Oct 30th, 12:00 AM - 12:00 AM

PHENOTYPIC AND ALLELIC VARIATIONS OF BLOOD TYPES AT DIFFERENT TIME AND SPATIAL INTERVALS

Hyzer Rizani
University for Business and Technology, hyzer.rizani@ubt-uni.net

PHENOTYPIC AND ALLELIC VARIATIONS OF BLOOD TYPES AT DIFFERENT TIME AND SPATIAL INTERVALS

Hyzer Rizani[1], Vita Radoniqi[1], Magbule Rizani[1], Naser Kamberi[1]*, Shkelzim Ukaj[1]

[1]UBT- Higher Education Institution, Address: Kalabria , street RexhepKrasniqi Nr. 56, Prishtina 10000, Kosovo
*E-mail : naser.kamberi@ubt-uni.net

ABSTRACT

In the human population blood types are different which are due to time, space and evolutionary processes. During this research, we used a questionnaire to collect material for the groups. The sample in this paper includes a total of 2529 individuals from six settlements as follows: Prishtina-752, Lipjan -534, Gjakova-436, Peja-184, Ferizaj-338 and in Prizren-285. Knowing that their antigens in the human population react selectively to the antigen of viruses and bacteria, which cause various diseases, we will investigate their correlation with blood types[2]. Thus, in this research we have some cases of diseases which are related to blood types. All this data is recorded in the data evaluation software. Mathematical-statistical methods were used to obtain these results. To visually observe the cases we have used the method of digital genealogical coding of adjectives which play the role of genes[1],[2].

Keywords:frequency, blood type, allele, phenotype

INTRODUCTION

According to the genealogical coding, we can track the visualization of the blood types by generations and thus confirm the inherited type, the distribution of the blood type as well as the correlation with any disease[3]. We have provided codes for each group. 0 = 1; A = 2; B = 3 and AB = 4. From the questionnaire,we observed cases of genetic diseases and there was a correlation with blood type. With this study we have noticed that the population of Presevo Valley has an attendance of both blood type and genetic diseases[5]. We have created some statistical tables where we have categorized the individuals based on the blood types that they belong to.

EXPERIMENITAL

In this study, we collected samples in 6 different settlements and areas in Kosovo and the Presevo Valley. This material was collected according to the questionnaire in families. The collection was done without selection and in ambulance registers. We also used the figures for blood types as follows: 0 = 1; A = 2; B = 3 and AB = 4, for the male gender we have marked the number 1, while for the female gender we have marked the number 2. This idea has also been presented by foreign authors such as the Hungarian scholar Ludwig von Thallóczy as for blood types across generations, as for the biomorphological features, which says that: "There is no other people in the Balkans who know how to connect their history with ancient times in an accuracy and in the genealogical order of themselves as the Albanian people"[5].

RESULTS AND DISCUSSION

The material for each settlement where we interviewed people is presented in the following tables at different time intervals and in the form of generations.

Table-1:Individuals sorted by blood type in Pristina

Time intervals	Blood Type – Pristina				
	0	A	B	AB	Total
1941-1960	59	32	16	2	109
1961-1980	120	95	31	3	249
1981-2000	170	95	48	11	324
2001-2020	29	19	19	3	70

Table-2:Individuals sorted by blood type in Lipjan

Time intervals	Blood Type – Lipjan				
	0	A	B	AB	Total
1941-1960	41	19	4	0	64
1961-1980	92	42	15	2	151
1981-2000	134	79	27	3	243
2001-2020	32	30	10	4	76

Table-3:Individuals sorted by blood type in Gjakove

Time intervals	Blood Type – Gjakove				
	0	A	B	AB	Total
1941-1960	39	27	5	0	71
1961-1980	88	43	17	1	149
1981-2000	93	48	20	2	163
2001-2020	29	19	4	1	53

Table-4:Individuals sorted by blood type in Peje

Time intervals	Blood Type – Peje				
	0	A	B	AB	Total
1941-1960	66	7	2	0	75
1961-1980	22	10	6	0	38
1981-2000	15	16	3	1	35
2001-2020	13	19	3	1	36

Table-5:Individuals sorted by blood type in Ferizaj

Time intervals	Blood Type – Ferizaj				
	0	A	B	AB	Total
1941-1960	25	20	3	0	48
1961-1980	39	42	16	1	98
1981-2000	69	33	26	4	132
2001-2020	23	24	11	2	60

Table-6:Individuals sorted by blood type in Prizren

Time intervals	Blood Type – Prizren				
	0	A	B	AB	Total
1941-1960	24	12	3	0	39
1961-1980	57	39	12	1	109
1981-2000	53	26	19	3	101
2001-2020	16	11	6	3	36

So, as seen visually we have presented the number of respondents in 6 settlements. So for each generation we have presented the number of individuals for each blood group[5].

Table-1**:**Individuals sorted by blood type in the 6 settlements where the information was obtained

Time intervals	Blood Type – Pristina, Lipjan, Gjakove, Peje,Ferizaj dhe Prizren				
	0	A	B	AB	Total
1941-2020-Pristina	378	241	114	19	752
1941-2020-Lipjan	299	170	56	9	534
1941-2020-Gjakove	249	173	46	3	436
1941-2020-Peje	116	52	14	2	184
1941-2020-Miratoce	156	119	56	7	338
1941-2020-Prizren	150	88	40	7	285

Then we calculated the frequency of blood type phenotypes for each settlement. The results are presented in the following tables and diagrams.

Table-7**:**Phenotypic frequency of blood type in Pristina

Time intervals	Blood Type - Pristina			
	0	A	B	AB
1941-1960	0.54	0.3	0.14	0.02
1961-1980	0.48	0.38	0.12	0.01
1981-2000	0.52	0.29	0.15	0.03
2001-2020	0.41	0.27	0.27	0.04

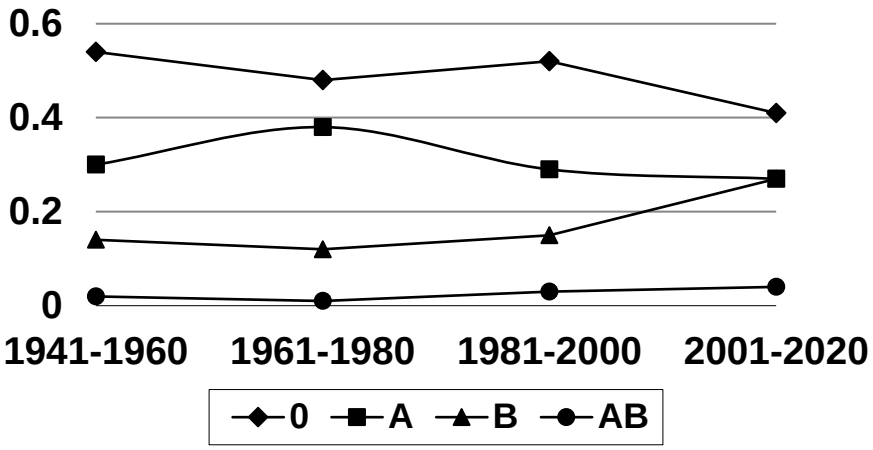

Diagram-1:Phenotypic frequency of blood type at different time intervals in Pristina

Table-8**:**Phenotypic frequency of blood type in Lipjan

Time intervals	Blood Type - Lipjan			
	0	A	B	AB
1941-1960	0.64	0.3	0.06	0
1961-1980	0.6	0.28	0.1	0.01
1981-2000	0.55	0.32	0.11	0.01
2001-2020	0.42	0.4	0.13	0.05

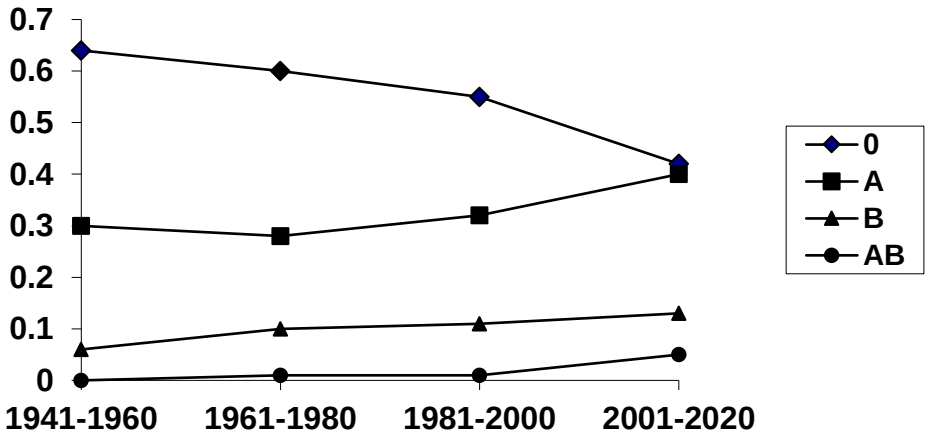

Diagram-2: Phenotypic frequency of blood type at different time intervals in Lipjan

Table-9:Phenotypic frequency of blood type in Gjakove

Time intervals	Blood Type - Gjakove			
	0	A	B	AB
1941-1960	0.55	0.38	0.07	0
1961-1980	0.6	0.28	0.11	0.006
1981-2000	0.57	0.3	0.12	0.01
2001-2020	0.55	0.36	0.07	0.02

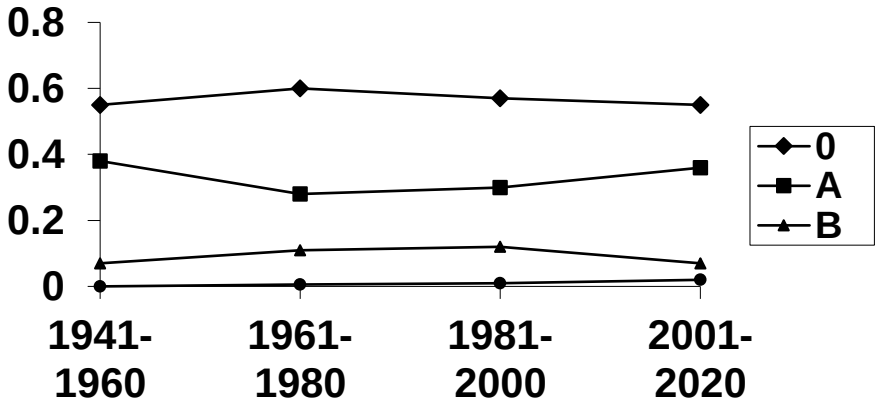

Diagram-3: Phenotypic frequency of blood type at different time intervals in Gjakove

Table-10: Phenotypic frequency of blood type in Peje

Time intervals	Blood Type - Peje			
	0	A	B	AB
1941-1960	0.88	0.093	0.026	0
1961-1980	0.58	0.26	0.16	0
1981-2000	0.43	0.46	0.08	0.03
2001-2020	0.36	0.53	0.083	0.027

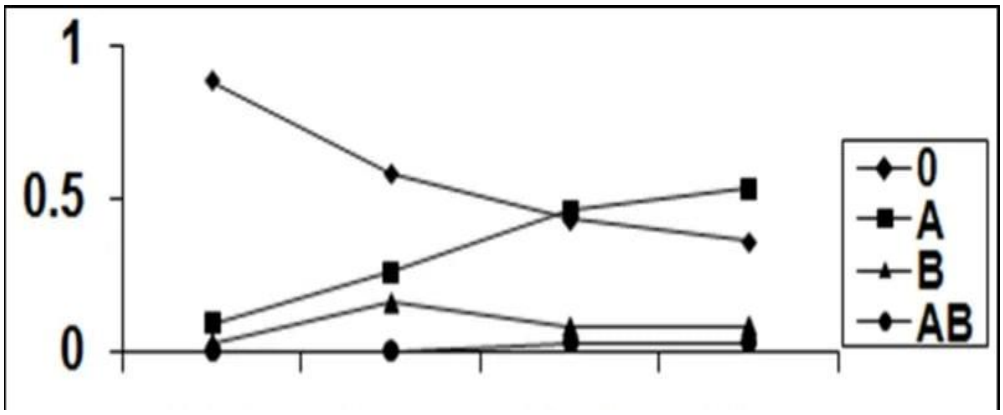

Diagram-4:Phenotypic frequency of blood type at different time intervals in Peje

Table-11:Phenotypic frequency of blood type in Ferizaj

Time intervals	Blood Type - Ferizaj			
	0	A	B	AB
1941-1960	0.52	0.42	0.06	0
1961-1980	0.4	0.43	0.16	0.01
1981-2000	0.52	0.25	0.2	0.03
2001-2020	0.38	0.4	0.18	0.03

Diagram-5:Phenotypic frequency of blood type at different time intervals in Ferizaj

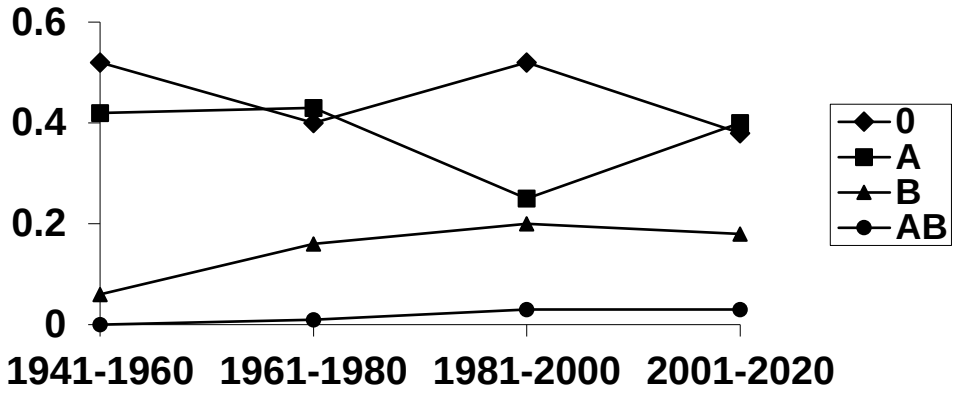

Table-12:Phenotypic frequency of blood type in Prizren

Time intervals	Blood Type - Prizren			
	0	A	B	AB
1941-1960	0.62	0.3	0.08	0
1961-1980	0.52	0.36	0.11	0.01
1981-2000	0.52	0.26	0.19	0.03
2001-2020	0.44	0.3	0.17	0.083

Diagram-6:Phenotypic frequency of blood type at different time intervals in Prizren

According to the analysis of the diagram, we can highlight the following:

First, in all areas populated in this study, the phenotype for blood type 0 has a higher frequency than other blood groups[3].

Second, there are attempts at variability across all blood types at time intervals.

Third, this variability is related to the migration process at different time intervals.

VARIATION OF BLOOD ALLELES IN THIS RESEARCH

From the phenotype values obtained, we also calculated the frequency of blood type alleles[6]. Since blood types are dependent on three alleles I^o, I^A and I^B, we calculated each allele separately[4].[7]. According to the results obtained, the allele frequencies in all settlements have approximately the following values: 0.7 (O), 0.2 (A) and 0.1 (B).

Table-13:Blood allele frequencies

Settlements	Frequency of alleles		
	I^0	I^A	I^B
Pristina	0.7	0.2	0.1
Lipjan	0.75	0.19	0.06
Gjakove	0.75	0.19	0.06
Peje	0.79	0.16	0.05
Ferizaj	0.68	0.22	0.1
Prizren	0.73	0.19	0.08

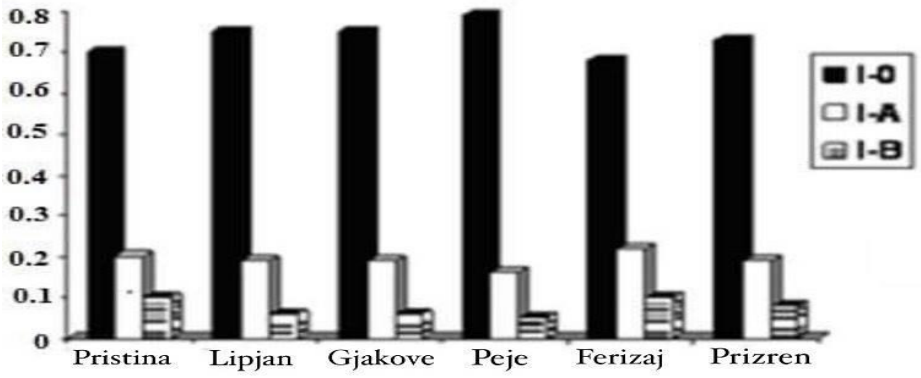

Diagram-7**:**Frequency of alleles in settlements

Based on the results obtained we can emphasize that:

Alleleof 0 blood typeis the most present in every settlement.

CONCLUSION

Based on the phenotypic values of the blood, we can say that they are very approximate.

The frequency of blood alleles in all settlements is as follows: 0 = 0.3; A = 0.2 and B = 0.1.

In Peja, the value of the frequency of the 0 allele is higher than other settlements and this may be as a result of the flow of genes in Peja from other areas.

The phenotypic frequency through 20-year time intervals in Peja has a pronounced fluctuation which, as we said above, is related to numerous immigrations, while on the other hand in other settlements there is a more stable genetic balance.

REFERENCES

1. Bajrami, Z., Mikerezi, I.1988, "*Genetics" (second part)*. Tirana, 563
2. Emery, E. H. A., Muller, F. R. 1987. "*Elements of medical genetics"*, 66
3. Kamberi, N., Rizani, H. 2019. "*Molecular cell biology with genetics"*. Pristina
4. Memushi, L. 2003. "*Human Biology"*. SHBLU Tirana, 72-84
5. Mustafa, N. 2004. "*Demographic-genetic study of the population of Presevo"*.(Master thesis, Presevo).
6. Rexha, T. 2010. *"Molecular Biology"(SHBLU).*Tirana,p.130.
7. Shehu, B., Çabej, N., 1999. "*Genetics"*.Tiranë, 88-102.