the same and that there are no migrations; in other words, only as a consequence of reproductive depopulation.

In accordance with the natural demographic trends of the population under post-transition conditions, the total fertility rate, as the most-frequently-used aggregate indicator (and a good approximation of the number of children in a family) shows a very significant decline. In 1961 this rate was 2.15, which only ensured (theoretically) simple replacement (this is an approximate rate, the actual one was smaller, probably around 2.05). In 1994 it fell to 1.5! Thus, for over three decades the simple generational replacement of the total population has not been ensured; individual age groups reduced in both actual and relative numbers. In this manner, the number of children aged 0–14 during the 1961–1991 period decreased by 17.2 percent, while at the same time the total population increased by 21.5 percent. Accordingly, the share of the 0–14 age group in the total population fell from 28.8 percent to 19.4 percent. This means that the base for future demographic reproduction is narrowing. It is indisputable that generational depopulation is very unfavorable for the further renewal of the total population, as well as its individual parts (functional groups).

How did the total fertility of women in Croatia change in relation to potential fertility, which is 8.32 children (according to F. Lorimer, 1954:49)? The data for selected years indicates that the share of realized total fertility in potential fertility was: 69.0 percent in 1857; 72.6 percent in 1890; 48.9 percent in 1931; 35.6 percent in 1948; 25.9 percent in 1961; 19.6 percent in 1990; and 18.0 percent in 1994. It follows that the actual birthrate of the generation of women born in 1990 will be only one fifth of potential fertility.

On the basis of these data it can be averred that the self-reproductive strength of the Croatian population is far from that which would satisfy even simple replacement. The fact that the total population is still growing can be explained by the characteristics of the age structure, which can still (but not for long) ensure the low and declining growth rate of the population.

CONTEMPORARY REGIONAL CHARACTERISTICS OF POPULATION REPRODUCTION

In the post-transition stage of demographic development, natality is the fundamental long-term foundation of biological reproduction. Thus it is necessary to study fertility rate trends in detail, all the more so because it is from fertility rates that the principal indicators of reproduction are derived.

After the short period of growth in the fertility rate of the total population from 1971 to 1981 (as a result of the aforementioned "echo effect"), during the 1981–1990 period it decreased considerably (Table 2). It is noticeable that in all Croatian counties the fertility rate fluctuations are the same as those on the state level (the exception is the Lika-Senj County, in which a slightly lower rate was recorded during the 1971–1981 period). During the 1981–1990 period, there were no spatial differences in the direction of changes in the fertility rate, i.e. it decreased in all counties. A further characteristic is the reduced range of variation: in 1981 the highest rate (Medimurje County) was

69.2, while the lowest (Lika-Senj County) was 48.3; in 1990 the highest rate was 59.3-(Brod-Posavina County), while the lowest was 41.8 (Zagreb County).

In the study of the regional characteristics of biological reproduction, it is necessary to at least touch on the relationship between spatial movement of the population and fertility. Migration from traditionally high-natality regions (villages and rural regions in general) to low natality areas (cities and urban regions) had a considerable influence on the decreased birthrates in all of Croatia¹ during its period of highest intensity (1960s and 1970s). This also augmented spatial differences in natural demographic transition (e.g. from the middle of the 1960s urban populations began to have higher birthrates than rural; I. Nejašmić, 1986: 126).

Table 2: General Fertility Rate (Women) by County in 1971, 1981 and 1990 and the Net Migration Balance, 1981-1991.

| County* | General Fertility Rate | | | Net Migration Balance | |
|--------------------------|------------------------|------|------|-----------------------|----------------|
| | 1971 | 1981 | 1990 | rel.** | type*** |
| | 1 | 2 | 3 | 4 | 5 |
| 1. Zagreb | 46.1 | 55.5 | 44.0 | 5.20 | I ₂ |
| 2. Krapina-Zagorje | 54.1 | 54.3 | 52.0 | -0.53 | E ₄ |
| 3. Sisak-Moslavina | 48.2 | 54.3 | 47.6 | -0.45 | E ₄ |
| 4. Karlovac | 46.2 | 53.9 | 44.8 | 0.56 | I ₄ |
| 5. Varaždin | 57.0 | 60.6 | 50.0 | -1.15 | E ₁ |
| 6. Koprivnica-Križevci | 49.3 | 54.3 | 48.2 | -0.21 | E ₄ |
| 7. Bjelovar-Bilogora | 46.0 | 53.6 | 48.7 | -0.25 | E ₄ |
| 8. Gorski Kotar-Littoral | 50.1 | 57.9 | 42.6 | 3.87 | I ₁ |
| 9. Lika-Senj | 50.1 | 48.3 | 47.6 | -1.65 | E ₄ |
| 10. Virovitica-Podravina | 47.5 | 58.9 | 50.5 | -0.67 | E ₄ |
| 11. Požega-Slavonia | 52.9 | 60.8 | 55.2 | 0.37 | I ₁ |
| 12. Brod-Posavina | 58.8 | 66.9 | 59.3 | 0.26 | I ₁ |
| 13. Zadar-Knin | 59.9 | 61.3 | 52.1 | 4.32 | I ₁ |
| 14. Osijek-Baranja | 52.8 | 57.4 | 48.7 | 0.32 | I ₁ |
| 15. Šibenik | 53.6 | 58.0 | 47.4 | -0.22 | E ₁ |
| 16. Vukovar-Srijem | 60.7 | 60.8 | 55.4 | -1.14 | E ₁ |
| 17. Split-Dalmatia | 66.5 | 63.4 | 52.3 | 2.79 | I ₁ |
| 18. Istria | 51.9 | 58.7 | 48.1 | 5.30 | I ₁ |
| 19. Dubrovnik-Neretva | 57.7 | 63.9 | 54.4 | 5.17 | I ₁ |
| 20. Međimurje | 61.9 | 69.2 | 52.9 | -0.65 | E ₁ |
| 21. City of Zagreb | 50.7 | 58.4 | 41.8 | 5.60 | I ₁ |
| Croatia | 53.7 | 58.9 | 48.3 | 2.00 | I ₁ |

* Territorial organization according to the Law on the Territory of Counties, Cities and Municipalities in the Republic of Croatia (*Narodne novine*, 90/1992); in this work the City of Zagreb is considered a county.

** Share (%) of the absolute net migration balance in the number of inhabitants in 1981

*** The type of general population movement is based on the ratio between natural and census-determined dynamics (according to: M. Friganović, 1978:101-102)

Source: Calculated by the author (see methodological explanations) on the basis of data on live births (Table-graphs on "Births and Deaths by Settlement" for individual years, State Bureau of Statistics, Zagreb) and the number of women in their childbearing years (*Statistički ljetopis hrvatskih županija 1993*, Zagreb: DZS, 1994); for the net migration balance, the data on the number of inhabitants by settlement (*Dokumentacija 553*, Zagreb: RZS SRH /Statistics Bureau of the Socialist Republic of Croatia/, 1984 and *Dokumentacija 882*, Zagreb: DZS, 1994) and natural movement (Table-graphs on "Births and Deaths").

In the meantime, many things changed. The focus of biological reproduction irreversibly moved from villages to cities, but the latter were not prepared for this, which, to a certain extent, is confirmed by the presented data. Among the counties, the lowest fertility rate is in the City of Zagreb, despite the fact that it has the highest positive migration balance (type I_1 – expansion by immigration; Table 2). The same is true of Gorski Kotar-Littoral and Zagreb Counties. On the other hand, some emigration regions recorded above-average fertility rates (Vukovar-Srijem, Medimurje, Krapina-Zagorje). Accordingly, it can be stated that modern internal migrations do not significantly influence the fertility level of the total population, nor do they have any greater importance from the regional point of view (at least not on the county level).

It is also interesting to consider the possible influence of (pure) demographic determinants on the fertility level, i.e. the age composition of the fertile female contingent. In 1991 this contingent decreased numerically by .3 percent in relation to 1981, while its share in the total population fell from 25.1 percent to 24 percent. Even more significant is the aging of this contingent; the number of women aged 20–29 decreased during the same period by 8.1 percent (in Croatia, approximately 70% of total fertility relates to women in this age bracket). As a rule, this has an unfavorable influence on the reproduction of the total population. A verification of the correlation (by county) between the decrease in the number of women aged 20–29 and the decrease in the number of live births (1981–1991) indicates the existence of a positive relationship, but not necessarily a significant one ($r = .67$). Therefore, the role of (pure) demographic factors is not crucial in the formation of a modern reproductive pattern.

It can be concluded that a process of spatial homogenization on the level of low fertility was very apparent in Croatia during the last decade. This is a result of a long-term decrease in natality and the tendency towards "zero growth". The significance of some factors that had a certain influence on regional differentiation (migration, age structure, etc.) lessened, while the role of a combination of socio-economic, cultural, psycho-social and other factors that form a stance in relation to reproduction expanded. It is obvious that the acceptance of low birthrates is a reality in all Croatian regions (counties).

In accordance with the fluctuation of fertility rates, reproduction indicators also show a notable decrease in the last inter-census period, both for the total population and for counties (Tables 3 and 4). In all counties during 1990 the net rates are below 1.0, which means that not even the simple reproduction of the population is assured (Figure 1). Counties with net rates above 0.9 (the lowest possible unsatisfactory status) are Brod-Posavina (0.99), Požega-Slavonia (0.92) and Vukovar-Srijem (0.92); nine counties have net rates between 0.81 and 0.90; eight are in a very poor state with rates between 0.71 and 0.80; the worst standing is in the City of Zagreb, in which the net reproduction rate is 0.70 (and it is lower than the rate of the "county seat" group; see Table 5). This is particularly disturbing if one keeps in mind that according to the last census, 18.1 percent of Croatia's population lives in Zagreb (the administrative territory of the city).

If the reproduction rate is taken as an indicator of the future decrease in the total number of inhabitants (reproduction depopulation), it follows that by 2020 six counties would experience a decrease greater than 20 percent (Zagreb, Sisak-Moslavina, Kar-

lovac, Gorski Kotar-Littoral, Lika-Senj, Šibenik), while it would be 30 percent² for the City of Zagreb.

The total fertility rate, as the best aggregate reproduction indicator, also experienced a considerable decrease during the 1981–1990 period. It is obvious that during the 1990s there was an acceleration in the long-term negative trends ("demographic collapse"). While in 1981 this rate was over 2.15 in six counties (Medimurje, Brod-Posavina, Dubrovnik-Neretva, Split-Dalmatia, Zadar-Knin and Požega-Slavonia), in 1991 all counties experienced a rate lower than the critical value (Table 4). Variations

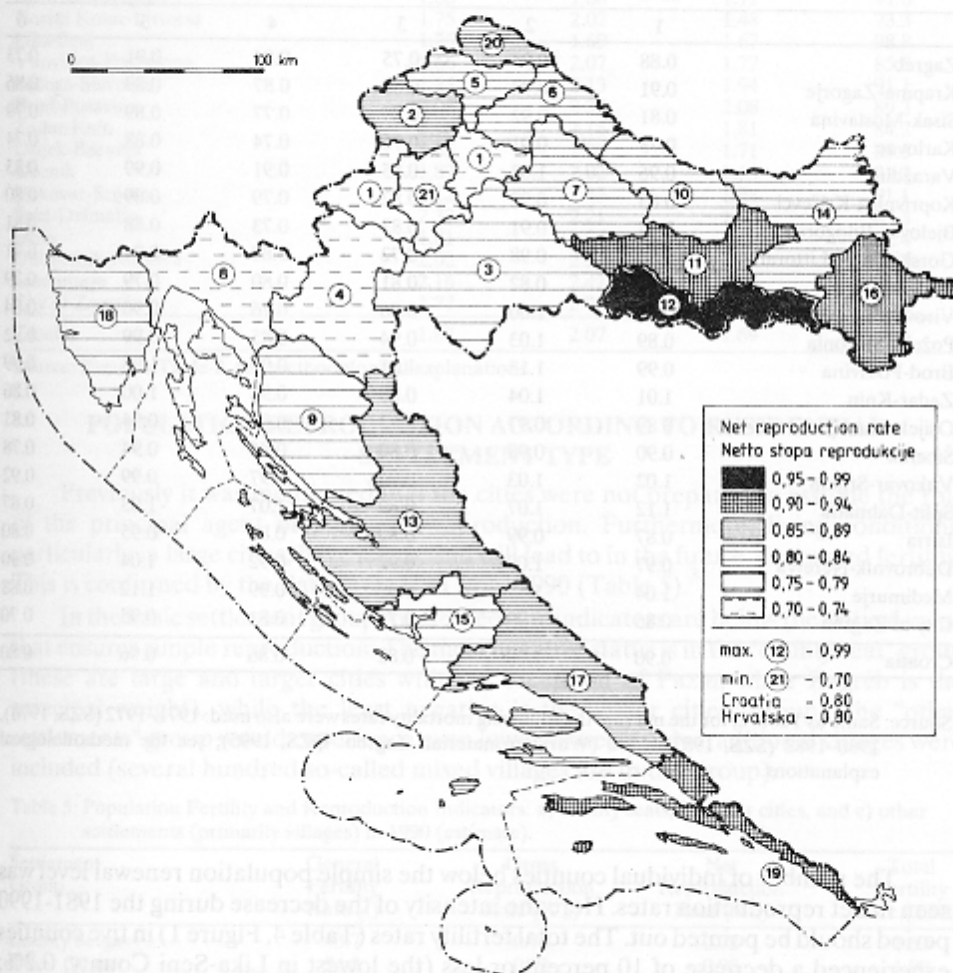


Fig. 1: The net reproduction rate of the population by counties of the Republic of Croatia in 1990 (see Table 2 for the corresponding county number).

Sl. 1. Neto stopa reprodukcije stanovništva po županijama Republike Hrvatske 1990. godine (pripadajući redni broj županije vidi u tab. 2).

in the total fertility rate (or rather, the average number of children in a family) range from 1.46 (City of Zagreb) to 2.08 (Brod-Posavina County). Therefore, generational renewal is not assured in any single Croatian county.

Table 3: The gross (R'_b) and net (R'_n) population reproduction rates by county, 1971, 1981 and 1990 (estimate).

| County* | Gross | | | Net | | |
|-----------------------|-------|------|------|------|------|------|
| | 1971 | 1981 | 1990 | 1971 | 1981 | 1990 |
| | 1 | 2 | 3 | 4 | 5 | 6 |
| Zagreb | 0.88 | 0.94 | 0.75 | 0.84 | 0.91 | 0.73 |
| Krapina-Zagorje | 0.91 | 0.92 | 0.88 | 0.87 | 0.89 | 0.86 |
| Sisak-Moslavina | 0.81 | 0.92 | 0.81 | 0.77 | 0.89 | 0.79 |
| Karlovac | 0.78 | 0.91 | 0.76 | 0.74 | 0.88 | 0.74 |
| Varaždin | 0.96 | 1.03 | 0.85 | 0.91 | 0.99 | 0.83 |
| Koprivnica-Križevci | 0.83 | 0.92 | 0.82 | 0.79 | 0.89 | 0.80 |
| Bjelovar-Bilogora | 0.77 | 0.91 | 0.83 | 0.73 | 0.88 | 0.81 |
| Gorski Kotar-Littoral | 0.84 | 0.98 | 0.72 | 0.80 | 0.94 | 0.71 |
| Lika-Senj | 0.84 | 0.82 | 0.81 | 0.80 | 0.79 | 0.79 |
| Virovitica-Podravina | 0.80 | 1.00 | 0.86 | 0.76 | 0.96 | 0.84 |
| Požega-Slavonia | 0.89 | 1.03 | 0.94 | 0.85 | 0.99 | 0.92 |
| Brod-Posavina | 0.99 | 1.13 | 1.01 | 0.94 | 1.08 | 0.99 |
| Zadar-Knin | 1.01 | 1.04 | 0.88 | 0.96 | 1.00 | 0.86 |
| Osijek-Baranja | 0.89 | 0.97 | 0.83 | 0.94 | 0.94 | 0.81 |
| Šibenik | 0.90 | 0.98 | 0.80 | 0.86 | 0.94 | 0.78 |
| Vukovar-Srijem | 1.02 | 1.03 | 0.94 | 0.97 | 0.99 | 0.92 |
| Split-Dalmatia | 1.12 | 1.07 | 0.89 | 1.07 | 1.03 | 0.87 |
| Istria | 0.87 | 0.99 | 0.82 | 0.83 | 0.95 | 0.80 |
| Dubrovnik-Neretva | 0.97 | 1.08 | 0.92 | 0.92 | 1.04 | 0.90 |
| Međimurje | 1.04 | 1.17 | 0.90 | 0.99 | 1.12 | 0.88 |
| City of Zagreb | 0.85 | 0.99 | 0.71 | 0.81 | 0.95 | 0.70 |
| Croatia | 0.90 | 1.00 | 0.82 | 0.86 | 0.96 | 0.80 |

Source: Same as Table 2; for the net rate the following mortality rates were also used: 1971–1972 (SZS, 1976), 1980–1982 (SZS, 1987), 1990 (Working material, Zagreb: DZS, 1995); see the methodological explanations.

The number of individual counties below the simple population renewal level was seen in net reproduction rates. Here the intensity of the decrease during the 1981–1990 period should be pointed out. The total fertility rates (Table 4, Figure 1) in five counties experienced a decrease of 10 percent or less (the lowest in Lika-Senj County, 0.2%; one of the reasons lies in the long-term negative processes, so that a general acceleration of the negative transition was not reflected here), in twenty counties 11–20 percent, while in four counties the decrease was greater than 20 percent (Zagreb, Gorski Kotar-Littoral and Međimurje, and the City of Zagreb, which had the greatest decrease, 28.8%).

Table 4: Total Fertility Rate (TFR*) by county in 1971, 1981 and 1990 (estimate).

| County* | General Fertility Rate | | | Index of Change 1990/81 |
|-----------------------|------------------------|------|------|----------------------------|
| | 1971 | 1981 | 1990 | |
| | 1 | 2 | 3 | 4 |
| Zagreb | 1.83 | 1.94 | 1.55 | 79.9 |
| Krapina-Zagorje | 1.89 | 1.90 | 1.81 | 95.3 |
| Sisak-Moslavina | 1.68 | 1.90 | 1.67 | 87.9 |
| Karlovac | 1.62 | 1.88 | 1.57 | 83.5 |
| Varaždin | 2.00 | 2.13 | 1.75 | 82.2 |
| Koprivnica-Križevci | 1.73 | 1.90 | 1.69 | 88.9 |
| Bjelovar-Bilogora | 1.60 | 1.88 | 1.71 | 91.0 |
| Gorski Kotar-Littoral | 1.75 | 2.02 | 1.48 | 73.3 |
| Lika-Senj | 1.75 | 1.69 | 1.67 | 98.8 |
| Virovitica-Podravina | 1.66 | 2.07 | 1.77 | 85.5 |
| Požega-Slavonia | 1.85 | 2.13 | 1.94 | 91.1 |
| Brod-Posavina | 2.06 | 2.33 | 2.08 | 89.3 |
| Zadar-Knin | 2.10 | 2.15 | 1.81 | 84.2 |
| Osijek-Baranja | 1.85 | 2.00 | 1.71 | 85.5 |
| Sibenik | 1.87 | 2.02 | 1.65 | 81.7 |
| Vukovar-Srijem | 2.12 | 2.13 | 1.94 | 91.1 |
| Split-Dalmatia | 2.33 | 2.21 | 1.84 | 83.3 |
| Istria | 1.81 | 2.05 | 1.69 | 82.4 |
| Dubrovnik-Neretva | 2.02 | 2.23 | 1.90 | 85.2 |
| Međimurje | 2.16 | 2.42 | 1.86 | 76.9 |
| City of Zagreb | 1.77 | 2.05 | 1.46 | 71.2 |
| Croatia | 1.87 | 2.07 | 1.69 | 81.6 |

Source: Same as Table 2, see methodological explanations.

POPULATION REPRODUCTION ACCORDING TO RESIDENTIAL SETTLEMENT TYPE

Previously it was mentioned that the cities were not prepared to assume the role of the principal agent of biological reproduction. Furthermore, living conditions, particularly in large cities, have led to, and will lead to in the future, decreased fertility. This is confirmed by the data presented from 1990 (Table 5).³

In the basic settlement groups presented, the indicators are below the critical value that ensures simple reproduction. The most negative status is in the "county seat" group (these are large and larger cities with the exception of Pazin, while Zagreb is the principal weight), while the least negative is the "other cities" group. The "other settlements" group would experience even lower values if only traditional villages were included (several hundred so-called mixed villages are in this group).

Table 5: Population Fertility and Reproduction Indicators: a) county seats, b) other cities, and c) other settlements (primarily villages) in 1990 (estimate).

| Settlement Group | General Fertility Rate (f) | Gross Reproduction Rate (R' _g) | Net Reproduction Rate (R' _n) | Total Fertility Rate (TFR') |
|------------------------------|----------------------------|--|--|-----------------------------|
| County Seats | 43.7 | 0.74 | 0.72 | 1.53 |
| Other Cities | 54.2 | 0.92 | 0.90 | 1.90 |
| Other Settlements (villages) | 50.1 | 0.85 | 0.83 | 1.75 |
| Croatia | 48.3 | 0.82 | 0.80 | 1.69 |

Source: Calculated by the author (see the methodological explanations) using data on live births (Table-*graphs "Births and Deaths by Settlement"* for individual years, State Bureau of Statistics, Zagreb) and the number of women in their childbearing years in settlements (*Dokumentacija 882*, Zagreb: DZS, 1994).

From the data presented in Table 5, it is apparent that the larger cities (county seats) are not exactly "fertile ground" for optimum biological reproduction levels. The data on the City of Zagreb presented earlier bear witness to this fact.

CONCLUSION

The above data show that population reproduction in Croatia is below the natural level of developed modern societies. Rates have been below the critical values necessary for simple reproduction for decades, while negative transition particularly accelerated during the last inter-census period. It is thus apparent that reproductive and generational depopulation is under way in Croatia.

On the regional level, it can be concluded that a process of spatial homogenization in terms of low fertility has been in effect in Croatia during the last decade. The population reproduction indicators of all Croatian counties are below the values necessary for simple reproduction. A common characteristic among them is the symmetry of processes (reproductive and generational depopulation), while the extent of differences is limited to the amount that county rates are less than the critical value. The indicators lead to the conclusion that by 2020 the regional demographic picture of Croatia will be generally determined by the current (and future) degree of reproductive depopulation.

From the aspect of "place of residence", it is apparent that larger cities (county seats) are not favorable for the optimum level of reproduction. Under circumstances in which villages are declining demographically (they are definitely no longer "demographic incubators"), the populations of smaller cities are practically the best agents of reproduction (they also have other positive demographic features, see I. Nejašmić, 1996).

What is to be done? It is obvious that raising the fertility level is the primary task, and that this is inseparable from economic and social progress. Croatia needs a "child support system", as this operates by generation, not momentarily (M. Friganović & S. Šterc, 1993:160). As a component part of pro-natality and population redistribution policies, and in order to ensure general demographic benefits, it is necessary to stimulate the overall development of smaller cities, and hinder migration to the largest cities, particularly Zagreb.

NOTES

1. If there were no village-to-city migrations, it is assumed that the total fertility rate would have been 2.99 in 1961—thus, considerably more than the actual rate; M. Rančić, 1973:45).

2. In the case of Zagreb this will not be realized (at least not to such an extent), as this metropolis continually attracts the populations of other regions. Since it will take in the most vital groups from other regions, Zagreb should also assume the increased burden of overall population reproduction. However, this should not be expected, as a large city is not the ideal atmosphere for higher fertility levels. A direct result will be a negative transition in the total population.

3. That this is not a matter of a temporary phenomenon and that one year can be taken as an status indicator is also confirmed by the fact that the number of live births from 1981 to 1990 decreased by 22.5 percent in "county seats", by 8.4 percent in "other cities", and by 17.7 percent in "other settlements (villages)."

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SAŽETAK

Regionalne značajke reprodukcije stanovništva Republike Hrvatske

Ivo Nejašmić

U domaćoj stručnoj literaturi (ne samo geografskoj) vrlo je malo radova o reprodukciji stanovništva. Posebice je zanemaren i znanstveno nedovoljno istražen prostorni aspekt reprodukcije. Popunjavanje ove praznine temeljna je zadaća predočenog rada.

Razmatranje se temelji na podacima službene demografske statistike, ali nije riječ o "gotovim" pokazateljima. Naime, na razini županije nema pokazatelja fertiliteta i reprodukcije (u pojedinim godinama nedostaju čak i za ukupnu populaciju) pa ih je trebalo izračunati iz jedinih raspoloživih podataka – broja živorođenih i broja žena u fertilnoj dobi. Dobiveni su približni (procijenjeni) pokazatelji: bruto i neto stopa reprodukcije te stopa ukupnog fertiliteta (TFR).

Retrospekcijom je obuhvaćeno razdoblje od 1857. do 1994. U ovom razdoblju završava dugotrajni tradicionalni sustav demoreprodukcije, potom 1880-ih započinje demografska tranzicija odnosno modernizacija reprodukcijskog sustava, da bi početkom 1980-ih nastupila posttranzicijska etapa. U tome je bitna posebnost suvremenog razvoja stanovništva Hrvatske. Učinci prijašnjih zbivanja (epidemije, ratovi, stalna emigracija), uz dinamičnu poslijeratnu industrijalizaciju, urbanizaciju i migraciju, uzdrimali su i znatno ubrzali "normalni" tijek demografske dinamike. To je dovelo do naglog smanjenja fertiliteta, bruto i neto stope reprodukcije te stope ukupnog fertiliteta. Svi pokazatelji za 1994. godinu, u odnosu na one iz 1948., imaju prepolovljene vrijednosti.

U Hrvatskoj se već tri i pol desetljeća ne obnavlja ženska populacija (nositelj reprodukcije), tj. traje reprodukcijaska depopulacija. Nakon kratkotrajne stabilizacije početkom 1980-ih, izazvane "eho efektom" (brojniji naraštaj žena; rođene u vrijeme poslijeratnog kompenzacijskog razdoblja), dolazi do naglog smanjenja stope neto reprodukcije (1990. iznosi 0,77). Ubrzano smanjenje stope posljedica je, prije svega, dugotrajnih nepovoljnih demografskih kretanja, a dijelom i rata protiv Hrvatske.

Sukladno prirodnom kretanju stanovništva u posttranzicijskim uvjetima, stopa ukupnog fertiliteta (TFR) pokazuje vrlo znakovito smanjivanje. Početkom 1960-tih ova je stopa pala ispod 2,15, da bi 1994. iznosila svega 1,5. Prema tome, više od tri desetljeća nije generacijski osigurana jednostavna reprodukcija ukupnog stanovništva (naraštajna depopulacija).

Stope reprodukcije po županijama također pokazuju osjetno smanjenje u zadnjem međupopisnom razdoblju. U svim su županijama neto stope 1990. ispod 1,0, dakle, nije osigurana niti jednostavna reprodukcija. Stopa ukupnog fertiliteta, pak, pokazuje da je u regijama (županije) manjkavo i generacijsko obnavljanje.

U svim osnovnim naseljskim skupinama: (a) "županijska sjedišta", b) "ostali gradovi" i c) "ostala naselja (sela)", pokazatelji reprodukcije su također ispod kritične vrijednosti koja osigurava jednostavnu reprodukciju. Najlošije je stanje u skupini "županijska sjedišta" (Zagreb je glavni ponder!). U okolnostima posvećenijeg demografskog slabljenja sela stanovništvo manjih gradova je praktički najvitalniji nositelj reprodukcije.

Može se zaključiti da je u Hrvatskoj reprodukcija stanovništva ispod razine imanentne razvijenom suvremenom društvu. Što se tiče regionalnog aspekta temeljni je nalaz da je zadnjeg desetljeća naglašen proces prostorne homogenizacije na razini niskog fertiliteta. Nadalje, sve hrvatske županije imaju pokazatelje reprodukcije stanovništva ispod vrijednosti potrebne za jednostavno obnavljanje, ali je prisutan i osjetan raspon različitosti. Pokazatelji upućuju na zaključak da će do 2020. regionalna demografska slika Hrvatske uvelike biti određena sadašnjim (i budućim) stupnjem reprodukcijaska depopulacije.

Očigledno je podizanje razine fertiliteta prvenstvena zadaća populacijske politike. Pritom je, u cilju općeg demografskog probitka, nužno poticati svakoliki razvoj manjih gradova, a otežavati doseljavanje u najveće, posebice u Zagreb.

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