Aleksander GANCHEV

The Bulgarians of Bessarabia in the 1940s: factors of the demographic process, birth rate and mortality

CZU: 314.04(477+478)(=163.2)"194" https://doi.org/10.52603/rec.2026.39.07

Rezumat

Bulgarii din Basarabia în anii ’40 ai sec. XX: factorii procesului demografic, rata natalității și mortalitatea

Articolul examinează mecanismele de transformare a dezvoltării demografice a populației bulgare din Basarabia în anii ’40 ai sec. XX, sub influența represiunilor, deplasărilor forțate și foametei din 1946–1947. Sunt analizate interacțiunile dintre factorii demografici endogeni ai reproducerii populației și circumstanțele externe legate de transformările socio-economice din anii 1940. Natalitatea, ca proces istorico-demografic, este analizată prin patru dimensiuni analitice principale: rata brută a natalității, variabilitatea indicatorilor fertilității, vârsta la prima naștere și modelul sezonier al nașterilor. Mortalitatea reprezintă un indicator-cheie al stării generale a societății și al proceselor sale de dezvoltare. Împreună cu natalitatea, mortalitatea joacă un rol fundamental în formarea sporului natural al populației. Această abordare conceptuală oferă o bază solidă atât pentru studiile retrospective, cât și pentru cele prospective asupra mortalității. Studiul concluzionează că transformarea factorilor fertilității și mortalității delimitează două etape ale tranziției demografice. Prima etapă a început în ultimul sfert al secolului al XIX-lea, când mortalitatea ridicată a început să scadă ca parte a unui proces mai amplu, care a inclus și reducerea ratelor fertilității. A doua etapă a fost determinată de intervenția factorului exogen al foametei din 1946–1947 în mecanismele mortalității naturale, ceea ce a condus la o transformare substanțială a structurii acesteia.

Cuvinte-cheie: bulgarii, Basarabia, procese demografice, natalitate, mortalitate, represiuni, foamete

Резюме

Болгары Бессарабии в 40-х гг. XX в.: факторы демографического процесса, рождаемости и смертности

В статье рассматриваются механизмы трансформации демографического развития болгарского населения Бессарабии в 1940-х гг. под влиянием репрессий, принудительных переселений и голода 1946–1947 гг. Анализируется взаимодействие эндогенных демографических факторов воспроизводства населения и внешних обстоятельств, связанных с социально-экономическими преобразованиями 1940-х гг. Рождаемость как историко-демографический процесс исследуется с учетом четырех основных аналитических измерений: общий коэффициент рождаемости, вариативность показателей фертильности, возраст при рождении первого ребенка и сезонность рождений. Смертность представляет собой ключевой показатель общего состояния общества и процессов его развития. Вместе с рождаемостью смертность играет фундаментальную роль в формировании естественного прироста населения. Такой концептуальный подход создает прочную основу как для ретроспективных, так и для перспективных исследований смертности. В статье делается вывод, что трансформация факторов рождаемости и смертности очерчивает два этапа демографического перехода. Первый этап начался в последней четверти XIX в., когда высокая смертность начала снижаться как часть более широкого процесса, включавшего также снижение уровня рождаемости. Второй этап был обусловлен вмешательством экзогенного фактора голода 1946–1947 гг. в механизмы естественной смертности, что привело к существенной трансформации ее структуры.

Ключевые слова: болгары, Бессарабия, демографические процессы, рождаемость, смертность, репрессии, голод

Summary

The Bulgarians of Bessarabia in the 1940s: factors of the demographic process, birth rate and mortality

The article examines the mechanisms of transformation in the demographic development of the Bulgarian population of Bessarabia in the 1940s under the influence of repression, forced displacement, and the famine of 1946–1947. It analyses the interaction between endogenous demographic factors of population reproduction and external circumstances related to socio-economic transformations during the 1940s. Birth rate as a historical-demographic process is explored through four main analytical dimensions: the crude birth rate, variability of fertility indicators, age at first birth, and seasonality of births. Mortality represents a key indicator of the overall condition of society and its developmental processes. Together with the birth rate, mortality plays a fundamental role in shaping natural population change. This conceptual approach provides a solid basis for both retrospective and prospective studies of mortality. The study concludes that the transformation of fertility and mortality factors delineates two stages of the demographic transition. The first stage began in the last quarter of the nineteenth century, when high mortality declined as part of a broader process that included falling fertility rates. The second stage was driven by the intervention of the exogenous famine factor of 1946–1947 in the mechanisms of natural mortality, leading to a substantial transformation of its structure.

Key words: Bulgarians, Bessarabia, demographic processes, fertility, mortality, repression, famine

Birth rate, as a historical and demographic process, is an important factor in population reproduction and is defined in scholarship as a category of a mass phenomenon reflecting the emergence of new individuals within a population. Within this approach, it is customary to examine this category using statistical methods, distinguishing between two concepts: the number of births and the birth rate. The former is understood as an absolute extensive indicator of the number of persons born within a specific chronological period (most often a year), whereas birth rate denotes the intensity of births in a specific historical and ethnocultural environment.

According to the conceptual framework of historical demography, natural birth rate is usually identified as a process occurring under conditions of the complete absence of conscious birth control through contraception and abortion. It is determined exclusively by physiological and structural factors, namely fertility and population structure by sex, age, and marital status (Борисов 2003: 176, Население 1994: 197). The realization of this biological potential in ethnocultural contexts is examined through reproductive behavior, defined as "a system of actions and attitudes that determine the occurrence of birth or its rejection within or outside marriage" (Население 1994: 384).

In one issue of the journal, the characteristics of demographic processes and natural population growth among the "Trans-Danubian settlers" (which included Bulgarians) in Bessarabia at the beginning of the 19th century were examined (Ganchev 2022: 30-40).

A later period in the history of the Bulgarians – the 1940s, a time of upheaval caused by repression and famine – is of particular interest to specialists in the field of demography.

In this article we aim to conduct a statistical analysis of the birth rate among the Bulgarians of Budjak during the 1940s, focusing on the factors of population reproduction. Given the historical and anthropological nature of the study, the following tasks are addressed:

- describing the birth rate of the group in historical dynamics;
- analysing the influence of individual factors on changes in this process, with particular attention to socio-economic and ethnocultural factors;
- determining the impact of reproductive representations on demographic situations within the group.

To address these tasks, three main analytical dimensions are employed, which make it possible to reveal the historical, cultural, and social characteristics of the birth rate: the crude birth rate, the age at first birth, and the seasonality of births. These are examined using methods of grouping averages and relative values, the index method, correlation and regression analysis, and the construction of sample time series. In addition, the use of mass form documents as sources necessitates reference to the concepts of the "conditional" and "actual generation". Taken together, these approaches make it possible to characterise the typicality of the phenomena under study and the traditionality (patriarchy) of reproductive behaviour, as well as its dependence on ethnocultural and historical factors.

The most commonly used category in the study of birth rate is the crude birth rate (CBR). It is calculated as the ratio of the number of live births within one year to the average population of the studied group (Ганчев 2020: 143).

In historical demography, the crude birth rate is regarded as a relatively conditional indicator, since it also includes individuals who are not capable of reproduction. For this reason, demographers consider the total fertility rate (TFR) to be a more accurate indicator. It characterizes the average number of births over a five-year period per woman whose exact age falls within the interval "a – 2.5" to "a + 2.5", where *a* denotes the average age of women at the time of childbirth, calculated based on crude birth rates for the analyzed five-year period (Ганчев 2020: 146-147).

The intensity of childbirth varies across age groups within the reproductive female population. To account for this variation, age-specific fertility rates (ASFR) are also calculated. They provide an indication of the frequency of childbirth in different age categories and make it possible to characterize the influence of the sex and age structure of the population on fertility rates (Ганчев 2020: 148).

The generalised analysis of the crude birth rate (Tab. 1) demonstrates the main trends during the 1930s–1940s. While the birth rate in the period from 1932 to 1937 was 50%, in the early 1940s it fell to 30%. This decline was caused by the outbreak of World War II and changes in the life of the Bessarabian Bulgarians after the incorporation of Southern Bessarabia into the USSR. The beginning of repression (DAOO F.R-8065, op. 2, 13166, 12139 and 18707-p) and uncertainty about the future affected the reproductive behaviour of the population towards birth control. Based on the data presented in Tab. 1, the decline in the birth rate that began in the early 1940s continued throughout the first half of the decade and reached its peak in the second half. The more than threefold decline in the birth rate is ex-

plained by a number of factors. Firstly, in 1944, after the incorporation of Bessarabia into the USSR, a significant part of the male population of reproductive age was mobilised for the labour front and sent to the Urals and Kazakhstan. Secondly, in 1945–1946, a wave of arrests and trials took place, as a result of which part of the male population was executed (DAOO F.R-8065, op. 2, d. 1331), while another part was sent to Siberia (DAOO F.R-8065, op. 2, d. 9617). Thirdly, dekulakisation (KP IA FR-888, op. 1, l. 69-73), collectivisation and, as a result, the famine of 1946–1947 further aggravated the demographic situation. Similar transformations are observed in the analysis of the total fertility rate (Tab. 2). In 1941, it was 4.1 per woman aged 27-32; in 1946 it declined to 2.6, and in 1949 to 1.4. This nearly threefold decrease was the result of the tragic events of the 1940s.

These configurations are further emphasised by the analysis of age-specific fertility rates (Tab. 3). A sample analysis of household registers suggests that the trend towards a narrowing of the childbearing age range continues. On the one hand, the tables show a significant decrease in births among women under the age of 20. While in 1941 the age-specific fertility rate was 16%, by 1946 it had fallen to 6%, and by 1949 to 3%, indicating that early births were becoming extremely rare. On the other hand, the data for 1946 and 1949 show a complete absence of births among women over the age of 50. In all three cross-sections, the birth rate peaks among women aged 24-29. In general, the social turbulence of the 1940s led to a significant decline in age-specific fertility rates. In 1941, the rate was 74 births per 1 000 women; by 1946 it had fallen to 68%, and in 1949, after the famine, to only 35%.

Table 1
Crude birth rates*

	Number of births including infant mortality							Average population						Crude birth rates										
1941	$N_{1932-1936}$ =	1.8	x	742	=	1,336		849	x	6356	=	5396		$N_{1932-1936}$ =	267	/	5396	x	1000	=	50	%		
	$N_{1937-1941}$ =	1.6	x	560	=	896		0.95	x	6356	=	6038		$N_{1937-1941}$ =	179	/	6038	x	1000	=	30	%		
1946	$N_{1937-1941}$ =	1.1	x	703	=	773		0.87	x	7816	=	6808		$N_{1937-1941}$ =	155	/	6808	x	1000	=	23	%		
	$N_{1942-1946}$ =	1.1	x	777	=	855		0.96	x	7816	=	7480		$N_{1942-1946}$ =	171	/	7480	x	1000	=	23	%		
1949	$N_{1940-1944}$ =	1.1	x	1952	=	2147		0.87	x	21951	=	19119		$N_{1940-1944}$ =	429	/	19119	x	1000	=	22	%		
	$N_{1945-1949}$ =	1.1	x	1159	=	1275		0.96	x	21951	=	21007		$N_{1945-1949}$ =	255	/	21007	x	1000	=	12	%		

Table 2
Crude birth rates

	The total number of women aged 32.5 – 37.5														The average number of women aged 32.5 – 37.5					Total firtility rate								
1937–1941	F =	353	+	238	+	258	+	174	+	176	+	127	=	1326	1326	÷	6	=	221	$\Sigma f_{1937-1941}$	=	5N	896	÷	221	=	4.1
1942–1946	F =	497	+	329	+	322	+	265	+	202	+	174	=	1789	1789	÷	6	=	298	$\Sigma f_{1942-1946}$	=	5N	777	÷	298	=	2.6
1945–1949	F =	1,191	+	1109	+	626	+	863	+	567	+	463	=	4819	4819	÷	6	=	803	$\Sigma f_{1945-1949}$	=	5N	1159	÷	803	=	1.4

Table 3
Age-specific fertility rates

	1941			1946			1949		
	Chld	F	%	Chld	F	%	Chld	F	%
15-19.	6	382	16	2	362	6	3	1064	3
20-24	36	353	102	44	497	89	37	1,191	31
25-29	33	238	139	49	329	149	85	1109	77
30-34	35	258	136	32	322	99	36	626	58
35-39	6	174	34	15	265	57	32	863	37
40-44	8	176	45	3	202	15	11	567	19
45-50				1	174	6	4	463	9
50>	1	110	9						
Total	125	1691	74	146	2,151	68	208	5883	35

Table 4
Variability of fertility indicators 1941

1941	Number of children									Total
	1	2	3	4	5	6	7	8	9	
15-19	3	1		1						5
20-24	37	26	14	4	1	1				83
25-29	40	59	28	5	3	1			1	137
30-34	7	22	13	8	2					52
35-39	9	9	5	4	3	2				32
40-44	7	11	10	7	1		1	1		38
45-49	5	13	8	7	2	1				36
Total # mothers	108	141	78	36	12	5	1	1	1	383
%	28.2%	36.8%	20,4%	9.4%	3.1%	1.3%	0.3%	0.3%	0.3%	100.0%
Total # of children	108	282	234	144	60	30	7	8	9	882

Table 5
Variability of fertility indicators 1946

1946	Number of children									Total
	1	2	3	4	5	6	7	8	9	
15-19	3	1								4
20 -24	31	16	2	2						51
25-29	31	35	16	4		1				87
30-34	46	73	45	25	2	3				194
35-39	22	58	47	32	6	1	1			167
40-44	22	44	30	30	9	5	1			141
45-49	30	34	29	25	9	3		1	1	132
Total # mothers	185	261	169	118	26	13	2	1	1	776
%	23.8%	33.6%	21.8%	15.2%	3.4%	1.7%	0.3%	0.1%	0.1%	100.0%
Total # children	185	522	507	472	130	78	14	8	9	1925

Table 6
Variability of fertility indicators 1949

1949	Number of children									Total
	1	2	3	4	5	6	7	8	9	
15-19		2								2
20-24	91	40	4	1						136
25-29	160	150	39	11	4					364
30-34	88	156	94	32	2	5	1			378
35-39	74	196	183	91	43	15	3		1	606
40-44	45	103	130	87	45	14	7			431
45-49	68	77	87	65	27	6	4			334
Total # mothers	526	724	537	287	121	40	15	1	1	2252
%	23.4%	32.1%	23.8%	12.7%	5.4%	1.8%	0.7%	0.0%	0.0%	100.0%
Total # children	526	1448	1611	1148	605	240	105	8	9	5,700

The concept of *fertility* is transdisciplinary. In general demography, it is commonly understood as an indicator characterising the state and qualitative composition of the population, denoting the reproductive ability of women to bear children. Quantitatively, it is expressed through indicators measured at the population level. Similar approaches are applied in historical demography: to establish the total fertility rate of a particular group, the total number of children born to one woman is calculated. Since this study focuses on fertility as a property of human collectives, the variability of the general fertility rate is examined in a historical perspective. In this research, the reproductive age of women is defined as ranging from 15 to 44 years, although it has been established that in traditional societies this range is, in fact, wider.

The analysis and empirical data from the 1940s characterise the Bulgarians of Bessarabia as a community with a high level of fertility. Despite the transformational processes associated with the transition to a modern type of population reproduction, intra-family factors evidently retained elements of traditional patterns. The trend towards a decrease in the number of children per woman nevertheless continued. In 1941, this indicator amounted to 2.3, while in 1947 and 1949 it was 2.5. It may therefore be assumed that the birth rate remained almost unchanged, whereas demographic losses were primarily expressed through relatively high infant mortality and mechanical factors, which in the 1940s were associated with the tragic events of famine and repression.

A comparison of data from 1941–1949 (Tab. 4-6) shows a certain degree of constancy throughout the decade, while fluctuations in individual indicators remain within the limits of possible arithmetic error. The largest group consists of women with two children, accounting for about one third of the total (36.8% in 1941, 33.6% in 1947, and 32.1% in 1949). Approximately one quarter of women gave birth to only one child (28.2%, 23.8%, and 23.4%, respectively). Nearly the same proportion had three children (20.4%, 21.8%, and 23.8%). Women with four children accounted for 9.4%, 15.2%, and 12.7% of the total. Cases of women with five or more children were relatively rare, ranging from 5% to 8% of all women, while cases of seven or more children were recorded only as isolated instances.

Another important category that reveals the scholarly understanding of fertility processes is the age at first birth, also referred to as the age of the first motherhood/parenthood. This demographic concept has become particularly widespread now in connection with societal challenges in Ukraine (Аксьонова 2018: 53-66) and globally. Along with the narrowing of the reproductive age of childbirth, this indicator is regarded as a serious demographic threat.

As a rule, this category is studied through changes in the average age of the mother in conditional generations, that is, "period mean ages at birth" (Frejka et al. 2006, Аксьонова 2018). Such an approach has a clearly retrospective orientation. At the same time, there are effective and well-established attempts to analyse this category synchronously in real cohorts ("cohort mean ages at birth"), since this indicator demonstrates whether childbirth occurs earlier or later (on average within each generation) and whether there is a tendency to postpone the birth of a child to an older age (Стешенко 2010: 3-14, Аксьонова 2015: 64-74, Аксьонова 2018: 55).

Our empirical materials and calculations make it possible to refine this theory by revealing its features on the basis of data on the Bulgarians of Bessarabia in the 1940s. In particular, this can be achieved by distinguishing between the first and second stages of the demographic transition.

Among the demographic characteristics of the first stage of fertility transition are the correlation between fertility and marriage rates and a decline in the coefficient resulting from a decrease in births among women of older age groups, a lower average age of mothers at first birth, the absence of contraception (which mainly affected the fertility of women of older reproductive age), and a decrease in extramarital fertility.

Among the characteristics of the second stage of the demographic transition are the postponement of childbirth to older ages and, accordingly, an increase in the average age of parenthood, the spread of effective contraception (with the exception of certain social groups), an increase in extramarital fertility, parenthood outside marriage (including consensual unions and single motherhood), and a rise in childlessness among women who have ever been married (Стешенко 2010: 3-14, Аксьонова 2015: 64-74, Аксьонова 2018: 55).

In the historical and anthropological context, the age at first birth reveals the characteristics of public perceptions and related social practices concerning marriage as an institution, as well as customs of procreation.

Data for 1941 indicate a certain return to the traditional model, which may be interpreted as a tendency towards the restitution of patriarchal ways of life.

Table 7
Age of birth of the first child

Age	1941		1946		1949	
13	7	3.4%	3	3.0%	1	0.2%
14			4	4.0%	9	2.1%
15	4	1.9%	1	1.0%	7	1.7%
16	7	3.4%	3	3.0%	5	1.2%
17	2	1.0%	3	3.0%	7	1.7%
18	13	6.3%	5	5.1%	20	4.7%
19	16	7.8%	6	6.1%	36	8.5%
20	24	11.7%	13	13.1%	74	17.5%
21	36	17.5%	18	18.2%	67	15.8%
22	36	17.5%	14	14.1%	65	15.3%
23	22	10.7%	10	10.1%	47	11.1%
24	15	7.3%	9	9.1%	30	7.1%
25	13	6.3%	6	6.1%	27	6.4%
26	10	4.9%	0	0.0%	10	2.4%
27	2	1.0%	3	3.0%	9	2.1%
28	1	0.5%	0	0.0%	5	1.2%
29	4	1.9%	1	1.0%	4	0.9%
30	1	0.5%	0	0.0%	1	0.2%
Total	206	100.0%	99	100.0%	424	100.0%

Tendencies towards a return to a traditional way of life, and consequently to an extensive pattern of birth rate, are clearly observable throughout the second half of the 1940s (Tab. 7). Early first births – defined as cases where the mother was under 18 years of age – accounted for every fifth and every tenth case in 1946 and 1949, amounting to 19.1% and 11.6%, respectively. At the same time, nearly four out of five first births continued to occur when mothers were under the age of 23, accounting for 80.7% in 1946 and 79.8% in 1949. Such indicators clearly testify to a temporary restitution of earlier demographic models among the Bulgarians of Bessarabia and a return to these models under the influence of external factors

The expediency and productivity of appealing to the study of the seasonal factor in historical demography have been recognised since the nineteenth century. On the basis of data from parish registers and personal observations, researchers have examined the seasonality of infant mortality and the seasonality of fertility (Архангельский 1872: 505-509, 544). Over time, attempts have been made to identify the relationships between seasonal fluctuations in marriages, births, and deaths (Авдеев et al. 2002: 35-45).

Beyond purely demographic characteristics, the seasonality of births offers broad heuristic opportunities for analysing the processes of secularisation of society, as well as its worldview and social norms. It is this historical and cultural perspective that we seek to explore on the basis of seasonality data. However, before doing so, it is necessary to focus on three key points:

– firstly, according to studies of the Bulgarian family in the Balkans by Maria Todorova, after marriage 68% of women give birth to their first child within the first year (Todorova 2006: 62). At the same time, the seasonality of marriages is clearly regulated by the Church. In this regard, the seasonality of births should reflect a regular distribution across the months of the year;

– secondly, according to the customs of the Orthodox Church, marital relations are prohibited during periods of fasting. Formally, strict observance of this prohibition should reduce fertility to a minimum during certain periods of the year. The presence of extended fasts (for example, the forty days of Lent before Easter or the Nativity Fast before Christmas) should affect fertility levels in December and September. Verification of this assumption makes it possible to determine the extent to which the Bulgarians of Bessarabia adhered to this tradition at different stages of their lives;

– thirdly, throughout its existence in Budjak, the Bulgarian population constituted a distinctly agrarian community. In this context, all spheres of life were closely linked to the cycles of agricultural labour. This assumption can be tested by correlating the seasonality of conception and birth with these agricultural cycles.

We follow the view of Louis Henry and Alain Blum that, when analysing data from small population groups, seasonal movements should be examined over extended time periods (Анри et al. 1997: 62). This approach is based on the fact that months differ in the number of days, which makes direct comparison problematic and requires standardisation. A standardised value is obtained by dividing the number of births per month by the number of days in that month. The resulting monthly figure is then converted into a conditional value based on 1200 events per year. In this way, each month is assigned the value of 100, regardless of its duration in days (Анри et al. 1997: 62). On the basis of this method, we present the analysis and empirical data on the seasonality of births and conceptions in Bulgarian settlements of Bessarabia in the relevant tables.

According to Tab. 8, in 1941 February returned to a leading position in seasonal fertility, with a value of 221, meaning that approximately every sixth child was born in this month. May (149) and June (132) also retained high positions. Together with April

(110), these months accounted for the birth of every third child in 1941. It is important to note that December, as a month of conception, retained minimal values at 44, which is about half of the average level relative to other months. This situation indicates the persistence of relic religiosity in behavioural practices, as well as the complete loss of dependence on the agricultural calendar of labour cycles.

This historical dynamic is most clearly revealed in Fig. 1. A gradual evolution is observed only in August, while a reverse regression, expressed as a gradual decline in indicators, is evident in January, February, and December. The remaining months do not display a pronounced linear pattern. Paradoxically, the 1941 curves appear the least balanced. The May figures differ fundamentally not only from the preceding data, exceeding them by two and three times respectively, but also surpass the other indicators for that year by more than three times. Such an imbalance significantly limits the heuristic value of assumptions concerning 1941, as the available data reflect a random pattern that cannot yet be adequately explained due to the lack of sources.

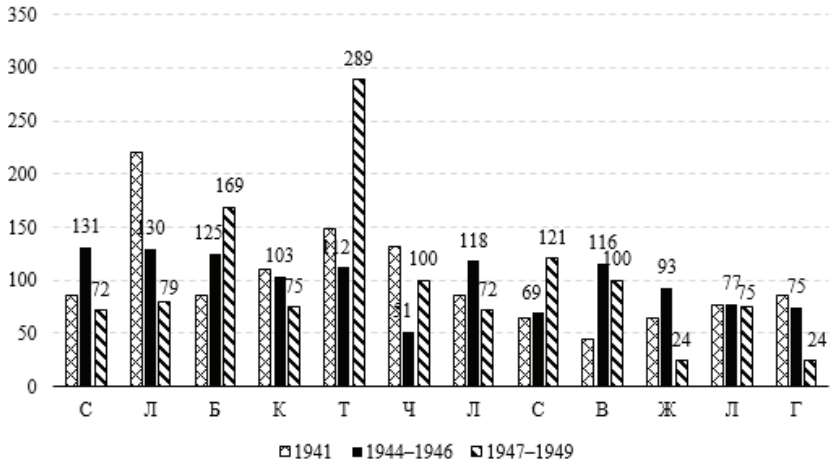
In this context, updated sources from the 1940s are of particular importance, as they provide more representative information on the seasonality of births among the Bulgarians of Bessarabia. These data are therefore included in the generalisations concerning developments during the 1940s (Tab. 8). Since this period already reflects a largely secularised community, the correlation between the birth calendar and religious cycles proves unproductive. Within this social context, only the pragmatics of economic activity remain significant. The influence of these factors on the seasonality of births is examined below.

In the second half of the 1940s (our sample covers 1944–1946 and 1947–1949), the differences between the two series of conditional relative data are significant, indicating a certain destruction of the traditional calendar and the formation of new mechanisms of population reproduction. For example, according to Fig. 1, in 1944–1946 births most frequently occurred in January–March, accounting for almost one quarter of all cases, as well as in July and September, which together accounted for about one fifth. The lowest birth rates during this period were recorded in June and August. In contrast, during 1947–1949 the absolute majority of births occurred in May, accounting for almost one quarter, as well as in March and August, while the lowest values were recorded in October and December. These shifts clearly indicate a transition towards a secular demographic model characterised by a minimal in-

Table 8
Seasonality of births

Year	Month of births												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	Month of conceptions												
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	
1941	85	221	85	110	149	132	85	64	44	64	77	85	1200
1944–1946	131	130	125	103	112	51	118	69	116	93	77	75	1200
1947–1949	72	79	169	75	289	100	72	121	100	24	75	24	1200

Figure 1
Seasonality of births



fluence of religious practices. On the basis of conception months, local social and economic events of both individual and collective nature appear to play a significant role.

The category of *mortality* is an important indicator of the overall state of society and its development processes in demography. Its study as a key social component is based on scholarly concepts concerning the role and impact of death on a specific population group, as well as its formal (quantitative) and internal (structural) manifestations. Mortality is examined as patterns of generational extinction through the consideration of "a mass statistical process consisting of a series of individual events occurring across different age parameters and collectively determining the order of extinction of actual and conditional (hypothetical) generations" (Население 1994: 448). Within the framework of historical and demographic reconstructions, this approach involves the consideration of mortality through the frequency of deaths within a particular social environment (Борисов 1999: 196). Together with the birth rate, mortality forms the natural movement (reproduction) of the population. It is this scientific understanding that underlies both retrospective (historical-demographic) and prospective (forecasting) studies of mortality (Цвигун 2010: 160-164, Слабкий et al. 2010).

In this context, death is presented as the primary event, the understanding of which underlies the collection and aggregation of demographic statistical data. Among the fundamental indicators are annual coefficients and death rates of the population, its sex and age structure, child and infant mortality, as well as factors influencing both death rates and generational change. Taken together, these characteristics make it possible to assess the level of development of a particular society and to draw conclusions regarding population reproduction strategies.

The overall death rate is most commonly used to calculate the crude death rate (Григор'єва 2010: 52). In this study, the crude death rate and its dynamics during the 1940s are calculated on the basis of household registers of village councils. The specificity of this type of current statistical source lies in the fact that it contains all the primary data required for the present reconstructions.

In 1946, the population of the villages of Vinogradovka, Glavany, and Zadunaevka amounted to 8,204 persons. Between 1944 and 1946, 451 children were born and 375 persons died. Accordingly, in 1944 the total population of these three villages was 8,128. The average population size in 1945 was 8,166, while the average number of deaths during this period was 175. As a result, the crude death rate amounted to 15.3%. The same calculations were carried out for all selected data sets, and the results are summarised in Tab. 9.

Because of public resonance and academic inquiry, the methodology for calculating mortality during large-scale tragic events has become particularly significant. In this context, we possess unique materials that make it possible to calculate the demographic losses of the Bulgarian population of Bessarabia during the famine of 1947. Our calculations show that in that year the death rate reached 113.8%, meaning that more than every tenth (!) resident of a Bessarabian village died.

In absolute terms, this corresponds to more than ten thousand Bulgarians across the region. If three village councils alone lost 2,751 people, extrapolation to the entire ethnic community indicates losses of approximately 13-15 thousand individuals (a total Bulgarian population of about 130 thousand in 1959) as a result of the famine of 1947.

To construct accurate models, it is necessary to establish a correlation coefficient. For these years, the natural death rate ranges from 15.3 to 4.5%, resulting in an average death rate of 9.9%. Accordingly, the demographic losses of 1947 should be attributed partly to natural causes, within 1%, and predominantly to exogenous factors. The correlation between these components is presented in the following formula:

$$Mg = Mf \pm m,$$

where *Mg* is the total demographic loss; *Mf* is the number of deaths recorded; and *m* is the average mortality rate. Accordingly, Mg = 113.8±9.9 in %, or 11.4±1.0 in %.

Table 9
Crude death rates. 1945–1949

	Average population					Crude death rates							
1945	1	x	8166	=	8166	m	125	/	8166	x	1000	=	15.3	%
1947	1	x	24175	=	24175	m	2751	/	24175	x	1000	=	113.8	%
1948	1	x	23063	=	23063	m	104	/	23063	x	1000	=	4.5	%
1949	1	x	21951	=	21951	m	40	/	21951	x	1000	=	1.8	%

This means that 2,476 people died of hunger in three village councils. In general, for the Bulgarians of Bessarabia this amounts to between 13 and 15 thousand deaths, or, taking the correlation into account, approximately 14 thousand ±1.5 thousand. Compared with the death rates of 1932–1933, the scale of the famine in Bessarabia was at least one and a half times more severe. During the Soviet famine of the 1930s, the death rate was about 70% (Население 1993: 57).

In demography, age-specific death rates are usually analysed by sex. Differences in the life expectancy of men and women are variable and constitute a fundamental indicator for assessing the overall level of societal development (Население 1994: 448, Борисов 1999: 196, Демографический 1985: 438-439, Григор'єва 2010: 52). Indicators calculated separately for males and females are therefore the most informative for analysing mortality levels and trends.

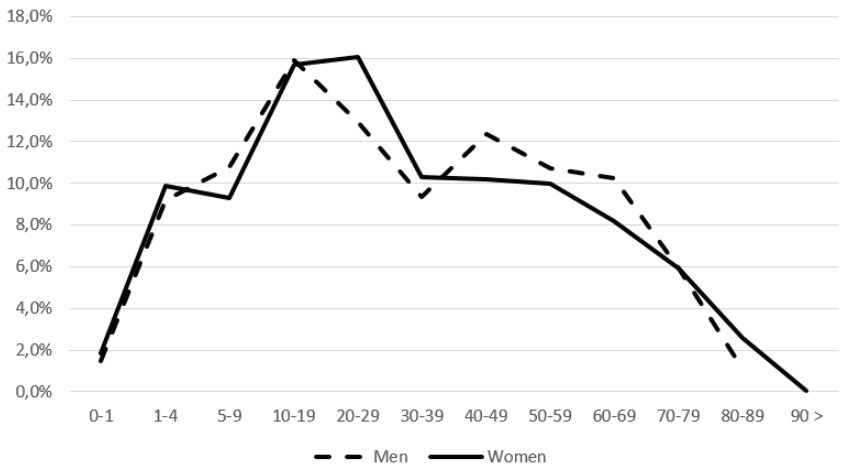
In this context, we examine the dynamics of mortality across different sex and age groups. It is not accidental that in the early twentieth century S. A. Novoselsky noted that "a clear and definite judgement about the nature and characteristics of mortality can be derived only by studying mortality separately for each age group, since individuals at different ages are physiologically characterised by differing levels of resistance to death" (Новосельский 1916: 4). Age ratios thus allow consideration not only of demographic, but also of social characteristics of the population. Parish registers constitute an invaluable source in this respect, as they contain data on the number of deaths recorded within the same age groups.

A fundamentally different picture of the sex and age characteristics of mortality is observed in the second half of the 1940s (Tab. 10 and Fig. 2). Above the conditional average indicator of 8.3%, obtained

Table 10
Sex and age structure of mortality. 1947–1949

1947–1949	Men	%	Women	%	Total	%	Ratio
0-1	22	1.5%	25	1.8%	47	1.6%	88.0
1-4	138	9.2%	135	9.9%	273	9.5%	102.2
5-9	162	10.8%	127	9.3%	289	10.1%	127.6
10-19	239	15.9%	214	15.7%	453	15.8%	111.7
20-29	195	13.0%	219	16.0%	414	14.4%	89
30-39	141	9.4%	141	10.3%	282	9.8%	100.0
40-49	186	12.4%	139	10.2%	325	11.3%	133.8
50-59	161	10.7%	136	10.0%	297	10.4%	118.4
60-69	154	10.2%	112	8.2%	+266	9.3%	137.5
70-79	89	5.9%	81	5.9%	170.00	5.9%	109.9
80-89	17	1.1%	35	2.6%	52	1.8%	48.6
90 >			1	0.1%	1	0.0%	0.0
Total	1504	100.0%	1365	100.0%	2869	100.0%	110.2

Figure 2



arithmetically by dividing 100% by the number of clusters (12), representatives of both sexes are clearly positioned across all cohorts older than 5 and younger than 69 years.

This situation reflects radical changes occurring both in Bessarabian Bulgarian society as a whole and, more specifically, in the structure of mortality.

Firstly, the community had already completed the demographic transition towards a more intensive, modern type of population reproduction, expressed in a significant reduction in mortality in both quantitative and percentage terms. Secondly, these transformations also led to a restructuring of mortality. In particular, infant mortality, female mortality associated with childbirth, and male mortality from exogenous and epidemiological causes were significantly reduced.

It should be noted that the high absolute mortality figures are directly related to the famine of 1947, when crude death rates increased more than tenfold. At the same time, in certain generations this resulted in proportional shifts. Specifically, this led to a temporary decline in the average age at death and, accordingly, reduced the relative weight of the youngest and, conversely, the oldest generations.

High infant mortality should be regarded as a relic phenomenon characteristic of the previous, traditional demographic stage. Boys under the age of 10 accounted for 22.5% of all deaths, while girls of the same age accounted for a further 21.2%. The artificial and temporary nature of this situation is demonstrated by intra-group comparisons. Only 1.5% of boys and 1.6% of girls belonged to the youngest cohort under one year of age, that is, infants. This most vulnerable group, or rather its almost minimal mortality levels, indicates that society was already moving away from the previous extensive model.

We collected a sufficiently large sample from our database was used for the years 1947–1949. It includes 1,504 males and 1,365 females, resulting in a sex ratio of 52.5% male and 47.5% female. This predominance of males is explained by the exogenous nature of mortality during this period. This is further confirmed by markedly non-harmonic indicators for individual age cohorts, for example 127.6 in the 5-9 age group, 133.8 in the 40-49 group, and 137.5 in the 60-69 group. Such values clearly indicate an abnormal structure of mortality in 1947–1949.

Elevated female mortality associated with pregnancy and childbirth should be regarded as a residual feature of the previous demographic stage. This is reflected in the high mortality rates observed in the 20-29 age group.

Following demographic stabilisation, Bulgarian society in Bessarabia remained for a prolonged period a transitional type characterised by pronounced eclecticism and a combination of diverse features. For instance, the high birth rates typical of traditional agrarian societies persisted for a considerable time. At the same time, the structure of mortality was already fundamentally modern, although it occasionally retained elements of the earlier type of population reproduction.

In demography, seasonality is also identified as one of the structural components of mortality. On the basis of factor and component analysis, the variability and patterns of mortality distribution across individual seasons and months can be identified. Fluctuations in this indicator reflect both natural cycles of disease exacerbation and the sociocultural capacity of society to respond to these risks.

It is well established that increases in the incidence of cardiovascular diseases, bronchitis, influenza, and pneumonia are more frequently observed during the cold months of the year, while acute intestinal infections are more typical of the summer period. Mortality from neoplasms is not associated with seasonal changes in weather conditions. In general, morbidity and mortality "reach their maximum at very low and very high air temperatures, and their minimum within the temperature range corresponding to the 'comfort zone', from 21 to 23°C" (Семенюк 2015: 92). During hot periods of the warm half of the year, mortality among the elderly increases. In the nineteenth century, a major cause of death was infectious epidemics, which led to large-scale changes in both the structure and seasonality of mortality. Their influence can also be identified through this analytical perspective.

The next data corpus used in the study of seasonality consists of an array of economic accounting records dating from 1941 onward (Tab. 11).

Our study shows that in the 1940s seasonality was even more pronounced than in the nineteenth and early twentieth centuries. The absence of data for November should be noted and taken into account, given the scarcity and fragmentary nature of the sources. Nevertheless, even under these conditions it can be argued that a significant proportion of deaths occurred in February–April, with relative indices of 313, 184, and 168, respectively. Together, these months account for a total of 665, which constitutes more than half of all deaths recorded within the calendar year. In addition to the usual endogenous factors, this seasonal structure of mortality was clearly influenced by the tragic events of the famine of 1947, which fundamentally increased the average daily death rate to 18.3. July also stands out slightly,

Table 11
Seasonality of mortality. 1941–1949

1941–1949	Month of death												Total
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Absolute number	33	135	87	77	49	40	52	37	29	3		8	550
Days in a month	31	28.3	31	30	31	30	31	31	30	31	30	31	
Deaths per day	1.1	4.8	2.8	2.6	1.6	1.3	1.7	1.2	1.0	0.1	0.0	0.3	18.3
Relative indices	70	313	184	168	104	87	110	78	63	6	0	17	1200

with an index of 110, close to the monthly average. Mortality during this period was traditionally associated with infectious causes. These demographic transformations clearly exhibit an exogenous character. At a time when society would normally be expected to level seasonal fluctuations in mortality, it instead intensified them through the introduction of artificial social experiments, in this case famine.

Therefore, the processes of transformation of birth rate and mortality within the Bulgarian community of Southern Bessarabia delineate two stages of the demographic transition. The first stage began in the last quarter of the nineteenth century as a result of overcoming high mortality, which, in turn, was accompanied by a gradual decline in birth rates. The second stage was driven by the exogenous impact of the famine of 1946–1947 on the mechanisms of natural mortality, leading to a significant restructuring of its patterns. The events of the 1940s contributed to a decline in the birth rate in the early 1960s and resulted in a further decrease in its coefficients.

Note

*Hereinafter, the Table is compiled by the author according to the household registers of the village councils of the villages of Glavany, Vinogradivka, Vinogradnoye, Zadunaivka and Novi Troiani of the Bolgrad district of the Odesa oblast, the village of Dmitrivka of the Bilgorod-Dnistrovskyi raion of the Odesa oblast (held in the village councils).

References

Ganchev A. Dynamics of "Transdanubian settlers" in Bessarabia in the early XIXth century: migration processes and natural growth. In: Revista de Etnologie și Culturologie, vol. XXXI, 2022, 30-40. https://doi.org/10.52603/rec.2022.31.04

Frejka T., Sardon J.-P. First birth trends in developed countries: a cohort analysis. No WP-2006-014, MPIDR Working Papers, Max Planck Institute for Demographic Research, Rostock, Germany, 2006. https://core.ac.uk/download/pdf/7127546.pdf (vizited 14.01.2026).

Todorova M. N. Balkan family structure and the European pattern: demographic development in Ottoman Bulgaria. Budapest: CEU, 2006.

Авдеев А., Блюм А., Троицкая И. Сезонный фактор в демографии российского крестьянства в первой половине 19 века: брачность, рождаемость, младенческая смертность. In: Российский демографический журнал, № 1, 2002, 35-45. / Avdeev A., Blyum A., Troitskaya I. Sezonnyi faktor v demografii rossiiskogo krestianstva v pervoi polovine XIX veka: brachnost, rozhdaemost, mladencheskaia smertnost. In: Rossiiskii demograficheskii zhurnal, no. 1, 2002, 35-45.

Аксьонова С. Ю. Середній вік матері при народженні дитини: чи можлива реверсія? In: Демографія та соціальна економіка, № 2 (33), 2018. http://nbuv.gov.ua/j-pdf/dse_2018_2_6.pdf (vizited 14.01.2026). / Aksionova S. Yu. Serednii vik materi pry narodzhenni dytyny: chy mozhlyva reversiia? In: Demohrafiia ta sotsialna ekonomika, no. 2 (33), 2018. http://nbuv.gov.ua/j-pdf/dse_2018_2_6.pdf (vizited 14.01.2026).

Аксьонова С. Ю. Черговість народження у матерів середнього і пізнього репродуктивного віку. In: Демографія та соціальна економіка, № 3 (25), 2015, 64-74. / Aksonova S. Yu. Cherhovist narodzhennia u materiv serednoho i piznoho reproduktyvnoho viku. In: Demohrafiia ta sotsialna ekonomika, no. 3 (25), 2015, 64-74.

Анри Л., Блюм А. Методика анализа в исторической демографии. Москва: РГГУ, 1997. / Anri L., Blyum A. Metodika analiza v istoricheskoi demografii. Moskva: RGGU, 1997.

Архангельский Г. И. Влияние урожаев на браки, рождаемость и смертность в Европейской России. In: Сборник сочинений по судебной медицине и гигиене. Санкт-Петербург. Т. 1, 1872, 503-560. / Arkhangelskii G. I. Vliianie urozhaev na braki, rozhdaemost i smertnost v Evropeiskoi Rossii. In: Sbornik sochinenii po sudebnoi meditsine i gigiene. Sankt-Peterburg. T. 1, 1872, 503-560.

Борисов В. Л. Демография. Москва: Нота Бене Медиа Трейд Компания, 2003. / Borisov V. L. Demografiya. Moskva: Nota Bene Media Trejd Kompaniyatskaya entsiklopediya, 2003.

Ганчев О. І. Демографічні трансформації болгарської спільноти Південної Бессарабії (XIX – початок XXI ст.). Одеса: Сімекс-Прінт, 2020. / Ganchev O. I. Demohrafichni transformatsii bolharskoi spilnoty Pivdennoi Bessarabii (XIX – pochatok XXI st.). Odesa: Simeks-Print, 2020.

Григор'єва С. В. Основи демографії: текст лекцій. Харків: НТУ „ХПІ", 2010. / Hryhorieva S. Osnovy demohrafii: tekst lektsii. Kharkiv: NTU "HPI", 2010.

ДАОО. Державний архів Одеської області. Ф. Р-8065, оп. 2, д. 1331./ GAOO. Gosudarstvennyj arkhiv Odesskoj oblasti. F. R-8065, op. 2, d. 1331.

ДАОО. Державний архів Одеської області. Ф. Р-8065, оп. 2, д.13166. / DAOO. Derzhavnyi arkhiv Odeskoi oblasti. F. R-8065, op. 2, d. 133166.

ДАОО. Державний архів Одеської області. Ф. Р-8065, оп.2, д. 9617. / DAOO. Derzhavnyi arkhiv Odeskoi oblasti.F. R-8065, op. 2, d. 9617.

ДАОО. Державний архів Одеської області. Ф. Р-8065, оп.2, д.11363. / DAOO. Derzhavnyi arkhiv Odeskoi oblasti. F. R-8065, op. 2, d. 11363.

ДАОО. Державний архів Одеської області. Ф. Р-8065, оп.2, д.18707-п. / DAOO. Derzhavnyi arkhiv Odeskoi oblasti. F. R-8065, op. 2, d. 18707-p.

ДАОО. Державний архів Одеської області. Ф. Р-8065, оп.2, д.12139. / DAOO. Derzhavnyi arkhiv Odeskoi oblasti. F. R-8065, op. 2, d. 12139.

Демографический энциклопедический словарь. Москва: Советская энциклопедия, 1985. / Demograficheskii entsiklopedicheskii slovar. Moskva: Sovetskaya entsiklopediya 1985.

Народонаселение: энциклопедический словарь. Москва: Большая российская энциклопедия, 1994. / Narodonaselenie: entsiklopedicheskii slovar. Moskva: Bol'shaya rossijskaya entsiklopediya, 1994.

Население Советского Союза. 1922–1991. Москва: Наука, 1993. / Naselenie Sovetskogo Soiuza. 1922–1991. Moskva: Nauka, 1993.

Новосельский С. А. Смертность и продолжительность жизни в России. Петроград: Типография Министерства внутренних дел, 1916. / Novoselskii S. A. Smertnost i prodolzhitelnost zhizni v Rossii. Petrograd: Tipografiya Ministerstva vnutrennih del, 1916.

Семенюк О. А. Статево-вікові особливості смертності населення працездатного віку та шляхи її попередження: дис. … канд. мед. наук: 14.02.03. Київ, 2015. / Semeniuk O. A. Statevo-vikovi osoblyvosti smertnosti naselennia pratsezdatnoho viku ta shliakhy yii poperedzhennia: dys. … kand. med. nauk: 14.02.03. Kyiv, 2015.

Слабкий Г. О., Слабкий Г. О. та ін. Сучасні та прогнозні тенденції смертності населення України. Київ: Знання, 2010. / Slabkyi H. O., Slabkyi H. O. ta in. Suchasni ta prohnozni tendentsii smertnosti naselennia Ukrainy. Kyiv: Znannia, 2010.

Стешенко В. С. Дослідження народжуваності й плідності у реальних поколінь жінок України: висновки для сьогодення. In: Демографія та соціальна економіка, № 1, 2010, 3-14. / Steshenko V. S. Doslidzhennia narodzhuvanosti y plidnosti u realnykh pokolin zhinok Ukrainy: vysnovky dlia sohodennia. In: Demohrafiia ta sotsialna ekonomika, no. 1, 2010, 3-14.

Цвігун І. А. Смертність населення України та її соціально-економічні наслідки. In: Вісник Хмельницького національного університету. Т. 3, № 2, 2010, 160-164. / Tsvihun I. A. Smertnist naselennia Ukrainy ta yii sotsialno-ekonomichni naslidky. In: Visnyk Khmelnytskoho natsionalnoho universytetu. T. 3, no. 2, 2010, 160-164.

Received 14.01.2026 *Accepted 16.06.2026*

Alexandr Gancev (Odesa, Ucraina). Doctor habilitat în istorie. Universitatea de Stat de Tehnologii Intelectuale şi Comunicaţii.

Александр Ганчев (Одесса, Украина). Доктор исторических наук. Государственный университет интеллектуальных технологий и связи.

Aleksandr Ganchev (Odesa, Ukraine). Doctor of Historical Sciences. State University of Intelligent Technologies and Communications.

E-mail: Alexander_Ganchev@yahoo.com

ORCID: 0000-0002-0201-2270