

The population of the SE corner of Estonia at the end of the Iron Age and in the Middle Ages

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The paper presents a short anthropological survey and demographic situation of the population of the south-eastern corner of Estonia in the 12th–15th centuries – before and after the conquest and Christianisation of the area. The anthropological material (267 burials) from the Siksali 11th–18th century cemetery was used. Richly furnished burials, including also weapons, formed an excellent base for dating. The first inhumation burials appear in the 12th century beside the cremations. The majority of the burials (94%), however, belong to the period of the 13th–15th centuries. The average life expectancy of the population in that period was 24 years. The masculinization index is 1.1 for adults. Male life expectancy at the age of 20 was estimated at 22.8 years and female at 19.2 years. The maximum mortality (both for males and females) occurred at the age of 20–39 years, being especially high for females at 25–34 years (33%), connected evidently with the reproductive age of females and with military activities of males, which is also suggested by weapons in burials, lead bullets or wounds in some skeletons. There were some differences in mortality in age groups of the population in the 13th–13/14th and the 14/15th–15th cc. The masculinization index of the age groups of 20–39 and 40–59 in the earlier period was 0.7 and 2.0, in the later period being 1.2 and 1.2, which refers to a very high mortality of young men at the later time, accompanied also with a high mortality (ca 57%) of children and youth.

The anthropometric characterization of the Siksali population was compared with the archaeological populations of the adjacent territories. Gradual changes took place in all bone dimensions of both males and females. The average cranial length and height of the male population diminished by 7 mm during 300 year and the stature by 5–6 cm.

The Siksali burials reflect vividly the history and the demographic situation of the SE corner of Estonia in a wider morphological and cultural context.

Key words: palaeodemography, craniology, osteology, end of Iron Age, Middle Ages, temporal changes, Estonians

INTRODUCTION

For a better understanding of the morphological-genetical structure and history of the modern population, the knowledge about archaeological populations is of special interest.

In the first millennium AD cremations predominated in Estonia. A few inhumation burials have been discovered dating from the 11th century. The custom of inhumation burials spread more widely in Estonia since the 12th century, being used contemporaneously with cremation burials. Recently some osteological materials from the Siksali 11th–18th cc. cemetery in the most distant south-eastern corner of Estonia have become available. The burials of the cemetery were richly furnished and thus well datable.

The accurate dating provides better possibilities to observe the establishment of the cemetery as well as the temporal changes of the morphological traits of the buried population.

In the present paper, a preliminary survey is given of the demography and anthropology of the population buried in the cemetery.

MATERIALS AND METHODS

Siksali is one of the remotest places in South-East Estonia, near the Misso village, about 3 kilometers from the Estonian–Latvian border and 5 km from the Russian border. The Siksali cemetery is located on a small hillock between two small lakes, Mustjärv and Hino.

Archaeological excavations of the cemetery were carried out in 1980–1988, 1990–1991 and 1993 under the supervision of the archaeologists Silvia Laul and Jyri Peets.

Four fifths of the cemetery has been excavated. The burial place at Siksali was used in the 11th–18th centuries, the most intensive period being from the second quarter of the 13th to the third quarter of the 15th century. Into the time of the use of the cemetery falls the German conquest of the district, as well as the centuries before and after it.

In the 11th century, grave goods appeared in cremation burials, and the first richly furnished inhumation burials date from the 12th century. Inhumation graves predominate above rare cremations from the 13th century until the desertion of the burial ground in the 3d quarter of the 15th century. The rare later burials date from the 17th and even later, the 18th centuries. From the beginning of the 13th century the opposite orientation of male and female burials appears. The males were buried with their heads to the SW-W direction and females to the NE-E. That is opposite to the Latgals' burials in the southern neighbourhood.

From the excavated part of the cemetery, 284 burials were discovered, among them 26 cremation burials. This study embraces 258 inhumation and 9 cremation burials, altogether 267 individuals, which form 94% of the total of burials.

The age and gender of the burials were determined for 267 burials according to a standard methodology (1–4).

Demographic indicators were calculated using tables of mortality (2) on 251 burials of the period from the second quarter of the 13th century to the third quarter of the 15th century.

RESULTS AND DISCUSSION

In Table 1, the age distribution of skeletons from the Siksali cemetery is shown. Of the 267 skeletons analysed, 132 (49.4%) belonged to children and youth, 135 (50.6%) to adults. For comparison, in the material of the Tartu Jaani church from the 13th–14th centuries, 57% skeletons belonged to children and youth, 43% to adults (5), in Tääksi burials of the 14th–18th centuries the ratio was correspondingly 57.6% and 42.4% (6).

The death rate was high in infants and young children in the Siksali cemetery. However, in comparison with the other cemeteries, it was somewhat lower. Here, we must keep in mind that about 1/5 of the cemetery has not been excavated yet. We can also presume that children's burials are not preserved or have been destroyed by cultivation at one side of the cemetery. It cannot be precluded, either, that the death rate of infants in Siksali actually was relatively low.

The death rate in the adultus group at the Siksali cemetery is unnaturally high (19.9%) being almost as high as in infans I group (20%), which refers to very hard conditions for the young adults. Approximately 11% of the buried belonged to the senilis group.

Among the 135 adult burials uncovered, the male and female burials were approximately equally represented: 69 (51.1%) belonged to males, 66 (48.9) to females. The masculinization index of the burial site is 1.04.

The first period beginning in the 12th century is distinguished by a low intensity of use: the burials were few, inhumation burials even more so. That continued until the conquest of the district at the beginning of the 13th century. From that point until the 15th century the number of burials increased.

The osteological material from the latter period (13th–15th cc.) was temporally divided into two groups: 1) 13th–13/14th cc., the earlier, and 2) 14th–14/15th cc., the later period. The distribution of deaths among children, juveniles, and adults by the 20-years age and gender groups within these two periods were compared. It turned out that the death rate of children as well as of juveniles (42%) was lower in the earlier (13th–13/14th cc.) period than in the later one (Fig. 1). To the age group of 20–39 belong almost by 9% more individuals than to the age group of 40–59. The death rate of males in the older age group exceeds by 2% that in the younger group. The death rate of females, on the contrary, was higher in the younger age group and exceeded that in the older group over 2.5 times (probably due to childbirth complications). The masculinization index for the younger age group is 0.70 and for the older one 2.0. Almost 7% of the individuals belong to the group older than 60 years.

In the 14th–14/15th century the higher death rate was shifted to the groups of children and youth (57%) (Fig. 1). The male death rate in the age group of 20–39 exceeds that of the females of the same age. The masculinization index is 1.2. In the older group (40–59) the number of the individuals was only 1/3 of the previous one. These figures refer to a very high death rate among young males, supposedly connected with military actions. Like in the previous period, the share of the individuals aged 60 and more among the burials is over 6%.

Table 1. Age distribution of the skeletons of Siksali cemetery

Age group	Age limits	Number of burials and % of population	
Infant	0–1	23	8.61
Infans I	1–6	54	20.22
Infans II	7–12 (14)	39	14.61
Juvenilis	(13) 15–19	16	5.99
Adultus	20–34	53	19.85
Maturus	35–54	47	17.60
Senilis	55–(75)	28	10.49
Adultus/maturus	20–54	1	0.38
Maturus/Senilis	35–(75)	4	1.50
Adultus/Senilis	20–(75)	2	0.75
Total:		267	100.00%

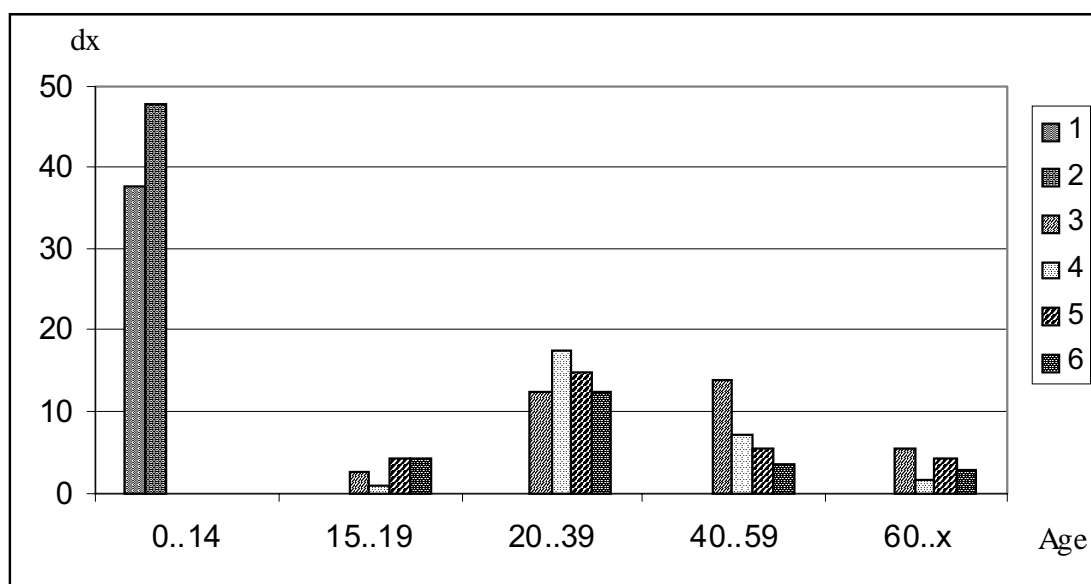


Fig. 1. Distribution of deaths among age groups at Siksali cemetery in 13th–13/14th and 14/15th – 15th cc.
1 – children 13th–13/14th cc; 2 – children 14/15th – 15th cc; 3 – males 13th–13/14th cc; 4 – females 13th–13/14th cc; 5 – males 14/15th – 15th cc; 6 – females 14/15th – 15th cc

Palaeodemographic analysis was carried out on the basis of 251 burials of the period from the 1st quarter of the 13th century to the 3rd quarter of the 15th century.

Of the 251 skeletons buried during the period under study, 126 (50.2%) belonged to children and youth, 125 (49.8%) to adults. Among the latter, 66 (52.8%) were males and 59 (47.2%) females. The masculinization index was 1.12.

Of 251 skeletons under study, 22 (9%) belong to the infant burials, 35% to children; approximately 23% of the individuals had died at the age of 0–4. Actually, more than half (51.8%) of the children in the age group 0–14 had died before the age of 5. The lowest death rates appear among the children in the age group of 11–14 and among the juvenile group (Fig. 2).

Analysis of the mortality distribution in Siksali shows that the highest male (47.8%) as well as female (59.8%) mortality occurred at the age 20–39. In the case of males it can be the result of hostilities, while in females it was probably connected with the reproductive age as due to childbirth complications. Female mortality culminates at the age of 25–34, but it is high also in the age group 35–39.

A little more than half of the male population (52.2%) reached the age of 40, among females the corresponding number was only 40.2%. 47.8% of males and 59.8% of females died before the age of 40. Before the age of 45 the male death rate was 57.6% (42.42% of survivors), the respective numbers for females being 70% with 30% of survivors.

The expectation of life at birth (e_0^0) was 23.98 years for Siksali population. Life expectancy at the age of 20 (e_{20}^0) was estimated to be 22.8 years for males and 19.2 years for females. For comparison: male life expectancy

at the age of 20 for 14th–18th cc population of Tääksi was 20.38 (6), for 13th–15th cc populations of Ikšķile and Mārīņšala – 20.2 (7). The corresponding female life expectancy was 17.5 and 13.7. In comparison with the other populations, life expectancy for males at the age of 20 was nearly the same in Siksali, Tääksi and Ikšķile-Mārīņšala. Life expectancy for females at the age of 20 was highest at Siksali and lowest at Ikšķile-Mārīņšala.

Expectation of life for males in the Siksali population was higher than for females in each age group, the difference being 3.6 years in young adult ages and diminishing to 0.6 at senile age.

The demographic data on the Siksali population of the 12th–15th cc. refer to hard living conditions, especially for the male population. The maximum rate of deaths occurs at the younger and middle-adult ages. It is evidently connected with the reproductive age of females and with the military activities of males, which is also suggested by weapons in burials and lead bullets or wounds in some skeletons. A very high mortality of young men in the period of the 14th–15th cc., accompanied with a high mortality of children and youth suggest especially hard living conditions. Several hostilities, e.g., between the Livonian Order and the Principality of Pskov in the mid-14th century, fall into this period. Military activities are also indicated by the construction of the castles in Vastseliina as well as Marienburg (Aluksne) in the middle of the 14th century.

This was the period of ancient struggle for independence for Estonians. Military actions were often accompanied by epidemics. According to the Heinrich's chronicle of Livonia, famine occurred in 1211–1212. The times to follow were also difficult due to ecological changes – climate began to grow cooler in the 13th century.

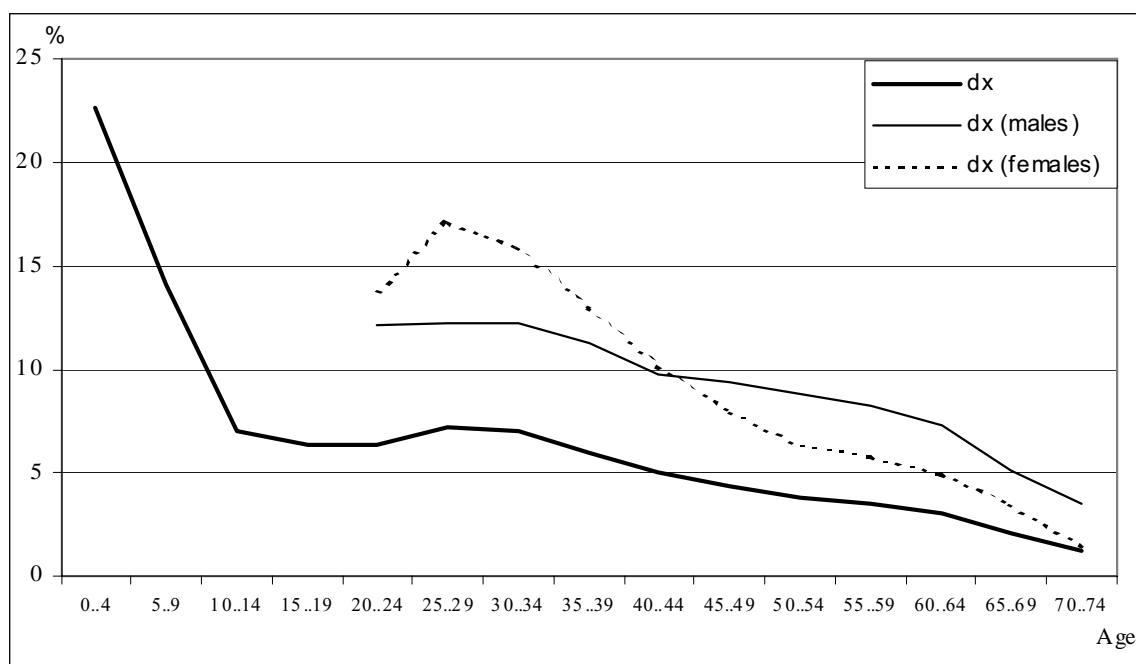


Fig. 2. Distribution of deaths among age groups at Siksali cemetery

Anthropometric characterisation of the Siksali (12th–15th cc.) population

The Siksali 12th–15th cc. cranial sample is characterised by a wide range of variation of the traits. According to the mean preliminary data, the male skulls belong to the mesocran, mesomorphic cranial type. The Siksali male cranial sample was compared with other Estonian samples by cluster analysis on the ground of 9 traits. In the comparison of Estonian samples with those from the southern adjacent territories from the 1st millennium AD and from the first half of the 2nd millennium, seven traits were used (8). In the first case, the Siksali sample joins into the mesocran cranial samples grouping with the Viski (14th–15th cc.), near Pechory, and the Kaberla, North Estonia (15th–17th cc.) samples. On the other hand, to that grouping belong the South-Eastern and North-Eastern cranial samples (like Otepää and Jõuga) from the same period of time.

According to the other cluster analysis, the Siksali sample joins the grouping of the mesomorphic cranial samples, constituted by Siksali (12th–15th cc.), and Selpils (13th–15th cc.), Ikšķile and Mārtiņšala (14th–15th cc.) from Latvia, and Viski (14th–15th cc.) near Izborsk. The other part of that cluster is formed by samples from Otepää, Makita from South-East Estonia and Jõuga, together with Lejasdopeles (11th–12th cc.) and Jauniela (13th–14th cc.) from Latvia. Apparently these cranial samples are characterised by a common morphological component, and that anthropological type was evidently wider spread in ancient times.

During the whole period of the use of the cemetery, gradual changes were taking place in cranial dimensions as well as in the stature of the population (Table 2). The average cranial length and height, for example, of the male population diminished by 7 mm, bizygomatic breadth by 2.2 mm, the stature by 5–6 cm during 300 years.

Table 2. Average measurements of skulls and stature from the 12th–13th and 14th–15th centuries in Siksali

Measurement	12 th –13 th cc.		14 th –15 th cc.	
	Average	Variation	Average	Variation
1. Cranial length	191.0(10)*	185–200	183.9(10)	175–192
8. Cranial breadth	143.2(10)	140–147	141.9(9)	137–148
17. Basion-bregma height	138.9(7)	136–144	131.6(9)	127–134
45. Bizygomatic breadth	135.4 (5)	134–136	133.2(6)	127–138
48. Upper facial height	72.9(10)	68–76	70.8(10)	66–75
8/1. Cranial index	75.0(10)	70–79.5	77.3(9)	74–79
Stature (9)	175.8(10)	187.3–168.3	169.4(9)	173.7–165.1
Stature (10)	174.5(10)	182.6–169.1	169.9(9)	172.9–166.6

* Numbers in brackets mark the number of individuals.

According to the mean measurements of skulls from the 12th–13th cc. at Siksali, similar population was spread in the 10th–12th centuries in the eastern part of Latvia, represented by a complex group of the Latgals (10th–12th cc.) (11), as well as in the Novgorodian region in the 11th–14th centuries (Udrai 11th–14th cc. cemetery) (12).

The mesocranic narrow-faced anthropological type at Siksali in the 14th–15th cc., with a low cranial vault, resemble those in medieval cranial samples of the Žemaičiai (Samogitians): Western – the Kuršiai and Skalviai, Northern as well as Southern Samogitians (13). Some similarities in cranial traits of the Siksali as well as the Viski samples with Prussian and Jotvingian samples may refer to the migrations of the more western populations to eastern and northeastern territories of the Eastern Baltic (probably after the Migration Period?). The migrations of the population groups from south- and westernmore districts to South-East Estonia, especially in the first half of the first millennium, may be reflected in the modern population genetic structure of South-East Estonia (14). However, a more profound study of the Siksali 12th–15th cc. osteological material is required to explain the genesis of the morphological type of the population.

The Siksali burials reflect vividly the history and demographic situation of the SE corner of Estonia in a wider morphological and cultural context.

CONCLUSIONS

1. Paleodemographic analysis of the 13th–15th century population of Siksali indicates that infant life expectancy was 24 years, adult life expectancy being 22.8 years for males and 19.2 years for females.

2. Mortality of both males and females had only one maximum – at the age of 20–39. Female mortality culminates at the age of 25–34, which might be a consequence of childbirth and hard social conditions. The male mortality curve is smoother (up to the age of 35–39). The high mortality of young males may be caused by a high violence rate in the society, i.e. military conflicts. A particular indicator of it is the higher mortality of males than females at the age of 20–39 in the 14th–15th centuries.

3. According to preliminary anthropometric data, the male cranial sample of Siksali (12th–15th cc.) belongs to the mesocran cranial type of skulls spread in the 12th–15th century in Eastern Estonia. They are close to the version of the mesocran type that was spread on the lower and middle reaches of the Daugava River and near Izborsk in the same period.

4. During the whole period when the cemetery was in use, cranial dimensions as well as the body stature were decreasing.

5. The massive dolicho-mesocran skulls of the early male population of Siksali (12th–13th cc.) resemble greatly the 11th–14th century skulls from Udrai in Novgorod district and are rather similar to those of the 10th–12th cc. Latgals from Eastern Latvia.

6. The later male population of Siksali (14th–15th cc.) is characterised by mesocran skulls with a low cranial vault and a narrower face. The closest parallels to that cranial type can be found from the areas towards south and south-west from South-East Estonia. e.g., from Žemaitija.

7. Changes of cranial dimensions as well as body stature could be explained by temporal changes. However, in Siksali, a small influx of inhabitants could have taken place supposedly at the beginning of the 13th century when the opposite orientation of burials appears.

8. The modern population genetic structure of South-East Estonia may reflect the demographic and migration processes from southern and southwestern directions at the end of the 1st millennium and at the beginning of the 2nd millennium.

9. A more profound study of the Siksali 12th–15th cc. osteological material is required to explain the genesis of the morphological type of the population.

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