

# PRELIMINARY DEMOGRAPHIC ASPECTS ON THE IX<sup>th</sup>–X<sup>th</sup> CENTURY POPULATION FROM THE INTRA-CARPATHIAN SPACE (THE ALBA IULIA NECROPOLE)

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The authors develop a demographic study on an osteological series formed of 342 skeletons, digged out from the IX<sup>th</sup>–X<sup>th</sup> century necropole of Alba Iulia. Sex and age distribution of the skeletons permits the following observations: a high mortality of subjects under 20 years of age and a very low one in those older than 60; the subjects having exceeded the adult age (20–x years) represent slightly more than half of the population (about 61%), most of them having died during maturity; if considering the sex criterion, a higher mortality was recorded in men, comparatively with women (about 37% *versus* only about 21%), with the exception of the adult age, when a higher number of deceases is registered in women (about 14% *versus* about 6%); the average life time for the whole population is quite low (around 24 years), which results from the high mortality of children; on sexes, for the subjects having exceeded the age of 20, the average life time is about 8 years longer in men, *versus* women (42 years comparatively with 34). The results on the demographic situation of the pre-feudal population from Alba Iulia should be viewed, at least for the time being, as only preliminary.

*Key words:* life expectancy at birth, life expectancy at 20 years, probability of death, sex ratio.

## 1. INTRODUCTION

The archaeological diggings developed between 1979–1981, by a group of specialists from the Union Museum of Alba Iulia, in the North-Western part of the town, in the area known as “the Roman plateau”, provided a rich osteological material, the dating of which attests, beyond any doubt, a succession of necropoles belonging to different periods of time: Roman (II<sup>nd</sup>–III<sup>rd</sup> century), prefeudal (IX<sup>th</sup>–X<sup>th</sup> century) and early feudal (XI<sup>th</sup>–XIII<sup>th</sup> century) [2, 3]. The whole osteological material (more than 1,500 skeletons) was sent to the Section of Anthropological Researches of Iași, for the initiation of a complex paleo-anthropological (morpho-biological, demographic and paleo-pathological) study. Up to now, only 674 skeletons have been investigated, of which 128 are dated as belonging to the Roman period, 342 to the pre-feudal period and 206 – to the early feudal one. The study is still in progress, as only the Roman pieces (II<sup>nd</sup>–III<sup>rd</sup> century) have been analyzed on the whole.

Out of the osteological material belonging to the prefeudal period, digged out from the “Stația Salvare” cemetery (diggings made by archaeologist M. Blăjan

between 1980–1981) [4], a complex study was performed on only 342 skeletons, the partial results obtained on the anthropological structure of the population being discussed in a previous study [7].

## 2. MATERIALS AND METHOD

Once generally acknowledged that analysis of the anthropological structure of the various groups of population cannot leave aside some demographic aspects, such as estimations on the number and density of inhabitants in certain areas, on general and infantile mortality, on the mortality ratio on sexes and age, on life expectancy at birth, etc., the present paper will discuss the results on the demographic situation in the prefeudal population of Alba Iulia (IX<sup>th</sup>–X<sup>th</sup> century), even if only from a preliminary perspective.

Determination of sex and age for each skeleton in part was based on the working methods and techniques established at the international meetings of anthropologists in Prague (1973) and Sarospatak (1978). Reconstitution of the demographic profile was based on tables, on the distribution of skeletons according to sex and age, as well as on tables on mortality and life expectancy at birth [1].

## 3. RESULTS AND DISCUSSION

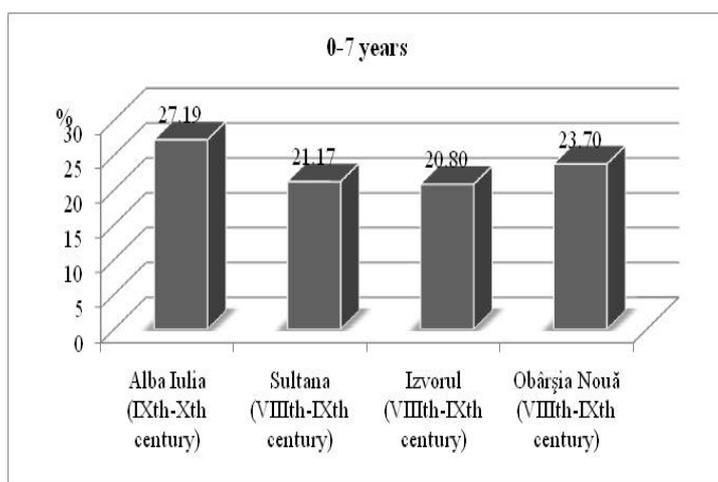
Table 1 illustrates the sex and age distribution of the skeletons forming the osteological series here under analysis.

*Table 1*  
Sex and age distribution of the skeletons of Alba Iulia (IX<sup>th</sup>–X<sup>th</sup> century)

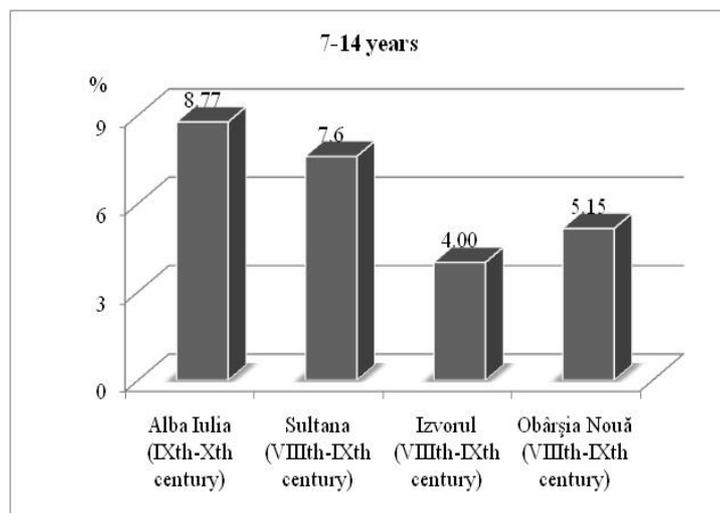
Sex	Men		Women		Indeterminate		Total	
	N	%	N	%	N	%	N	%
<i>Infans I</i> (0–7 years)	2	0.58	2	0.58	89	26.02	<b>93</b>	<b>27.19</b>
<i>Infans II</i> (7–14 years)	6	1.75	11	3.22	13	3.80	<b>30</b>	<b>8.77</b>
<i>Juvenis</i> (14–19 years)	7	2.05	2	0.58	2	0.58	<b>11</b>	<b>3.22</b>
<i>Adultus</i> (19–30 years)	22	6.43	49	14.33	–	–	<b>71</b>	<b>20.76</b>
<i>Maturus</i> (30–60 years)	88	25.73	39	11.40	–	–	<b>127</b>	<b>37.13</b>
<i>Senilis</i> (60–x years)	5	1.46	3	0.88	–	–	<b>8</b>	<b>2.34</b>
Indeterminate	2	0.58	–	–	–	–	<b>2</b>	<b>0.58</b>
<b>Total</b>	<b>132</b>	<b>38.60</b>	<b>106</b>	<b>30.99</b>	<b>104</b>	<b>30.41</b>	<b>342</b>	<b>100.00</b>

Analysis of data from Table 1 strikes firstly by the high ratio represented by children with ages between 0–14 years (about 36%) and especially of those with

ages between 0–7 years (*infans I* – about 27%). The deceases recorded during adolescence (14–19 years) attain only about 33%; together with the already-mentioned ones for young ages, the mortality ratio attained is already around 39%, which may be viewed as one of the highest values recorded, comparatively with other prefeudal series under investigation (Sultana – Călărași county [6], Izvorul – Giurgiu county [8], Obârșia Nouă – Olt county [5], even if their dating is already one century anterior to the series here under study, the geographical area being also different – *i.e.*, the Southern extra-Carpathian region (Fig. 1a, 1b, 1c, 1d).



a



b

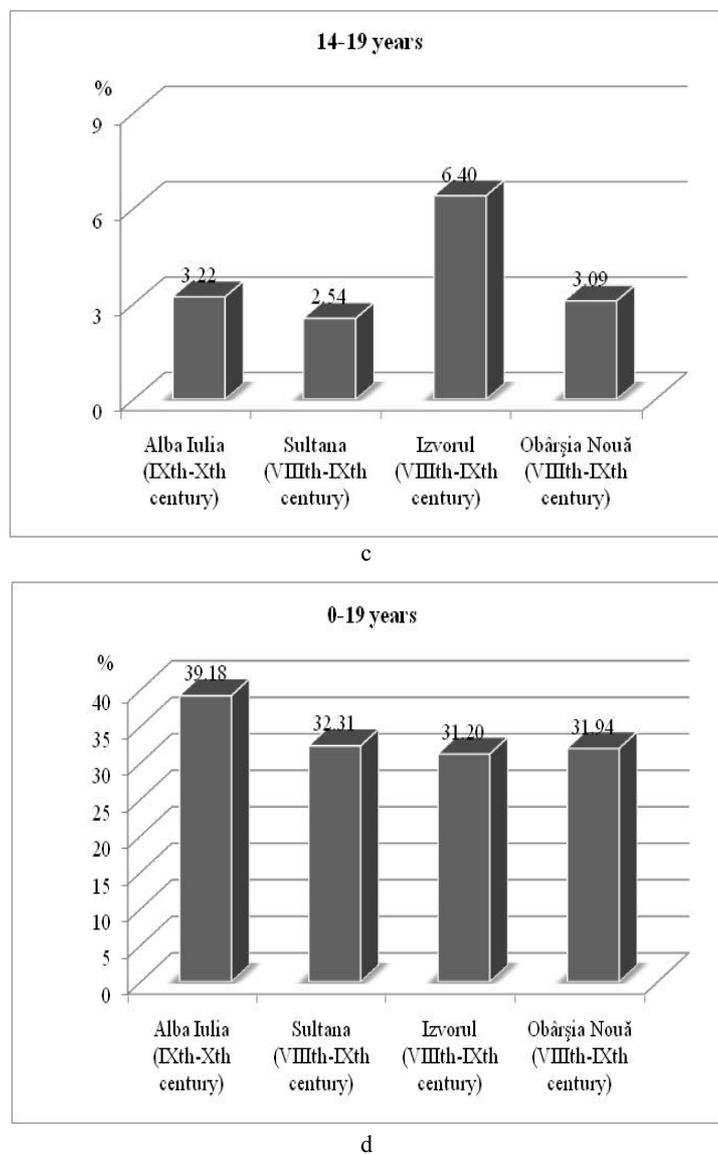


Fig. 1. Mortality of young groups in some prefeudal populations.

The above considerations show that it was only 61% of the whole population that had reached at least an adult age, of whom about 21% did not attain maturity, about 37% died in full maturity and only about 2% attained old ages (over 60 years). From the viewpoint of sex distribution, a higher mortality rate is registered in men, comparatively with women (about 39% *versus* about 31%, at a *sex ratio* index of 2.26). In turn, in the adult stage (19–30 years), a higher decese

frequency is recorded in women, comparatively with men (about 14% *versus* about 6%, with a *sex ratio* index of 0.45). Such a situation is even better evidenced if analyzing the tables describing the decease distribution on semi-decades of age (Table 3), according to which the mortality ratio in women is higher between 20–35 years (about 54%) while a similar situation appears in men of 30–50 years (about 53%, with almost equal percent values for the 4 semidecades). Such a phenomenon may be explained by the fact that, in the case of women, the adult age and the first part of the mature one correspond to the period of maximum fertility, which – under the conditions of those times (scarce hygiene and medical assistance) – assumed high risks of decease during childbirth. On the other hand, the high number of man deceased in their maturity stages may be the result of their involvement in various military activities, according to which the dead ones were buried in the vicinity of the battlefield and not in their native places, which also supports the hypothesis that the masculine population had been even more numerous.

Another important demographic index considered in the evaluation of the demographic profile refers to the life expectancy at birth and at 20 years, calculated on the basis of the deceases recorded on semi-decades, of the survivor percent of the probability of death (Tables 2 and 3), as well as on the average life duration of this population.

Table 2

Mortality ratio and life expectancy at birth for the whole population (0–X years)

Class of age	N (D <sub>x</sub> )	% (d <sub>x</sub> )	Survivors (l <sub>x</sub> )	Probability of death (q <sub>x</sub> )	L <sub>x</sub>	T <sub>x</sub>	Life expectancy at birth ( $e_x^0$ )
0–4 years	82	25.55	100.0	0.2555	436.125	2430.300	24.30
5–9 years	27	8.41	74.45	0.1130	351.225	1994.175	26.79
10–14 years	15	4.67	66.04	0.0707	318.525	1642.950	24.88
15–19 years	17	5.30	61.37	0.0864	293.600	1324.425	21.58
20–24 years	25	7.79	56.07	0.1389	260.875	1030.825	18.38
25–29 years	37	11.53	48.28	0.2388	212.575	769.950	15.95
30–34 years	19	5.92	36.75	0.1611	168.950	557.375	15.16
35–39 years	20	6.23	30.83	0.2021	138.575	388.425	12.60
40–44 years	23	7.16	24.60	0.2911	105.100	249.850	10.16
45–49 years	19	5.92	17.44	0.3394	72.400	144.750	8.30
50–54 years	19	5.92	11.52	0.5139	42.800	72.350	6.28
55–59 years	10	3.11	5.60	0.5553	20.225	29.550	5.28
60–64 years	6	1.87	2.49	0.7510	7.775	9.325	3.74
65–69 years	2	0.62	0.62	1.0000	1.550	1.550	2.50

Analysis of the data listed in Tables 2 and 3 permits drawing of the following conclusions:

- life expectancy at birth (corresponding to the average life time) for the whole population (0–x years) is quite reduced (24.3 years), being one of the lowest values recorded among other prefeudal series (Fig. 2); this value remains approximately constant up to adult age, decreasing almost uniformly in the last semi-decades, up to senile ages (51%);
- at the level of sexes, life expectancy at 20 years (53%) is about 8 years longer in men than in women (21.8 *versus* 14.2%), which indicates an average age at death of about 42 years in men and of about 34 years, respectively, in women, a difference maintained up to the age of 30 years, after which – until 50 years – the differences (recorded on semi-decades) get attenuated, being of 1–2 years in favour of men; the observation to be made is that, after the age of 50 years, the values of life expectancy at birth in women slightly exceed those registered in men (about 1 year), which is quite easy to explain, if considering the high number of women deceased at young ages (20–35 years) – the causes being already discussed – and also the high number of men having attained adult ages.

Table 3

Mortality and life expectancy at birth for the 20–x year category of age

Class of age	N (D <sub>x</sub> )	% (d <sub>x</sub> )	Supervisors (1 <sub>x</sub> )	Probability of death (q <sub>x</sub> )	L <sub>x</sub>	T <sub>x</sub>	Life expectancy birth ( $e_x^0$ )
MEN (101)							
20–24 years	11	10.89	100.00	0.1089	472.775	2186.000	21.86
25–29 years	8	7.92	89.11	0.0889	445.750	1713.225	19.23
30–34 years	13	12.87	81.19	0.1585	373.775	1267.475	15.61
35–39 years	13	12.87	68.32	0.1884	309.425	893.700	13.08
40–44 years	15	14.86	55.45	0.2680	240.100	584.275	10.53
45–49 years	13	12.87	40.59	0.3182	170.775	344.175	8.48
50–54 years	14	13.86	27.72	0.5000	103.950	173.400	6.26
55–59 years	9	8.91	13.86	0.6429	47.250	69.450	5.01
60–64 years	3	2.97	4.95	0.6000	17.250	22.200	4.48
65–69 years	2	1.98	1.98	1.0000	4.950	4.950	2.50
WOMEN (79)							
20–24 years	14	17.73	100.00	0.1773	455.675	1420.700	14.20
25–29 years	29	36.71	82.27	0.4462	319.575	965.025	11.73
30–34 years	6	7.59	45.56	0.1666	208.825	645.450	14.17
35–39 years	7	8.85	37.97	0.2333	167.700	436.625	11.48
40–44 years	8	10.13	29.11	0.3480	120.225	268.925	9.23
45–49 years	6	7.59	18.58	0.3999	75.925	148.700	7.83
50–54 years	5	6.33	11.39	0.5557	41.125	72.750	6.39
55–59 years	1	1.26	5.06	0.2490	22.150	31.650	6.25
60–64 years	3	3.80	3.80	1.0000	9.500	9.500	2.50

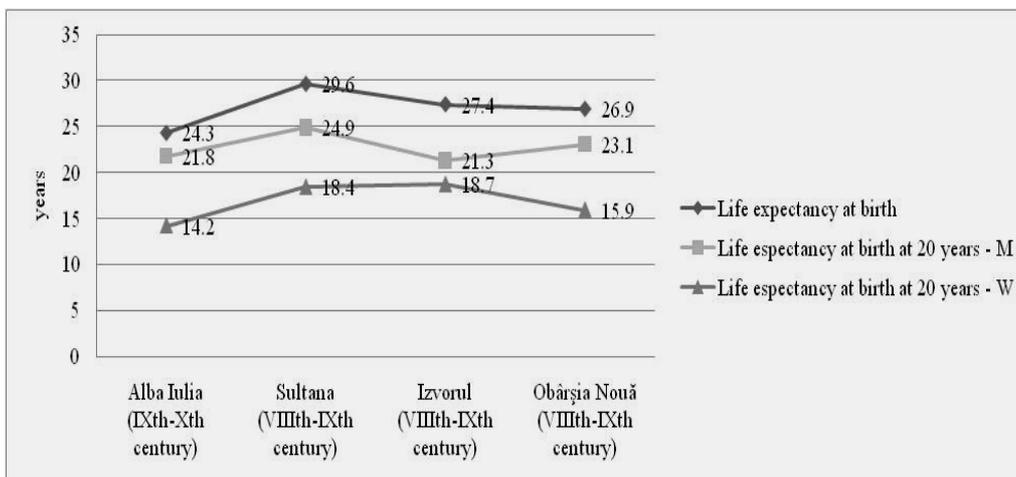


Fig. 2. Life expectancy at birth in some prefeudal populations.

#### 4. CONCLUSIONS

The anthropological study developed on part of the osteological material digged out from the Alba Iulia necropole (“Stația Salvare”) put into evidence some important demographic aspects characterizing the community having devel there along the IX<sup>th</sup>–X<sup>th</sup> centuries.

The main demographic indices (general and infantile mortality, on sexes and ages, the average life time) determined by the anthropological analysis of a number of 342 skeletons involved determination of some especially important elements of any demographic investigation, namely sex and age at death.

Analysis of distribution on groups of ages of the deceased people evidences first a high mortality during childhood (0–14 years, about 36%) and very low in the subjects from the *senilis* group (60–x years, about 2%). In the young groups, the highest ratio of deceases is registered in the first group of age, that of the first childhood (0–7 years about 27% while, in the second stage of childhood (7–14 years) and in adolescence (14–19 years), the frequency of deceases is much lower (about 8% and, respectively, 3%). Out of the deceased subjects with ages older than 20 years, about 21% died during adult age and 37% during maturity.

Subjects’ distribution on ages and sexes evidences some differences between the slightly higher frequencies of death in men, comparatively with women, at mature and senile ages (27% *versus* about 12%). Nevertheless, more women than men die at young ages, when marriages occur, as a result of abortion or birth complications (about 14% *versus* 6%). As to the average life time parameter, and, respectively, of life expectancy at birth, it records a value of 24 years for the whole population, indicating

a very short life time compared to the value recorded in 2004–2006, of 7.2 years (according to the data provided by the National Institute of Statistics).

On sexes, for the 20–x year population segment, life expectancy is about 8 years higher in men than in women (about 22% *versus* 14%), which indicates an average life time around 42 years in men (*versus* 68.7 in 2004–2006), and around 34 years, respectively, in women (*versus* 75.8 % in 2004).

A comparative analysis between these data and those registered for other populations, having lived in the same period in other Romanian regions, leads to the conclusion that, at Alba Iulia, the shortest average life time and the highest mortality ratio has been recorded in the young groups (0–19 years), especially in the first childhood (0–7 years). If considering that the series of skeletons under study represents only part of the digged out osteological material, the demographic processing is not viewed as finalized until the investigation of the whole collection, which will also permit approaching of more extended demographic aspects.

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