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Demographic Analysis and Population Catastrophes in the USSR

The demographic history of the Soviet Union is marked by catastrophes. Even in 1970 the age distribution of the Soviet population displayed large gouges caused by World War I, the Revolution and Civil War, the collectivization of agriculture and the famine, and World War II. These calamities led to an increase in deaths, a decrease in births, massive displacement of population, and emigration from the Soviet Union. Territory with a large population was also annexed to the USSR.

For many observers the magnitude of the suffering, much of it wrought by a regime against its own people, is what makes the Soviet experience important and distinctive. Particularly for scholars focusing on the demographic development of the USSR, it is important to determine both the short-term and the long-term effects of these events on the Soviet population. It is difficult, however, to sort out the separate effects of each of the traumatic events either directly on population size and composition or indirectly on economic development.

In the last few years, an intense debate concerning these catastrophes has been engaged in by Steven Rosefielde¹ and Stephen Wheatcroft.² The controversy involves several related issues. The emphasis was first on the question: What was the role of forced labor in Soviet industrial growth from 1929 until the death of Stalin? Later the dispute shifted to the question: How many forced laborers were there from 1929 until the death of Stalin? The question then became: What was the loss of Soviet population due to forced-labor camps and collectivization? Most recently, the central concern has been about the amount of "excess mortality" or the number of "excess deaths."

Rosefielde's main interest has been in estimating the size of the Soviet prison camp population. He focuses on this issue because he thinks that forced labor was a much more important contributor to Soviet economic growth than other scholars have realized; this point of view is more plausible the larger the size of the camp population.

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1. Steven Rosefielde, "The First 'Great Leap Forward' Reconsidered: Lessons of Solzhenitsyn's *Gulag Archipelago*," *Slavic Review*, 39, no. 4 (December 1980): 559-87; "Reply," *ibid.*, pp. 612-15; "An Assessment of the Sources and Uses of Gulag Forced Labour 1929-56," *Soviet Studies*, 23 (January 1981): 51-87; "Reply to Nove," *Slavic Review*, 41, no. 4 (Winter 1982): 766-71; "Excess Mortality in the Soviet Union: A Reconsideration of the Demographic Consequences of Forced Industrialization, 1929-1949," *Soviet Studies*, 35 (July 1983): 385-409; "Excess Collectivization Deaths, 1929-1933: New Demographic Evidence," *Slavic Review*, 43, no. 1 (Spring 1984): 83-88.

2. R. W. Davies and S. G. Wheatcroft, "Steven Rosefielde's *Kliukva*," *Slavic Review*, 39, no. 4 (December 1980): 593-602; Stephen G. Wheatcroft, "On Assessing the Size of Forced Concentration Labour in the Soviet Union, 1929-56," *Soviet Studies*, 33 (April 1981): 265-95; "Towards a Thorough Analysis of Soviet Forced Labour Statistics," *ibid.*, 35 (April 1983): 223-37; "A Note on Steven Rosefielde's Calculations of Excess Mortality in the USSR, 1929-1949," *ibid.*, 36 (April 1984): 277-81.

Davies and Wheatcroft, among others, have raised serious questions about the premises, the logic, and the conclusions reached by Rosefielde concerning the role of forced labor in Soviet industrial growth.³ Wheatcroft also argues that the camp population was far smaller than Rosefielde contends.

Other scholars have also made estimates of the number of forced laborers, population losses, or excess deaths. Robert Conquest, in particular, has long been concerned with the causes and effects of the Great Terror; more recently, he has also studied the famine of 1932–33 in the Ukraine.⁴ In addition, Mace has studied the causes and consequences of the famine in the Ukraine,⁵ and Maksudov and Diadkin have looked at the question of excess deaths during several catastrophes that occurred between World War I and the 1950s.⁶

Another group of scholars has estimated population losses due to these calamities as an incidental part of their study of Soviet population. The exact size of the camp population or the exact number of excess deaths has not been their central focus. In this vein, population losses during the 1930s were estimated by Lorimer;⁷ losses during World War II were estimated by Notestein⁸ and Timasheff;⁹ and Eason¹⁰ considered losses during the 1930s and 1940s generally. These scholars made clear that their estimates of losses were subject to a great deal of uncertainty and were part of an effort to improve upon unanalyzed reported data rather than to obtain definitive numbers.

In summarizing one aspect of the Rosefielde-Wheatcroft debate, Conquest has written:

Wheatcroft may have found methodological errors in Rosefielde's work; all the same, in principle, Rosefielde has the nub of the matter, for he does at

3. Others who have commented on Rosefielde's interpretation of the role of forced labor in Soviet economic development include Igor Birman, "Limits of Economic Measurement," *Slavic Review*, 39, no. 4 (October 1980): 603–607; Paul Gregory, "Valueless Goods and Social Bads in the Measurement of Soviet Output Series, 1928–1932," *ibid.*, pp. 608–11; Hoiland Hunter, "The Economic Costs of the Gulag Archipelago," *ibid.*, pp. 599–92; Alec Nove, "Letter to the Editor," *Slavic Review*, 40, no. 4 (Winter 1981): 691–93, and *ibid.*, 41, no. 4 (Winter 1982): 771–73.

4. Robert Conquest, *The Great Terror* (New York: Macmillan, 1968); "Forced Labour Statistics: Some Comments," *Soviet Studies*, 34 (July 1982): 434–39; Robert Conquest, Dana Dalrymple, James Mace, and Michael Novak, *The Man-Made Famine in Ukraine* (Washington, D.C.: American Enterprise Institute, 1984).

5. James E. Mace, *Communism and the Dilemmas of National Liberation: National Communism in Soviet Ukraine, 1918–1933* (Cambridge, Mass.: Harvard University Press, 1983), pp. 280–96; and "Famine and Nationalism in Soviet Ukraine," *Problems of Communism*, 33 (May–June 1984): 37–50.

6. Maksudov (pseud.), "Pertes subies par la population de l'URSS, 1918–1958," *Cahiers du monde russe et soviétique*, 18 (July–September 1977): 223–62; Iosif G. Dyadkin, *Unnatural Deaths in the USSR, 1928–1954* (New Brunswick, N.J.: Transaction Books, 1983).

7. Frank Lorimer, *The Population of the Soviet Union* (Geneva: League of Nations, 1946).

8. Frank Notestein et al., *Future Population of Europe and the Soviet Union* (Princeton, N.J.: Office of Population Research, "League of Nations Publications," 1944).

9. Nicholas S. Timasheff, "The Postwar Population of the Soviet Union," *American Journal of Sociology*, 54 (September 1948): 148–55.

10. Warren W. Eason, *Soviet Manpower: The Population and Labor Force of the U.S.S.R.* (Ph.D. diss., Columbia University, 1959); "The Soviet Population Today," *Foreign Affairs*, 37 (July 1959): 598–606; "Labor Force," in Abram Bergson and Simon Kuznets, eds., *Economic Trends in the Soviet Union* (Cambridge, Mass.: Harvard University Press, 1963), pp. 38–93.

least realize that official statistics are not the best or the only source of evidence.

May I conclude by expressing the strong opinion that we are unlikely to be able to deduce with any certainty the labour camp population from any of the demographic material at present available; but that we *can* work out the excess mortality from it.¹¹

For reasons that we will state later, we do not share Conquest's certitude about being able to estimate excess mortality from available demographic statistics. We agree with Conquest that estimating the size of the camp population with certainty is not possible from currently available demographic data. But since the inability of scholars to determine this number with certainty has not inhibited many of them, including Conquest, from publishing estimates of this population, it is important that the assumptions that underlie the estimates be defensible.

Wheatcroft deserves credit for undertaking the difficult task of identifying and evaluating these assumptions, particularly regarding the size of the camp population. We think his criticisms of Rosefielde's (and Conquest's) forced-labor estimates are appropriate and correct, precisely because they show in detail the weaknesses of many of the assumptions involved.

We focus on Rosefielde's estimates of the number of excess deaths during the 1930s. Our principal goal is to alert scholars to some of the issues in demographic analysis that need to be attended to before more definitive estimates of the magnitude of Soviet population losses in the 1930s can be made. Although Wheatcroft has questioned Rosefielde's analysis of demographic data, he has not given as much attention to this aspect of Rosefielde's work as he has to the argument about forced labor and its role in Soviet economic development.

The debate over forced-labor statistics has focused on the credibility of individual informants and observers and on the logic of assembling evidence from disparate and often obscure sources. Our approach is different. A source-by-source or statistic-by-statistic approach is not the only way to evaluate the quality of demographic estimates. Instead, after discussing the logic of determining the amount of excess mortality, we will present a set of estimates based on a range of plausible scenarios of the normal or expected course of fertility and mortality in the Soviet Union during the 1930s. Then we will measure the excess mortality that is implied by these alternative scenarios.

Our purpose is to demonstrate how sensitive estimates of excess mortality are to the assumptions that are made about demographic data and the "natural" course of demographic change. Although we focus on the 1930s, many of our comments also apply to analyses of excess mortality during the 1940s. We think that the demographic evidence has been misunderstood and misused, and that the sensitivity of demographic estimates to the assumptions made about levels of mortality and fertility, as well as about the accuracy and completeness of Soviet census data and vital statistics, has not been given adequate attention.

Scholars who write about the Soviet Union apply the term "excess deaths" to deaths that would not have occurred if certain historical events had never happened. Sometimes the comparative standard against which an excess is mea-

11. Conquest, "Forced Labour Statistics," p. 438.

sured is not very precise. The impact of Stalin's rise to power or even the establishment of Bolshevik rule in 1917–1921 is sometimes considered in this sense.

Usually, however, “excess mortality” has had a more specific meaning. The term has been used in three ways, all of which have in common a comparison of an expected with an actual population size. They differ, however, in the purpose of the measurement of this residual as well as in its interpretation.

1. *Excess Deaths as a Check on the Consistency of Sources of Population Data.* One use of the concept “excess deaths” refers to a comparison of the reported total population at a second date with the expected population at that date given the population count at the first date and everything that is *known* about fertility, mortality, and migration between the two dates. The purpose of the comparison is to check on the accuracy—the consistency—of different sources of data about the population

For example, the quality of vital statistics is sometimes assessed by comparing the actual number of people reported at a census date with the number predicted on the basis of the population count at an earlier census date and of reported mortality and fertility statistics between the two census dates. Discrepancies can stem from inaccuracy in either census, in the reported vital statistics data, or in the estimates of vital rates for years in which those data were not published.

Lorimer made this kind of “excess deaths” calculation for the USSR between 1926 and 1939. He estimated the difference between the recorded size of the Soviet population in 1939 and his estimate of what the population size would have been, given the count in the 1926 census and all available information on fertility and mortality between 1926 and 1939. For years for which vital statistics data were not published, he interpolated birth rates and death rates between the dates for which such data were published.

Lorimer realized that such an interpolation does not represent reality. When he found a difference of 5.5 million between the reported 1939 census total and his “best estimate” of the population in 1939 based on the 1926 census and information on births and deaths between 1926 and 1939, he concluded that this could be either because mortality was higher in years for which data were available than what was recorded, mortality was higher in years for which data were not available than that estimated by interpolation, or fewer births occurred in years for which birth data were not published than he had estimated.¹²

This kind of “excess mortality” is not an excess in comparison to normal experience. Rather, it points to a discrepancy between estimates of the population derived from different data sources.

2. *Excess Deaths of the Population Alive at the First Date.* Sometimes “excess mortality” refers to an unusually large number of deaths between two dates among people who were alive at the first date. If there were major population catastrophes between the two dates, their effect on the mortality of the population can be assessed by comparing the actual number of deaths that occurred to the number that would have occurred given the prevailing mortality schedule at the beginning of the period, the end of the period, or some other estimate of the normal course of mortality between the two dates.

12. Lorimer, *Population of the Soviet Union*, p. 137.

This method of measuring the number of excess deaths allows examination of the mortality effects of catastrophes without the complication of making assumptions about the course of fertility. It does, however, depend on the accuracy of the data in the two censuses and on the assumptions about “normal” mortality between the two dates.

In examining excess deaths between the 1926 and 1939 Soviet censuses, Lorimer projected those enumerated in the 1926 census to 1939 using an adjusted life table based on the published age-specific mortality rates for European Russia in 1926–27. Using this procedure, he found 4.8 million too few people age 12 or older in the Soviet census of 1929.¹³ Thus, he estimated 4.8 million excess deaths among those who were alive at the time of the 1926 census.

Lorimer commented that there is no way of knowing precisely how accurately the adjusted life table for European Russia for 1926–27 reflected the “normal” mortality experience of the Soviet population for the period 1927–1938. Although Lorimer’s estimates were based on the best available data, estimates of excess deaths are extremely sensitive to the mortality schedule used as a baseline or standard of comparison. Later we will illustrate the sensitivity of the estimates of the number of excess deaths between 1926 and 1939 to the assumption about the normal course of mortality by estimating the number of excess deaths under alternative mortality assumptions.

3. *Population Deficits and Excess Deaths.* Sometimes the focus of demographic analysis is not on excess deaths per se but on the size of the population deficit that is derived by comparing the total population size at the second date with an estimate of the expected total population size at that date. For this type of analysis, rather than using all observed (reported) information about fertility, mortality, and migration between two dates, the population at the first date is projected to the second date under what the researcher considers to be normal fertility, mortality, and migration.

“Normal” can be any standard the researcher chooses. It can be based on the population of interest (perhaps historical data from that population, or data for a segment of that population) or on another population (perhaps a population that has not gone through turbulent times). Estimation of the total size of the population at a given date, in comparison to what it would have been if mortality, fertility, and migration patterns had been normal, necessarily involves assumptions about the course not only of mortality but also of fertility and migration if the given historical event had not occurred.

There is a risk of confusing the estimated population deficit with excess (actual) deaths. Maksudov is aware of this problem, for example, when he observes that the age groups reported in the 1959 census are especially small among those born in the years 1928 to 1933 in the Ukraine and some other regions, by comparison with the two contiguous five-year age cohorts.¹⁴ He interprets the deficit quite reasonably as evidence of the geography of the famine (perhaps the intensity of the collectivization campaign would correspond to the same geography). Maksudov recognizes implicitly that much of the deficit could have occurred because of a short-term drop in fertility.

13. Ibid., pp. 231–36.

14. Maksudov, “Geografiia goloda 1933 goda,” *SSR: Vnutrennie protivorechiia*, 1983, no. 7, pp. 5–17.

But Rosefelde has interpreted population deficits as if they were excess (actual) deaths. Although sometimes he uses the term population deficit appropriately, at other times he describes his estimates as estimates of excess mortality. For example, at one point he writes that “these data indicate that the Soviet Union experienced 37 million excess deaths during the 1940s; a figure nearly twice as large as the number officially ascribed to war related casualties.”¹⁵ In fact, the figure to which he refers is an estimate of a population deficit, not of excess deaths. And the estimate itself, as Wheatcroft has pointed out, is based on what are probably exaggerated assumptions about the number of wartime births.¹⁶

It is extremely misleading to interpret population deficits as excess deaths, because the population deficit includes not just extra people who died but also births that did not occur, whether because of delayed marriage, separation of spouses, poor nutrition of mothers, or voluntary fertility control, including the use of abortion. Since data on both births and infant deaths are often missing for the years in which population crises occur, researchers sometimes assume a normal (or an overly high) fertility rate for those years and attribute a later deficit in the size of the age cohort to excess deaths. We shall show that estimates of the population deficit in the Soviet Union between 1926 and 1939 are extremely sensitive to assumptions about fertility.

All estimates of excess deaths or of the population deficit at a given date in comparison to what would have occurred under normal conditions have employed a combination of data from censuses and vital statistics. Although official statistics are never completely accurate, they are the natural starting point for any analysis of the demographic characteristics of a population.

Estimation of what would have happened to the Soviet population between 1926 and 1959 in the absence of the calamities is complicated by several factors. First, major long-range (“normal”) demographic changes were taking place in the Soviet population in this period. For example, between 1926 and 1939 marital fertility declined substantially in all of the European part of the USSR, and it continued to decline after that time. It is not, however, possible to say precisely when it declined in every region, and we know that such a decline is often precipitous once it begins.¹⁷

Second, the quality of the vital statistics system almost certainly exhibited a trend toward improvement between 1926 and 1959, despite periods of massive disruption. This means that any improvements in actual mortality could be masked by more complete reporting of deaths. It also means that reported mortality (and fertility) rates from earlier dates are more likely to be underestimates of the true levels than are reported rates from later dates. This is a common phenomenon in currently developing countries and historically when the statistical reporting system is being improved.

15. Rosefelde, “Excess Mortality,” p. 392.

16. Wheatcroft, “A Note on Steven Rosefelde’s Calculations,” p. 279.

17. Ansley J. Coale, Barbara A. Anderson, and Erna Härm, *Human Fertility in Russia since the Nineteenth Century* (Princeton, N.J.: Princeton University Press, 1979), pp. 16–17, 43, 199–206. A number of related social changes occurred in the 1930s, including rapid urbanization and separation of families, which could have affected the normal course of fertility.

Even in the 1950s, an estimated 5 percent of births for the USSR as a whole were unregistered.¹⁸ In Tadzhikistan, as many as 23 percent of births were apparently unregistered in the 1950s.¹⁹ Registration of births was almost certainly less complete in the 1920s and 1930s than in the 1950s and later decades. After examining the reported 1926–27 life table for the USSR, Lorimer came to the conclusion that there was probably underreporting of deaths, that is, the reported mortality rates were probably too low.

While applying Lorimer's method of measuring excess deaths in some respects, Rosefelde unaccountably rejects Lorimer's calculation that the reported death rate for the European part of the USSR in 1926–27 was about 27 percent lower than the probable actual death rate for the USSR as a whole.²⁰ Rosefelde's stated reason for rejecting Lorimer's evaluation is that "official figures released after 1946 [namely, in 1975] do not confirm this surmise."²¹

The logic of this argument is invisible. Since there is no evidence that the Central Statistical Board recalculated the 1926–27 mortality tables—it reports the same tables now as it did in 1930²²—republication of the original estimates cannot be taken as proof that the earlier tables were correct, nor as disconfirmation of Lorimer's evaluation of them as overly optimistic. The result of Rosefelde's decision to accept the reported 1926–27 mortality rates at face value is to raise the number of expected survivors from 1926 to 1939, and hence to inflate Rosefelde's estimate of the number of excess deaths.

Third, when there is a serious disruption of the normal statistical reporting system, as occurred in the collectivization period and World War II, the publication of vital statistics data often ceases. Even if the collection of vital statistics data does not cease, the data that are collected are certainly of lower quality than at other times. Official population totals for these years are likely to be projections of census figures based on these incomplete vital statistics data or based on estimates of the course of mortality and fertility. Hence, one needs to be skeptical about the accuracy of intermediate official population totals for such years as 1931, 1933, 1937, or 1938—even if the Central Statistical Board believed them to be accurate.

Rosefelde repeatedly mentions the need to make estimates of mortality and of population size for years between the 1926 and 1939 censuses in lieu of "the suppressed official rates"²³ or "unpublished catastrophic death rates."²⁴ He refers to population totals or vital rates for the 1930s reported by the Soviet demographer Boris Uralnis in 1977 as "newly disclosed" official data that "expose troublesome irregularities previously concealed by the restrictive publication of selected vital statistics."²⁵

18. Barbara A. Anderson and Brian D. Silver, "Estimating Census Undercount from School-Enrollment Data: An Application to the Soviet Censuses of 1959 and 1970," *Demography*, 22 (May 1985): 298–308.

19. Coale, Anderson, Härm, *Human Fertility in Russia*, p. 239.

20. Lorimer, *The Population of the USSR*, pp. 113–19.

21. Rosefelde, "Excess Collectivization Deaths," p. 87.

22. Compare the original life tables calculated by S. A. Noyosel'skii and V. V. Paevskii, *Smertnost' i prodolzhitel'nost' zhizni naseleniia SSSR, 1926–1927. Tablitsy smertnosti* (Moscow-Leningrad: Plankhozgiz, 1930) with the tables reported in A. A. Vishnevskii and A. G. Volkov, eds., *Vosproizvodstvo naseleniia SSSR* (Moscow: Finansy i statistika, 1983), p. 298.

23. *Ibid.*, p. 84.

24. Rosefelde, "Excess Mortality," p. 390.

25. *Ibid.*, p. 389.

In fact, because no crude birth rates were available for 1931, 1933, or 1934, Uralnis attributed the reported birth rate for 1932 to the entire period between 1931 and 1934, even though the number of births in 1933 and 1934 was likely to be sharply depressed because of the famine of 1932–33.²⁶ If one assumes too high a birth rate for those years, then one will find a “deficit” of survivors from that cohort in 1939, even if one allows for catastrophic mortality rates among those who were born.

It bears emphasis that any official population statistics for the USSR for the 1930s have the potential for a substantial amount of error. They are also likely to be based to a considerable degree on estimates made at the time. “Disclosure” or republication of the data in the 1970s or 1980s does not make them any more accurate than if they had been published in the 1930s.

Crucial to the estimates of the magnitude of any of the events on which we focus is the quality of the Soviet censuses of 1926 and 1939. In general, vital statistics in the Soviet Union appear to be less complete than the data collection in the censuses. One reason for this is the greater centralization of control of the periodic censuses than of the centrally monitored but essentially locally administered day-to-day collection of mortality and fertility data.

The 1926 and 1959 censuses are often considered “good,” while the 1939 census is sometimes said to be “bad.” For example, in assessing the excess mortality of Ukrainians in the 1932–33 famine, Conquest and Mace characterize the 1926 census as a good one and use it to establish a baseline number of Ukrainians in the USSR.²⁷ Conquest describes the 1939 census as “a fake” and argues that it probably overestimated the number of Ukrainians in that year.²⁸

But such global characterizations of the quality of the censuses are a poor guide for demographic analysis. All of these censuses are good or bad depending on the uses to which they are put.²⁹ The accuracy or completeness of the count of the population by age and sex is one of the most sensitive aspects of any census to shortcomings in administration.

Even the “good” 1926 census exhibits many peculiarities. For example, what kind of age-sex distribution did the 1926 census find? In general, the balance of the sexes fluctuates by age in ways that are not unusual for censuses of that era in other countries but that suggest why caution needs to be used in accepting age data from any census at face value. The sex ratios for single-year age groups for persons age 29 through 46 in the 1926 census are shown in the last column of table 1. The figures are for the USSR as a whole.

Two patterns stand out sharply in table 1. First, there is a substantial amount of “age heaping,” at numbers ending in 0 or 5. For example, there are many more people of both sexes who are age 30, 35, 40, or 45 than there are in the age groups that are contiguous to each of these ages. The heaping is even more severe at older ages (not shown).

26. Boris Uralnis, “Dinamika urovnia rozhdaemosti v SSSR za gody sovetской vlasti,” in A. G. Vishnevskii, ed., *Brachnost', rozhdaemost', smernost' v Rossii i v SSSR: sbornik statei* (Moscow: Statistika, 1977), pp. 11–12.

27. For example, Conquest, “Forced Labour Statistics”; Conquest et al., *Man-Made Famine*; and Mace, “Famine in Ukraine.”

28. Conquest, “Forced Labour Statistics,” p. 436; and Conquest et al., *Man-Made Famine*, p. 7.

29. For an evaluation of the quality and uses of Soviet census data, see Ralph S. Clem, ed., *Research Guide to the Russian and Soviet Censuses* (Ithaca, N.Y.: Cornell University Press, forthcoming).

Table 1. *Number of Males and Females at Ages 29 through 46 in the 1926 Soviet Census*^a

Age	Number of Males	Number of Females	Males per 1,000 Females
29	828,562	817,539	1,013
30	1,373,719	1,860,318	738
31	595,042	529,657	1,123
32	890,663	928,673	959
33	796,958	803,547	992
34	640,856	645,738	992
35	1,038,357	1,344,735	772
36	768,909	796,869	965
37	694,567	786,425	883
38	868,868	947,721	917
39	623,474	582,579	1,070
40	1,121,764	1,506,785	744
41	459,880	380,377	1,209
42	739,718	677,924	1,091
43	592,981	545,049	1,088
44	478,623	451,840	1,059
45	892,100	1,077,181	828
46	578,761	515,074	1,124

^aUSSR, Ts.S.U., *Vsesoiuznaia perepis' naselenii 1926 goda* (Moscow: Statizdat, 1928–1933), vol. 17, p. 46.

Second, table 1 shows wildly fluctuating male-female ratios linked to this pattern of heaping, a result of the stronger tendency toward heaping for female ages than for male ages. The detailed pattern by age and sex in the 1926 census clearly is not plausible. Other unusual patterns in the age-sex distribution of the 1926 census also have been noted by Lorimer.³⁰

This discussion is intended to emphasize that even the best available demographic data should not be accepted as accurate in every detail. Even modern censuses are subject to systematic error. For example, the Soviet censuses of 1959 and 1970, which are generally regarded as well-managed, apparently underenumerated people in certain age categories. An estimated 3 to 4 percent of preschool children were missed in each census, and between 3 and 4 percent of persons in their early 20s appear to have been missed in the 1970 census.³¹

A census of the USSR was conducted in 1937. The results of that census have been suppressed. There are no official census figures. A population total of 156 million, said to be from that census, has sometimes been used by Conquest and Rosefielde. This number, reported by Anton Antonov-Ovseenko,³² comes

30. Lorimer, *Population of the Soviet Union*, pp. 42 and 88. Lorimer notes a high ratio of adolescent girls to boys and a deficit of young children in the 1926 census, and he speculates about the reasons for these patterns. We think these patterns are consistent with those found in the 1959 and 1970 Soviet censuses: undercounting of young children and of geographically mobile adolescents.

31. Anderson and Silver, "Estimating Census Undercount." Underenumeration of young children in the 1959 census has also been noted by Godfrey Baldwin, *Estimates and Projections of the Population of the U.S.S.R., By Age and Sex: 1950–2000*, U.S. Department of Commerce, International Population Reports, Series P-91, no. 23 (Washington, D.C.: Government Printing Office, 1973), p. 6.

32. Anton Antonov-Ovseenko, *Portret tirana* (New York: Khronika, 1980), p. 211.

from the rumor mill in Soviet labor camps. There is no basis for representing this number, as Rosefelde has done in his publications, as a "1937 Census" total.³³

The chief arguments advanced against the accuracy of the 1939 census count have been that it appeared after the suppression of the 1937 census and that it has not been published in full. No thorough evaluation of the completeness of the 1939 census or any other Soviet census has ever been published. Although the 1939 census probably contains the types of error found in later Soviet censuses—undercounting of young children and adolescents, for example—the existence and magnitude of other forms of misenumeration in that census have not been demonstrated. Therefore it seems sensible to treat the published census data as the best information about the 1939 population of the USSR (in pre-annexation borders), but to maintain the caution that is appropriate when using unevaluated demographic data.³⁴

Rosefelde has been inconsistent in his assumptions about the 1939 census. In arguing recently that there were 11.9 million concealed excess deaths in the 1939 census, Rosefelde contended that the 1939 census was an overcount.³⁵ But earlier, when interpreting Eason's observations of a discrepancy between the 1939 census count of people working for pay and the sum of such workers from establishment data as evidence of the size of the labor camp population, Rosefelde treated the 1939 census as if it were a "good" census.³⁶

The officially reported expectation of life at birth for both sexes combined for 1926–27 (for the European part of the USSR) is 44 years and for 1938–39

33. Using the 1959 census age-sex distribution, as Rosefelde has done, in an effort to validate Antonov-Ovseenko's 1937 population total is extremely problematic because it requires heroic assumptions about the course of fertility, mortality, and migration (annexation and displacement of populations) during the period 1938–1958. This is why Rosefelde's attempt at such validation (see "Excess Mortality") fails. For further discussion, see Wheatcroft, "A Note."

34. The coverage of both the 1926 and 1939 censuses needs further study. The 1926 census should not be considered a completely accurate baseline. It suffered not only from the type of misenumeration by age noted in table 1, which is typically a symptom of other kinds of misenumeration, but probably also from *underenumeration*, especially of children and of mobile adolescents and young adults. The cohorts who were adolescents and young adults in the 1926 census might have been counted more completely in 1939, so that there would be an apparent "excess" of people in the age range 25 to 39 compared to what might be predicted on the basis of expected mortality between 1926 and 1939. One should not be too hasty to conclude that any such excess is a sign of padding of the 1939 census count.

35. Rosefelde, "Excess Mortality."

36. Rosefelde, "An Assessment." When Eason calculated the difference between the number of people working for pay in the 1939 census and the sum of such workers from economic establishment and sector statistics, he found that the census exceeded the establishment and sector total by 6.3 million. (See Eason, "Labor Force," pp. 83–85.) Although Eason attributed this discrepancy to the possible combination of a number of causes, including forced labor or other exclusions from establishment data, Rosefelde attributes not only the entire discrepancy of 6.3 million to forced labor but also the difference of 1.4 million between the 1939 census figure for the military and Eason's judgment that the military in January 1939 could not have numbered more than 2 million. Wheatcroft has pointed out that more complete 1939 census data published along with the 1959 census results eliminate the disparity that Eason had observed between the census count and the establishment data for 1939. See "On Assessing the Size," pp. 278–83.

(for the entire USSR) 47 years.³⁷ We calculate how many of those alive at the 1926 census date would have still been alive at the 1939 census date using a slightly broader range of assumptions about life expectancy at birth: a High Mortality (low expectation of life) assumption of a 38.6 year life expectancy for both sexes combined; a Medium Mortality assumption of a 43.5 year life expectancy; and a Low Mortality assumption of a 48.3 year life expectancy. The High Mortality assumption (lowest life expectancy) approximates the mortality rates that Lorimer thought actually prevailed in the USSR as a whole in 1926–27, which were higher than those officially reported.³⁸

We use Biraben's adjustment of the 1926 census data by single year of age.³⁹ Twelve years and one month elapsed between the 1926 and 1939 census dates; for these sensitivity tests we assume the period to be exactly twelve years. The single-year cohorts age 0 or older in 1926 are "survived" 12 years according to each of the three mortality schedules to estimate the number expected to be alive in the same cohort in the 1939 Soviet census under each mortality assumption. The expected number is then compared with the actual (reported) number in the 1939 census age 12 or older to calculate the number of excess deaths.⁴⁰

As shown in column 1 of table 2, under the Low Mortality assumption (expectation of life at birth of 48.3 years) the projected total population age 12 or older in 1939 is only 4 percent larger than the projected total population under the High Mortality assumption (expectation of life at birth of 38.6 years). The relative size of the estimated total number of deaths is somewhat more sensitive to the mortality assumption than the total population size. The Low Mortality assumption projects 21 percent fewer deaths than the High Mortality assumption (column 2).

37. USSR, Ts.S.U., *Naselenie SSSR (chislennost', sostav i dvizhenie naseleniia) 1973: statisticheskii sbornik* (Moscow: Statistika, 1975), p. 139. Life tables by sex for these years can be found in Vishnevskii and Volkov, *Vosproizvodstvo naseleniia SSSR*, pp. 298–99.

38. For mortality schedules, we use Coale-Demeny East Model life tables (levels 9, 11, and 13). We use model mortality schedules to obtain a range of mortality assumptions that spans the best estimates of normal mortality schedules for the USSR during this period. Each level of the model life tables provides a separate male and female mortality schedule, so that differential mortality by sex is assumed.

39. Jean-Noel Biraben, "Naissances et répartition par âge dans l'Empire russe et en Union soviétique," *Population*, 31 (March-April 1976): 441–78. Biraben smoothed the age distribution to reduce the effects of age heaping. To help in making comparisons across censuses, Biraben also adjusted the 1926 Soviet population to correspond to the 1939 post-annexation borders. While maintaining the proportions by single-year by sex estimated by Biraben, we scale down the total to match that reported in the 1926 census.

40. An age distribution for 1939 was published in the 1959 census (USSR, Ts.S.U., *Itogi vse-soiuznoi perepisi naseleniia 1959 goda, SSSR: Svodnyi tom* [Moscow: Gosstatizdat, 1962], p. 49). This distribution was for the post-annexation population, was not given separately by sex, and does not allow us to break the population into those aged 0–11 and 12+. However, Kolosova provides sex ratios by age from the 1939 census (G. Kolosova, "Pol, vozrast' i sostoianie v brake naseleniia SSSR," in G. M. Maksimov, ed., *Vsesoiuznaia perepis' naseleniia 1970 goda: Sbornik statei* [Moscow: Statistika, 1976], p. 169). And in 1956 the Central Statistical Board published an age distribution (not by sex) from the 1939 census for the pre-annexation population (see *Vestnik statistiki*, 1956, no. 6). This distribution provides a break between ages 11 and 12. Using these data in combination with Kolosova's data, it is possible to estimate the distribution of the pre-annexation 1939 population by age and sex. Note that the Ts.S.U. apparently assumed that the age distribution of the annexed population in 1939 was nearly identical to that for the Soviet population in pre-annexation boundaries. This can be inferred from the distribution of population by age in its reported pre- and post-annexation figures.

Table 2. *Estimates of Excess Deaths 1926–1939 to Persons Alive in 1926, Assuming High, Medium, and Low “Normal” Mortality^a (in millions)*

	(1) Population Age 12+ in 1939 Under Given Assumption	(2) Total Deaths 1926–1939 Under Given Assumption	(3) Excess Deaths 1926–1939 Under Given Assumption ^b
Reported in 1939 Census	122.5		
Difference between Reported 1926 Population and Number Age 12+ in 1939 Census		24.6	
<i>Expected Under Different Mortality Assumptions</i>			
High Mortality	123.0	24.1	0.5
Medium Mortality	125.7	21.4	3.2
Low Mortality	128.0	19.0	5.5
Ratio of Low Mortality Estimate to High Mortality Estimate ^c	1.04	.79	11.40

^aHigh, Medium, and Low Mortality correspond to Coale-Demeny East Model Life Table Levels 9 (life expectancy 38.6 years), 11 (life expectancy 43.5 years), and 13 (life expectancy 48.3 years), respectively.

^bThe “excess death” figures in column 3 are the difference between the *reported* total number of deaths between 1926 and 1939 (to those alive at the first date) and the *estimated* number of deaths between 1926 and 1939 under the given mortality assumption.

^cRatios are not derived directly from the figures reported above but instead from the results containing a greater number of significant figures.

The relative size of the estimated number of excess deaths is extremely sensitive to the mortality assumption. Compared to the estimated number of deaths if the Soviet population alive at the time of the 1926 census had age-specific death rates consistent with an expectation of life at birth of 38.6 years (High Mortality), there were 0.5 million excess deaths (column 3). Had there been an expectation of life at birth of 48.3 years (Low Mortality), however, there would have been 5.5 million excess deaths. Thus, Low Mortality would have resulted in 11 times as many “excess deaths” by 1939 among those alive in 1926 as High Mortality. This illustrates how volatile the estimates of the relative magnitude of population calamities can be when they are based on calculating the difference between two large numbers.

These estimates do not include deaths of people born between 1926 and 1939. In particular, excess deaths of infants and children in the 1932–33 famine would not be included in any estimate of the total number of excess deaths in the period between censuses. The population born after 1926 will be dealt with in the next section. But it is clear that one would have to make an extraordinarily optimistic assumption about the “normal” mortality rate, an assumption that the mortality rate was far lower than that reported for 1938–1939, to conclude that the number of excess deaths during 1927–1938 of persons who were alive in 1926 was in the neighborhood of 8 or 10 million.

A more reasonable approach, allowing for a decline in mortality between 1926–27 and 1938–39, would place the baseline in the range between the Low

Mortality and the Medium Mortality assumptions. Thus, the estimated number of excess deaths in the Soviet Union between 1926 and 1939 of people who were alive in 1926 could range between 3.2 and 5.5 million. This range brackets Lorimer's estimate of 4.8 million.

A breakdown of the estimates by sex reveals that at least 75 percent of the excess deaths between 1926 and 1939 of people alive at the first date occurred among males. This is consistent with other evidence that the mass repression in the 1930s fell most heavily on men.

Estimates of the excess mortality of persons born between the 1926 and 1939 censuses are subject to much greater uncertainty than estimates of the excess mortality of older persons. The basic reason for this is that we lack reliable information on the number of births and on the number of infant and child deaths by year, particularly for the most disruptive years of the collectivization of agriculture and the famine of 1932–33. Therefore, instead of estimating the excess mortality of persons born between the censuses, we estimate the population deficit of those cohorts in 1939. Like the estimates of mortality among those alive in 1926, these estimates are based on a range of assumptions, but in this case we must make assumptions about both fertility and mortality.

The High Fertility assumption uses the age-specific fertility rates reported for 1926–27 for the European part of the USSR.⁴¹ The Low Fertility assumption uses the reported age-specific fertility rates for the USSR as a whole in 1938–39.⁴² The Medium Fertility schedule is the average of the High Fertility and Low Fertility rates at each age.

The projection of the population to 1939 uses the cohort-component method. The number of women by age is projected from the 1926 census, using the three alternative mortality schedules employed earlier. In each year between censuses, the number of births to women of childbearing age is then estimated according to each of the three alternative age-specific fertility schedules. The newborns from each year are then “survived” to 1939 using the three mortality schedules.

Table 3 shows the extreme sensitivity of the estimates to both the fertility and the mortality assumptions. In column 1, the estimated number of births during 1927–1938 varies between 69.3 million (with a Low Fertility, High Mortality assumption) and 85.4 million (with a High Fertility, Low Mortality assumption). This is a difference of 16 million in the estimated number of births under “normal” conditions. The range in the projected size of the 0 to 11 age cohort in 1939 (column 2), under the various mortality and fertility assumptions, is even greater: a difference of 19 million.

These are differences in the projected numbers of births and of survivors to 1939 in the absence of a demographic cataclysm. The range reflects the magnitude of uncertainty about the true birth and death rates. Depending on the actual birth and death rates, between 15 and 26.3 million infants and children would have died in 1927–1938 in the absence of a cataclysm (column 3). Since the range in the estimated number of births and in the estimated number of

41. Vishnevskii and Volkov, *Vosproizvodstvo naseleniia SSSR*, p. 257.

42. USSR, Ts.S.U., *Naselenie SSSR*, p. 136.

Table 3. *Estimated Number of Births 1927–1938 and of Deaths to Those Born 1927–1938, Assuming Various Levels of Fertility and Mortality (in millions)^a*

	(1) Projected Number of Births 1927–1938	(2) Projected Number Age 0–11 in 1939 Census	(3) Projected Number of Deaths to Those Born 1927–1938	(4) Population Deficit of Those Age 0–11 in 1939 Census
<i>High Fertility^b</i>				
Low Mortality	85.4	66.5	18.8	18.5
Medium Mortality	84.6	63.0	21.6	14.9
High Mortality	83.9	57.6	26.3	9.5
<i>Medium Fertility</i>				
Low Mortality	77.9	61.0	16.9	12.9
Medium Mortality	77.2	57.5	19.8	9.4
High Mortality	76.6	52.6	24.0	4.5
<i>Low Fertility</i>				
Low Mortality	70.4	55.4	15.0	7.3
Medium Mortality	69.8	51.9	17.9	3.9
High Mortality	69.3	47.6	21.7	–0.5

^aThe number age 0–11 in the 1939 census was 48.1 million.

^bThe High Fertility assumption is based on the reported 1926–27 age-specific fertility rates for European Russia. The Low Fertility assumption is based on the reported 1938–39 age-specific fertility rates for the USSR. The Medium Fertility schedule is the average of the High and Low Fertility rates at each age.

deaths is very large, the range of estimated size of the population deficit of 0 to 11-year-olds in 1939 (column 4) is also very large: over 18 million.

It would be incorrect to interpret the population deficit (in column 4 of table 3) as excess deaths because the variation in the estimated size of the deficit depends as much on the size of the birth cohorts as on the mortality experience of those cohorts. Moreover, given the available information, it is impossible to determine for certain what proportion of the population deficit is due to births that did not occur and what proportion is due to excess deaths of infants and children. To make this kind of allocation, we would need to know either how many children actually were born in the period between the censuses or how many children died. These are exactly the figures that we do not have.

If one were to accept the implausible crude birth rates reported by Uralnis for the early 1930s at face value, as Rosefielde does, then it would be possible to derive estimates of excess mortality among those born in that period. But such estimates are extremely sensitive to any inaccuracy in the data. And Uralnis makes no adjustment for a decline in births related to the famine. If one were to deflate Uralnis's estimates of the crude birth rates by just 10 percent for 1933 and 1934, when the birth deficit due to the 1932–33 famine was probably most

Table 4. *Estimated Size of Population Deficit in 1939 Census Due to Population Age 0–11 and Population Age 12 or Older, Assuming Various Levels of Fertility and Mortality (in millions)^a*

	(1) Deficit Among Persons Age 0–11 in 1939	(2) Deficit Among Persons Age 12+ in 1939	(3) Total Deficit	(4) Percent of Deficit Due to Persons Age 0–11	(5) Percent of Deficit Due to Persons Age 12+
<i>High Fertility</i>					
Low Mortality	18.5	5.5	24.0	77.0	23.0
Medium Mortality	14.9	3.2	18.1	82.4	17.6
High Mortality	9.5	0.5	10.0	95.2	4.8
<i>Medium Fertility</i>					
Low Mortality	12.9	5.5	18.4	70.0	30.0
Medium Mortality	9.4	3.2	12.6	74.6	25.4
High Mortality	4.5	0.5	5.0	90.3	9.7
<i>Low Fertility</i>					
Low Mortality	7.3	5.5	12.9	57.0	43.0
Medium Mortality	3.9	3.2	7.0	54.7	45.3
High Mortality	–0.5	0.5	–0.0 ^b	—	—

^aThe fertility and mortality assumptions are the same as those in tables 2 and 3. The figures in this table are derived from those tables.

^bThe estimated number is –0.018 million.

severe, then the number of estimated births in those two years would decline over 1 million in total.⁴³

Table 4 combines results from tables 2 and 3 to show the total calculated population deficit in 1939 under different combinations of assumptions about the normal or baseline rates of mortality and fertility. The totals range from no estimated deficit at all (assuming Low Fertility and High Mortality) to 24 million (assuming High Fertility and Low Mortality). Under the assumption of Medium Fertility and Medium Mortality, the estimated population deficit in 1939 is 12.6 million.

For all of the nine combinations of mortality and fertility assumptions, except the Low Fertility-High Mortality assumption for which there is no estimated deficit, over 50 percent of the estimated population deficit is attributable to those under age 12 at the time of the 1939 census. Under the High Fertility-High Mortality assumption, over 95 percent of the estimated deficit is due to those under age 12. Under the Medium Fertility-Medium Mortality assumption, 74.6 percent of the population deficit is due to those under age 12.

Hence, a very large part of any estimated population deficit in 1939 is due to the number of births and deaths of those born between the 1926 and 1939

43. This is true if one uses Rosefielde's estimates of the number of births in 1933 and 1934, which rely on his estimates of the population and Ulanis's estimates of the crude birth rates in those years ("Excess Mortality," p. 388). Using our cohort-component method, deflating the estimated birth rates by 10 percent also decreases the number of projected births by over 1 million for those two years.

censuses. This means not only that the deficit of those under age 12 in 1939 depends on assumptions about fertility and mortality under “normal” conditions, but also that any estimate of the total population deficit is similarly sensitive to assumptions about the course of fertility and mortality between the censuses.

Another Soviet population catastrophe that has received special attention recently is the famine in the Ukraine. The estimates by Western scholars of excess mortality during the 1932–33 famine are not consistent with one another partly because they do not all focus on the same referent population. Some estimates refer to excess mortality “among Ukrainians.” Others refer to excess mortality “in the Ukraine.” Still others refer to excess mortality “in the 1932–33 famine,” which was concentrated in the Ukraine but not limited to that region.

James Mace has been a major contributor to the literature on the famine. In his book published in 1983, Mace did not make his own estimate of losses during the famine, but he cited sources suggesting that the losses could fall in the range between 5 and 15 million.⁴⁴ In more recent publications, Mace fixes on 7.9 million, and Conquest on 7.8 million excess deaths to Ukrainians between 1926 and 1939 censuses.⁴⁵ Mace estimates that 7.5 million of these excess deaths were caused by the famine.

Estimates of population losses in the famine are subject to the problems discussed earlier, particularly the tendency to confuse population deficits with excess deaths. For example, Mace’s estimate is of a population deficit, which he misinterprets as excess deaths:

If we subtract our estimate of the post-famine population from the pre-famine population, the difference is 7,954,000, which can be taken as an estimate of the number of Ukrainians who died before their time.⁴⁶

But since Mace’s estimate is of a population deficit rather than of excess deaths, many of those said to have “died before their time” were never born, especially if Mace has overestimated the number of births during the 1930s. In fact, Mace’s method of estimation makes no allowance for a decline in the number of births among Ukrainians during the famine years. Yet there was undoubtedly a severe decline in the number of births during those years.

Estimates of the losses in the Ukraine in the 1930s are also sensitive to the special problems of making population estimates for regions or for ethnic groups. Estimates of excess losses in the Ukraine, or in any other particular region, are sensitive to migration. Mace states this as a reason for calculating the losses between 1926 and 1939 in the number of Ukrainians rather than the population of the Ukraine.⁴⁷

For estimates of excess deaths of Ukrainians, however, factors other than births, deaths, and migration must be taken into account. Assimilation can have an effect similar to that of migration on intercensal comparisons of the population size of an ethnic group. Assimilation could account for a declining number of Ukrainians relative to the decline in the size of the total population in the

44. Mace, *Communism and the Dilemmas*.

45. Mace, “Famine in Ukraine,” pp. 38–39; and Conquest et al., *Man-Made Famine*, p. 7.

46. Mace, “Famine in Ukraine,” p. 39.

47. *Ibid.*, p. 38.

Ukraine and in the Soviet Union as a whole. This is probably what Mace is referring to when he states that "some persons who were counted as Ukrainian in the 1926 census could have been listed as Russian in 1939."⁴⁸ But in estimating the deficit of Ukrainians in 1939, Mace makes no attempt to estimate how many Ukrainians might have become assimilated between 1926 and 1939.

It is not plausible that a large proportion of the Ukrainians Mace estimates as missing could have disappeared through assimilation in such a short time. But the number of Ukrainians who changed their ethnic self-designation between the 1926 and 1939 censuses could have been in the hundreds of thousands, judging by the estimated rate of ethnic reidentification of Ukrainians between the 1959 and 1970 censuses.⁴⁹

There is a crucial related question that publications on the famine appear to have overlooked: Who is a "Ukrainian" in the 1926 and 1939 censuses? Unlike comparisons of the size of the entire population of the USSR between censuses, which need not be concerned with how the various subpopulations are defined, comparisons of subpopulations can be distorted by changes in definitions.

Most users of Soviet census data appear to be unaware of the extent to which "nationality" in Soviet censuses is a constructed or synthetic category. When census respondents are asked their nationality, their answers are recorded verbatim and only later coded into the official categories that appear in the census reports. This has been the practice in all Soviet censuses.⁵⁰

Thus, for example, in the 1970 Soviet census people who claimed to be "Rus'ki" or "Lemko" or "Hutsul" were supposed to be classified as Ukrainians. People who claimed to be Cossacks were supposed to be classified as Ukrainians if they stated that Ukrainian was their native language but as Russians if they stated that Russian was their native language.⁵¹ Since these reclassifications of responses were made administratively, it is important to know whether the same administrative practices were in place in both the 1926 and the 1939 census. Unfortunately, we do not know for certain either the official rules or the actual practices.

Ronald Wixman has claimed (without citing a source) that "in the late 1920s the Kuban Cossacks were reclassified from Ukrainian to Russian. This resulted in a sharp decline (by between two and three million) in the Ukrainian population."⁵² If in fact such a reclassification occurred in the late 1920s, almost

48. Ibid., p. 39.

49. Barbara A. Anderson and Brian D. Silver, "Estimating Russification of Ethnic Identity Among Non-Russians in the USSR," *Demography*, 20 (November 1983): 461–90. On the assimilation of Ukrainians by Russians between 1926 and 1959, see Robert A. Lewis, Richard H. Rowland, and Ralph S. Clem, *Nationality and Population Change in Russia and the USSR: An Evaluation of Census Data, 1897–1970* (New York: Praeger, 1976), pp. 278–88 and 295–96.

50. Brian D. Silver, "The Ethnic and Language Dimensions in Russian and Soviet Censuses," Brown University Population Studies and Training Center, Working Papers, no. WP-84-07 (August 1984); forthcoming in Clem, *Research Guide to the Russian and Soviet Censuses*.

51. USSR, Ts.S.U., *Slovari natsional'nostei i iazykov—dlia shifrovki otvetov na 7 i 8 voprosy perepisnykh listov (O natsional'nosti, rodnom i drugom iazyke narodov SSSR) Vsesoiuznoi perepisi naseleniia 1970 g.* (Moscow: Statistika, 1969). The analogous glossary for the 1959 census did not list the Cossacks, either as a separate nationality or as a subgroup of another nationality. See USSR, Ts.S.U., *Slovari natsional'nostei i iazykov—dlia shifrovki otvetov na 7 i 8 voprosy perepis'nogo lista (O natsional'nosti i rodnom iazyke)* (Moscow: Gosstatizdat, 1959).

52. Ronald Wixman, *The Peoples of the USSR: An Ethnographic Handbook* (Armonk, N.Y.: M. E. Sharpe, 1984), p. 208.

certainly it would have been adhered to in the 1939 Soviet census. We are already aware that the 1939 census made numerous other arbitrary reclassifications of nationality. Soviet ethnographers have mentioned the “artificial contraction” in the number of nationalities listed in the 1939 census.⁵³ The director of the 1979 Soviet census even wrote in 1964 that the number of nationalities in the 1939 census was reduced as a result of the “influence of the personality cult.”⁵⁴ Lorimer also noted an unexpectedly large increase in the number of Russians in the USSR between 1926 and 1939 compared to other ethnic groups.⁵⁵

Hence it is possible that a sizable proportion of the Ukrainians who were “missing” from the 1939 census report disappeared through administrative reclassification rather than because they died from starvation. If the reclassified Ukrainians numbered in the 2 or 3 million suggested by Wixman, then between 25 and 40 percent of Mace’s estimated deficit of Ukrainians could be accounted for in this way. This does not lessen the evidence that there was a terrible famine in the Ukraine in 1932–33, but it diminishes the magnitude of the estimated direct loss of life among Ukrainians.

Even if a large-scale reclassification of the Kuban Cossacks did not occur, it is important to determine the extent of assimilation and of administrative reclassification of the census responses on nationality between 1926 and 1939. Without this knowledge, comparing the number of Ukrainians enumerated in the two censuses could provide a less accurate guide to the losses during the famine than comparing the size of the population of the affected Ukrainian provinces. Moreover, in any estimate of losses during the famine, it is important to distinguish the measurement of excess mortality from that of a population deficit.⁵⁶

At the conclusion of one of the technical appendixes to *The Population of the Soviet Union*, Lorimer wrote:

There are, of course, many other sources of possible error in all these computations. Consequently, the results should be accepted with many reservations.⁵⁷

The same reservations apply to the computations presented here. But the purpose of Lorimer’s technical appendixes, as well as of this article, is to improve the analysis of Soviet demographic data in order to obtain a more accurate picture of actual demographic experience.

53. S. I. Bruk and V. I. Kozlov, “Etnograficheskaia nauka i perepis’ naseleniia 1970 goda,” *Sovetskaia etnografiia*, 1967, no. 5, p. 6.

54. A. A. Isupov, *Natsional’nyi sostav naseleniia SSSR (Po itogam perepisi 1959 goda)* (Moscow: Statistika, 1964), p. 12.

55. Lorimer, *Population of the Soviet Union*, pp. 137–40.

56. After this article went to press, in response to a challenge by Wheatcroft Mace defended his estimates of losses in the famine in the Ukraine (see “Ukrainian Famine,” *Problems of Communism*, 34 [March–April 1985]: 132–38). Mace concluded that an “irreducible minimum” of 5.5 million Ukrainians died in the famine. But this estimate, like Mace’s earlier ones, is of a *population deficit*, not excess deaths. The figure depends on assumptions about the rates of both mortality and fertility among Ukrainians for all of the *nonfamine* years between 1927 and 1938. Much of the “irreducible minimum” difference could result from an overestimate of the number of births or an underestimate of the number of deaths in the nonfamine years.

57. Lorimer, *Population of the Soviet Union*, p. 240.

Lorimer believed that the Soviet population of the 1930s could be studied. His classic book had many important findings about that population which are still valuable today, in large measure because Lorimer understood the limitations of demographic data and approached untested data with an appropriate degree of skepticism. We have not adopted Lorimer's method of estimation, primarily because Lorimer sought to make a "best estimate" of overall population trends, while our main concern is to establish the sensitivity of estimates of excess mortality and population deficits to different assumptions.

The precision with which statements about the Soviet population in the 1930s can be made depends on the issue being addressed. We showed in table 2 that alternative mortality assumptions had very little effect on estimates of the size of the population age twelve or older at the time of the 1939 census. Similarly, alternative fertility and mortality assumptions have a fairly small influence on the estimated age distribution of women of childbearing age. But estimates of the size of the population deficit or of the number of excess deaths are so sensitive to the assumptions made that they cannot be fixed within any narrow range with confidence.

Rosefielde concludes one part of his analysis by stating that "in line with Conquest's estimates, these statistics indicate that 20 million adult excess deaths may be imputed to forced labour and the terror, with an additional 5.8 . . . million excess fatalities attributed to collectivization, including children."⁵⁸ He then sets arbitrary lower and upper "confidence bounds" of 16.3 and 26.4 million on his estimate of "excess deaths attributable to forced industrialization."⁵⁹

This estimate by Rosefielde refers to the entire 1929–1949 period. The accuracy of Rosefielde's estimates of the number of excess deaths, and particularly the distribution of these deaths between 1929–39 and 1940–49, depends on the accuracy of the rumored "1937 census" total and of death rates, birth rates, and population totals reported or imputed for the years 1926–1949. If there is a large unexplained population deficit in the 1940s (using the 1939 census as a baseline), perhaps because official reports of war losses are too low or because estimates of births and of deaths not related to the war for 1940–1949 are in error, it is not necessary to conclude that the unexplained deficit must actually have been accumulated in the 1930s. This is what Rosefielde does.

Our estimates (table 4) suggest possible scenarios consistent with a population deficit in the 16 to 26 million range between 1926 and 1939, but only if at least 75 percent of the deficit is due to the cohorts born between 1926 and 1939. Rosefielde's estimate of between 12.8 and 14.7 million "adult excess deaths" between 1929 and 1939 (based on accepting the rumored 1937 census number) far exceeds any number that can be supported by the data. Even half that number of excess adult deaths is out of the range of plausibility for that period.

The main goal of this article has been to demonstrate the sensitivity of estimates of excess mortality to assumptions about the "normal" trends in fertility and mortality. If one were able to make defensible assumptions about these trends, one might reduce the range of uncertainty about the extent of excess mortality. But a considerably greater effort to defend assumptions, to verify the quality of extant demographic data, and to determine what the actual demo-

58. Rosefielde, "Excess Mortality," p. 404.

59. Ibid.

graphic trends were is needed before more precise estimates of excess mortality during the 1930s can be made. Stephen Wheatcroft's work has been very helpful in moving scholarship in that direction. We hope that increased awareness of the sensitivity of any estimates to the assumptions will help scholars to avoid making or tolerating unwarranted interpretations of the data.