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## **THE GREAT FAMINE: POPULATION LOSSES IN UKRAINE\***

### **Introduction**

As early as 1935, in a way that now seems almost surreal, Ukraine's UNKhU (Directorate for the National Economy and Records) challenged the figures on births and deaths registered between 1930 and 1935. In a note addressed to the leadership of the Republic's Communist Party, presenting them with some figures on annual change in the Ukrainian population between 1926 and 1934, Aleksandr Asatkin, Director of the UNKhU of Ukraine, expressed his amazement at the peak in mortality observed in 1933. He attempted to explain it through errors in the registration system (ZAGS), without, of course, ever mentioning the famine that had reached its highest level in that year. However, in 1934–35, evaluations of the way in which ZAGS functioned showed that in fact deaths in the regions most affected by the disaster had been under-registered. Moreover, ZAGS' final results for 1933 were markedly higher than the 1935 document showed. In reality, the presence of the famine was clear, but everything was done to conceal it. Monitors from the TsUNKhU Central Directorate for National Economy and Records, covering the whole USSR, systematically reclassified deaths which had been initially classified as "from starvation" to either "cause of death unknown" or "from exhaustion."

The fact remains that, in spite of efforts made by the authorities to deny the famine, ZAGS statistics on population movement keep a clear trace of it and they certainly can serve as a starting point, even if they should be used cautiously.

Since the opening of the archives, some historians and statisticians have set about estimating the population losses attributable to the famines and to the waves of turmoil and repression that followed the collectivization of land, relying on statistics published before 1989. Thus, Robert Conquest<sup>i</sup> estimated the number of deaths caused by the famine in 1932–1933 to be 5 million. However, such estimation, extrapolating the growth rate of the 1920s to the 1930s, obviously overestimates real losses, since it is unrealistic to consider that the high fertility rate of the 1920s, still affected by the adjustment of births delayed by war, could have lasted until the 1930s. A few years later Stanislav Kulchytsky,<sup>ii</sup> using the same method but with a more prudent fertility hypothesis, estimated the losses of the period 1933–1936 to be 3.5 million.

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A fuller reconstruction of population movement for the whole USSR has since been published by Goskomstat of the USSR.<sup>iii</sup> In order to reconstruct the annual series of births and deaths and to produce annual population estimates for the USSR between 1920 and 1959, its authors adjusted the census results for 1926, 1937, 1939 and 1959 and corrected the registered series of births and deaths with the help of population models. However, the hypotheses inherent in the models that allowed them to adjust the data still seem to overestimate fertility and mortality.<sup>iv</sup> And, in any case, this estimate at the level of the USSR does not give us specific information about losses in Ukraine.

Several authors have attempted to assess Ukraine's losses but by relying only on the 1926 and 1939 census data. Serguei Maksudov<sup>v</sup> gives an overall estimate of 4.5 million for the period 1927–1938, without distinguishing between the effect of excess mortality and that of sub-fertility. Sergiy Pyrozshkov,<sup>vi</sup> on the other hand, arrives at 5.8 million for the period 1926–1939 by comparing the total numbers per generation from the 1939 census to those that would have been given by normal change in mortality and fertility. The use of models and the globalisation of the results vis-à-vis the full 1926–1939 period are likely to overestimate the consequences of the crisis without clearly distinguishing the respective effects of mortality, fertility and migration.

In the framework of a study on mortality and cause-of-death trends in Ukraine in the 20 century,<sup>vii</sup> we therefore embarked on a painstaking effort to reconstitute the multiple factors responsible for the huge demographic fluctuations which struck Soviet Ukraine and estimated the annual changes in Ukrainian mortality rates by sex and age during the years 1926 to 1959. We give here our new estimates for the Great Ukrainian Famine of 1932–33, the Holodomor.

Is it possible to estimate the demographic consequences of the Holodomor?

It seemed to us that more precise estimations can be done by using all available data and trying to correct them after a detailed discussion of their quality. Such an approach not only leads to a new estimation of the global losses more strictly focussed on the two years of the crisis (1932–1933), it also opens the door to distinguishing between (1) direct losses attributable to excess mortality and (2) indirect losses linked to the fall in fertility and to outward migration. In order to do this, a return to population change statistics is required, even if this means hypothesizing about under-registration. We think, along with most previous authors, that we can rely on the 1926 and 1939 censuses (after necessary corrections), but that vital statistics can also be used with rather modest adjustment for the years in between (with the exception of 1932 and 1933, years which certainly suffered from under registration). Migration flows are more problematic but even for them existing data marks a starting point.

Indeed, vital statistics give a quite plausible picture of the history of Ukrainian mortality for the years before and after the crisis (see Figure 1). Firstly, in relation to the 28.9 million inhabitants recorded in the 1926 census, the 519,000 deaths for that same year provide a crude death rate of 18 per thousand that is fully compatible with what we know about the country’s state of health at that time. The same applies to the fact that the crude male death rate exceeds the crude female death rate by 20%. In addition, until the major crisis of 1932–1933, the change in the number of deaths by sex does not indicate anything particularly abnormal. After the crisis, this number appears to fall slightly compared to 1930–1931 (predictably enough, since the total population was reduced by the impact of the crisis and since the crisis probably selected the most resistant individuals). Finally, on the eve of the Second World War, the total number of deaths, slightly lower than it had been during the 1920s, may show the beginnings of a downward trend in mortality. If there was under-registration of deaths during this period, it was probably not very significant—except during the crisis where the registration services really seem to have been “snowed under” (or perhaps manipulated to minimise the extent of the crisis). In spite of the fact that vital statistics show a very sharp increase in mortality in 1932–1933, registration of deaths could have deteriorated significantly then. It is essentially the extent of this ‘crisis under-registration’ that must be assessed. As for the rest, classical corrections for under-registration of infant deaths and deaths among the oldest should be quite satisfactory.

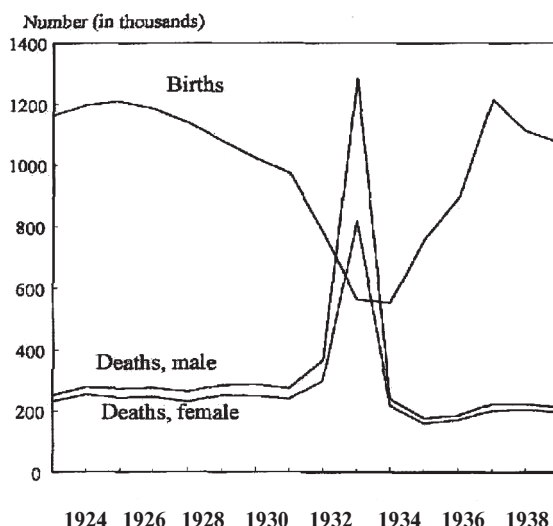


Figure 1. Annual change in numbers of births and deaths by sex, from 1924 to 1939

In terms of fertility, with a crude birth rate of 42 per thousand in 1926, it is hard to imagine a large under-registration of births, although the number of births declines in the late 1920s. The crisis obviously led to an abrupt fall, but it was less severe than the rise in mortality, followed by a catch-up peak. Situated in 1937, this peak may appear somewhat late, but that can be explained precisely by the gravity of the crisis and the way it threw families into profound disarray. Put another way, we cannot talk about large structural under-registration of births, any more than of deaths (and probably even less). The crisis years are more open to debate, but the same arguments as those put forward in relation to deaths cannot work, since the authorities had no interest in minimising them (in fact the opposite would be true). Therefore, we shall hypothesise that the number of births registered over the course of this period corresponds accurately to the reality of the time (apart from the under-registration of babies who died very soon after they were born).

To estimate the global losses due to the Great Famine, we followed the same general principle as in previous studies: to calculate an expected population by projecting the 1926 population until 1939 on the basis of fertility, mortality and migration rates that would have prevailed without crisis, and to compare it to the observed 1939 population. But unlike previous attempts, we decided that using vital statistics for the years before and after the crisis (after correction for under registration) would be much more effective than referring to theoretical models for hypothesizing fertility rates throughout the period.

This approach obviously relies, in the first instance, on the accuracy of the results of the two censuses, but this has hardly been challenged by specialists.<sup>viii</sup> Although the masters of the Kremlin tried on many occasions to manipulate the published results of the censuses, everyone views the statistical literature preserved in the archives, and now accessible, as reliable. Soviet power only falsified the results they published, not the detailed information held in (previously) secret archives. Even so, early 20th-century Soviet censuses, like many others of the time, did suffer from some imprecision in declarations of age, which classically leads to “age heaping.” To correct these deficiencies, we applied to 1926 and 1939 Ukrainian censuses methods quite similar to those already used for Russia.<sup>ix</sup>

Thus, after necessary corrections, existing data enabled us to calculate two life tables, for the start and the end of the period, relying on the 1926 and 1939 censuses and on the death statistics by sex and age available for 1926–1927 and 1938–1939. Between these two pillars, we interpolated survival probabilities by age for the period 1928 to 1938, assuming that in the absence of crisis, mortality rates would have decreased regularly from their 1926–1927 levels to the 1938–1939 ones. These probabilities were then applied, year by year from 1927 to 1939, to the generations involved in the 1926 census, in order to obtain an estimate of survivors, if there had been no crisis, on 1 January of each year from 1928 to 1939.

Then, to complete the projection, we estimated the numbers of births that would have occurred without the crisis. Contrary to mortality rates, the fertility rates observed before and after the crisis cannot be interpolated. The pre-crisis general fertility rate was diminishing significantly but climbed again, after the crisis, to a much higher level than in 1931. The fall in the late 1920s is completely consistent with what happened at that time in neighboring non-USSR countries (Poland, Czechoslovakia, Romania, Bulgaria). We considered prolonging this downward trend in order to estimate the births to be expected if there had been no crisis. However, the rise that followed the crisis cannot be explained solely by a recovery phenomenon. It also relates to the ban on abortion imposed in 1936, a measure which might very well have been taken even without the crisis. It is therefore almost impossible to reinvent what the annual change in the number of births might have been over the course of this period if there had not been a crisis, but we could not ignore either the pre-crisis down trend or its break by the abortion banishment. Therefore, we deliberately chose the simplest hypothesis possible: throughout the whole period 1932–1939,

the general fertility rate was maintained at its 1931 level. A birth series was obtained that combines births registered by ZAGS from 1924 to 1931 (corrected for under-registration) and estimated non-crisis births for 1932 to 1938. The projection was completed by applying the probabilities of survival if there had been no crisis affecting these births, which finally resulted in an expected 1939 population. While a total population of 35.5 million was expected at the time of the 1939 census only 30.9 million were actually observed: 4.6 million Ukrainians were missing.

How to distinguish excess mortality from birth deficit and migration effect?

Within these 4.6 million global losses, how many exactly would have been caused by excess mortality, birth deficit, and migration flows? The answer to this question will also provide an estimate or under-registration of crisis deaths by the authorities.

### 1. The role of the birth deficit

The easiest task is to estimate the role of birth deficit. Redoing the same population projection for 1939 and replacing the estimate of non-crisis births with registered births (corrected for under-registration of infant deaths) leads to a 1939 population of 34.4 million instead of 35.5.

Conversely, the difference of 3.5 million between the second projection and the population actually observed in 1939 gives us a measure of the extent of losses attributable to both excess mortality and outward migration.

### 2. Role of migration

Indeed, migration effects certainly are the most difficult to estimate, but not impossible if the various pieces of the puzzle are taken into consideration. Two types of migration have to be identified: forced migration, which has been carefully documented, and voluntary flight from the crisis, which is more difficult to assess.

For the first type of migration, it is possible to rely on a comprehensive study by Victor Zemskov who gathered every existing statistical data on various types of deported populations (towards camps, gulag, prison, etc.). Sometimes data are available by sex and place of origin, but even when they are not proportionate estimations are possible. We ended with 400,000 Ukrainian people deported to camps outside of Ukraine during the years 1930 to 1938 and 530,000 to the Gulag: a total of 930,000 forced migrations of whom 563,000 were male and 367,000 were female.

It is much harder to make an assessment of voluntary migration. According to a TsUNKhU report of 1937<sup>x</sup>, the net balance of outward migration rose to 1.3 million people between 1926 and 1936. However, in the absence of reliable statistics on migrations, this estimate is highly questionable. The number obviously includes — even if this is not stated explicitly — forced migration; moreover, it has been likely exaggerated in order to conceal the excess mortality of the crisis. In fact, true voluntary migration must have been small. Not only did the regime monitor the movements of the population closely (notably with the introduction of passports in towns in 1932) but there was hardly anywhere better to go in the USSR and fleeing abroad was out of the question. Of course, the famine led some Ukrainians to flee the disaster zone, to Russia and Belarus, but most of these refugees had to return to Ukraine quickly since their illegal migration status (linked to the passport requirement imposed in 1932) prevented them from living and working outside Ukraine. Therefore, we have preferred to accept the balance of voluntary migration as almost nil and to confine ourselves to forced migration alone, while acknowledging that net outward migration may thus be under-estimated. Thus, migration effect could account for 0.9 million.

**3. Estimating crisis mortality effect and under-registration of crisis deaths**

Finally, when subtracting from the 4.6 million global losses initially estimated the (1) 1.1 birth deficit effect and the (2) 0.9 outward migration effect, the remaining 2.6 million arises from the excess mortality of the crisis <sup>xi</sup> (see Table 1).

If we compare these 2.6 million deaths resulting from the excess mortality of the crisis to the 1.7 million difference observed between deaths registered and total numbers of deaths expected without the excess mortality arising from the crisis, we obtain the total number of deaths that escaped registration (0.9 million). However, among these, some are the result of the ordinary under-registration mentioned above, which was taken into account in correcting the 1926–1927 and 1938–1939 life tables that we used to estimate non-crisis mortality by interpolation. There finally remain 530,000 deaths that escaped registration because of the crisis and acts of concealment by the regime. To distribute them between the three years of crisis (1932–1934), we applied to them the distribution observed for registered crisis deaths. Most of these non registered deaths (460,000) were thus attributed to the year 1933.

**Table 1. Contributions of excess mortality and of birth deficit to overall losses in the 1930s crisis, by sex**

Population (observed and expected) and losses	Total numbers (thousands)		
	Males	Females	All
<b>Population</b>			
Observed in the census (1)	14 753	16 193	30 946
Expected, given non-crisis mortality and fertility (2)	17 373	18 142	35 515
Expected, given non-crisis mortality and after correction of registered births (3)	16 833	17 625	34 458
<b>Losses</b>			
Total (2) – (1), of which	2 620	1 949	4 569
due to forced outward migration (4)	563	367	930
due to excess mortality (or to voluntary outward migration) resulting from the crisis (3) – (1) – (4)	1 517	1 065	2 582
due to the birth deficit (2) – (3)	540	517	1 057

**All exceptional fall in life expectancy**

Given these hypotheses on the under-registration of deaths, an attempt can be made to estimate the annual change in life expectancy during the 1920s and 1930s, distinguishing the crisis years from other years.

For the years 1927–1931 and 1935–1938, age distribution of expected deaths can be ascribed to occurred deaths (registered deaths plus estimated non registered deaths), without great risk of error, and annual life tables can be computed taking into account the annual fluctuations in the number of registered deaths.

But there would be a risk of making a grave mistake by applying the same methodology to the three crisis years, since crisis deaths certainly have a different age structure from ordinary deaths. Fortunately, for the years 1933 and 1934, an age distribution of ZAGS-registered deaths is available. For these two years, the only unregistered deaths had to be redistributed by age; to do this, an age structure appropriate to crisis deaths was obtained by subtracting, for each age, expected non-crisis deaths from total ZAGS-registered deaths. That structure was then applied

to non-registered deaths and the results were adjusted for infant mortality and mortality at age 1–4 according to more precise observations done about the last case of extensive famine observed in Europe (in Finland, 1868<sup>xii</sup>). The year 1932 was then dealt with on the basis of the results obtained for 1933–1934.

Once distributed by age in this way, the unregistered deaths were added to the registered deaths, and mortality rates by age were obtained, allowing us to calculate the life tables for each of the three years by relating all deaths to the theoretical populations calculated previously (with non-crisis mortality and registered births) reduced by the crisis deaths.

While from 1927 to 1931, life expectancy was almost stable, with a few oscillations—going from 43.3 years to 43.5 for males and from 46.8 to 47.9 for females (see Table 2 and Figure 2)—it fell very abruptly with the crisis losing almost 9 years in 1932 then another 28 years in 1933. In that year, it was just over 10.8 years for females and 7.3 for males.

This result may appear exaggerated but we do not think that is the case. Firstly, with rates calculated only from ZAGS-registered deaths by age and our population estimates, we would have obtained 12.2 years' life expectancy for males and 19.5 for females. By correcting the deaths for under-registration, but without differentiating under-registration according to age, we would have obtained 10.3 and 14.0 years respectively. By introducing particular corrections to infant and child mortality, as we have, the figures reached are 7.3 and 10.8 years. It has been made clear that these two successive corrections were necessary in order to ensure consistent data. Secondly, by relying on the estimates given by Evgeni Andreev et al. <sup>xiii</sup> for Russia (15.2 years for males and 19.5 years for females) and by the same authors, <sup>xiv</sup> repeated by Alain Blum, <sup>xv</sup> for the whole USSR (10.3 years for males and 13.0 for females), it might be expected that life expectancy in Ukraine, which, of all the Republics of the USSR, suffered most from the famine, would be significantly below 10 for males and around 10 for females.

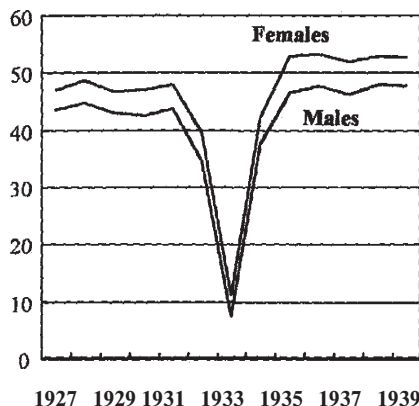
**Table 2. Estimate of annual change in life expectancy from 1927 to 1939**

Year	Males	Females	Year	Males	Females
1927	43.3	46.8	1934	37.6	42.1
1928	44.6	48.7	1935	46.3	52.7
1929	42.8	46.7	1936	47.6	53.1
1930	42.5	46.9	1937	46.2	51.9
1931	43.5	47.9	1938	47.9	52.7
1932	34.5	39.4	1939	47.7	52.5
1933	7.3	10.9			

Calculated transversally, life expectancy measures the extent of the immediate circumstances of the crisis. The impact of this on the survival of each generation is obviously much less, since each one experiences it only at a particular age. If, on the other hand, a crisis like this continued over several decades, it would soon lead to the population disappearing.

Ukrainian life expectancy was still abnormally low in 1934, but in contrast it reached a high point, just after the crisis, in 1935–1936. This is a fairly classic immediate post-crisis situation where, precisely because of the severe reductions of earlier years, mortality is temporarily lower than normal. After a significantly lower point in 1937, life expectancy rose again in 1938–1939.

Life expectancy (years)



**Figure 2. Change in life expectancy at birth between the Wars, annually**

### Conclusion

When precisely calculated by using all existent reliable data, total Ukrainian population losses strictly due to the Holodomor appears to be of 4.6 million people. This is significantly less than indicated by several previous studies. However, the source of discrepancy is mainly the use of real data instead of theoretical growth rates or fertility models, which ignored the actual fertility decline started in the mid 1920s, to compute a projection of population expected without crisis. Out of these 4.6 million losses, 1.1 million were due to the crisis birth deficit, 0.9 to forced outward migration, and 2.6 to the excess mortality. Here again, our 2.6 million estimate is much less than the levels currently available through the media, which vary from 4 to 10 million, such a difference is mainly due to the fact that the results of studies on global losses are taken as the proper effect of excess mortality, and also that some authors attribute to Ukraine losses of the whole USSR<sup>xvi</sup>. It is a pity that those who, very sincerely, intend to preserve the memory of Holodomor use estimates that are exaggerated. There is no need to use incredible estimation when one can easily demonstrate that the crisis was so severe that it immediately reduced life expectancy at birth to 7 years for males and 10 years for females. The Great Ukrainian Famine of 1932–1934 was far more brutal than the last great famine in Europe, which occurred in Finland in 1868. And the most astonishing is that such a famine resulted from deliberate human action, not from climatic hazard.

### Notes

i Robert Conquest, *The Harvest of Sorro: Soviet Collectivisation and the Terro-Famine* (London: Arrow Books, 1988 [1986]).

ii Stanislav Kulchytsky, *Ukraine's demographical losses from famine in 1932–1933 according to the general census of the population in 1937* (Kyiv: Institute of History of Ukraine, 1995); paper presented to the conference “Population of the USSR in the 1920s-1930s in light of newly classified documentary evidence.” – Toronto, 1995.

iii Evgueny M. Andreev, Leonid E. Darskij and Tatiana L. Khar'kova, *Население Советского Союза: 1922–1991* [Population of the Soviet Union: 1922–1991] (Moscow : Nauka, 1993).

iv Serguei Adamets and Vladimir Shkolnikov, *О довоенных таблицах смертности СССР* [About pre-war life tables] (Moscow: Institute for Economic Forecasts, Centre for Population and Human Ecology, 1995); paper presented at the conference on “Population of the USSR in the 1920s-1930s in light of newly classified documentary evidence.” – Toronto, 1995.



v Serguei Maksudov, *Потери населения СССР [Demographic losses of the Soviet Union]* (Benson: Chalidze, 1989).

vi Sergiy I. Pyrozhev, "Les pertes demographiques en Ukraine dans les années 1930 et 1940," *Population* 51: 4–5 (1996): 1032–1040.

vii France Meslé and Jacques Vallin, *Mortalité et causes de décès en Ukraine au XXe siècle* (Paris: INED, 2003) (Les cahiers de J'INED, cahier n° 152, with contributions by Vladimir Shkolnikov, Serhii Pyrozhev and Serguei Adamets).

viii Adamets, Serguei, Alain Blum, and Serguei Zakharov, *Disparités et variabilité des catastrophes démographiques en URSS* (Paris: INED, 1994) (Dossiers et Recherches n° 42); Alain Blum, *Naitre, vivre et mourir en URSS : 1917–1991* (Paris: Plon, 1994).

ix Serguei Adamets, Alain Blum, and Serguei Zakharov, *Disparités et variabilité des catastrophes démographiques en URSS* (Paris: INED, 1994) (Dossiers et Recherches n° 42).

x RGAE document (record group 1562, file 329, document 200, p 191).

xi It should also be made clear that people who were deported, once outside Ukraine, also suffered from high excess mortality, which is not taken into account here.

xii Kari J. Pitkänen, *Deprivation and Disease: Mortality During the Great Finnish Famine of the 1860s* (Helsinki: Hakapaino, 1933).

xiii Evgueny M. Andreev, Leonid E. Darskij, and Tatiana L. Khar'kova. *Демографическая история России: 1927–1959 [Demographic history of Russia: 1927–1959]* (Moscow: Informatika, 1998).

xiv Evgueny M. Andreev, Leonid L. Darskij, and Tatiana L. Khar'kova. "L'histoire de la population de l'URSS 1920–1958," *Annales de démographie historique* (1992): 61–150.

xv Alain Blum, *Naitre vivre et mourir en URSS : 1917–1991* (Paris: Plon, 1994).

xvi For example, in Courtois et al. (Stéphane Courtois, Nicolas Werth, Jean-Louis Panné, Andrzej Paczkowski, Karel Bartosek and Jean-Louis Margolin, *Le livre noir du communisme: crimes, terreur, répression* [Paris : Robert Laffont, 1997]), while a chapter devoted to the Great Famine gives the already exaggerated amount of 6 million "victims" for the whole USSR (179), the same number of deaths is attributed to Ukraine in the introduction (19).

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**Анотація.** У статті представлено нові розрахунки втрат внаслідок голодомору 1932–1933 рр. на підставі даних переписів 1926 та 1939 рр. і даних поточної статистики природного руху населення. Застосовано метод перспективного розрахунку від перепису 1926 року на базі коефіцієнтів народжуваності, смертності й міграції, які мали б місце за відсутності кризи та порівняння отриманого результату з даними перепису 1939 року.

**Аннотация.** В статье представлен новый расчет потерь вследствие катастрофического голода 1932–1933 гг. на основании данных переписей населения 1926 и 1939 гг. Применен метод перспективного расчета от переписи 1926 года на основе коэффициентов рождаемости, смертности и миграции, которые имели бы место в отсутствие кризиса и сравнения полученного результата с данными переписи 1939 года.

**Summary.** The new estimates for the Great Ukrainian Famine of 1932–33 "Holodomor" losses are given on the basis of census data 1926 and 1939 and vital statistics. The approach of projecting the 1926 population until 1939 on the basis of fertility, mortality and migration rates that would have prevailed without crisis, and comparing it to the observed 1939 population was implemented.

*Ключові слова:* голодомор; втрати населення; природний рух населення; коефіцієнт народжуваності, смертності й міграцій.

*Ключевые слова:* голодомор; потери населения; природное движение населения; коэффициент рождаемости, смертности и миграций.

*Key words:* holodomor; human losses; natural movement; fertility rate; death rate; migration rate.

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