MIGRATION AND SETTLEMENT: SOVIET UNION

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FOREWORD

Interest in human settlement systems and policies has been a central part of urban-related work at the International Institute for Applied Systems Analysis (IIASA) from the outset. From 1975 through 1978 this interest was manifested in the work of the *Migration and Settlement Task*, which was formally concluded in November 1978. Since then, attention has turned to dissemination of the Task's results and to the conclusion of its comparative study, which, under the leadership of Dr. Frans Willekens, is focusing on a comparative quantitative assessment of recent migration patterns and spatial population dynamics in all of IIASA's 17 National Member Organization countries.

The comparative analysis of national patterns of interregional migration and spatial population growth is being carried out by an international network of scholars who are using methodology and computer programs developed at IIASA.

In this paper, Dr. Soboleva examines the spatial population dynamics of the Soviet Union, relating them to historical events and national population policies. Of particular interest is the urban-rural disaggregation, and the use of heretofore unavailable Soviet multiregional age-specific data.

Reports, summarizing previous work on migration and settlement at IIASA, are listed at the end of this paper.

Andrei Rogers
Chairman
Human Settlements
and Services Area

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1. INTRODUCTION

This work is the result of research carried out within the framework of the Migration and Settlement Task in the Human Settlement and Services Area at IIASA. The goal of this project is a comparative analysis of the spatial dynamics and demographic characteristics (birth, death, and migration rates and sex-age structure) of the populations of the member nations of IIASA.

In accordance with this goal, the task of the present study was the analysis of the demographic development of regional populations in the USSR and the components of this development, both for the individual regions of the country and for the USSR as a whole. Particular attention is given to an examination of the dynamics of regional population growth and distribution with the help of IIASA's set of computer programs for the analysis of population and interregional migration.

The principle of spatial division of the USSR adopted in this study is based on the national division of the country into 15 republics. Data for 1974 are used for defining the rates of fertility, mortality, and migration, and a 50-year population projection until the year 2024 is included.

This study draws on the findings of several of the leading Soviet specialists in the field of population studies: scientists

such as B. Urlanis, D. Valentei, T. Ryabushkin, A. Kvasha, B. Khorev, Z. Rybakovskii, M. Kurman, and A. Vishnevskii.

1.1 Development of Population: Historical Overview

The USSR has the third largest population in the world, after China and India. On January 1, 1979, it had a total population of 262.4 million people. The country might have achieved this number much earlier had it not been for the deaths of many millions of people in World War II. More than 20 million people lost their lives during this war, and when indirect losses due to higher mortality and reduced fertility are included, the country's total loss was closer to 50 million. It took 10 post-war years for the nation's population to grow back to its pre-war numbers.

The most important changes in the dynamics and distribution of the USSR's population are connected with urbanization. In 1920 the fraction of the country's urban population was 15 percent while in 1975 it was 60 percent (Table 1). The average annual rates of increase of the country's urban population (Table 2) have slowed down somewhat during the last 15 years, and will continue to decrease as a higher level of urbanization is achieved.

In the post-war years, the size of the urban population has grown, while that of the rural population has declined. In a period of only 10 years, from 1940 to 1950, the size of the rural population was reduced by 22.2 million. This sharp decline is not only connected with wartime casualties and with the drop in the levels of natural growth, but also with the intensive rural-urban flow of the population. In the following decade, 1950-1960, the comparatively high natural increase of the rural population was counteracted by a high out-migration. As a result, the rural population in this period hardly changed in size, whereas the urban population grew by more than 34 million. This pattern did not continue, however. Beginning in the mid-sixties, the growing migration losses were no longer compensated for because of a sharp drop in the rural birthrate. From 1966-1975, the rural population declined by 8.3 million at the same time that the urban population grew by more than 29 million.

Table 1. Population of the USSR: 1920-1979 (in thousands).

Year	Population (in thousands)	Population		Percentage	
		Urban	Rural	Urban	Rural
1920	136810	20855	115925	15	85
1926	147028	26314	120714	18	82
1939	190678	60409	130269	32	68
1940	194352	63100	131252	33	67
1950	178547	69414	109133	39	61
1955	194415	86261	108154	44	56
1960	212372	103618	108754	49	51
1961	216286	107883	108403	50	50
1962	220003	111244	108759	51	49
1963	223457	114365	109092	51	49
1964	226669	117720	108949	52	48
1965	229628	120730	108898	53	47
1966	232243	123720	108523	53	47
1967	234823	126910	107913	54	46
1968	237165	129758	107407	55	45
1969	239468	132893	106575	55	45
1970	241720	135991	105729	56	44
1971	243873	139025	104848	57	43
1972	246293	142537	103756	58	42
1973	248625	146099	102526	59	41
1974	250869	149589	101280	60	40
1975	253261	153110	100151	60	40
1979	262442	163600	98800	62	38

SOURCES: Naseleniye SSSR, 1973. Statisticheskij sbornik. Moscow: Statistika 1975:7.

Newspaper Izvestiya, April 22, 1979.

Table 2. Average annual growth of urban population in the USSR.

Period	Annual Growth (in millions)	Average Annual Growth Rate (%)
1922-1940	2.4	4.6
1940-1950	0.6	0.95
1950-1960	3.4	4.1
1960-1970	3.2	2.8
1970-1975	3.4	2.4

SOURCE: Khorev and Moiseyenko 1976.

Table 3 presents data on urban and rural population size, size of territory, and the population density of each republic. It shows a large difference both in the area occupied by the territories and in the corresponding sizes and densities of urban and rural populations. For example, in the Estonian Soviet Socialist Republic (SSR) the rural population in 1974 consisted of 32.7 percent of the republics's total population, whereas in the Moldavian SSR the corresponding share was almost two times greater; in the Uzbek, Kirghiz, and Tadzhik SSRs it was 62 percent.

There also exists a large difference in the minimum and maximum population density of each union republic. According to 1974 data, in the Turkmen and Kazakh SSRs, population density was five persons per square kilometer; in the Ukrainian SSR it was 80.4; and in the Moldavian, 111.7.

The differences in the dynamics of relative changes of population size in the country as a whole, and in its republics' urban and rural populations also are substantial (Tables 4 and 5, and Figure 1). The total population from 1959-1974 of the RSFSR, the Ukrainian SSR, and the Byelorussian SSR increased only by 13 to 16 percent, while in the Kirghiz, Tadzhik, and Armenian SSRs, it grew by more than 50 percent, and in the Turkmen and Uzbek SSRs by more than 60 percent. At the same time the rural population in the Byelorussian SSR declined by 15 percent, by 20 percent in the RSFSR, but grew by almost 53 percent in the Uzbek, Tadzhik, and Turkmen SSRs.

Table 3. Territory, size, and density of the populations of the various USSR republics on January 1, 1974.

REPUBLIC	Territory (1000 km^2)	Population Size (1000)	Distribution		Percentage of Total Population		Number of Inhabitants per km^2
			Urban	Rural	Urban	Rural	
(Russia) RSFSR	17075.4	132913	88231	44682	66.4	33.6	7.8
Ukrainian	603.7	48521	28195	20326	58.1	41.9	80.4
Moldavian	33.7	3764	1332	2432	35.4	64.6	111.7
Byelorussian	207.6	9268	4549	4719	49.1	50.9	44.6
Uzbek	447.4	13289	5030	8259	37.9	62.1	29.7
Kirghizian	198.5	3219	1228	1991	38.1	61.9	16.2
Tadzhik	143.1	3283	1242	2041	37.8	62.2	22.9
Turkmen	488.1	2430	1182	1248	48.6	51.4	5.0
Kazakh	2717.3	13928	7348	6580	52.8	47.2	5.1
Georgian	69.7	4878	2398	2480	49.2	50.8	70.0
Azerbaijan	86.6	5514	2821	2693	51.2	48.8	63.7
Armenian	29.8	2728	1699	1029	62.3	37.7	91.6
Estonian	45.1	1418	954	464	67.3	32.7	31.4
Latvian	63.7	2454	1584	870	64.6	35.4	38.5
Lithuanian	65.2	3262	1796	1466	55.0	45.0	50.0
TOTAL USSR[a]	22402.2	250869	149589	101280	59.6	40.4	11.3

[a]This total in addition includes 90km^2 of the White Sea and 37.3km^2 of the Sea of Azov.

SOURCE: Naseleniye SSSR, 1973. Statisticheskij sbornik. Moscow: Statistika 1975:9.

Table 4. The total population of the union republics for the period 1920-1979.

Union Republic	1920 Total (1000)	1920 % of Total	1926 Total (1000)	1926 % of Total	1939 Total (1000)	1939 % of Total	1951 Total (1000)	1951 % of Total	1959 Total (1000)	1959 % of Total	1966 Total (1000)	1966 % of Total	1970 Total (1000)	1970 % of Total	1974 Total (1000)	1974 % of Total	1979 Total (1000)	1979 % of Total
RSFSR	88247	64.5	92735	63.1	1o8377	56.8	1o2945	56.7	117534	56.3	127189	54.8	13oo79	53.8	132913	53.o	137552	52.4
Ukrainian SSR	264oo	19.3	29515	20.1	4o469	21.2	37223	2o.5	41869	2o.o	45548	19.6	47126	19.5	48521	19.3	49757	19.o
Byelorussian SSR	4359	3.2	4986	3.4	8912	4.7	7781	4.3	8o56	3.9	8656	3.7	9oo2	3.7	9268	3.7	9559	3.6
Uzbek SSR	447o	3.3	4621	3.1	6347	3.3	6434	3.5	8119	3.9	1o399	4.5	118oo	4.9	13289	5.3	15391	5.9
Kazakh SSR	54oo	3.9	6o25	4.1	6982	3.2	6813	3.8	9295	4.5	12o47	5.2	13oo9	5.4	13928	5.5	14685	5.6
Georgian SSR	24o8	1.8	2677	1.8	354o	1.9	356o	1.9	4o44	1.9	45o5	1.9	4686	1.9	4878	1.9	5o16	1.9
Azerbaijan SSR	1952	1.4	2314	1.5	32o5	1.7	2933	1.6	3698	1.8	464o	2.o	5117	2.1	5514	2.2	6o28	2.3
Lithuanian SSR	-	-	-	-	288o	1.5	2561	1.4	2711	1.3	2989	1.3	3128	1.3	3262	1.3	3399	1.3
Moldavian SSR	233[a]	o.2	242[a]	o.2	2452	1.3	2392	1.3	2885	1.4	3367	1.4	3569	1.5	3764	1.5	3948	1.5
Latvian SSR	-	-	-	-	1885	1.o	1954.	1.1	2o93	1.o	2279	1.o	2364	1.o	2454	1.o	2521	1.o
Kirghiz SSR	86o	o.6	1oo2	o.7	1458	o.8	1764	1.o	2o66	1.o	2615	1.1	2933	1.2	3219	1.3	3529	1.3
Tadzhik SSR	924	o.7	1o32	o.7	1485	o.8	1554	o.9	1981	o.9	2556	1.1	29oo	1.2	3283	1.3	38o1	1.4
Armenian SSR	720	0.5	881	o.6	1282	o.7	136o	o.7	1763	o.8	2239	1.o	2492	1.o	2728	1.1	3o31	1.2
Turkmen SSR	837	o.6	998	o.7	1252	o.6	1225	o.7	1561	o.7	1917	o.8	2159	0.9	243o	1.o	2759	1.o
Estonian SSR	-	-	-	-	1o52	o.5	11o4	o.6	1197	o.6	1297	o.6	1356	o.6	1418	o.6	1466	o.6
TOTAL USSR	136810	1oo.o	147o28	1oo.o	19o678	1oo.o	181603	1oo.o	2o8827	1oo.o	232243	1oo.o	24172o	1oo.o	25o869	1oo.o	262442	1oo.o

[a]Without the regions that entered into the composition of this republic as a result of reunification in 1940.

SOURCES: Naseleniye SSSR, 1973. Statisticheskij sbornik. Moscow: Statistika 1975:10-13.

Newspaper Izvestiya, April 22, 1979.

Table 5. Urban and rural population in the union republics for the period 1920-1974.

5a. Population in thousands.

	1920		1926		1939		1959		1970		1974	
Union Republic	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
1. RSFSR	12553	75694	16455	76280	36296	72081	61611	55923	80981	49098	88231	44682
2. Ukrainian SSR	5110	21290	5673	23842	13569	26900	19147	22722	25688	21438	28195	20320
3. Byelorus. SSR	740	3619	848	4138	1855	7057	2481	5575	3908	5094	4549	4719
4. Uzbek SSR	807	3663	1012	3609	1470	4877	2729	5390	4322	7478	5030	8259
5. Kazakh SSR	380	5020	519	5506	1690	4392	4067	5228	6538	6471	7348	6580
6. Georgian SSR	481	1927	594	2083	1066	2474	1713	2331	2240	2446	2398	2480
7. Azerbaijan SSR	406	1546	650	1663	1157	2048	1767	1931	2564	2553	2821	2693
8. Lithuanian SSR	---	---	---	---	659	2221	1046	1665	1571	1557	1796	1466
9. Moldavian SSR	48[a]	185[a]	31[a]	211[a]	328	2124	643	2242	1130	2439	1332	2432
10. Latvian SSR	---	---	---	---	663	1222	1174	919	1477	887	1584	870
11. Kirghiz SSR	93	767	122	880	270	1188	696	1370	1098	1835	1228	1991
12. Tadzhik SSR	58	866	106	926	249	1236	646	1335	1077	1823	1242	2041
13. Armenian SSR	122	598	167	714	366	916	882	881	1482	1010	1699	1029
14. Turkmen SSR	87	750	137	861	416	836	700	816	1034	1125	1182	1248
15. Estonian SSR	---	---	---	---	355	697	676	521	881	475	954	464
TOTAL USSR	20885	115925	26314	120714	60409	130269	99978	108849	135991	105729	149589	101280

[a]Without the regions that entered into the composition of this republic as a result of reunification in 1940.

SOURCE: Naseleniye SSSR, 1973. Statisticheskij sbornik. Moscow: Statistika 1975:10-13.

Table 5b. Percentage distribution.

	1920		1926		1939		1959		1970		1974	
Union Republic	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
1. RSFSR	60.1	65.3	62.5	63.2	60.1	55.3	61.6	51.4	59.5	46.4	59.0	44.1
2. Ukrainian SSR	24.5	18.4	21.6	19.7	22.5	20.6	19.2	20.9	18.9	20.3	18.8	20.1
3. Byelorus. SSR	3.6	3.1	3.2	3.4	3.1	5.4	2.5	5.1	2.9	4.8	3.0	4.6
4. Uzbek SSR	3.9	3.2	3.8	3.0	2.4	3.7	2.7	5.0	3.2	7.1	3.4	8.2
5. Kazakh SSR	1.8	4.3	2.0	4.6	2.8	3.4	4.1	4.8	4.8	6.1	4.9	6.5
6. Georgian SSR	2.3	1.7	2.3	1.7	1.8	2.0	1.7	2.1	1.6	2.3	1.6	2.4
7. Azerbaijan SSR	1.9	1.3	2.5	1.4	1.9	1.6	1.8	1.8	1.9	2.4	1.9	2.7
8. Lithuanian SSR	---	---	---	---	1.1	1.8	1.0	1.5	1.2	1.5	1.2	1.4
9. Moldavian SSR	0.2	0.2	0.1	0.2	0.5	1.6	0.6	2.1	0.8	2.3	0.9	2.4
10. Latvian SSR	---	---	---	---	1.1	0.9	1.2	0.8	1.1	0.9	1.1	0.9
11. Kirghiz SSR	0.4	0.7	0.5	0.7	0.4	0.9	0.7	1.3	0.8	1.7	0.8	2.0
12. Tadzhik SSR	0.3	0.7	0.4	0.8	0.4	1.0	0.6	1.2	0.8	1.7	0.9	2.0
13. Armenian SSR	0.6	0.5	0.6	0.6	0.6	0.7	0.9	0.8	1.1	1.0	1.1	1.0
14. Turkmen SSR	0.4	0.6	0.5	0.7	0.7	0.6	0.7	0.7	0.8	1.1	0.8	1.2
15. Estonian SSR	---	---	---	---	0.6	0.5	0.7	0.5	0.6	0.4	0.6	0.5
TOTAL USSR	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

SOURCE: Table 5a.

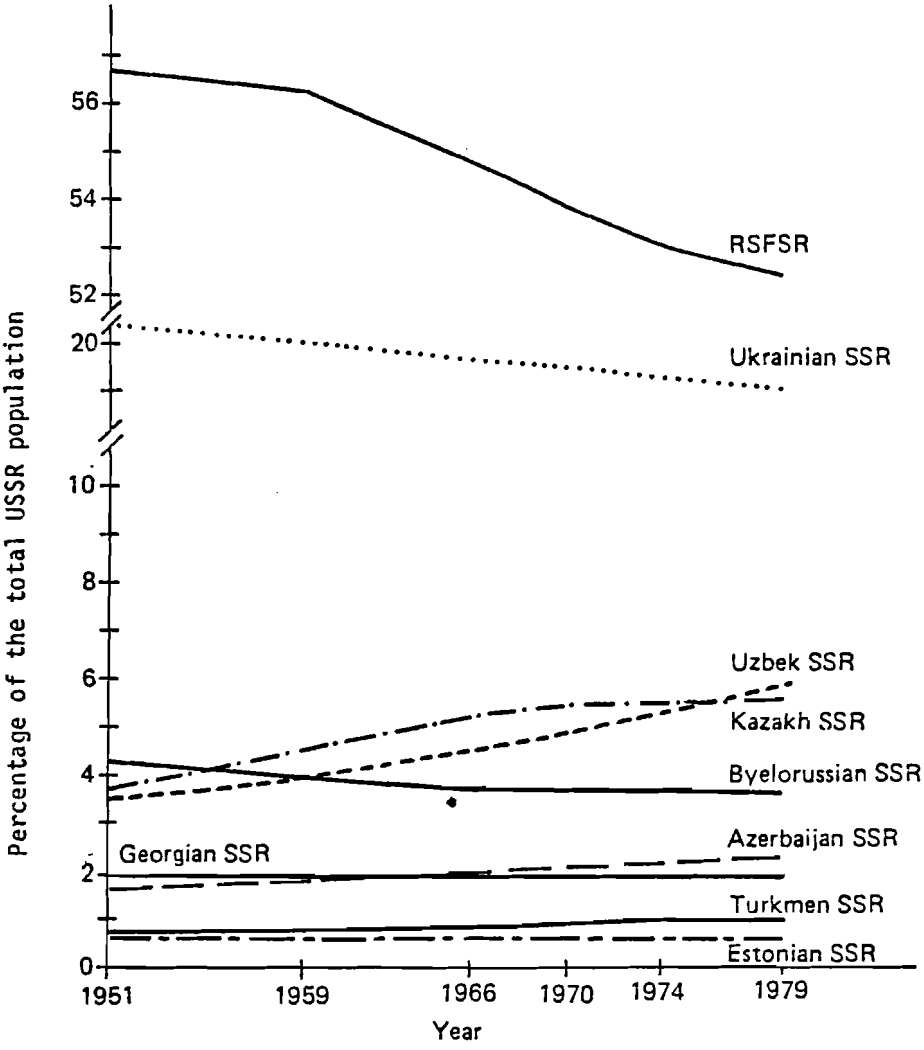

Figure 1. The shares of the population of several republics in the USSR, 1951-1979.

2. CURRENT PATTERNS OF SPATIAL POPULATION GROWTH

Population change is a complex process that is influenced by a wide range of social, economic, demographic, and political factors, which are reflected in variations in patterns of fertility, mortality, and migration.

2.1 Fertility

Differences among the birth rates of individual Union Republics (Table 6 and Figure 2) are the result of socioeconomic development and national traditions and customs. In 1940 the USSR was characterized by a comparatively high birth rate (over 30 per thousand), but even then, the Baltic Republics, Moldavia, and Byelorussia were noted for a lower birth rate. The highest birth rates were recorded in the Armenian SSR (41.2 per thousand), the Kazakh SSR (40.8 per thousand), and the Turkmen SSR (36.9 per thousand); the difference between the highest and lowest indices being 25.1 per thousand.

By 1960, an even greater difference in regional birth rates became evident. In the Central Asian Republics and in the Azerbaijan and Moldavian SSRs these rates became noticeably higher, while in the RSFSR, Ukraine, Byelorussia, and in the Baltic Republics, they fell. The highest birth rate in 1960 shifted to the Azerbaijan SSR, making the new difference between the highest and lowest republican birth rates 26 per thousand.

From 1960-1970 a significant decrease in the birth rate took place in the USSR. This decrease affected all of the republics except the Tadzhik SSR, where the birth rate increased from 33.5 to 34.7 per thousand. Simultaneously, the greatest declines were observed in the Armenian SSR (43.1 percent), the RSFSR (38.8 percent), and the Moldavian SSR (more than 35 percent); and the lowest in the Estonian SSR (6.6 percent). The national birth rate in 1967 was 17.3 per thousand and it has continued to decrease since then.

A detailed analysis of the dependence of the crude birth rates in individual regions of the country on the age composition of the female population, conducted during this period

Table 6. Crude birth rates in the USSR (per 1000 population).

Republic	1940	1950	1955	1960	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1975/60 %
RSFSR	33.0	26.9	25.7	23.2	15.7	15.3	14.4	14.1	14.2	14.6	15.1	15.3	15.1	15.6	15.7	67.7
Ukrainian SSR	27.3	22.8	20.1	20.5	15.3	15.6	15.1	14.9	14.7	15.2	15.4	15.5	14.9	15.1	15.1	73.7
Byelorus. SSR	26.8	25.5	24.9	24.4	17.9	17.6	16.8	16.4	15.9	16.2	16.4	16.1	15.7	15.8	15.7	64.3
Uzbek SSR	33.8	30.8	34.3	39.8	34.7	34.1	33.0	34.3	32.8	33.6	34.5	33.2	33.7	34.2	34.5	86.7
Kazakh SSR	40.8	37.6	37.5	37.2	26.9	25.7	24.7	23.8	23.4	23.4	23.8	23.5	23.2	21.0	24.1	64.8
Georgian SSR	27.4	23.5	24.1	24.7	21.2	20.3	19.5	19.4	18.7	19.2	19.0	18.0	18.2	18.3	18.2	73.7
Azerbaijan SSR	29.4	31.2	37.8	42.6	36.6	35.4	32.5	32.1	29.3	29.2	27.7	25.6	25.4	25.0	25.1	58.9
Lithuanian SSR	23.0	23.6	21.1	22.5	18.1	18.0	17.7	17.6	17.4	17.6	17.6	17.0	16.0	15.8	15.7	69.8
Moldavian SSR	26.6	38.9	30.4	29.3	20.4	21.0	20.7	20.0	19.0	19.4	20.2	20.6	20.4	20.4	20.7	70.6
Latvian SSR	19.3	17.0	16.4	16.7	13.8	14.0	13.9	14.0	14.0	14.5	14.7	14.5	13.9	14.2	14.0	83.8
Kirghiz SSR	33.0	32.4	33.5	36.9	31.4	30.8	30.5	30.8	30.1	30.5	31.6	30.5	30.6	30.5	30.4	88.4
Tadzhik SSR	30.6	30.4	33.8	33.5	36.8	35.4	35.2	36.7	34.7	34.8	36.8	35.3	35.6	37.0	37.1	110.8
Armenian SSR	41.2	32.1	38.0	40.1	28.6	27.1	24.4	23.9	22.8	22.1	22.6	22.5	22.1	21.0	22.4	55.9
Turkmen SSR	36.9	38.2	40.7	42.4	37.2	37.6	35.5	35.6	34.3	35.2	34.7	33.9	34.3	34.0	34.4	81.1
Estonian SSR	16.1	18.4	17.9	16.6	14.6	14.3	14.2	14.9	15.5	15.8	16.0	15.6	15.0	15.1	14.9	89.8
TOTAL USSR	31.2	26.7	25.7	24.9	18.4	18.2	17.3	17.2	17.0	17.4	17.8	17.8	17.6	18.0	18.1	72.7

SOURCES: Naseleniye SSSR, 1973. Statisticheskij sbornik. Moscow: Statistika 1975:69-83.
Central Statistics Office 1976b:45.

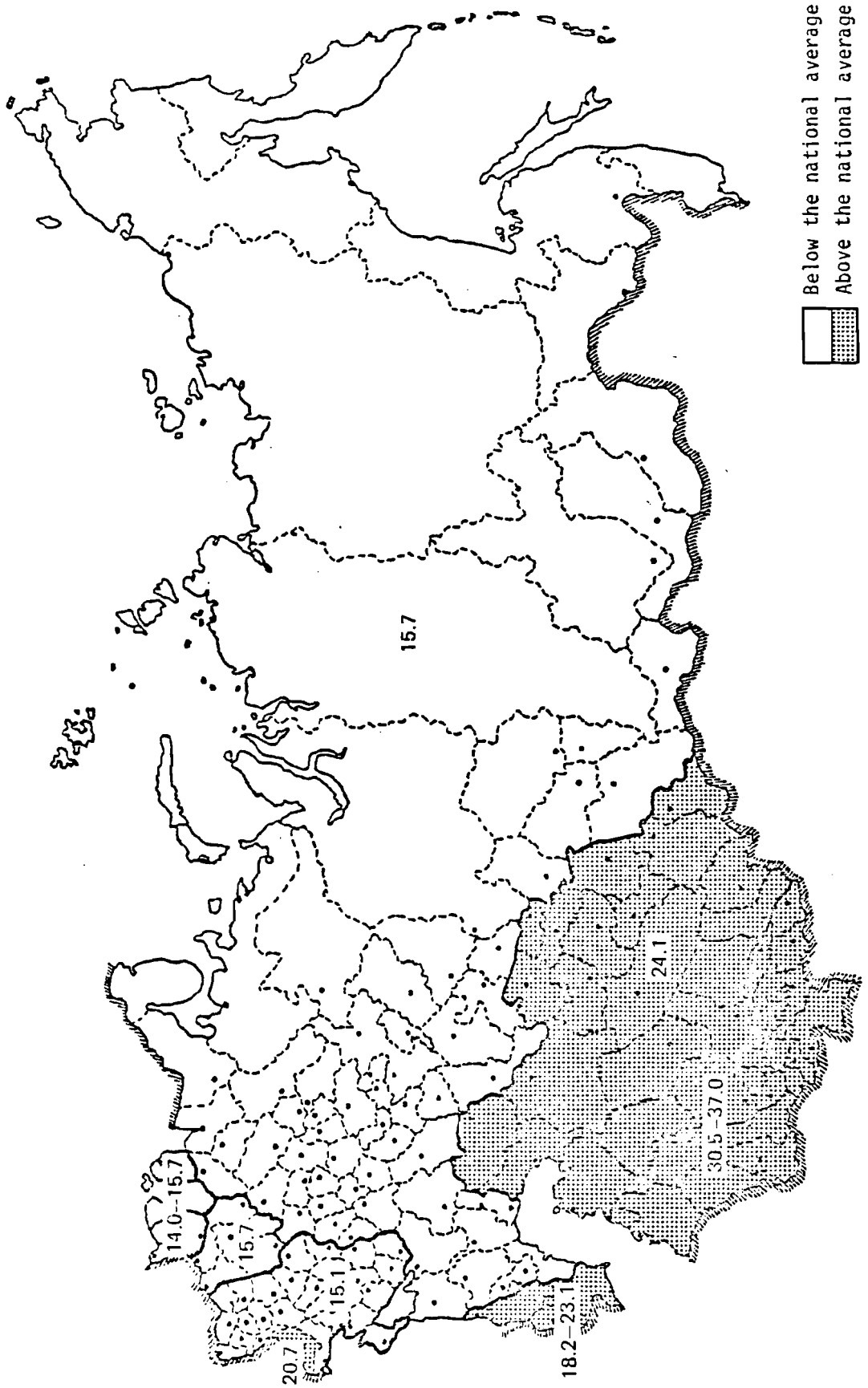

Figure 2. Crude birth rates in the Soviet republics, 1975.

(Pankrat'eva 1977), showed that in some republics (for example, Georgia, Azerbaijan, Moldavia, Lithuania, and Estonia) the change in the age structure of women of childbearing age exerted a basic influence by lowering the crude birth rate, and in the other republics (for example, RSFSR, and the Armenian and Kazakh SSRs) by lowering the mean age of childbearing (Figure 3).

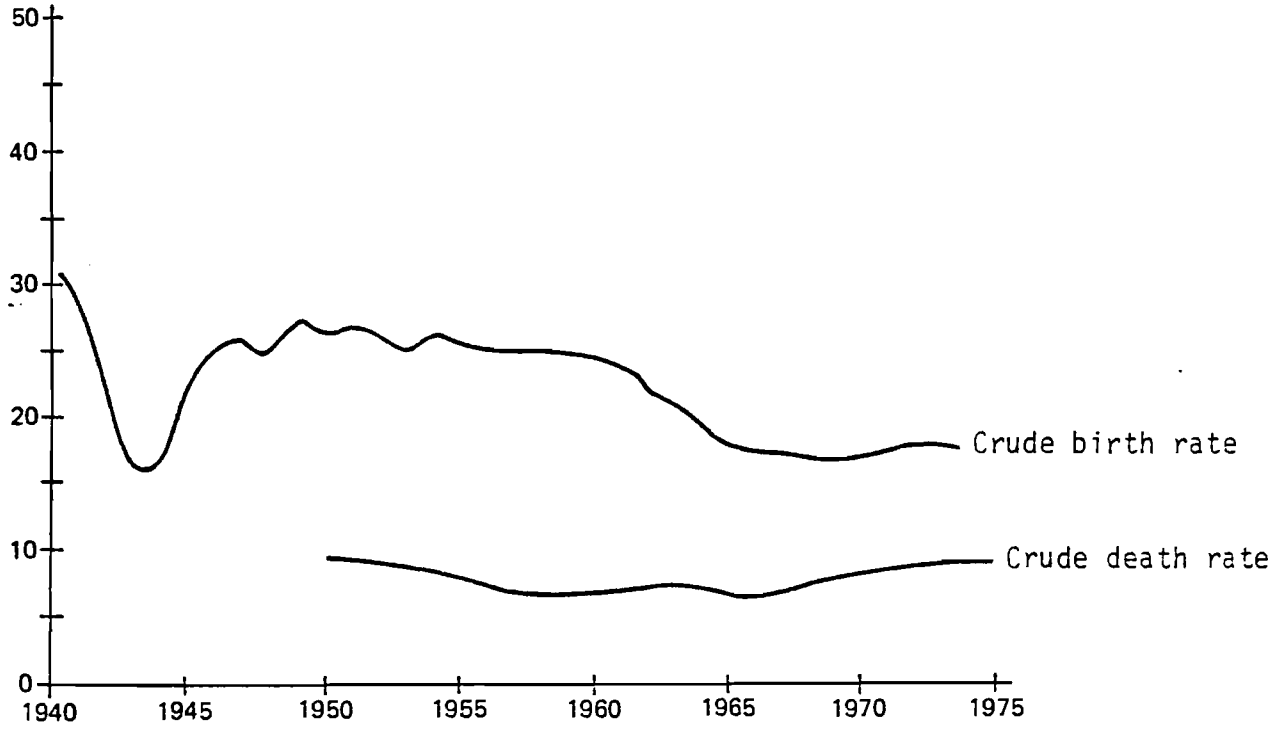

Figure 3. Crude birth and death rates for the USSR, 1940-1975. (Sources: Naseleniye SSSR, 1973. Statisticheskij sbornik. Moscow: Statistika 1975. Urlanis 1977:18.)

World War II left a substantial mark on birth rate dynamics. In Figure 3, the birth rate curve for the country as a whole shows two "waves" of the war's influence: the first in the 1940s and the second in the 1960s, the generation born after the war. Data on the absolute number of births in 1960-1975 (Figure 4) give a clear picture of the birth rate drop in the 1960s.

Today high birth rates persist in the Central Asian Republics, where the strong influence of Moslem traditions and customs which favor large families prevails. Marriages among young people are encouraged and there is little family planning. By contrast, among the Russian (RSFSR) population, and the peoples of

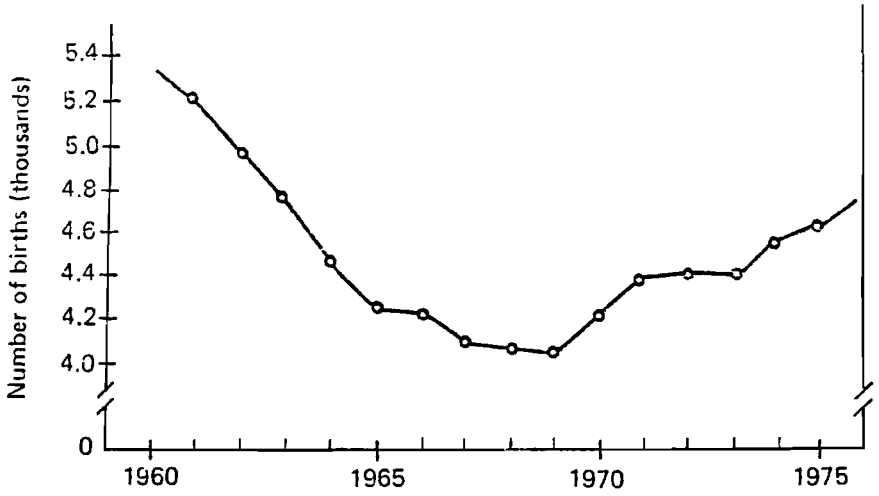

Figure 4. Number of births in the USSR, 1960-1975. (Source: Urlanis 1977:19.)

the Baltic Republics (the Ukraine and Byelorussia) the birth rate is lower than the country's national average.

As Figure 2 illustrates, geographical and national variations still play an important role in birth rate levels. In 1975, the birth rate in the Tadzhik SSR, the highest in the USSR, was 2.6 times higher than the birth rate in the Latvian SSR. These distinctions turn out to be even more significant when one considers the national makeup of these republics. The birth rate of the native populations of Central Asia exceeds that of the Baltic nationalities by almost four times. Thus, the national birth rate in the country is an aggregation of two different levels of population reproduction. On one hand, there is the lower average birth rate in the Baltic Republics, the RSFSR, the Ukraine, and Byelorussia. On the other hand, there is the high birth rate in the Central Asian and Caucasian Republics.

Having described the national and republican birth rate levels, we now will analyze age-specific fertility rates to obtain a more exact description of changes in birth rates with respect to population age structure.

The fluctuation of age-specific fertility rates among the territories of the USSR is significant (Table 7), not only in the

Table 7. Age-specific fertility rates in the republics of the USSR, 1972-1973.

Republic \ Age Group	Number of Births per 1000 Women							
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	15-49
RSFSR	31.5	154.7	114.4	63.3	32.5	7.5	0.6	54.9
Ukrainian SSR	36.5	163.9	115.2	63.2	31.1	6.3	0.4	56.2
Byelorus. SSR	23.6	170.6	135.3	77.5	39.3	9.7	0.8	59.7
Uzbek SSR	39.9	280.0	287.6	234.1	187.0	87.6	17.6	156.0
Kazakh SSR	28.7	199.9	187.2	126.5	86.6	29.1	5.8	93.6
Georgian SSR	32.3	184.8	157.2	83.9	42.9	11.1	2.1	69.0
Azerbaijan SSR	24.0	218.0	231.3	173.7	128.3	43.9	7.1	111.4
Lithuanian SSR	22.3	160.1	134.1	83.0	43.5	13.7	1.0	63.1
Moldavian SSR	30.6	180.9	140.9	94.7	58.1	18.4	1.5	75.6
Latvian SSR	26.7	147.7	116.5	67.5	31.3	7.0	0.4	53.8
Kirghiz SSR	38.8	264.9	249.3	191.2	149.8	69.9	13.9	132.9
Tadzhik SSR	41.1	292.0	280.4	250.8	214.5	109.2	26.2	168.0
Armenian SSR	37.3	214.3	180.4	97.1	61.5	20.3	3.1	87.3
Turkmen SSR	27.2	273.3	301.1	238.1	203.1	105.8	24.7	159.3
Estonian SSR	31.3	165.1	126.1	67.9	31.6	6.6	0.4	58.5
TOTAL USSR	32.4	172.3	135.9	81.8	48.0	14.3	1.9	66.4

SOURCE: Naseleniye SSSR, 1973. Statisticheskij sbornik. Moscow: Statistika 1975:137-138.

level of fertility among women of the same age groups in individual regions of the country, but also in the distribution of births within the entire reproductive period.

While in the majority of regions in the RSFSR, Ukraine, and Baltic Republics a woman's reproductive period virtually ends before 40 years of age, in the republics of Central Asia and the Caucasus, it continues well beyond. As is apparent from Table 7, the fertility rate of the 40-44 age group in these republics is more than 100 births per 1000. The significant fluctuation of age-specific fertility rates in each republic is reflected in its total fertility rate. In the RSFSR it is equal to 1.71 children; for the Uzbek, Tadzhik, and Turkmen Republics, the total fertility rate approaches six--that is, 3.5 times higher (Kurman 1976).

Examining the dynamics of age-specific fertility rates for the USSR as a whole in Table 8, it is seen that the age-specific birth rate dropped 1.6 times by the end of the 1950s from what it was in the pre-war years. Along with this, there was a fundamental change in the age pattern of fertility (Figure 5). In addition to the net drop in fertility of all age groups, a decrease in the mean age of childbearing also occurred.

In 1960-1970, fertility rates continued to fall in all age groups; however, in 1970-1975, slight increases occurred. These increases occurred in the pre-30 age group only. It should be observed that since 1935 there was no generation of women that had a higher birth rate for the 25-years-and-under age group than the generation born in the 1950s. This was due primarily to earlier marriages and a shift to a younger mean age of childbearing. In 1950, 54.7 percent of the women getting married were under 25; in 1973, their share was 73.8 percent, out of which total 81.9 percent were getting married for the first time.

The average age of women getting married was lowered from 24.9 in 1965 to 22.6 in 1973, and of men from 26.6 to 24.4 (Borisov 1976). At the same time the number of firstborns sharply increased. In 1970, 41.9 percent of all babies were

Table 8. Age-specific fertility rates, USSR, 1938-1975.

Age Group \ Year	1938-39	1958-59	1960-61	1965-66	1969-70	1970-71	1972-73	1973-74	1974-75	1974-75 and % 1970-71
15-19	32.8	29.2	35.2	25.5	30.4	32.0	32.4	33.3	34.4	107.2
20-24	214.4	162.2	164.8	159.6	163.9	170.2	172.3	173.4	176.8	103.9
25-29	230.6	164.8	160.7	136.0	128.7	132.1	135.9	134.8	133.5	101.1
30-34	183.5	110.1	110.0	97.0	88.1	87.1	81.8	79.3	77.9	89.4
35-39	131.7	66.6	60.7	50.6	48.5	49.6	48.0	45.5	42.7	86.1
40-44	68.1	24.1	23.5	19.1	15.3	14.9	14.3	14.4	14.4	96.6
45-49[a]	19.0	5.0	4.8	4.4	2.9	2.4	1.9	1.7	1.8	75.0
15-49[a]	139.5	88.7	90.6	70.8	65.7	66.9	66.4	66.8	67.8	101.4

[a]In determining coefficients for the age group 15-49, births to women over 49 are included.

SOURCES: Naseleniye SSSR, 1973. Statisticheskij sbornik. Moscow: Statistika 1975:136.
Pankrat'eva 1977:13-14.

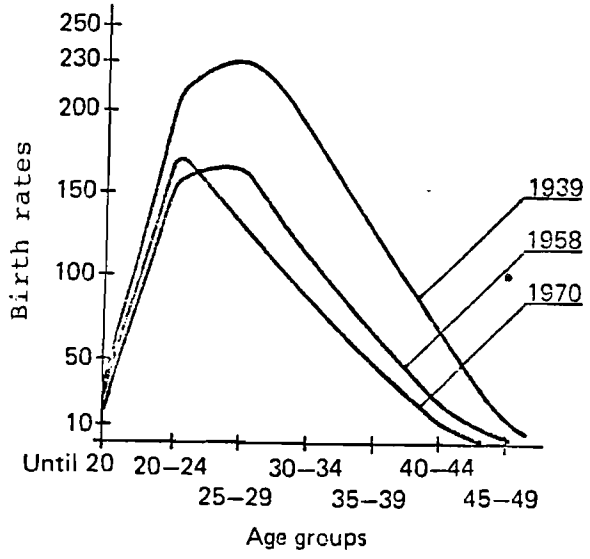

Figure 5. Age-specific fertility rates of women of the USSR according to age.

firstborn. In 1973 the share increased to 44.3 percent (Table 9). This age-specific acceleration of fertility, however, did not significantly affect the overall increase in the birth rate in the 1970s because of the substantial drop experienced in the preceding years. The 1975 fertility level was still 1.7 times lower than in the pre-war period.

In any country, fertility depends on an intricate combination of socioeconomic factors. The change in the tenor of life of the Soviet people, the growth of prosperity, the social demands for an increased level of educational and cultural resources, the changing needs of the population in connection with urbanization and growth of the cultural level, the change of the value orientations in the use of leisure time, the growing employment of women in public labor--all of these factors have left their imprint on the reproduction level of the population.

The growth of the proportion of the urban population also has had an influence on the change in the fertility level. As is apparent from Table 10, the age-specific fertility level of urban and rural populations in the USSR differs: it is higher for rural than for urban populations. In 1960, the number of births per 1000 women in the rural areas was 51.3 percent higher than in the urban areas. These differences are generated by the

Table 9. Distribution of babies according to order of birth, USSR, 1966-1973.

	Distribution (%)				Change in Comparison with 1966		
Year	Firstborn	Secondborn	Thirdborn	Total births	Firstborn	Secondborn	Thirdborn
1966	34.8	27.5	37.7	100.0	100.0	100.0	100.0
1967	36.1	27.2	36.7	96.5	100.1	95.6	93.9
1968	37.3	26.7	36.0	96.4	103.3	93.8	91.9
1969	39.2	27.1	33.7	96.4	108.7	95.2	85.9
1970	41.9	26.5	31.6	99.7	120.2	96.0	83.3
1971	43.1	26.6	30.3	103.1	127.7	99.5	82.8
1972	43.9	27.3	28.8	103.8	130.9	103.1	78.8
1973	44.3	27.7	28.0	103.5	131.7	104.1	76.9

SOURCE: Kurman 1976:86.

Table 10. Age-specific fertility rates in the urban and rural areas of the USSR, 1960-1973.

	1960-61			1965-1966			1969-1970			1972-1973		
Age	Urban	Rural	Index of Rural Over Urban (%)	Urban	Rural	Index of Rural Over Urban (%)	Urban	Rural	Index of Rural Over Urban (%)	Urban	Rural	Index of Rural Over Urban (%)
15-49	73.5	111.2	151.3	57.0	90.4	158.6	55.7	82.3	147.8	57.5	82.7	143.8
15-19	28.9	42.4	146.7	25.8	25.1	97,3	28.5	33.8	118.6	30.5	35.4	116.1
20-24	143.4	193.7	135.1	137.5	198.1	144.1	144.2	209.5	145.3	147.3	236.5	160.6
25-29	131.9	195.2	148.0	111.0	177.6	160.0	108.8	163.2	150.0	115.3	184.5	160.0
30-34	83.0	143.0	172.3	69.6	135.0	194.0	68.6	121.9	177.7	64.1	115.1	179.6
35-39	40.5	85.4	210.8	31.3	77.3	247.0	29.6	75.5	255.1	31.3	76.5	244.4
40-44	11.5	37.3	324.3	9.4	32.2	342.6	7.3	27.0	369.9	6.5	25.8	396.9
45-49	1.4	7.3	521.4	1.3	8.4	646.2	1.1	5.5	500.0	0.6	3.8	633.3

SOURCE: Naseleniye SSSR, 1973. Statisticheskij sbornik. Moscow: Statistika 1975:136.

differences in the conditions and ways of life between urban and rural populations that have developed historically. With each passing year, these differences are becoming minimized but even so they still are significant.

2.2 Mortality

The crude death rate in the USSR, shown in Figure 3, has had a tendency to fall in the past four decades. In 1973 the crude death rate in the USSR was 48.3 percent of the 1940 level, and the average life expectancy during this time increased from 44 years to 70 years (64 for men and 74 for women). The fall in the death rate and the increase in average life expectancy were a result of the increased standard of living and the improvement of labor conditions, as well as a consequence of achievements in the area of health care and medicine.

From 1960 to 1966 the crude death rate stabilized, but since that time it has risen: in 1966 it was 7.3 per thousand and in 1975 it was 9.3. The crude death rate, however, is calculated in relation to the entire population, and therefore it does not give a true representation of the mortality rate. One must also consider the age and the sex structure of the population.

The age-specific mortality rate (Table 11) permits a more precise description of the mortality trends in a country. As the calculations conducted by Pankrat'eva (1977) on the influence of age on the crude death rate showed, the increased rates were a consequence of changes in the populations's age structure. Between 1958-59 and 1973-74 there was a crude death rate increase of 17.6 percent: the true increase was only 2.0 percent; while the increase due to changes in the age structure was 15.6 percent. As the proportion of the population in the older age groups grew, the crude death rate rose. This increase was largely due to the war and its influence on the health and mortality of the people of these age groups.

During the period of observation (see Table 11), mortality fell by 31 percent in the under-5 age group, by more than 36 percent in the 5-9 age group, and by almost 38 percent in the

Table 11. Age-specific mortality rates, USSR, 1958-1975 (deaths per 1000 population).

Age	1958-1959	1965-1966	1969-1970	1972-1973	1973-1974	1974-1975	1974-1975 in % of 1958-1959
Total Population	7.4	7.3	8.2	8.6	8.7	9.0	108.1
0-4	11.9	6.9	6.9	7.2	7.7	8.2	68.9
5-9	1.1	0.8	0.7	0.7	0.7	0.7	63.6
10-14	0.8	0.6	0.6	0.5	0.5	0.5	62.5
15-19	1.3	1.0	1.0	1.0	1.0	1.0	76.9
20-24	1.8	1.6	1.6	1.6	1.6	1.7	94.4
25 29	2.2	2.0	2.2	2.1	2.0	2.1	95.5
30-34	2.6	2.6	2.8	2.8	2.8	3.0	115.4
35-39	3.1	3.2	3.7	3.6	3.6	3.7	119.4
40-44	4.0	3.9	4.7	4.8	4.9	5.2	130.0
45-49	5.4	5.1	6.0	6.2	6.4	6.7	124.1
50-54	7.9	7.9	8.7	8.6	8.8	9.0	113.9
55-59	11.2	11.1	11.7	12.5	12.3	13.0	116.1
60-64	17.1	17.2	18.0	18.0	18.2	18.3	107.0
65-69	25.2	25.5	27.5	27.2[1]	27.0	27.4	108.7
70 and over	63.8	65.8	75.7	75.5	73.5	73.3	114.9

SOURCES: Naseleniye SSSR, 1973. Statisticheskij sbornik. Moscow: Statistika 1975:141.
Central Statistics Office 1976b:43.

10-14 age group. Infant mortality also dropped substantially, nationally and among republics. In 1940 the difference between the greatest and the smallest indices of infant mortality was 144 percent, whereas in 1967 it was only 26 percent. This discrepancy, however, is sufficiently large for one to see that there are still enormous possibilities for lowering infant mortality.

The group of children under one year of age is the only age group in the entire population where there is a significant difference in the mortality level among individual regions of the country. The share of deaths in specific regions substantially influences the country's total mortality level. There exists here, then, a large potential for a decline in the total mortality rate, by reducing the deaths in the 0-1 year age group in certain regions in the USSR. In all the remaining age groups, mortality indices for the various regions are sufficiently similar.

As well as being affected by age, death rates are dependent on the sex structure. In all age groups, the mortality level is lower among women than among men (Figure 6). Apparently, as child mortality falls, a bigger and bigger role is played by deaths from causes which affect men more than women. Among men, there is a higher mortality rate from cardiovascular diseases, malignant tumors, and accidents.

Analysis of male and female mortality trends in the individual age groups shows that the most substantial difference in the mortality rate is observed in the 20-40 year old age groups. In this group, not only is the difference in mortality rates substantial, but also there exist opposing tendencies in the direction in which these changes occur. This is more noticeable in Figure 7. The mortality rate of women in 1968-71 in the 25-35 age group was 20-40 percent *lower* than the corresponding mortality rate in 1958-59. The mortality rate for men, however, was 10-29 percent *higher* for the same period.

In Table 12, data is introduced on male and female mortality in the individual union republics of the USSR. The data in

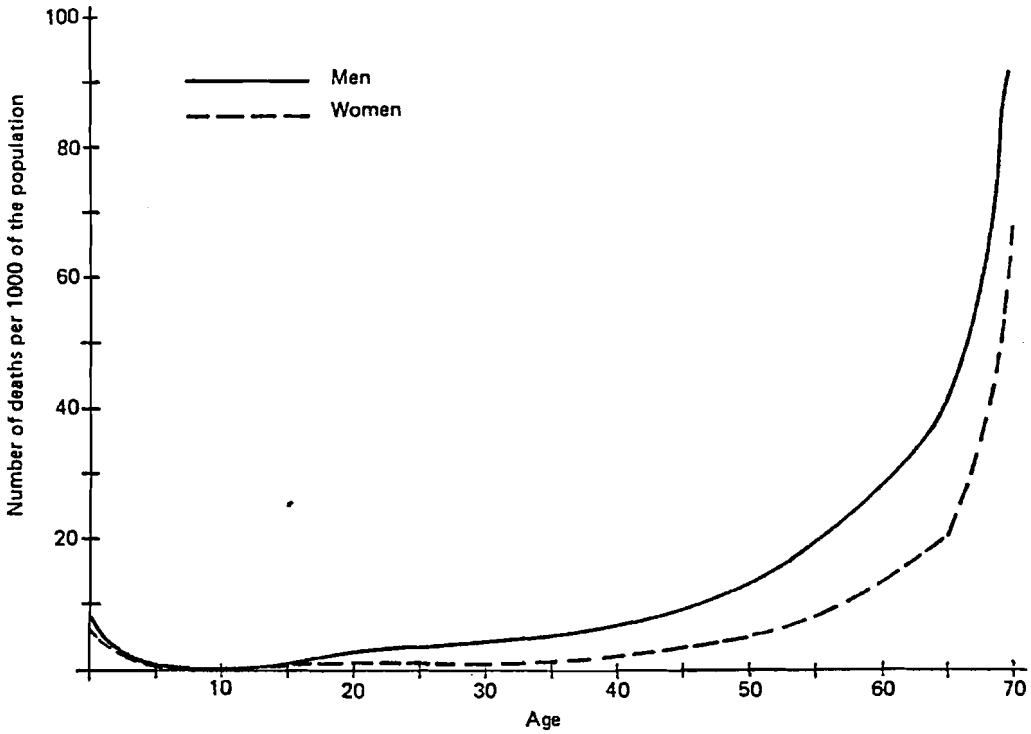

Figure 6. Age-specific mortality rates by sex, USSR, 1972-1973. (Source: Naseleniye SSSR, 1973. Statisticheskij sbornik. Moscow: Statistika 1975:142.)

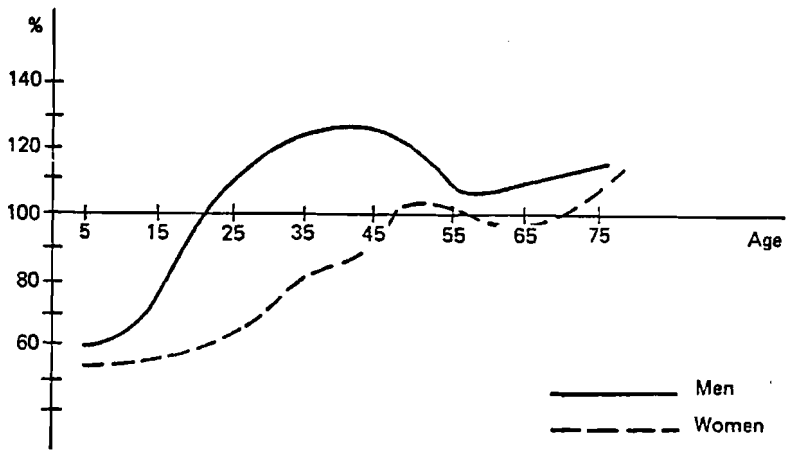

Figure 7. Age-specific mortality rates, 1968-1971, as compared to corresponding rates in 1958-1959 (in percent). (Source: Brachnost', rozhdayemost', smertnost' v Rossii i v SSSR. Moscow: Statistika 1977:45.)

Table 12. Crude death rates of the male and female populations of individual union republics, 1965-1973.

	Number of Deaths per 1000 Population								
	1965			1970			1973		
	Men	Women	Both Sexes	Men	Women	Both Sexes	Men	Women	Both Sexes
RSFSR	8.1	7.1	7.6	9.4	8.1	8.7	9.7	8.7	9.2
Ukrainian SSR	8.0	7.2	7.6	9.4	8.4	8.9	9.7	9.0	9.3
Byelorussian SSR	7.2	6.4	6.8	8.1	7.3	7.6	8.4	7.7	8.0
Uzbek SSR	6.5	5.3	5.9	6.2	4.9	5.5	7.0	5.7	6.4
Kazakh SSR	6.8	5.1	5.9	7.1	5.0	6.0	7.6	5.6	6.5
Georgian SSR	7.8	6.2	7.0	8.2	6.4	7.3	8.2	6.7	7.4
Azerbaijan SSR	6.8	5.9	6.4	7.3	6.1	6.7	6.7	6.0	6.4
Lithuanian SSR	8.5	7.4	7.9	9.8	8.1	8.9	9.8	8.2	9.0
Moldavian SSR	6.5	5.9	6.2	7.9	6.9	7.4	8.8	7.7	8.2
Latvian SSR	10.6	9.6	10.1	11.5	10.9	11.2	12.0	11.2	11.5
Kirghiz SSR	7.4	5.7	6.5	8.3	6.5	7.4	8.5	6.7	7.6
Tadzhik SSR	6.8	6.3	6.6	6.7	6.0	6.4	7.7	6.8	7.2
Armenian SSR	6.2	5.3	5.7	5.5	4.7	5.1	5.6	4.8	5.2
Turkmen SSR	7.4	6.5	7.0	7.3	5.9	6.6	7.6	6.9	7.2
Estonian SSR	10.5	10.4	10.5	11.3	11.0	11.1	11.0	11.1	11.0
TOTAL USSR	7.8	6.9	7.3	8.9	7.7	8.2	9.2	8.2	8.7

SOURCE: Naseleniye SSSR, 1973. Statisticheskij sbornik. Moscow; Statistika 1975:100-101.

this table show that a higher mortality rate among men can be observed in all union republics. There are large differences, however, among the individual regions. For example, in the Kazakh SSR in 1973, the differences in the crude death rates of men and women were two per thousand, while in the Estonian SSR, they were only 0.1 per thousand.

Many of the differences in the death rates in the individual republics may be explained by differences in population age structure. The highest crude death rate is in the Baltic Republics (in the Estonian and Latvian SSRs) where the birth rate is low and the share of population over 60 is high. The lowest mortality rate of 5.2 to 6.4 per thousand occurs in the republics where the birth rate is high and where a large share of the population is young.

The existing differentiation of birth rates among the individual union republics of the USSR leaves its mark also on the natural growth rate (Table 13 and Figure 8). The highest natural growth rate in 1971-73 was in the Tadzhik, Uzbek, and Turkmen SSRs (31-27 per thousand) and the lowest was in the Baltic Republics (5-2 per thousand).

Table 13. Crude birth rates, death rates, and rates of net population increase (per 1000 of the population) in the union republics of the USSR, 1971-1973.

	1971			1972			1973		
Union Republic	Birth Rate	Death Rate	Increase Rate	Birth Rate	Death Rate	Increase Rate	Birth Rate	Death Rate	Increase Rate
RSFSR	15.1	8.7	6.4	15.3	9.0	6.3	15.1	9.2	5.9
Ukrainian SSR	15.4	8.9	6.5	15.5	9.2	6.3	14.9	9.3	5.6
Byelorussian SSR	16.4	7.5	8.9	16.1	7.8	8.3	15.7	8.0	7.7
Uzbek SSR	34.5	5.4	29.1	33.2	6.1	27.1	33.7	6.4	27.3
Kazakh SSR	23.8	6.0	17.8	23.5	6.3	17.2	23.2	6.5	16.7
Georgian SSR	19.0	7.4	11.6	18.0	7.6	10.4	18.2	7.4	10.8
Azerbaijan SSR	27.7	6.5	21.2	25.6	6.6	19.0	25.4	6.4	19.0
Lithuanian SSR	17.6	8.5	9.1	17.0	9.1	7.9	16.0	9.0	7.0
Moldavian SSR	20.2	7.7	12.5	20.6	7.6	13.0	20.4	8.2	12.2
Latvian SSR	14.7	11.0	3.7	14.5	11.3	3.2	13.9	11.5	2.4
Kirghiz SSR	31.6	7.0	24.6	30.5	7.4	23.1	30.6	7.6	23.0
Tadzhik SSR	36.8	5.7	31.1	35.3	6.3	29.0	35.6	7.2	28.4
Armenian SSR	22.6	4.9	17.7	22.5	5.2	17.3	22.1	5.2	16.9
Turkmen SSR	34.7	6.7	28.0	33.9	7.2	26.7	34.3	7.2	27.1
Estonian SSR	16.0	10.9	5.1	15.6	11.1	4.5	15.0	11.0	4.0
TOTAL USSR	17.8	8.2	9.6	17.8	8.5	9.3	17.6	8.7	8.9

SOURCE: Naseleniye SSSR, 1973. Statisticheskij sbornik. Moscow: Statistika 1975:69-83.

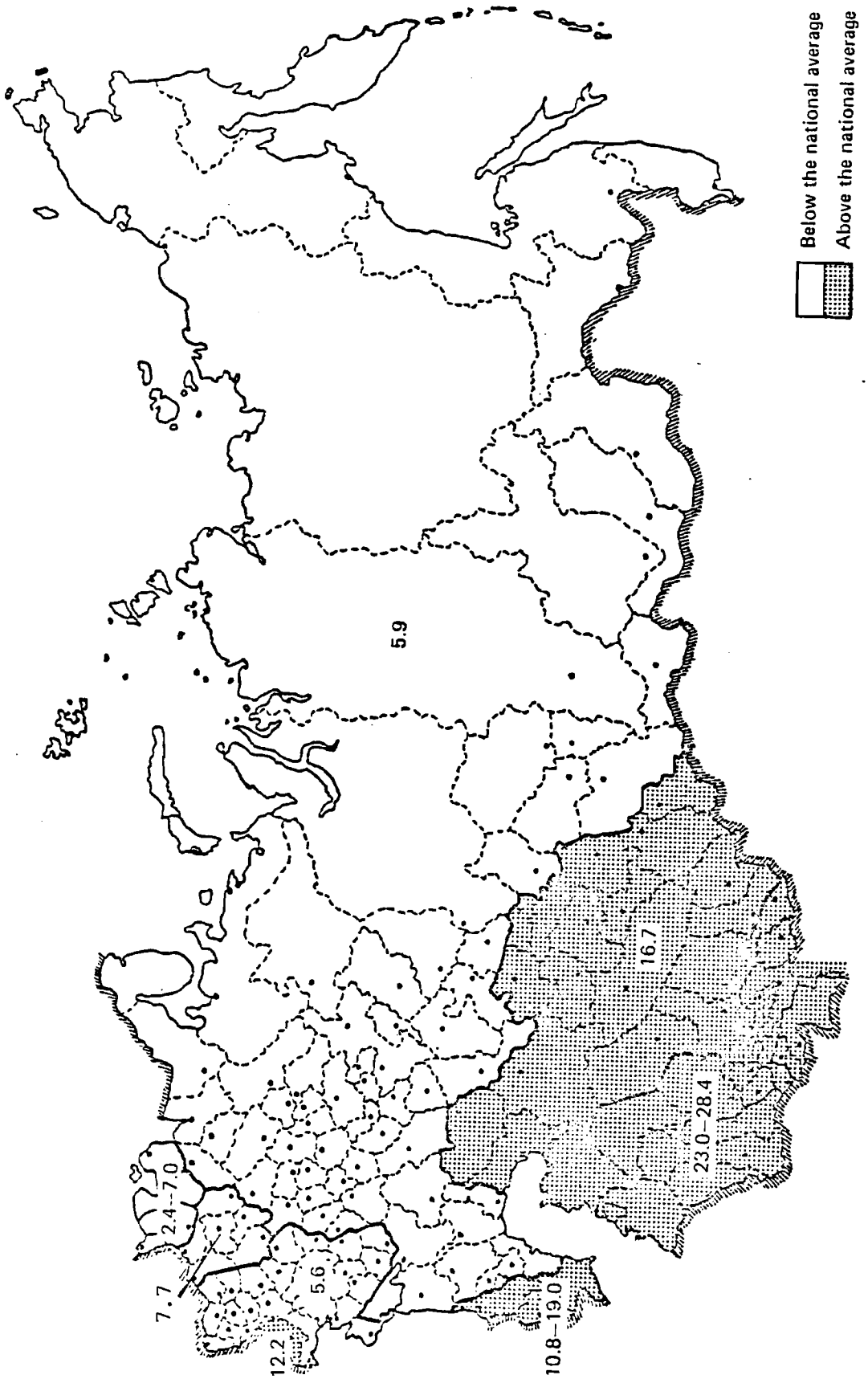

Figure 8. Natural increase rates in the USSR, 1973.

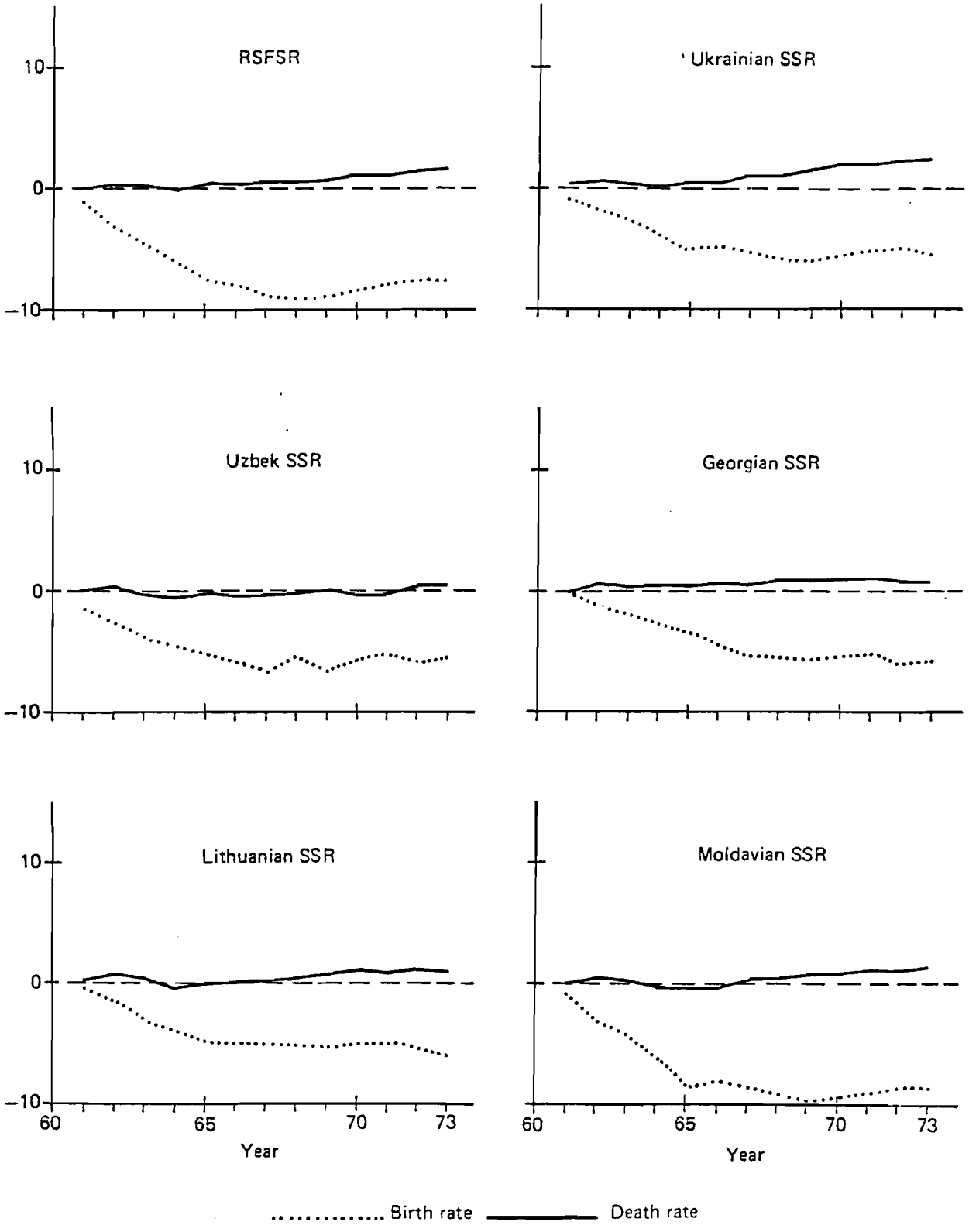

Figure 8a. Comparison of crude birth and death rates in the republics of the USSR: percentage change between 1960 and 1974.

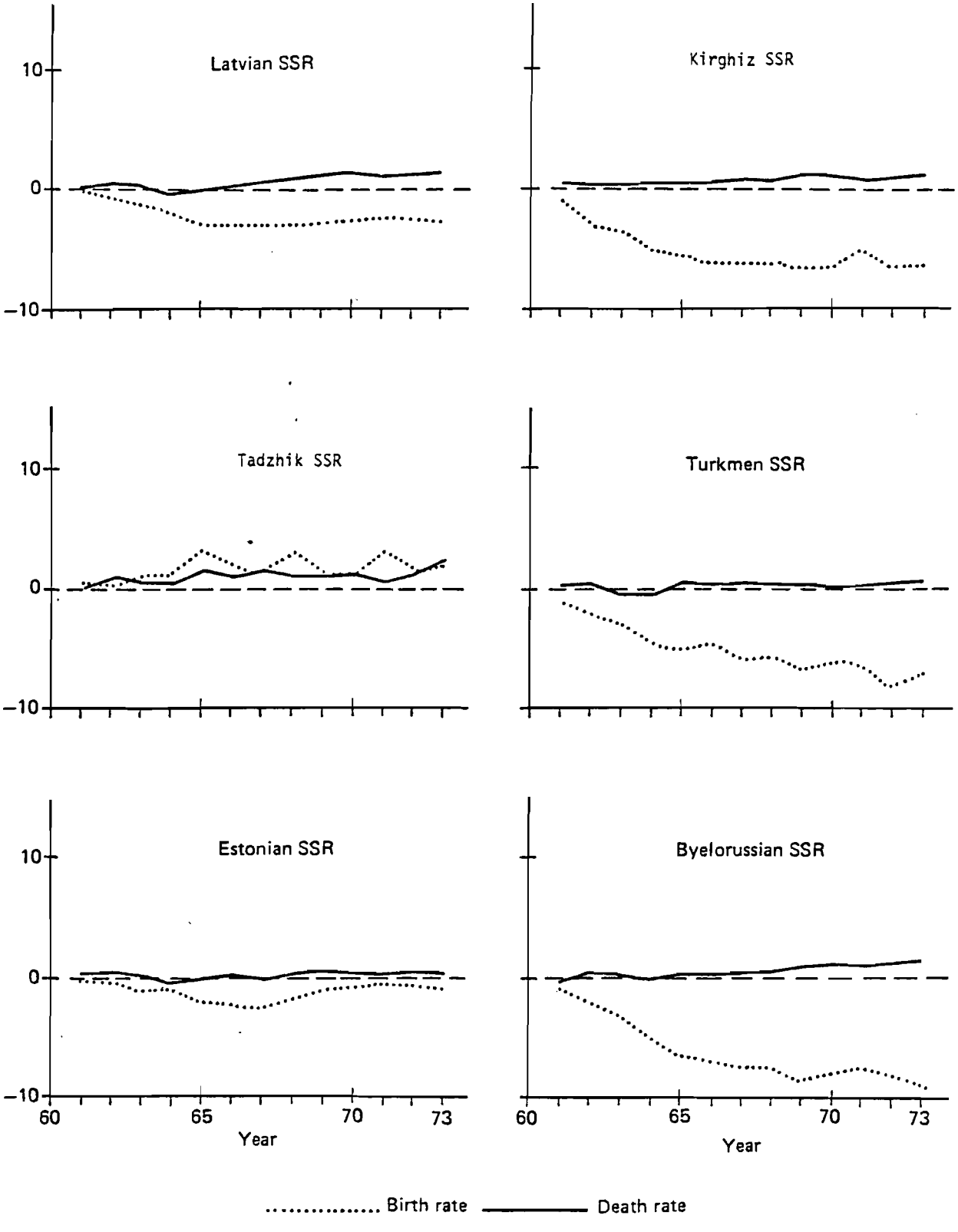

Figure 8a continued.

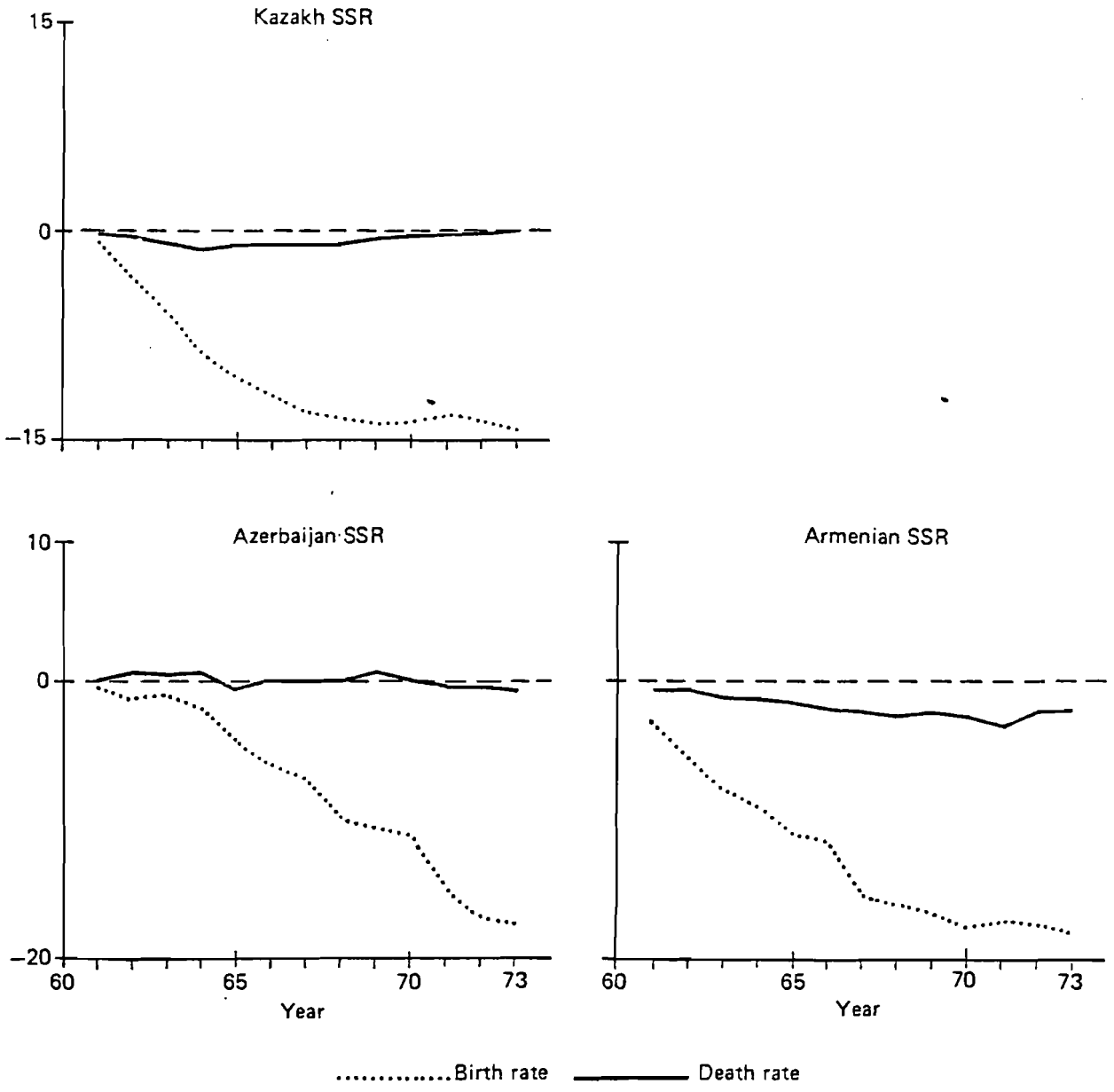

Figure 8a continued.

2.3 Migration

In discussing migration it will be useful to differentiate between urban-urban migration among several regions and rural-urban migration. The two types of migration flows are distinguished by their recent trends. These trends are based on the difference between life in the city and life in the country: industrial versus agricultural labor, private versus public ownership of the means of production, and urban versus rural quality of life.

At the present time, there is more information available for urban than for rural populations due to the quality of registration. We, therefore, have more accurate data on the urban populations on which to base our study.

Differences in urban and rural migration in the USSR are graphically depicted in Figure 9 and Table 14. As the table shows, migration of the rural population, at the national level, exceeds that of the urban population by 24.9 percent. The highest rural crude out-migration rates occur in the RSFSR, the Baltic Republics, and the Ukrainian Republic. The out-migration of the rural population in these republics is higher than their natural growth, resulting in an absolute decrease in the number of people living in these rural areas. In the Byelorussian and Moldavian SSRs, the level of migration is approximately identical for both urban and rural populations. In the Caucasian and Central Asian Republics, the crude out-migration rate of the rural population is lower than that of the urban.

As is apparent from the graph in Figure 9, the sum of the total number of in- and out-migrants for the country between 1961 and 1973 grew by 23.2 percent (Khorev and Moiseyenko 1976) and the outward flow from rural areas increased by almost 80 percent. The increase in migration from rural areas is a direct result of high rates of urban industrialization, which cause a concentration of material production in the big cities and release the labor force from agriculture.

Many specialists studying the question of migration in the USSR feel that this migratory flow from rural to urban areas will

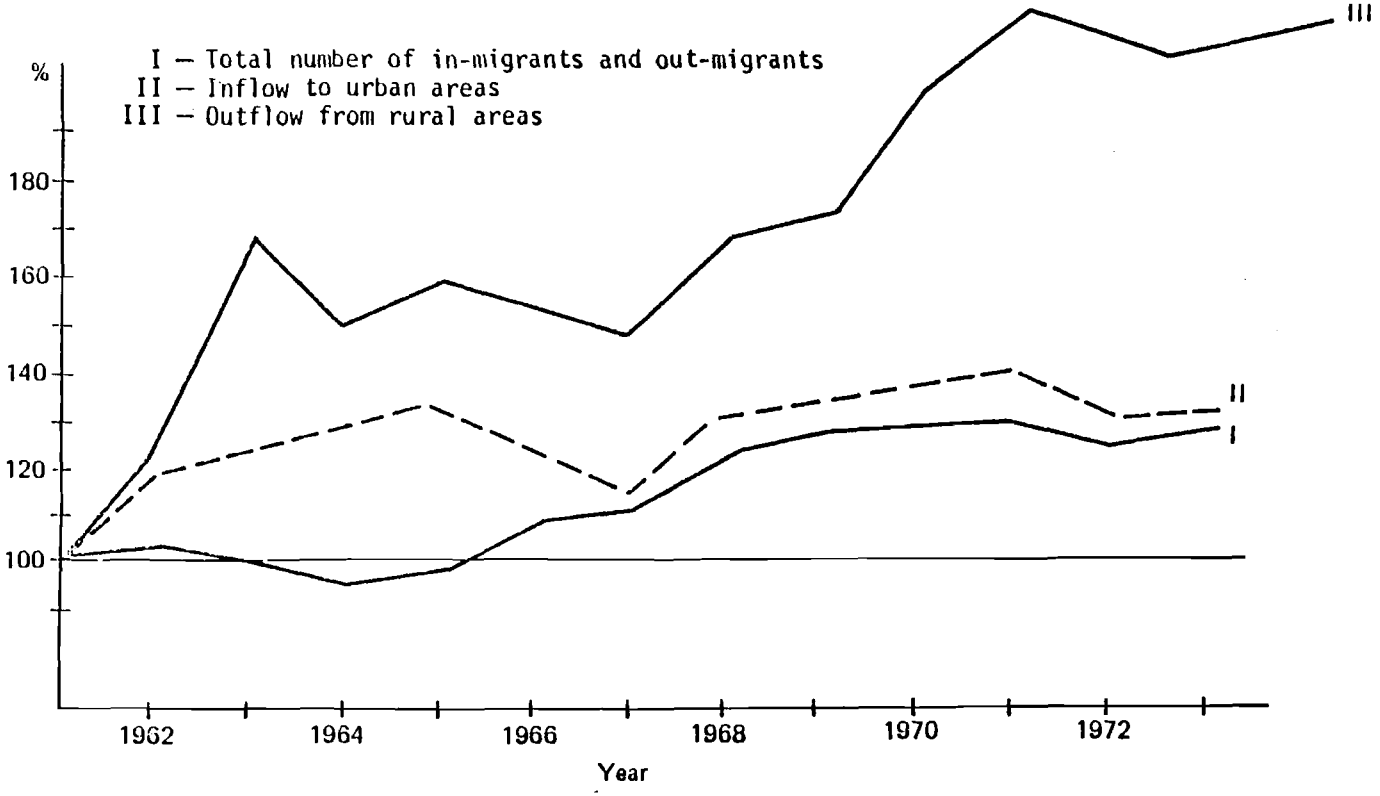

Figure 9. Crude urban and rural migration rates in the USSR, 1961-1973 (in percent, relative to 1961 rates).

Table 14. Crude migration rates of USSR urban and rural populations (according to figures of the 1970 census).

Union Republics and Economic Regions	Migration Per 1000 of the Population		Migration Rate of Rural Population as Percentage of Migration Rate of Urban
	Urban	Rural	
USSR	51.8	64.7	124.9
RSFSR	55.4	83.9	151.4
Ukrainian SSR	41.7	51.5	123.5
Moldavian SSR	48.2	42.2	88.0
Baltic Region[a]	41.7	63.2	151.6
Caucasian Region[b]	28.1	23.9	85.1
Central Asian Region[c]	46.7	25.1	53.7
Kazakh SSR	75.5	85.5	113.2
Byelorussian SSR	50.2	51.6	102.8

[a] Estonian, Latvian, and Lithuanian SSRs.

[b] Georgian, Armenian, and Azerbaijan SSRs.

[c] Uzbek, Turkmen, Tadzhik, and Kirghiz SSRs.

SOURCE: Khorev and Moiseyenko 1976:56.

have the tendency to decline, whereas intercity (urban to urban) migration will increase in importance.

The growth of migration to urban areas has been influenced by a further deepening of labor division in urban and rural areas, caused by the growing demand for non-agricultural labor. The most important source of employment growth in cities has been the in-migration of the rural population, which has contributed almost half of the total increase of employment in 1959-1970.

Socioeconomic differences between urban and rural areas play an important role in the redistribution of the population between cities and villages. A significant gap in the development of the productive forces in industry and in agriculture has been the basic reason for differences in the condition, level, and ways of life of the urban and rural populations. Because of this gap, the rural population has a lower level of income, a lag in the improvement of living and housing conditions in the country, a difference in its domestic economy, a necessity to conduct a personal, secondary economy, and a different correlation between free time and work time (Khorev and Moiseyenko 1976).

Migration of the rural population into the cities fulfills a most important economic and social function--the spatial redistribution of labor, thus raising the welfare of the rural inhabitants by means of specialized education and work according to ability and inclination. Migration, by redistributing manpower in the country, substantially influences different aspects of social and economic development in the individual regions. However, often this crossing-over of the rural population to non-agricultural activities in urban areas deviates from the interests of society.

As stated above, the exchange between city and village is not equal in many regions. Rural areas lose several times as many people as they receive in return. By far the majority of the migrants from the city to the country are those people who not long ago moved to the city, did not become acclimated to the new place, and then returned to the conditions to which they were accustomed. The outflow from villages of skilled personnel

occurs most intensively in such regions. The newcomer's level of education and skill does not correspond to the contemporary demands of public production in the village. Skilled personnel pour out from the village along with the young. Having received training in the industrial-technical schools, machine operators find work easily, quickly adapt themselves and get accustomed to city life.

Migration from the village to the city also leaves a substantial imprint on the rate of natural increase in the rural areas. The out-migration of the young, healthy villagers lowers the demographic potential of the village. Fertility levels drop and so does the natural rate of growth. Furthermore, the village is left with a predominantly older and less healthy population as a result of the "selective" migration from village to city.

Another form of population redistribution occurs as the consequence of migration between economic regions and union republics. Table 15 presents data on the exchange of population between the union republics and the major economic regions of the USSR during 1959-1970 (Kurman 1976).

The disproportion in the economic-geographic distribution of the population and manpower inherited from pre-revolutionary times still persists today to a certain extent in the USSR. This disproportion leads to a lack of manpower in some regions and a surplus in others.

Since the Revolution much has been done to overcome this imbalance, particularly in Kazakhstan. Before the Revolution, Kazakhstan was a colonial outlying district of the Russian Empire, regarded by Russian manufacturers as a source of raw materials and as a commodity market. The population of this region was made up primarily of the native population. In the post-revolutionary period, the increased industrialization of this region encouraged a significant inflow of people from other areas in the Soviet Union. Between 1959-1970 alone, the Kazakh SSR experienced a positive net in-migration of around 0.75 million people, which amounted to a more than six percent increase in the size of its population during this period.

Table 15. Population growth in the economic regions of the USSR, 1959-1970.

Union Republics & Economic Regions	Growth Rate		Natural Growth		Balance of Migration	
	(%) of average population	annual average (per 1000 of pop.)	(%) of average population	annual average (per 1000 of pop.)	(%) of average population	annual average (per 1000 of pop.)
RSFSR	10.1	9.2	11.5	10.4	-1.4	-1.2
Ukrainian SSR	11.8	10.7	10.7	9.8	1.1	1.0
Moldavian SSR	21.2	19.3	19.1	17.3	2.2	2.0
Baltic Region	13.6	12.4	9.1	8.3	4.5	4.1
Caucasian Region	25.6	23.2	26.0	23.5	-0.3	-0.3
Central Asian Region	36.5	33.2	33.8	30.7	2.7	2.5
Kazakh SSR	33.3	30.2	26.7	24.2	6.6	6.0
Byelorussian SSR	11.1	10.1	14.6	13.3	-3.5	-3.2
TOTAL USSR	14.6	13.3	14.6	13.3	---	---

SOURCE: Kurman 1976:134-135.

Table 16 presents data on migratory flows between different regions in the form of a matrix according to economic regions of in- and out-migration.

As is apparent from the tables and from Figures 10 and 11, the level of intraregional migration is highly significant for all regions without exception. For the Central Asian region, out of the number of those out-migrants in 1968-69, 54.8 percent of the population left for other areas in the same economic region; for the Ukrainian SSR, it was 74.5 percent; and for the RSFSR, 88.3 percent. This tendency also holds for the in-migrants of individual economic regions. That is, intraregional population redistribution is the most important tendency of the total migration among all regions.

In this population exchange, the majority of the observed regions interact primarily with a limited number of other regions. Those regions losing significant masses of population also receive, as a rule, the bulk of the migrants from these same regions, that is, the population exchange is usually symmetric. This is mainly due to territorial, economic, and cultural proximity.

The RSFSR and the Kazakh SSR are regions with a broad and dispersed range of migratory interaction. On the other hand, there are regions with a highly limited sphere of migration interaction--the Baltic Republics, the Caucasian region, and the Byelorussian and Moldavian SSRs. In view of the significant volume of territorial migration for the country as a whole, which made up more than 11 percent of the total population size of the country in the period 1968-69, the "efficiency" of migration is not very high. For example, the Ukrainian SSR received only 102 in-migrants for every 100 out-migrants and in the Byelorussian SSR, the number of in-migrants almost equaled the number of out-migrants.

The intensity of migration depends on a multitude of diverse factors--economic, geographic, sociological, ethnic, cultural, legal, etc. It is also a well-known fact that identical conditions evoke varying intensities of migration in different sex-age groups.

Table 16. Migration among union republics and economic regions of the USSR, 1968-1969 (in thousands).

Migrating from \ Migrating to	RSFSR	Ukrain. SSR	Moldav. SSR	Baltic Region	Caucas. Region	Central Asian Region	Kazakh SSR	Byelor. SSR
RSFSR	7604	420	23	105	29	132	262	79
Ukrainian SSR	428	1621	18	20	7	14	48	23
Moldavian SSR	30	18	99	1	1	1	8	1
Baltic Region	95	15	--	346	--	3	6	6
Caucasian Region	76	17	1	1	178	4	8	2
Central Asian Region	203	32	2	5	3	400	82	6
Kazakh SSR	298	66	5	9	3	47	603	19
Byelorussian SSR	85	22	1	15	1	2	9	326

SOURCE: Kurman 1976:136-137.

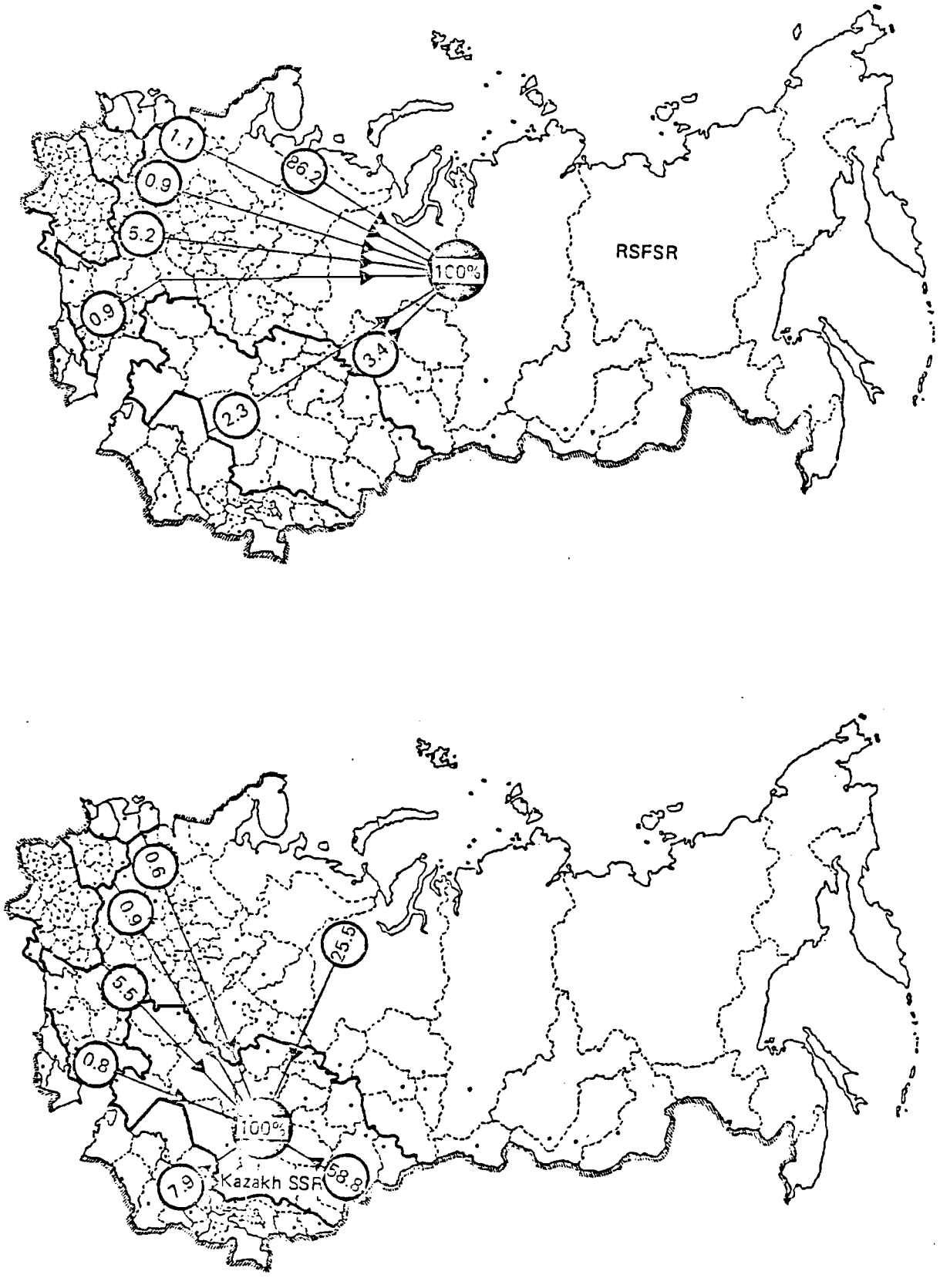

Figure 10. Geography of the distribution of the flow of the in-migrating population for the RSFSR and the Kazakh SSR, 1968-1969. (Source: adapted from Table 16.)

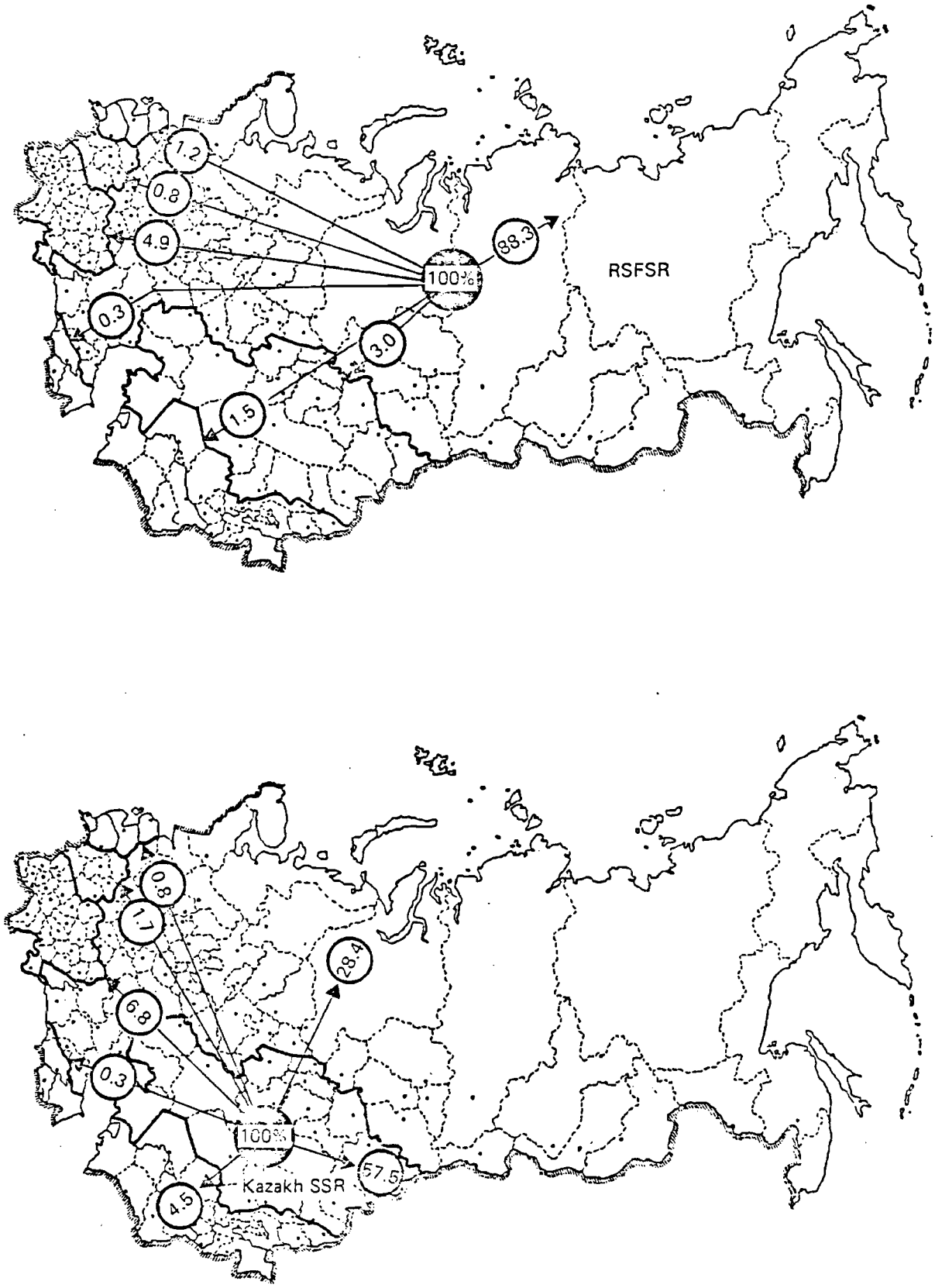

Figure 11. Geography of the distribution of the flow of the out-migrating population for the RSFSR and the Kazakh SSR, 1968-1969. (Source: adapted from Table 16.)

Table 17 gives the population distribution by sex of people who had lived a minimum of two years in their place of residence at the time of the 1970 census. As can be seen from the table, it is obvious that the highest proportion of male migrants is found in the republics that have traditionally low mobility rates among the native population: the Central Asian Republics, Kazakhstan, and Azerbaijan. Of the migrants from the RSFSR, the Ukraine, Byelorussia, Moldavia, Lithuania, Armenia, Estonia, and Kirghizia, the majority are women. This sex-specific migration pattern within separate regions is principally a result of a development of the economy emphasizing either male or female labor, and also of the characteristics of population mobility in these regions.

The profiles introduced in Table 18 describing the age structure of migrants show that the age distribution of those migrating to urban areas of the individual union republics has approximately the same structure for all republics. The fraction within the same age group in every migrating population fluctuates only slightly.

The most mobile population groups are those aged 16-25 years. The territorial redistributions in these groups are connected with such reasons as the move to study in educational institutions, the attraction of newly-developed regions and new building projects, and the drafting of men into the Soviet Army.

2.4 Age Composition*

The history of demographic development in the USSR during the past several decades is characterized by a gradual decrease in the fraction of children in the total national population, and an increase in the fraction of pensioners† (Table 19). This aging process is taking place as a consequence of the lowering of the birth rate, especially evident in the post-war years.

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*This section is written for the most part from the materials of research conducted by I.V. Kalinjuk. The source of all tables and figures of this section is his work *Vozrastnaja struktura naseleniya SSR*, Moscow: Statistika 1975.

†Pension age in the USSR begins at 55 for women and 60 for men.

Table 17. Population distribution according to the previous place of residence and sex (in percent).

Union Republic	Both Sexes	Men	Women
RSFSR	100.0	49.5	50.5
Ukrainian SSR	100.0	49.0	51.0
Byelorussian SSR	100.0	47.8	52.2
Uzbek SSR	100.0	53.0	47.0
Kazakh SSR	100.0	52.5	47.5
Georgian SSR	100.0	50.0	50.0
Azerbaijan SSR	100.0	58.5	41.5
Lithuanian SSR	100.0	48.9	51.1
Moldavian SSR	100.0	47.7	52.3
Latvian SSR	100.0	50.4	49.6
Kirghiz SSR	100.0	47.1	52.9
Tadzhik SSR	100.0	52.9	47.1
Armenian SSR	100.0	48.4	51.6
Turkmen SSR	100.0	58.1	41.9
Estonian SSR	100.0	49.9	50.1

SOURCE: Khorev and Chapek 1978:76.

Table 18. Age distribution of in-migrants to urban areas of the union republics of the USSR, 1973 (in percent).

Union Republic \ Age Group	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	TOTAL
RSFSR	3.44	2.46	2.53	21.05	33.27	12.02	5.57	6.06	3.34	2.85	1.39	1.13	1.59	1.16	1.54	100.0
Ukrainian SSR	4.26	3.04	3.03	23.52	32.25	11.67	5.58	5.33	2.52	2.40	1.24	1.04	1.46	1.06	1.54	100.0
Byelorussian SSR	4.44	3.12	3.09	26.81	33.28	11.41	4.62	4.36	2.31	1.95	0.88	0.66	1.00	0.77	1.18	100.0
Uzbek SSR	3.37	2.41	1.86	20.96	33.64	13.16	5.94	5.84	3.21	2.76	1.34	1.14	1.19	0.89	1.22	100.0
Kazakh SSR	4.47	3.33	2.75	20.50	32.41	11.66	5.62	6.17	3.23	2.94	1.53	1.19	1.49	1.12	1.53	100.0
Georgian SSR	1.92	1.67	1.62	13.09	25.32	16.79	9.93	8.61	6.01	5.08	3.64	2.52	1.40	0.98	1.40	100.0
Azerbaijan SSR	2.00	1.51	1.54	30.88	37.08	11.83	3.91	7.09	2.18	1.71	0.78	0.56	0.71	0.50	0.71	100.0
Lithuanian SSR	5.09	3.84	4.23	22.45	27.33	11.99	6.44	4.68	3.04	2.18	1.27	0.98	2.12	1.62	2.49	100.0
Moldavian SSR	3.54	2.54	2.90	28.16	33.14	10.18	5.04	4.45	2.57	2.18	1.37	0.81	1.12	0.81	1.18	100.0
Latvian SSR	4.47	3.64	4.18	20.98	27.86	11.47	6.76	5.37	3.41	2.78	1.56	1.12	1.98	1.66	2.75	100.0
Kirghiz SSR	5.22	3.78	2.84	21.64	30.83	11.85	5.30	5.67	3.29	3.13	1.62	1.18	1.31	0.95	1.35	100.0
Tadzhik SSR	3.49	2.52	1.82	20.85	33.62	12.29	6.49	6.37	3.42	2.92	1.41	1.02	1.29	0.94	1.25	100.0
Armenian SSR	2.93	2.22	1.70	17.60	38.62	13.40	5.10	5.64	3.36	2.89	1.46	0.94	1.26	0.96	1.48	100.0
Turkmen SSR	4.35	2.96	1.95	15.98	35.22	14.15	6.91	7.16	3.64	3.06	1.35	0.94	0.91	0.61	0.82	100.0
Estonian SSR	4.92	3.64	3.81	20.58	31.26	11.93	5.50	4.89	2.99	2.31	1.30	1.07	1.79	1.51	2.49	100.0

SOURCE: adapted from Naseleniye SSSR, 1973. Statisticheskij sbornik. Moscow: Statistika 1975:190-191.

Table 19. Evolution of the age composition of the male and female populations of the USSR, 1939-1974 (in percent).

	1939		1959		1970		1974	
Age	Male	Female	Male	Female	Male	Female	Male	Female
0-19	46.4	42.8	42.2	33.6	42.1	34.6	40.2	33.5
20-39	33.4	32.6	34.1	32.3	30.5	26.5	30.7	26.8
40-59	14.6	16.8	16.6	22.7	19.1	24.0	20.3	23.5
60 and above	5.6	7.8	7.1	11.4	8.3	14.9	8.8	16.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

The decline in the birth rate is the most important factor influencing the age composition of a population. The enormous human losses, however, during World War II must also be considered (Figure 12). According to the 1959 census, the war adversely affected the number of people in the 35-44 age group primarily, but an effect was also seen in the 10-14 year-olds (born in 1944-48) and in the 15-19 year-olds (born in 1939-43). The base of a population age pyramid in 1959 is significantly narrower than one of the pre-war period (Figure 13). The fall in child mortality was largely reflected in the greater number of surviving boys. The part of the pyramid relating to the female population has a narrower base.

With respect to the reproductive potential, these pyramids are of two different types. The female population of 1959 relates to a stationary type, whereas the male population still relates to a growing one, characterized by a high fraction of children and low fraction of population older than 60. By 1970, the age structure has undergone substantial changes. The war has had an adverse effect on the 50-54 year age group as well as the 20-24 year age group (those born in 1945-49) and the 25-29 year age group (those born in 1940-44). Table 19 shows that in 1970 the share of the population aged 20-39 dropped significantly, thus causing a decrease in the relative size of the working age population. In 1959, the 15-59 year age group

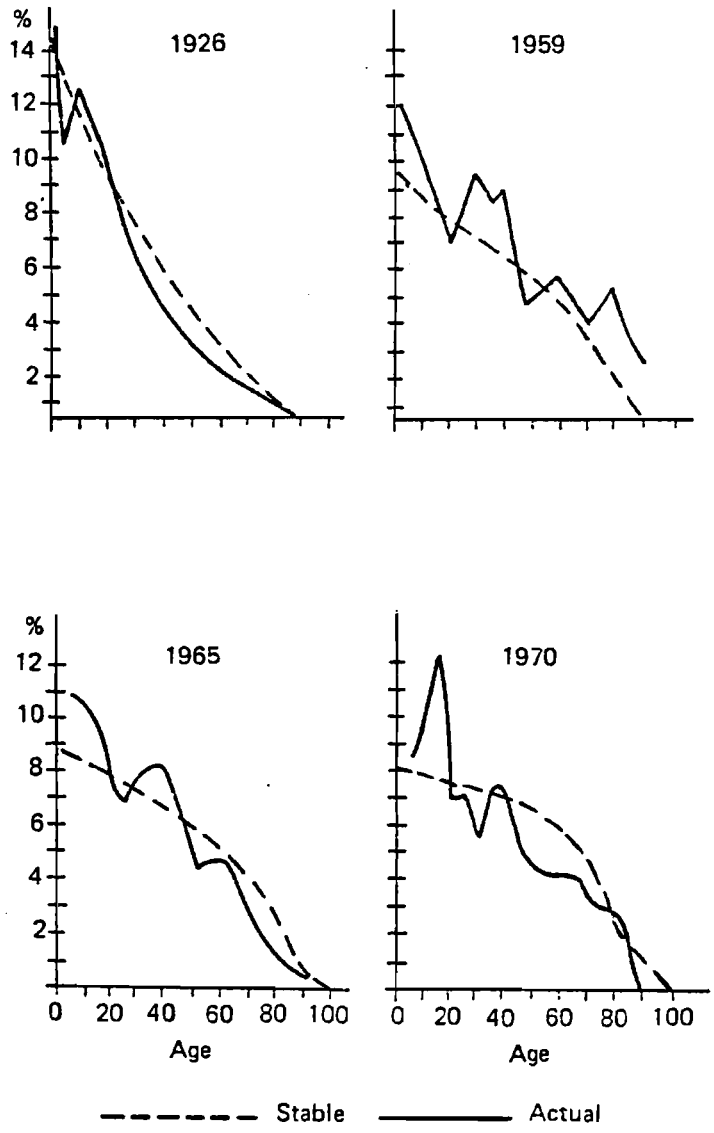

Figure 12. Age composition of observed and stable equivalent populations of the USSR: 1926, 1959, 1965, and 1970.

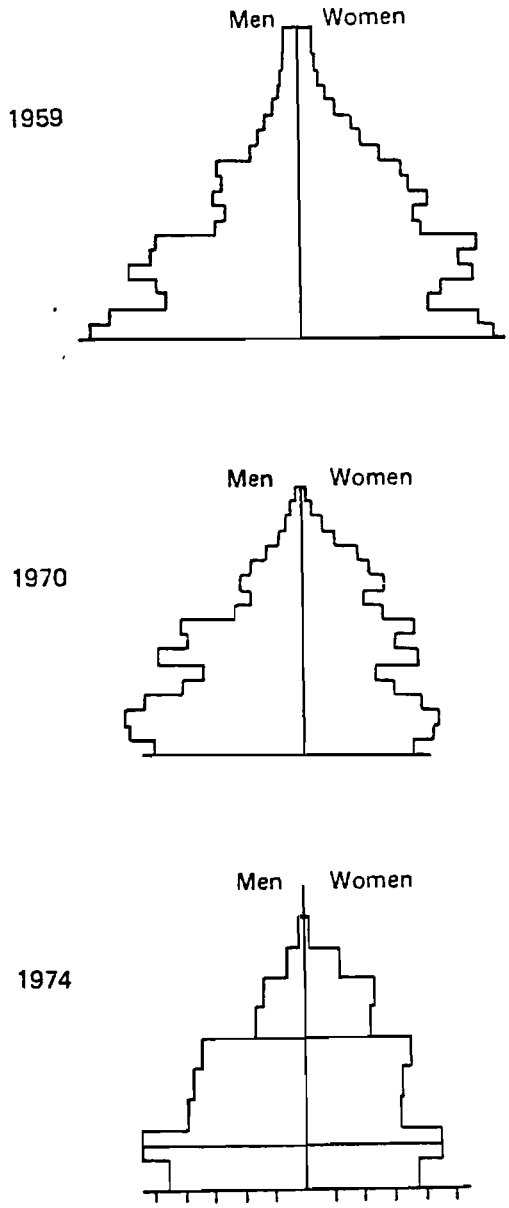

Figure 13. Age pyramids for the USSR population in 1959, 1970, and 1974.

made up 61.1 percent of the population, while in 1970 it dropped to 59.3 percent. At the same time, the fraction of population older than 60, increased.

A basic feature of the change in the age structure of the post-war population is that the growth of the size of the older age groups is greater than total population growth. This aging process also has affected the working age population (Table 20):

Table 20. Evolution of the age composition of the population of working age, 1939-1970 (in percent).

Age	1939	1959	1970
15-19	15.6	12.9	15.4
20-29	32.1	30.2	21.6
30-39	26.1	24.0	26.2
40-49	15.8	17.8	22.2
50-59	10.4	15.1	14.6
15-59	100.0	100.0	100.0

the share of older people capable of working has increased, while the share of the younger 20-39 age groups has dropped. After 1970, however, this tendency was checked somewhat by the influx of youths born in 1955-1959.

The female population of the country is many times older than the male. Together with the fall of the share of children, the share of those over 60 has increased. In 1974, the fraction of women 60 and older was almost two times higher than that of men of this age.

The aging process of males of working age is different from that of women. Thus in 1970, the fraction of men from 16-39 years of age surpassed the pre-war and 1959-levels by comprising 50 percent of the total number of men capable of working (Table 21). Toward 1974, a rejuvenation of both the male and female populations of working age took place: the share of those between the ages of 20-29 grew, while the share of those between 50-59

Table 21. Changes in the structure of the male population of working age (in percent).

Age	1939	1959	1970	1974
20-29	44.1	39.8	28.0	30.7
30-39	36.5	27.5	33.5	29.5
40-49	5.3	18.2	24.5	27.3
50-59	14.1	14.5	14.0	12.5
Total	100.0	100.0	100.0	100.0

dropped. Nevertheless, the aging tendency of the working age population has been sustained and women have held the "advantage" in the total process of population aging.

Aging of the female population also affects the fertility rates in the country. The increase of women in the older age groups leads to a decline in the size of the actively reproducing cohort, and consequently in the birth rate. In just the period 1959-70, the number of women in the 15-29 age group dropped from 27.8 million to 26.2 million, and their share in the total number of women of reproductive age dropped from 47 percent to 41.6 percent. Even larger was the drop in the number of women in the 20-29 age group. During this same period, their number dropped from 18.6 million to 15.4 million, and the share of this age group in the total number of women of reproductive age, declined from 33.1 percent to 24.5 percent.

Figure 14 illustrates changes in the age compositions of urban and rural populations. The urban population of the USSR is characterized by a rather high share of elderly and middle-aged people, which in the period between the 1959 and 1970 census increased by 32 percent and made up 10.3 percent as opposed to 7.8 percent of the total population. The fraction of the 0-14 age group dropped to 25.6 percent. Also the fraction of population of working age (those in the 20-59 age group) dropped. In 1959 this age group made up 57.4 percent of the population; by 1970 it had fallen to 54.9 percent. Nevertheless, the fraction

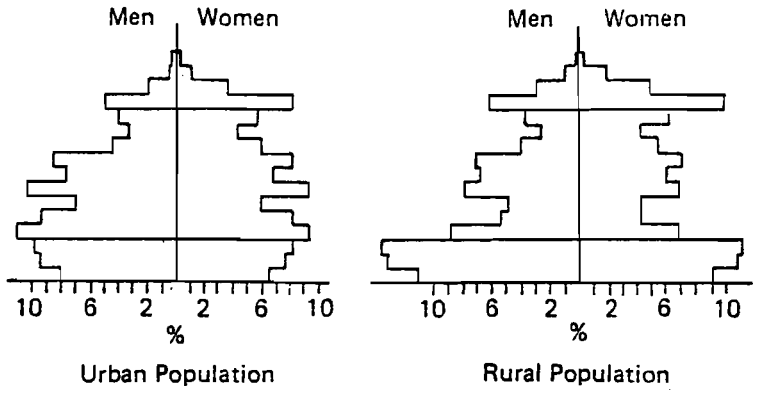

Figure 14. Age pyramids for the urban and rural populations of the USSR according to the 1970 census.

of urban population that is of working age remains sufficiently high. A similar population composition, in which the fractions of children, middle-aged, and elderly people are comparatively low, but the fraction of population of working age is sharply increased, describes a population which is structured as a result of heavy migration between city and country.

In rural areas the fraction of the 0-14 year age group remains rather high, as do those of the middle-aged and elderly age groups. At the same time, the fraction of the working age population gradually decreases.

When the total population is analyzed by region, substantial differences in the age structure become evident (Table 22). For the Central Asian Republics and Azerbaijan, around 50 percent of the population is younger than 14-19 years of age. The share of the younger age groups (0-19) is within the range of 51-55 percent of the total population, and the fraction of the basic working age group of 20-59 years lies within 37-40 percent. The 60 and over age group is declining and accounts for approximately 7-9 percent of the total population.

Around 80 percent of the total USSR population, represented by the Russian Federation, the Ukraine, Byelorussia, Kazakhstan, Moldavia, Georgia, and Armenia, reflects a stationary age composition. The share of young age groups is 33-49 percent, the share of the working age population is 53 percent, and the share of middle-aged and elderly people has gradually been increasing to 8-14 percent.

Table 22. Evolution of the basic age groups among the union republic populations: USSR, 1959-1970.

Republics	Age Groups					
	0-19		20-59		60 and above	
	1959	1970	1959	1970	1959	1970
RSFSR	36.8	35.9	54.2	52.2	9.0	11.9
Ukrainian SSR	34.3	33.1	55.2	53.0	10.5	13.9
Byelorussian SSR	38.2	37.5	51.1	49.4	10.7	13.1
Uzbek SSR	45.8	54.2	44.8	37.1	9.4	8.7
Kazakh SSR	43.9	47.3	48.3	44.4	7.8	8.3
Georgian SSR	37.6	39.1	52.5	49.1	9.9	11.8
Azerbaijan SSR	45.0	53.2	46.6	38.8	8.4	8.0
Lithuanian SSR	35.6	34.5	52.5	50.6	11.9	14.9
Moldavian SSR	41.9	41.8	50.4	48.5	7.7	9.7
Latvian SSR	29.9	28.6	55.1	54.1	15.0	17.3
Kirghiz SSR	44.6	51.2	45.7	39.9	9.7	8.9
Tadzhik SSR	46.6	55.6	45.5	36.9	7.9	7.5
Armenian SSR	44.7	49.2	47.3	42.6	8.0	8.2
Turkmen SSR	46.0	54.3	46.1	38.5	7.9	7.2
Estonian SSR	29.9	29.5	55.0	53.7	15.1	16.8

Finally, the Baltic Republics exhibit their own type of population age composition. Approximately half of the total population is older than 30-34 years of age. On the average, the fraction of children consists of 30 percent, and the fraction of middle-aged and elderly people in the population is the highest in the USSR at 17.3 percent.

3. MULTIREGIONAL POPULATION ANALYSIS

Multiregional population analysis serves as an instrument for estimating the dynamics of interregional population change. Along with traditional indices, showing the demographic development of an individual region, this analysis permits one to estimate the population characteristics that can be calculated only by taking into account the entire system of regions. These characteristics include:

1. The probability that an individual in a particular age group of the population in a given region will reach the next age group and stay or move to any other region.

2. The probability that a female in a particular age group of women in the fertile range in a given region will give birth to a child in the same or another region.

3. The expected number of migrations that an inhabitant of a given region will make during a lifetime out of each region in the system.

4. The expected number of births in each region according to the birth place of parent.

5. The contribution to total births in each region arising as a result of changes in population structure due to migration.

6. The mean age of migrants moving from region i to region j and other related demographic characteristics.

The methods, algorithms, and computer programs for the multiregional interregional demographic analysis reported here were developed at IIASA under the leadership of Andrei Rogers and are described in Rogers (1968, 1975), Willekens and Rogers (1976, 1977, 1978), Willekens (1977, 1978), and Ledent (1978).

3.1 Data Preparation

The analysis of fertility, mortality, sex-age-composition, and migration in the USSR, represented in the first part of this work, showed that there are considerable differences in the demographic characteristics of the individual union republics. The choice of a republic as a spatial unit was dictated by the lack of necessary demographic data on smaller regions of the country.

Taking into consideration the difficulties of obtaining information, the relative homogeneity of demographic development in the individual union republics, and the territorial proximity of these republics, we aggregated the 15 union republics into seven territorial regions, all of which were further divided into urban and rural areas for the purposes of a more detailed analysis.

The urban areas of each of the seven regions were defined as independent territorial units, whereas all rural areas were aggregated into a single eighth region because of the absence of age-specific data on rural to rural migration between republics. Thus, the following eight regions (Figure 15) were defined:

Region I:	Urban areas of the Russian Federal Republic (the RSFSR),
Region II:	Urban areas of the Ukrainian and Moldavian SSRs,
Region III:	Urban areas of the Byelorussian SSR,
Region IV:	Urban areas of the Central Asian Republics (the Uzbek, Kirghiz, Tadzhik, and Turkmen SSRs),
Region V:	Urban areas of the Kazakh SSR,
Region VI:	Urban areas of the Caucasian Republics (the Georgian, Azerbaijan, and Armenian SSRs),
Region VII:	Urban areas of the Baltic Republics (the Estonian, Latvian, and Lithuanian SSRs),
Region VIII:	All rural areas of the USSR.

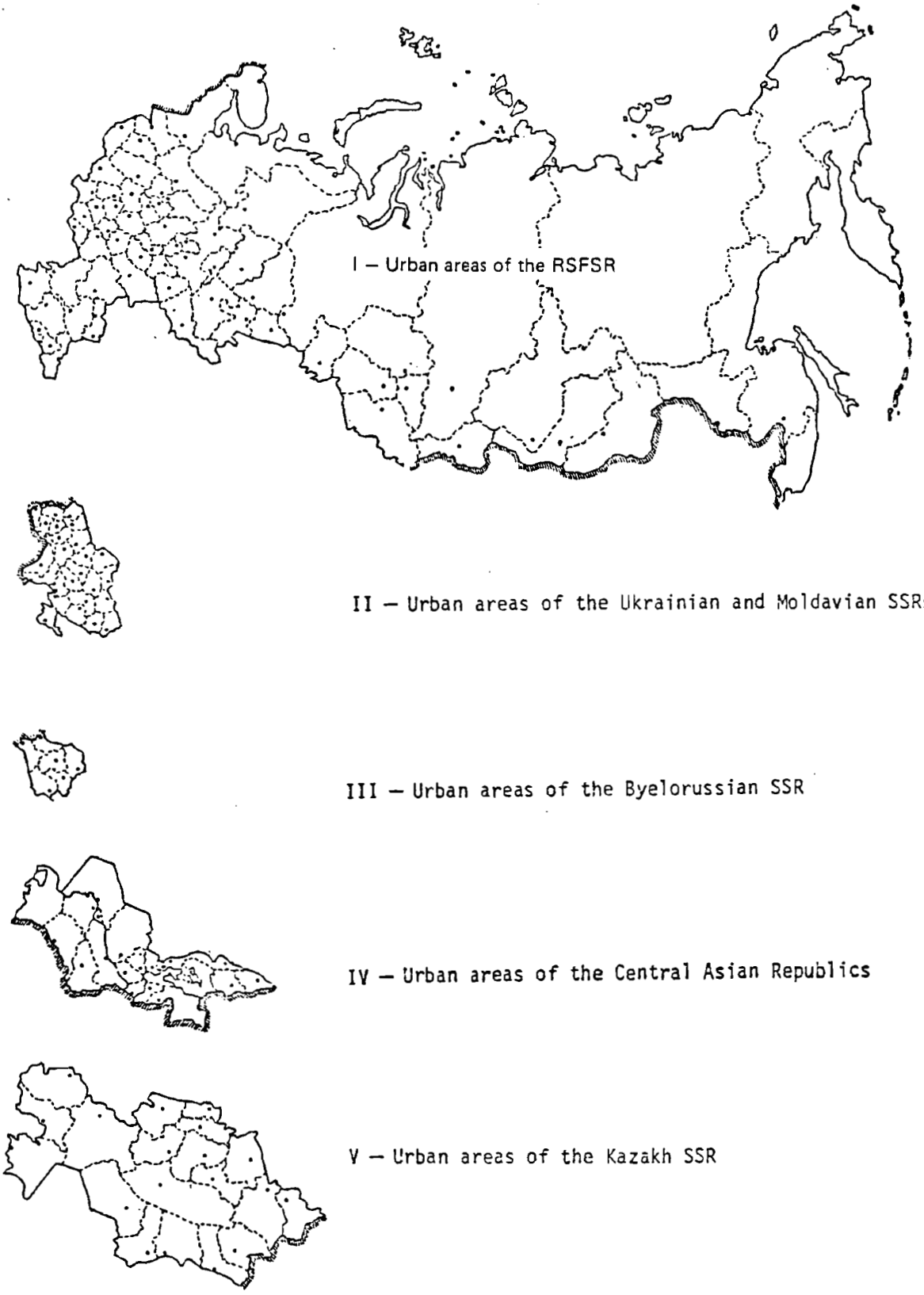

Figure 15. The multiregional system.

VI — Urban areas of the Caucasian Republics

VII — Urban areas of the Baltic Republics

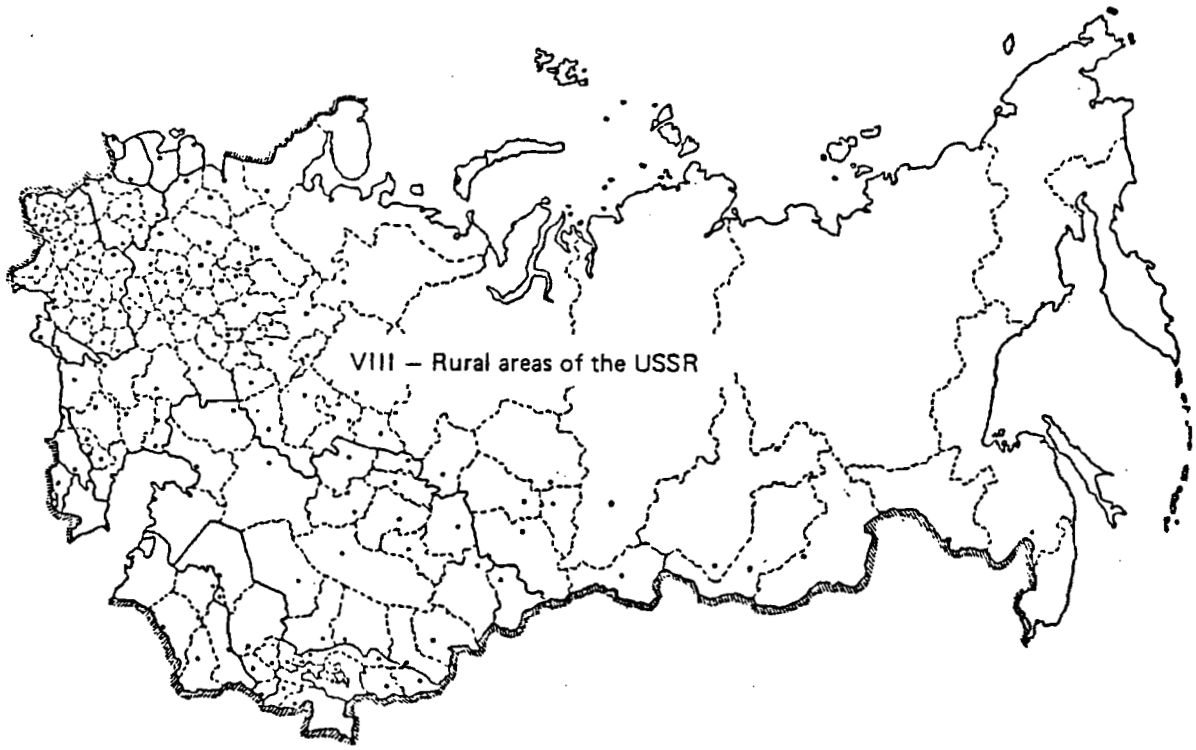

Figure 15 continued.

In addition to our division of eight territorial regions, we also made an aggregation involving only two regions, with all urban areas as the first region and all rural areas as the second region.

For the USSR multiregional population analysis, the following 1974 input data, with both sexes added together, were used for each region of the observed territorial system:

1. Population by age and region at mid-year.

2. Number of deaths by age and by region.

3. Number of births by age of mother and by region.

4. Number of migrants by age, region of origin, and region of destination.

The base year for our study is 1974. The data on population by age groups (for the beginning of 1970-1974) and for births, deaths, and migrations (1973-1974) were compiled from the nation's official statistical materials,* supplemented by other statistical sources described below.

The population distribution in individual regions was obtained by 5-year age groups, the last including people of "70 years and over". However, for the purposes of this study, it was believed to be important to include the age distribution in older age groups: between the ages of 70 and 85.

Because of a lack of USSR information for these groups in 1974, we used 1974 age profiles obtained in Poland for all eight regions. These data were found to be acceptable because the age structure and mortality patterns in the older age groups of the USSR and Poland in 1970 are believed to be similar. The age-specific mortality rates were recorded according to 5-year age

*Itogi vsesojusnoyi perepisi naseleniya 1970 goda M., Statistika 1973. (T.1. Chislennost' naseleniya SSSR, sojusnykh i avtonomnykh respublik krajev i oblastyi) U. 1973; Naseleniye SSR (Statisticheskij sbornik). U. Statistika 1975.

groups (between the ages of 0-70). For the age-specific mortality rates in the older age groups (70-74, 75-79, 80-85, 85 and over), data obtained in Poland were used.

Age-specific migration rates were calculated from data on the total in-migration to the urban areas of each union republic of the USSR (for urban regions), and the migration rate of the rural population for the USSR as a whole. Age-specific migration rates for the older age groups (70-85 years of age) were assumed to follow the age profile of corresponding rates for Poland.

All preliminary information was collected separately for the urban areas in each union republic and for rural areas for the USSR as a whole. In the final stage of preparation, the aggregation of republics was carried out as shown above, with an 8-region aggregation and an urban/rural dimension.

3.2 Analysis of Observed Population Characteristics

Appendix A presents data on mortality rates (Table A1), fertility rates (Table A2), and migration rates (Tables A3-A10) for all regions in the system, including both the 8-region and the 2-region divisions (Table A11).

Along with the observed 5-year age-specific death, birth, and migration rates are included other rates, for example, the gross and crude fertility, mortality, and out-migration rates, as well as the mean ages of death, birth, and out-migration.

The crude rate, defined as the total number of births, deaths, or out-migrants divided by the total mid-year population, characterizes the aggregate level of birth, mortality, and out-migration. Thus, the crude death rate (CDR) for urban areas of the RSFSR is estimated to be 0.0083 (or 8.3 per thousand), and for the urban areas of the Ukraine Republic it is 0.0079. The lowest CDR occurs in the urban areas of Byelorussia and the highest in the rural areas of the country.

The gross death rate (GDR), the sum of the age-specific death rates times five, ranges between 2.01 and 2.34 in the eight regions. The analogous measure for fertility, the gross fertility

rate (GFR) is five times the sum of the age-specific fertility rates. This rate also is known as the *gross reproduction rate* (GRR).

The GRR reflects the level of population reproduction in the various regions, giving an indication of the number of babies each person will have during the reproduction period without taking into account the effects of mortality and migration.

The gross reproduction rate characterizes the level of population reproduction; it indicates the number of babies each person will have during the reproductive ages if migration and mortality are not taken into account. Table A2 in the Appendix presents data on gross reproduction rates for all regions. Gross reproduction rates significantly greater than unity indicate a population that replaces itself, but since migration and mortality need to be taken into account, the reproductive behavior of regional populations needs to be examined using *net reproduction rates*, i.e., the NRR.

The gross migraproduction rate (GMR) is the sum of the age-specific migration rates multiplied by five. The GMR is an index of the migration level; it indicates the average number of out-migrations from a given region to another region during a person's lifetime, without taking into account the effects of internal migration and mortality. Thus it is a period and not a cohort index of migration.

Table 23 shows the results of GMR calculations for each region. As is apparent from the table, the highest level of the total GMR is typical for regions V (6.792), III (5.957), VIII (5.696), and I (5.544). By comparing the data in the columns of this table, it is possible to analyze the interregional migration relationships between regions. For example, region I has the "strongest" links with region VIII, and region VI with region I.

The elements of this table arranged on the main diagonal ($_iGMR_i$) represent intraregional migrations. The highest level of intraregional migration occurs in region I: 4.169 migrations within the same region per person, more than 75 percent of the total. Such levels of intraregional migration are of course

Table 23. Gross migraproduction rates for the eight regions of the USSR, 1974.

	Region of Destination	Region of Origin							
		I	II	III	IV	V	VI	VII	VIII
Urban Areas of the									
I	RSFSR	4.169	0.789	0.925	0.883	1.553	0.538	0.505	2.157
II	Ukrainian & Moldavian SSR	0.283	3.427	0.279	0.117	0.286	0.134	0.128	0.664
III	Byelorussian SSR	0.037	0.036	3.632	0.012	0.035	0.011	0.054	0.161
IV	Central Asian Republics	0.085	0.033	0.031	2.441	0.275	0.047	0.015	0.164
V	Kazakh SSR	0.113	0.056	0.053	0.224	3.558	0.028	0.017	0.198
VI	Caucasian Republics	0.022	0.018	0.011	0.019	0.017	1.776	0.008	0.071
VII	Baltic Republics	0.037	0.028	0.155	0.012	0.018	0.012	3.465	0.116
VIII	Rural Areas of the USSR	0.797	0.792	0.869	0.859	1.048	0.289	0.842	2.162
	TOTAL	5.544	5.183	5.957	4.569	6.792	2.837	5.035	5.696

SOURCE: Appendix A.

related to the size of a given region. However, in region VIII, a rather large region, there are only 2.162 intraregional migrations per person. The lowest level of intraregional migration is observed in region VI.

Once the intraregional flows have been excluded, one can estimate the level of interregional streams. The highest level of GMR for intraregional migration exists in the rural areas of the country. For example, we have a GMR of 2.157 directed toward region I, 0.644 toward region II, and 0.161 toward region III.

It is interesting to analyze the correlations between migration flows connecting each pair of selected regions, particularly between the symmetrical pair of regions with regard to origin and destination. Such analyses permit one to estimate the "attractiveness" of one region in comparison with the other. Thus, for example, in region I there are 0.037 out-migrations into region III, but in region III there are 0.925 out-migrations into region I. Residents in rural areas show a strong migration association with region I. As has been pointed out above, for each person living in a rural area of the country, there are 2.16 out-migrations into urban areas of the RSFSR during a year. This flow is considerably higher than the reverse flow. For each resident in region I there are only 0.79 out-migrations to rural areas of the country. The comparison of analogous flows in all other regions indicates that the flow of migrants from urban areas is dominant with respect to the flow from rural areas.

The most striking differences in population flows are between regions VIII and V, VIII and III, and VIII and IV. If for each person in region VIII there are 0.198 out-migrations to region V, then for each resident of region V there are 1.048 out-migrations to region VIII. The corresponding relationship between regions VIII and IV gives 0.164 versus 0.859, and between regions VIII and III it is 0.161 versus 0.869. The predominance of the urban flow over the rural flow may seem to be paradoxical, but it may be explained by the choice of territorial aggregation, the incomparability of the dimensions of each of the two regions, and by the mixing of rural populations in the individual republics with those of all other republics. A more detailed disaggregation of

region VIII, which consists of all rural areas in the USSR, to individual union republics would make it possible to carry out a more accurate study of the interregional flows. However, such data are not currently available.

The mean age is an important demographic indicator characterizing the peculiarities of an age profile. As Table 24 shows, the population of region VII (urban areas of the Baltic region) has the highest mean age among the eight regions of the USSR. The mean age of the population in this region is 34 years. Other regions with a high mean age are regions II (33.96 years) and I (33.84 years). As the previous description of the demographic trends in the country's individual regions showed, the high level of the mean age of the population, typical for these regions, is the result of low birth rates over a long period of time.

The lowest mean age is exhibited by the population of the Central Asian and Caucasian Republics, where high birth rates have existed for a long period of time. The difference between the highest and the lowest levels of mean ages among the country's regions is 6.29 years.

The younger mean ages of the people living in the Central Asian and Caucasian Republics have left their mark on the mean ages of the mortality rate schedule. The mean age for each of these regions lies between 74.4-76.6 years. It is the lowest mean death age in the country. By contrast, in the urban areas of the Baltic, Ukrainian, and Moldavian Republics, where the proportion of the population in the younger ages is low, the corresponding mean ages are the highest (77.3-77.4 years).

Figure 16 shows the distribution of mean ages by region of the population, of childbearing, and of mortality rates. It is interesting to note that the highest mean ages of childbearing are found in the Central Asian Republics and the rural areas of the country. This may be explained by reproduction patterns in these regions: the longer duration of the reproductive period, and the increased number of "third" child births.

The mean ages of out-migration rate schedules for the country as a whole range between 27.0-38.8 years (Table 24). The

Table 24. Mean ages of the population, and the schedules of age-specific rates of fertility, mortality, and out-migration: eight regions of the USSR, 1974.

		Region	Population	Births	Deaths	Out-Migration								
						I	II	III	IV	V	VI	VII	VIII	IX
Urban Areas of	I	RSFSR	33.84	26.07	76.28	---	30.88	28.49	30.66	31.58	31.28	34.27	31.99	---
	II	Ukrainian & Moldavian SSR	33.96	26.08	77.29	31.42	---	28.12	30.30	31.19	31.36	33.94	31.51	---
	III	Byelorussian SSR	30.67	26.56	77.31	35.05	34.03	---	33.72	35.06	33.90	38.61	35.13	---
	IV	Central Asian Republics	27.71	28.33	74.42	35.61	34.71	32.19	---	35.53	32.88	38.33	35.65	---
	V	Kazakh SSR	29.48	27.14	75.38	35.69	34.56	31.68	34.17	---	34.06	38.83	35.75	---
	VI	Caucasian Republics	29.89	27.09	76.60	34.04	33.18	30.96	32.19	34.22	---	37.45	34.09	---
	VII	Baltic Republics	34.00	26.75	77.38	30.89	29.76	27.54	30.46	30.51	29.67	---	30.99	---
	VIII	Rural Areas of the USSR	32.83	27.40	75.53	29.43	28.66	27.00	28.76	29.36	28.25	31.06	---	29.17
	IX	Urban Areas of the USSR	33.02	26.41	76.40	---	---	---	---	---	---	---	32.44	---

SOURCE: Appendix B.

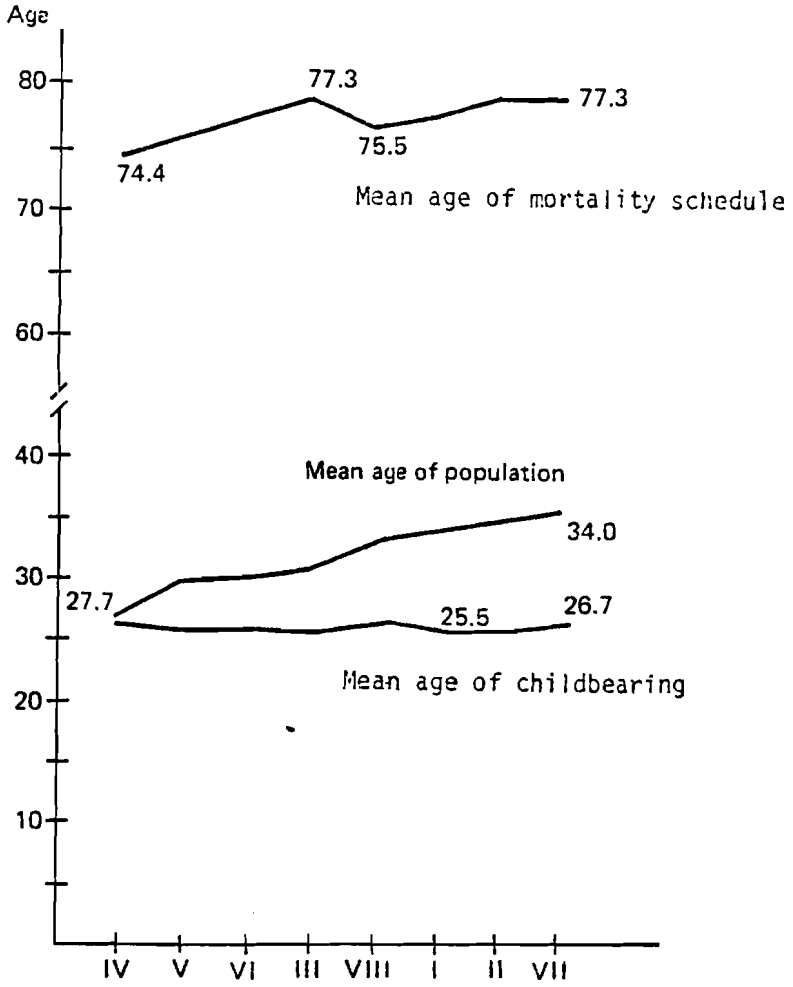

Figure 16. Distribution of the regions according to the mean ages of the population, and of the schedules of mortality and fertility rates (of childbearing): USSR, 1974.

lowest mean age is typical for migration out of the rural areas of the country. Thus, the mean age of the out-migration schedule from the rural to the urban areas of the RSFSR is 29.4 years, to the urban areas of the Ukrainian and Moldavian Republics--28.7 years, and to the urban areas of the Byelorussian Republic--27.0 years.

On the whole, the mean age of the out-migration schedule from the rural to the urban areas is 29.2 years, and from the urban to the rural areas it is 32.4 years. Urban areas of the Central Asian Republics with the youngest age structure are characterized by the highest mean age. Thus, the mean age of the out-migration schedule from the Kazakh urban areas to region I is 35.7 years, to region VIII--35.8 years, and to region VII--38.8 years.

The mean number of years expected to be lived by an individual beyond a given age is known as the *life expectancy*. If it is supposed that during the rest of a person's life the individual will stay in a given region, then conventional single-region demographic calculations may be used to obtain the life expectancies set out in Table 25. In the last two columns of this table, expectancies for the population of the country's urban areas and of the USSR as a whole are also included.

Apart from the indices given above, Tables B1 to B10 in Appendix B give data on the single-region net reproduction rates (NRR) and net migraproduction rates (NMR). Figure 17 shows the regional distribution of the NMR. All urban areas of the USSR are observed as one region--region IX. As the figure shows, the NMR for the country's urban areas is 4.67. Such a level is also recorded for the urban areas of the Ukrainian and Moldavian Republics. The NMR of regions VI, IV, and VII (the urban areas of the Caucasian, Central Asian, and Baltic Republics, respectively) is below the national average, and the NMR of regions I, VIII, III, and V (the urban areas of the RSFSR, the rural areas of the USSR, and the urban areas of the Byelorussian and Kazakh Republics, respectively)--is above the national average. The lowest NMR (2.52) is exhibited by region VI, and the highest by region V (5.72).

3.3 The Multiregional Life Table

The life table is an important model in demographic analysis. Such factors as probability of survival, number of survivors, number of years to be lived, and life expectancy make it possible to observe the evolution of a hypothetical cohort born in some fixed moment in time. The method of calculating a single-region life table is well known and is widely used in different countries of the world.

The multiregional life table is a generalization of the concept of the single-region life table. Its main distinguishing feature is the fact that one is able to model each region as an open territorial subsystem experiencing in- and out-migration flows.

Table 25. Single-region life expectancies by age, for the USSR regions, 1974.

Age	Regions								Urban Areas of the USSR	Total USSR
	I	II	III	IV	V	VI	VII	VIII		
0	69.44	71.49	73.49	68.27	68.55	71.51	71.70	68.24	69.90	69.32
5	67.39	68.47	70.25	68.09	66.85	69.60	68.31	66.44	67.80	67.38
10	62.59	63.63	65.36	63.31	62.05	64.79	63.43	61.67	62.99	62.59
20	52.99	53.95	55.62	53.73	52.51	55.10	53.79	52.24	53.37	53.04
30	43.97	44.62	46.22	44.68	43.61	45.71	44.53	43.70	44.26	44.09
40	35.13	35.62	37.06	35.88	34.92	36.45	35.54	35.18	35.36	35.32
50	26.99	27.17	28.45	27.88	26.92	27.94	27.18	27.38	27.13	27.26
60	19.35	19.39	20.70	20.45	19.63	20.18	19.59	19.93	19.48	19.68
70	12.55	12.52	13.59	13.79	13.03	13.26	12.52	12.69	12.66	12.67
80	7.52	7.50	8.38	8.55	7.91	8.11	7.49	7.64	7.61	7.62
85	5.87	5.84	6.68	6.85	6.24	6.42	5.84	5.97	5.95	5.96

SOURCE: Appendix B.

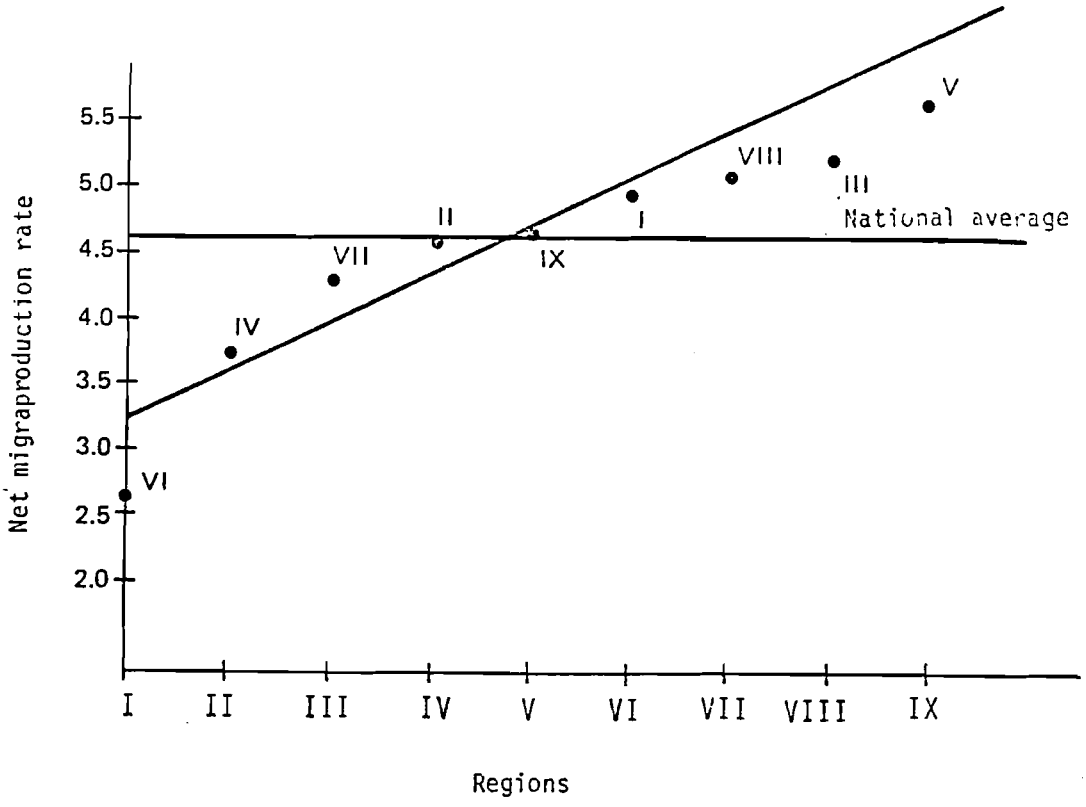

Figure 17. Regional distribution of the (single-region) net migraproduction rates (NMRs), USSR, 1974. (Source: Appendix B.)

The method used to construct these multiregional tables was developed by Rogers and is described in the works: Rogers (1975), and Willekens and Rogers (1978). It is initiated with the estimation of age-specific death and migration probabilities for each region which are applied to hypothetical cohorts born in different regions. These probabilities are derived from observed mortality and migration rates.

3.3.1. Multiregional Migration and Death Probability Matrices

The death and migration probabilities make it possible to estimate the probabilities that individuals at given ages reach subsequent ages and stay in a given region or move to any other region. The results of the death and migration probabilities calculations are given in Appendix C (Tables C1.1 to C1.9) which show, for example, that the probability of people born in region I, surviving and moving within the next five years to region II,

is 0.013, to region III is 0.002, and to the rural areas of the country is 0.029.

The probability that a person of age 20 and residing in region I will still be in that region at the age of 25 is 0.750. The probability of a migration to region II is 0.061, to region III is 0.010, and so on. The probability of remaining in the region for five years is much higher at higher ages. For example, it is 0.917 at the age of 50.

In Tables 26 and 27 there are death and migration probabilities for the two ages with the highest population mobility according to all observed regions of the country. For 20-year-olds (Table 26) the out-migration probability is lowest in regions I and VI. The probability to stay in the region in the course of five years is between 0.75-0.76. In the age group 20-24, the migration mobility of the rural population of the country is the highest. The probability to stay in the place of birth is 0.26.

The mobility of people of 25 years is slightly lower for all regions (Table 27). The lowest mobility is observed in the urban areas of the Baltic Republics (region VII), the Caucasian Republics (region VI), and the RSFSR (region I). The rural areas of the country have the highest mobility at the age of 25, as well as in the previous one, though the probability to stay in the place of birth is two times higher than at age 20. The data clearly show the migration patterns between the individual regions.

For region III (the urban areas of the Byelorussian SSR) in the age group of 20-24 years, the strongest migration links are evident for the urban areas of the RSFSR, the rural areas of the country, and the urban areas of the Ukrainian Republics. The same also holds for region V (the urban areas of the Kazakh Republic).

The analysis of the death and migration probabilities for the individual age groups within the two-region urban-rural system is also interesting. As is apparent from Table C1.9, almost in all age groups the mobility of the urban population is lower than that of the rural population. Thus, the probability for the urban population at the age of 15-19 years and 20-24 years to

Table 26. Five-year death and migration probabilities for people of age 20, for eight regions of the USSR, 1974.

From / To		Regions							
		I	II	III	IV	V	VI	VII	VIII
Regions	I	0.75033	0.19097	0.18555	0.19346	0.27054	0.12369	0.14707	0.44102
	II	0.06163	0.63138	0.05731	0.03701	0.06009	0.03323	0.04106	0.13761
	III	0.01006	0.01056	0.59158	0.00614	0.00971	0.00408	0.01428	0.03348
	IV	0.01907	0.01116	0.00968	0.58813	0.04338	0.01171	0.00773	0.03604
	V	0.02158	0.01433	0.01227	0.03676	0.46497	0.00761	0.00822	0.03906
	VI	0.00599	0.00563	0.00388	0.00582	0.00508	0.75972	0.00379	0.01650
	VII	0.00762	0.00685	0.02027	0.00422	0.00516	0.00314	0.63820	0.02101
	VIII	0.11562	0.12259	0.11424	0.12068	0.13192	0.05148	0.13237	0.26343
TOTAL		0.99190	0.99347	0.99478	0.99222	0.99085	0.99466	0.99272	0.98815
DEATH		0.00810	0.00653	0.00522	0.00778	0.00915	0.00534	0.00728	0.01185
TOTAL		1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000

SOURCE: Appendix C.

Table 27. Five year death and migration probabilities for people of age 25, for eight regions of the USSR, 1974.

From / To		Regions							
		I	II	III	IV	V	VI	VII	VIII
Regions	I	0.81526	0.10246	0.11149	0.12536	0.18552	0.08403	0.05979	0.27046
	II	0.03978	0.78364	0.03418	0.02145	0.03837	0.02203	0.01613	0.08373
	III	0.00577	0.00507	0.73324	0.00304	0.00549	0.00227	0.00572	0.01944
	IV	0.01289	0.00569	0.00536	0.71110	0.03236	0.00831	0.00283	0.02244
	V	0.01415	0.00729	0.00681	0.02548	0.61252	0.00475	0.00284	0.02345
	VI	0.00406	0.00319	0.00214	0.00358	0.00323	0.82878	0.00153	0.01025
	VII	0.00547	0.00403	0.01547	0.00263	0.00337	0.00219	0.83278	0.01513
	VIII	0.09008	0.08016	0.08295	0.09509	0.10566	0.03985	0.06956	0.54044
TOTAL		0.98746	0.99153	0.99164	0.98773	0.98652	0.99222	0.99118	0.98534
DEATH		0.01254	0.00847	0.00836	0.01227	0.01348	0.00778	0.00882	0.01466
TOTAL		1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000

SOURCE: Appendix C.

stay in the place of birth is 0.90 and 0.88. For the rural population it is 0.58 and 0.26. For 100,000 urban people at the age of 20 only 11.5 thousand people move to the rural areas, but the flow from the rural to the urban areas constitutes 72.5 thousand people. The discrepancies in the size of direct and reverse flows are great in all age groups. These data confirm clearly the non-equal character of urban-rural population exchange among the individual age groups.

3.3.2. The Life History of the Initial Cohorts

The above examination of the age-specific probabilities of dying and out-migrating permits one to estimate the life histories of the cohort born in each region. A part of this life history calculation is given in Appendix C (Tables C2.1 to C2.9). These tables show the evolution of the initial cohort born in a given region. They also show regional distributions of the number of survivors reaching an exact age.

In Table C2.9 figures are given for the expected number of survivors who reach exact age x, for the two-region system of the country: urban and rural. For example, out of 100,000 people born in the urban areas of the country (Table C2.9), 95.868 will reach the age of 5. Of this number, 93,320 people will live in urban areas and 2548 in rural areas. Out of the 100,000 population born in the urban areas of the country, 94,932 will survive to the age of 20; 83,272 people of this number will live in the urban areas and 11,660 in the rural areas. Of the 100,000 people born in the rural areas, 95,363 will reach the age of 5; of this number, 88,095 people will live in the rural areas and 7267 in the urban areas. By the age of 20, 46,324 people out of 94,164 of this cohort will live in the rural areas and 47,822 in the urban areas.

A similar analysis of the number of survivors at each age was carried out for the 8-region system. Thus, for example, 94,791 people out of 100,000 born in the urban areas of the RSFSR (Table C2.1) will reach the age of 20.

Table 28 shows the probabilities of surviving to age 20 for the initial cohorts born in the eight regions of the USSR. This table clearly shows the strong and the weak migration ties of each region with all of the others.

3.3.3. Life Expectancies by Place of Birth

The index of life expectancy according to place of birth and current residence is a very important measure in multiregional population analysis. In Table 29 the results of the life expectancy calculations according to place of birth for the urban and the rural areas of the USSR are set out. These indices clearly show the differences in the mobility of the urban and rural populations of the country. Whereas, an individual born in urban areas of the country is expected to live 60.3 years in the place of birth and only 9.4 in rural areas, a person born in rural areas is expected to live 26.6 years in the place of birth and the remaining 42.5 years in urban areas.

Table 30a presents life expectancies at birth by place of residence for all eight regions of the system. Thus, for example, people born in the urban areas of the RSFSR (region I) are expected to live 46.3 years out of a total of 69.5 years in the region of birth, 6.9 years in region II, 1.1 years in region III, and so on.

The main diagonal shows how many years a person born in the region can expect to remain in that region. By comparing these figures with the total life expectancy in the final column, the "stability" of each regional population can be clearly identified. As is apparent from this table, the highest stability in the USSR exists in region I (46.3 years) and in region VI (42.4 years), and the lowest in region III (28.2 years) and region VIII (26.7 years). Total regional life expectancies at birth are illustrated in Figure 18. The checkered (highest) areas represent the populations of the urban areas in the Baltic, Ukrainian, Moldavian, and Caucasian Republics, the dotted (lowest) levels denote the urban areas of the Central Asian Republics (the Uzbek, Tadzhik, Turkmen, and Kirghiz SSRs).

Table 28. Probability of survival to age 20 of regional birth cohorts, by region of residence.

region of residence	region of birth 1-	2-	3-	4-	5-	6-	7-	8-
rsfsr	0.70349	0.17015	0.17732	0.13739	0.23269	0.09550	0.13492	0.27309
ukrmol	0.06333	0.62454	0.06081	0.02794	0.05713	0.02822	0.04130	0.09463
belssr	0.01066	0.01079	0.55781	0.00467	0.00943	0.00350	0.01552	0.02419
uzkitatu	0.01671	0.00909	0.00849	0.61915	0.03735	0.00790	0.00646	0.02131
kazakh	0.01992	0.01254	0.01150	0.02657	0.46756	0.00567	0.00702	0.02381
grazarm	0.00493	0.00443	0.00331	0.00386	0.00392	0.76006	0.00314	0.00952
eslali	0.00848	0.00731	0.02489	0.00324	0.00512	0.00275	0.61789	0.01604
rural	0.12039	0.12448	0.12421	0.09947	0.12879	0.04555	0.14228	0.47915
total	0.94791	0.96334	0.96833	0.92229	0.94199	0.94914	0.96852	0.94173

SOURCE: calculated by author.

Table 29. Life expectancy by place of birth for the urban and the rural areas of the USSR.

	Initial Region of Cohort					
	Urban			Rural		
Age	Total	Urban	Rural	Total	Urban	Rural
0	69.72	60.27	9.45	69.11	42.54	26.57
5	67.62	57.83	9.79	67.35	44.42	22.93
10	62.81	53.16	9.64	62.58	44.08	18.49
15	57.95	48.53	9.42	57.75	43.53	14.22
20	53.21	44.19	9.01	53.10	42.18	10.92
25	48.62	40.18	8.44	48.69	39.34	9.35
30	44.17	36.34	7.83	44.16	35.70	8.45
35	39.56	32.41	7.14	39.55	31.90	7.65
40	35.33	28.84	6.49	35.32	28.41	6.91
45	31.00	25.21	5.78	31.00	24.86	6.13
50	27.18	22.02	5.15	27.18	21.74	5.44
55	23.52	18.99	4.53	23.53	18.75	4.77
60	19.56	15.71	3.85	19.56	15.52	4.04
65	15.92	12.71	3.20	15.92	12.56	3.35
70	12.66	10.05	2.60	12.66	9.94	2.72
75	9.82	7.76	2.06	9.82	7.67	2.14
80	7.61	5.98	1.63	7.61	5.91	1.69
85	5.95	4.64	1.30	5.95	4.59	1.35

Table 30. Expectations of life for the eight regions of the USSR.

a. Expectations of life

	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
rsfsr	46.3207	20.3948	20.8614	19.4033	23.9662	14.4872	17.8107	25.5295
ukrmol	6.9114	34.9208	6.8254	4.9100	6.6586	4.2853	5.5250	8.5234
belssr	1.0803	1.0983	28.1539	0.7673	1.0380	0.5506	1.3320	1.6819
uzkitatu	1.8865	1.4386	1.3963	29.5788	2.9535	1.2747	1.2171	2.1168
kazakh	1.8067	1.4543	1.4065	2.3306	22.7975	0.9310	1.1390	1.9516
grazarm	0.8028	0.7735	0.6689	0.7262	0.7417	42.4425	0.6444	1.1123
eslali	1.0993	1.0354	2.1898	0.7502	0.9154	0.5773	33.5721	1.5330
rural	9.6379	9.7253	9.9198	9.3061	9.9958	5.9301	9.9573	26.6747
total	69.5456	70.8411	71.4219	67.7726	69.0668	70.4788	71.1977	69.1232
eigenvalue	69.721977							
eigenvector								
- right	1.000000	0.346403	0.056728	0.090527	0.073838	0.061885	0.064422	0.375366
- left	1.000000	1.031550	1.045545	0.955459	0.988746	1.030740	1.044306	0.993787

b. Migration levels

	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
rsfsr	0.666049	0.287895	0.292086	0.286300	0.347000	0.205554	0.250158	0.369334
ukrmol	0.099379	0.492945	0.095564	0.072448	0.096408	0.060803	0.077601	0.123308
belssr	0.015534	0.015504	0.394191	0.011322	0.015029	0.007812	0.018709	0.024331
uzkitatu	0.027126	0.020308	0.019550	0.436442	0.042764	0.018086	0.017094	0.030624
kazakh	0.025979	0.020529	0.019693	0.034388	0.330079	0.013210	0.015998	0.028233
grazarm	0.011543	0.010919	0.009366	0.010715	0.010739	0.602203	0.009051	0.016092
eslali	0.015807	0.014616	0.030659	0.011070	0.013254	0.008191	0.471533	0.022177
rural	0.138584	0.137283	0.138890	0.137314	0.144727	0.084140	0.139855	0.385901
total	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

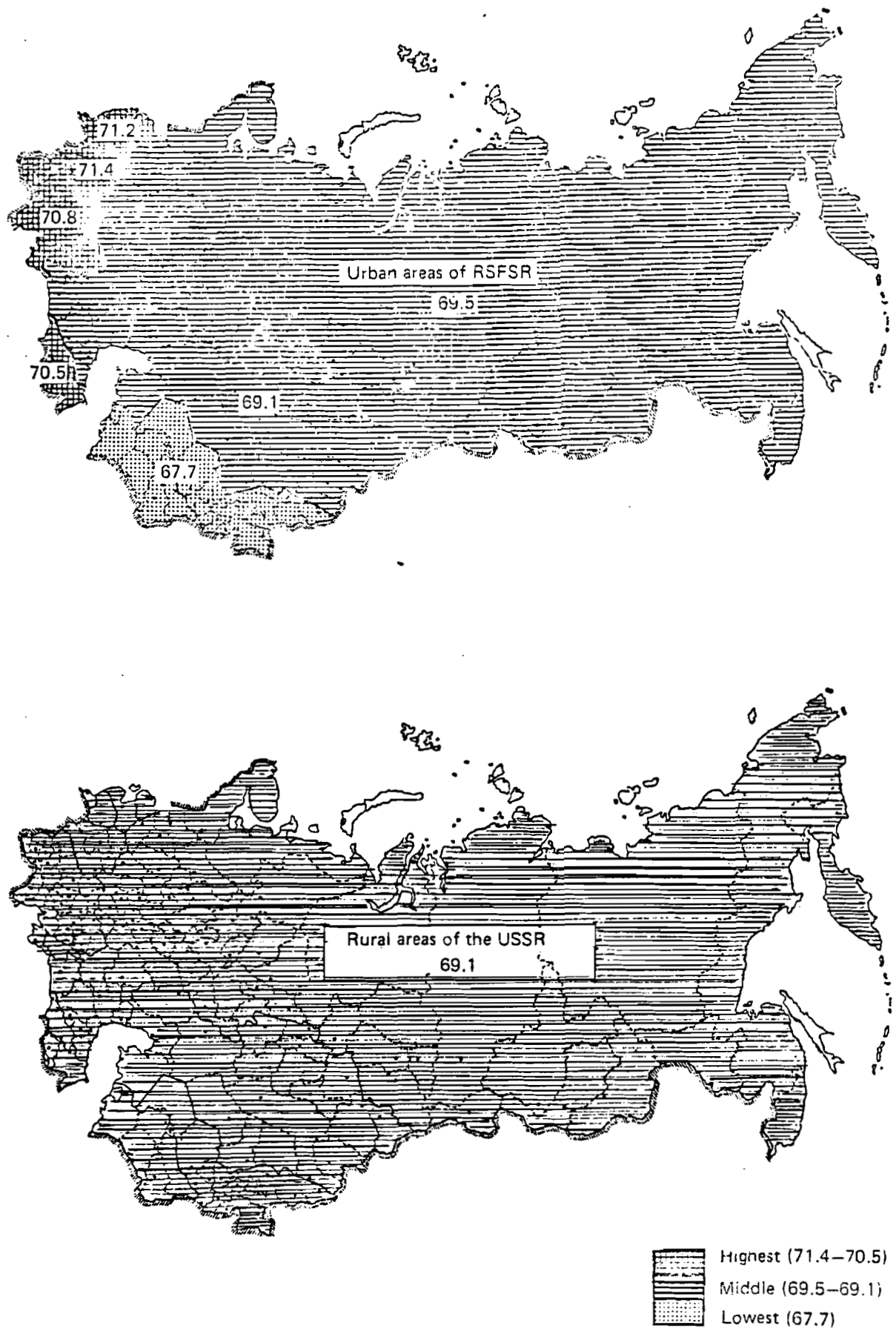

Figure 18. Regional life expectancies at birth, eight regions, USSR, 1974.

The life expectancy index, by place of birth and future residence, is a useful measure for assessing the migration levels between individual regions. The *migration level* is defined as ${}_i\theta_j$, where ${}_i\theta_j = {}_ie_j(0)/{}_ie(0)$. This means that the migration level from region i to region j is the fraction of the total life expectancy in region i that is expected to be lived in region j.

Table 30b gives migration levels between all eight regions in the USSR. The elements along the main diagonal reflect the "non-migration" level. For example, one-third of the average lifetime of a baby born in the urban areas of the RSFSR is expected to be lived outside of that region (and two-thirds in it). These fractions are reversed for a baby born in the urban areas of the Kazakh SSR.

3.4 Fertility and Mobility Analysis

Normally, fertility is studied by using only data on age-specific and gross fertility rates. The multiregional life table, however, allows for a more accurate analysis of fertility patterns in different regions of the country by introducing the impact of internal migration. Spatial net reproduction rates and net reproduction allocations are the relevant multiregional indices.

Table 31a gives net reproduction rates (NRR) for all regions of the USSR. The bottom row of this table shows the total expected number of births per parent born in region j, given the multiregional regime of fertility, mortality, and migration. The elements in each column represent the distribution of this total among the different regions of birth of the child. The NRR matrix as a whole shows the regional distribution of the expected number of births by region of birth of parent and child. For example, of the expected 1.101 births per parent born in region I, 0.617 will occur in the same region, 0.099 will occur in region II, 0.018 in region III, and so on.

As is apparent from Table 31a, the NRR for each observed region is higher than one, indicating progressive reproduction for all regions. The highest level of the NRR is recorded in the

Table 31. Spatial fertility expectancies for the eight regions of the USSR.

a. Net reproduction rate

	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
rsfsr	0.617470	0.280237	0.283713	0.255046	0.343691	0.181463	0.240210	0.394466
ukrmol	0.098550	0.479390	0.096031	0.062055	0.093773	0.054764	0.075807	0.134883
belssr	0.018405	0.018858	0.393518	0.011883	0.017495	0.008301	0.023997	0.033035
uzkitatu	0.054785	0.039568	0.037762	0.708136	0.093420	0.034386	0.032848	0.066051
kazakh	0.035657	0.027399	0.025837	0.047888	0.325579	0.015705	0.020424	0.041811
grazarm	0.015286	0.014586	0.012154	0.013510	0.013752	0.849020	0.011863	0.024009
eslali	0.013687	0.012699	0.030168	0.008219	0.010657	0.006241	0.417444	0.021705
rural	0.246736	0.253060	0.250828	0.234201	0.259923	0.132937	0.267132	0.485047
total	1.100576	1.125797	1.130012	1.340938	1.158288	1.282818	1.089725	1.201007
eigenvalue	1.168009							
eigenvector								
- right	1.000000	0.350973	0.072770	0.294186	0.111812	0.139421	0.053587	0.709581
- left	1.000000	1.022773	1.024210	1.462956	1.087024	1.467942	0.971376	1.119626

b. Net reproduction allocations

	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
rsfsr	0.561043	0.248923	0.251071	0.190200	0.296723	0.141457	0.220432	0.328446
ukrmol	0.089544	0.425823	0.084982	0.046277	0.080958	0.042691	0.069565	0.112308
belssr	0.016723	0.016751	0.348243	0.008862	0.015104	0.006471	0.022021	0.027506
uzkitatu	0.049779	0.035146	0.033418	0.528090	0.080653	0.026805	0.030143	0.054996
kazakh	0.032398	0.024338	0.022864	0.035712	0.281087	0.012243	0.018742	0.034813
grazarm	0.013889	0.012956	0.010756	0.010075	0.011872	0.661840	0.010886	0.019991
eslali	0.012436	0.011280	0.026697	0.006129	0.009200	0.004865	0.383073	0.018072
rural	0.224189	0.224783	0.221969	0.174655	0.224403	0.103629	0.245137	0.403867
total	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

republics of Central Asia and the Caucasus; the lowest in the RSFSR and the Baltic Republics. For the urban and rural populations of the USSR as a whole, the NRR is 1.123 and 1.204, respectively.

The spatial net reproduction allocation is another way of looking at the net reproduction rate. It is simply the fraction of each column total in Table 31a that is allocated to each row. The allocations of the total regional net reproduction rates are shown in Table 31b which shows, for example, that 32.8 percent of the births to parents born in region VIII, the rural areas of the USSR, will occur in region I.

Along with spatial net reproduction rates and allocations, one can also calculate spatial net migraproduction rates and allocations. These are given in Tables 32a and 32b, respectively.

The elements in Table 32a represent the number of out-migrations that a person born in region i can expect to make from region j during a life time. (In contrast to the GMR discussed in the section on observed population characteristics, the NMR includes the effects of mortality and interregional migration.) The elements of the main diagonal of this table characterize the pattern of interregional migration by region of birth. The highest interregional out-migration refers to the urban areas of the RSFSR (region I). Of the total 4.9 migrations made by an individual born in the RSFSR, 3.4 will originate in this region of birth. The lowest rate is in region VI (urban areas of the Caucasus).

By comparing the total spatial net migraproduction rates (Table 32a) with the total gross migraproduction rates (Table 23) for each region, one can estimate the migration changes taking place owing to regional differences in mortality and internal migration (Table 33).

As is apparent from this table, the NMR is lower than the GMR for all regions except region VI. In region VI the number of migrations per person increased from 2.837 to 3.234. Note that the traditional single-region calculation gives 2.516. This difference is attributed to the internal migration that is taken into account in the former measure.

Table 32. Net migraproduction rates for the eight regions of the USSR.

a. Net migraproduction rate

	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
rsfsr	3.354594	1.283122	1.308196	1.174245	1.563450	0.850954	1.098917	1.744400
ukrmol	0.403216	2.561328	0.393515	0.254488	0.381515	0.226558	0.307133	0.535683
belssr	0.075868	0.077267	2.421802	0.048652	0.071567	0.034635	0.098057	0.133086
uzkitatu	0.107333	0.077484	0.074332	1.762041	0.182309	0.067772	0.064212	0.126707
kazakh	0.154293	0.118875	0.113179	0.202958	1.977853	0.070593	0.088885	0.174548
grazarm	0.025532	0.024373	0.020473	0.022586	0.023028	1.602826	0.019859	0.038819
eslali	0.056898	0.052475	0.126473	0.034243	0.043995	0.026484	2.409023	0.087350
rural	0.676557	0.692498	0.690636	0.627359	0.710596	0.353794	0.736318	1.869905
total	4.854291	4.887421	5.148608	4.126572	4.954313	3.233618	4.822403	4.710498
eigenvalue	4.808535							
eigenvector								
- right	1.000000	0.314205	0.069555	0.067941	0.100446	0.016844	0.050869	0.374186
- left	1.000000	1.014789	1.122632	0.769083	1.027421	0.502287	0.991041	0.959719

b. Net migraproduction allocations

	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
rsfsr	0.691058	0.262536	0.254087	0.284557	0.315573	0.263159	0.227877	0.370322
ukrmol	0.083064	0.524065	0.076431	0.061670	0.077007	0.070063	0.063689	0.113721
belssr	0.015629	0.015809	0.470380	0.011790	0.014445	0.010711	0.020334	0.028253
uzkitatu	0.022111	0.015854	0.014437	0.426999	0.036798	0.020959	0.013315	0.026899
kazakh	0.031785	0.024323	0.021982	0.049183	0.399219	0.021831	0.018432	0.037055
grazarm	0.005260	0.004987	0.003976	0.005473	0.004648	0.495676	0.004118	0.008241
eslali	0.011721	0.010737	0.024565	0.008298	0.008880	0.008190	0.499548	0.018544
rural	0.139373	0.141690	0.134140	0.152029	0.143430	0.109411	0.152687	0.396965
total	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

Table 33. The regional GMR and NMR for the eight regions of the USSR.

Indices	Regions							
	I	II	III	IV	V	VI	VII	VIII
GMR	5.544	5.183	5.957	4.569	6.792	2.837	5.035	5.696
NMR	4.853	4.887	5.148	4.126	4.954	3.234	4.822	4.711
Single-Region NMR	4.854	4.669	5.354	3.847	5.719	2.516	4.481	5.061

3.5 Multiregional Population Projection to Stability

The consistent projection of regional population growth is one of the most important contributions of multiregional demographic analysis. In this section, the projection of the 1974 populations of all eight regions (and for the urban-rural aggregation as well) is described. Appendix D (Tables D1 to D5) gives the populations by age projected until the year 2024. All age-specific fertility, mortality, and migration rates for this projection were held constant at their 1974 levels. A program developed at IIASA and described by Willekens and Rogers (1978) was used.

Table 34 presents the aggregate totals of the population projection and the percentage of the total population in the individual regions of the country for the period of 1984-2024. According to this table, the assumption of constant rates of fertility, mortality, and migration changes implies that the population of the USSR will increase in all regions, except region VIII, during the projection period. Associated with the total increase of the USSR population of 88,246 thousand, is a growth of the urban population of the country by 100,830 thousand, and a decrease of the rural population by 12,583 thousand.

The largest increase of the population is expected in region IV. During the period of 1984-2024, this population is expected

Table 34. Multiregional population projection, USSR, 1974.

Region	1984	1994	2004	2014	2024
	Population numbers (1000s)				
I	109168.5	126828.8	139760.8	152497.7	162998.4
II	36683.3	42799.1	47413.8	51989.1	55795.0
III	6244.8	7656.7	8652.4	9570.2	10294.1
IV	11694.6	14683.8	17218.7	19776.4	22141.8
V	9226.4	10829.3	11968.5	13059.9	13947.4
VI	8309.5	7709.1	10372.2	12125.7	13285.4
VII	5680.6	6849.6	7765.5	8633.1	9349.5
VIII	89263.7	80281.6	75937.5	75480.3	76678.4
Total	276271.7	299629.2	319589.5	343132.6	364517.0
	Population shares (percentage of total population)				
I	39.51	42.33	43.73	44.44	44.72
II	13.28	14.28	14.84	15.15	15.31
III	2.26	2.56	2.71	2.79	2.82
IV	4.23	4.90	5.39	5.76	6.08
V	3.34	3.61	3.74	3.81	3.83
VI	3.01	3.24	3.40	3.53	3.64
VII	2.06	2.29	2.43	2.52	2.56
VIII	32.31	26.79	23.76	22.00	21.04
Total	100.00	100.00	100.00	100.00	100.00

SOURCE: Appendix D.

to increase almost twofold. The populations in region III and region VII should grow considerably, increasing by 64.8 percent and 64.6 percent, respectively. The rural population is expected to decrease by 14 percent.

The regional shares will also change considerably. The share of the national population residing in region I will increase substantially. In 1974 it was 35.2 percent; by 1984 it will approach 39.5 percent, and by 2024, converge to 44.7 percent. The share of population of region II will grow by 2.0 percent for 1984-2024, and in region IV by 1.8 percent. The share of the country's rural population will decrease to about 21.0 percent.

The mean age of the population will increase along with the growth in size of the old age groups, confirming that the population is aging. Thus, even though the birth rates are assumed to remain constant, the proportion of the population in the older age groups will change.

Along with the increase in the mean age of the country's population by 1.94 years (Appendix D), the mean age in region I will increase by 2.80 years, in region II by 1.91 years, in region V by 3.41 years, and so on. The mean age of the population of the country's rural areas (region VIII) will be changed least of all. The population of the Central Asian and the Caucasian Republics will continue to be the "youngest" in the country. The mean age of the urban population of these regions is projected to lie in the range of 28.6 to 32.9 years. The "oldest" age structure will be typical for the urban areas in the Baltic Republics and in the RSFSR. By the end of the projection period, the mean age of the population of these regions will be around 36.6 to 37.0 years.

Table D6 in Appendix D presents the *stable equivalent* of the observed population. This hypothetical population (Rogers 1975) represents the total number of people which, if distributed as the stable population, would increase at the same rate and tend toward the same ultimate population as would, in the long run, the observed population under projection. The comparison

of the indices of the stable equivalent population and the observed population makes it possible to estimate the effect on a population of changes in age structure.

Figures 19 through 21 show the curves of the observed and the stable equivalent populations in three individual regions of the country.

As is apparent from these figures, the Central Asian urban population and the country's rural population have an age structure that is considerably different from the age structure of the corresponding stable population. The high migration level in particular age groups brings considerable changes in the size of the original population in comparison to the corresponding stable population. The population of the Baltic urban areas, on the other hand (Figure 21), has an age structure that is similar to the age structure of the stable population.

One can see that for the urban areas of Central Asia the curve of the distribution of the stable equivalent population (Figure 19) lies above the curve showing the distribution of the original population; this is characteristic of a growing population. In the rural areas of the country, however, where a population decrease is observed in the projection, the curve showing the distribution of the stable equivalent population lies below the curve of the observed population.

It is interesting to compare the mean age of the original population and the mean age projected for the year 2024 with the mean age of the stable equivalent population. As is apparent from Table 35, the mean age of the stable population differs considerably from the mean age of the original population but not so much from its projection to the year 2024 for the USSR as a whole and for the majority of the individual regions.

The stable 5-year growth ratio λ exceeds unity in all regions to the end of the projection period (Table 35). In the beginning this growth ratio in region VIII is below unity, but by the year 2024 it is projected to be 1.0081. The highest population growth rate occurs in regions IV and VI, and the lowest in region VIII. The difference between the highest and lowest population growth

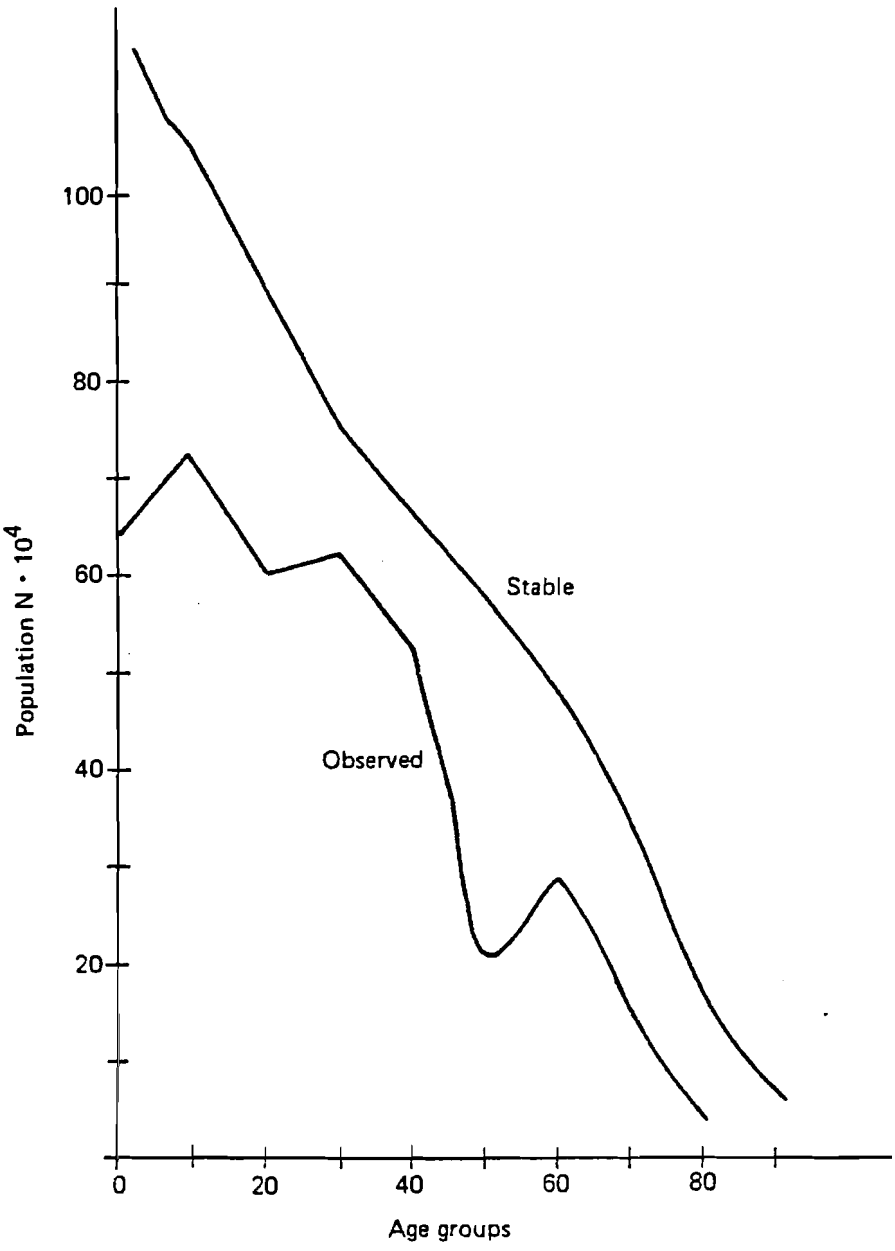

Figure 19. The age composition of the observed and the stable equivalent populations in the urban areas of the Central Asian Republics.

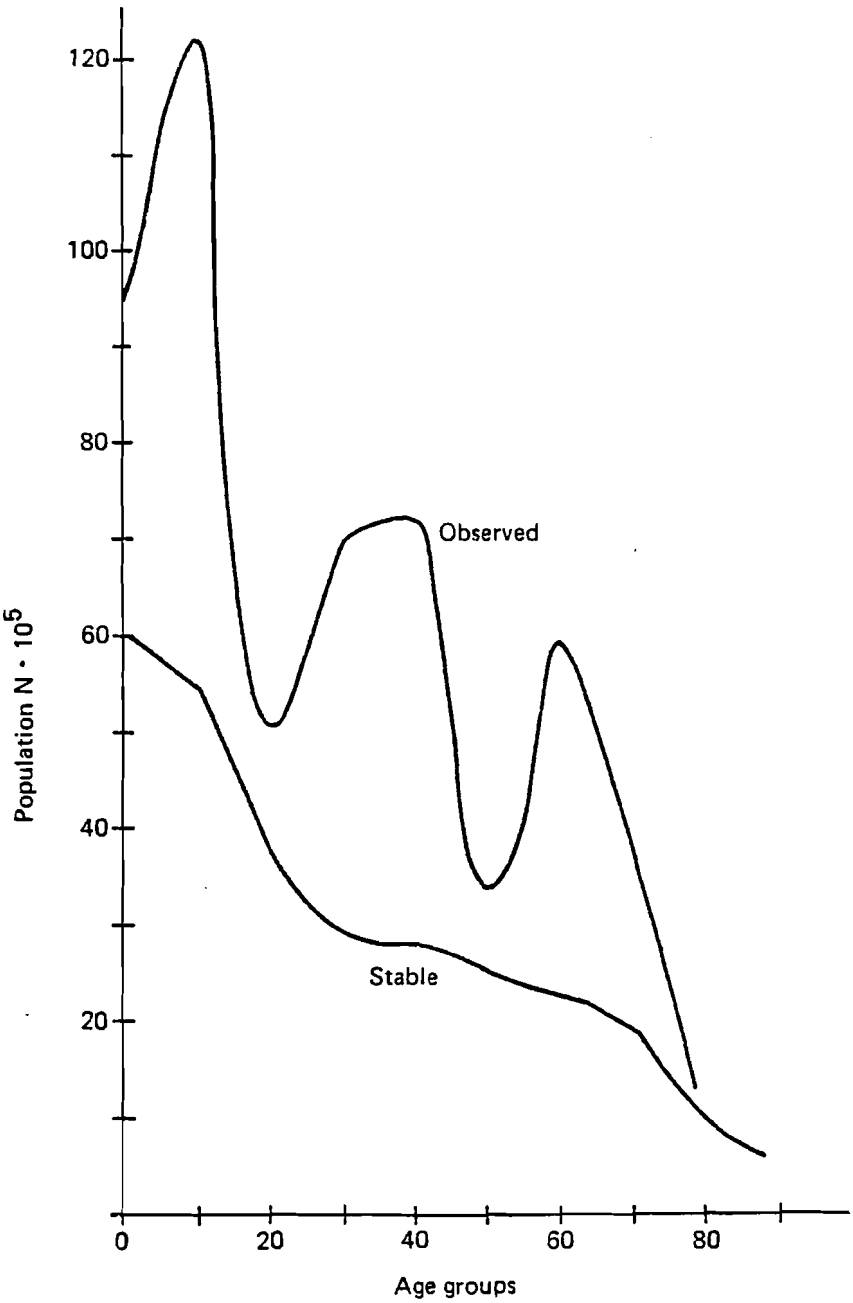

Figure 20. The age composition of the observed and the stable equivalent populations in the rural areas of the USSR.

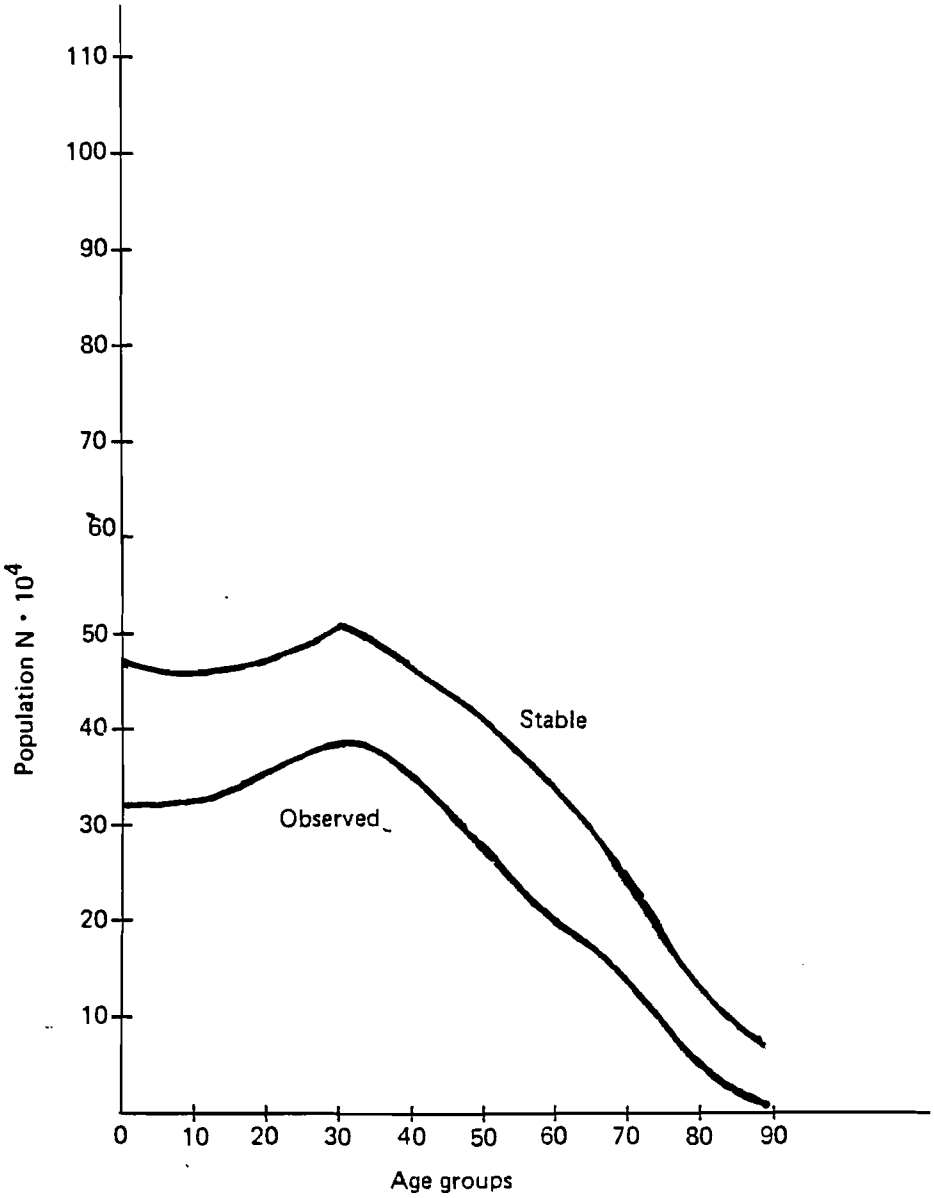

Figure 21. The age composition of the observed and the stable equivalent populations in the urban areas of the Baltic Republics.

Table 35. Characteristics for the initial population and the stable equivalent population in the USSR.

		REGIONS								
		I	II	III	IV	V	VI	VII	VIII	TOTAL
Population (in 1000s)	Initial (1974)	88,230	29,527	4,549	8,682	7,348	6,918	4,337	101,280	250,869
	2024	162,998	55,795	10,294	22,142	13,974	13,285	9,349	76,678	364,517
	stable equivalent to original population	118,753	40,667	7,435	19,406	10,373	11,704	6,866	54,526	269,729
Mean Ages	Initial (1974)	33.84	33.96	30.67	27.71	29.48	29.89	34.00	32.83	32.94
	2024	36.67	35.87	33.49	28.64	32.89	32.50	37.00	32.92	34.88
	stable equivalent to original population	37.04	36.35	34.06	29.01	33.21	32.96	37.68	32.74	37.04
Growth Ratio λ	Initial (1974-1979)	1.1183	1.1209	1.1865	1.1676	1.1277	1.0963	1.1565	0.9401	1.0499
	2019-2024	1.0305	1.0326	1.0334	1.0536	1.0310	1.0430	1.0367	1.0081	1.0281
	stable equivalent to original population	1.0297								
$r = \frac{1}{5} \ln \lambda$	Initial (1974-1979)	0.0224	0.0228	0.0342	0.0310	0.0240	0.0184	0.0291	-0.0123	0.0097
	2019-2024	0.0060	0.0064	0.0065	0.0104	0.0061	0.0084	0.0072	0.0016	0.0055
	stable equivalent to original population	0.0058								

rates in the individual regions is 0.0455. The growth ratio for the entire population of the USSR is 1.0281.

The growth ratio for the stable population is 1.0297. The growth ratio can be used to calculate the intrinsic growth rate $r = \frac{1}{5} \ln\lambda$, shown in Table 35 to be 0.0058.

The aggregation of the input data on birth, death, and migration rates for the urban areas in the seven regions into a single region (Figure 15) makes it possible to calculate the projection for the entire urban and rural population of the country. In Appendix D (Tables D7-D11) the results of such a calculation for 1984-2024 are given.*

We now consider the urban and rural population age structure according to the enlarged age groups given in Table 36. As is apparent from this table, in the urban areas of the country the number of children aged 0 to 4 years increases during the entire projection period. By 1984 the population size of this age group makes up 17 million; by the year 2004 it will increase to 19 million, and by the year 2024 grow to 22 million. The number of children aged 5 to 14 years also increases in this region. The population size in this age group will increase form 25 to 42 million over the 40 year period (1984-2024).

*Minor differences between these calculations and the above mentioned calculations of the population projection for the 8-region territorial system result from the aggregation of the input data.

Table 36. The projected urban and rural population of the USSR, 1984-2024 (in thousands).

Years / Age Groups	1984		1994		2004		2014		2024	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
0- 4	17,240.8	8,698.4	18,412.3	8,049.0	19,355.8	7,827.9	21,576.4	8,163.3	22,157.6	8,2707
5-14	25,218.7	17,216.2	35,205.2	16,454.8	36,021.4	15,116.9	39,241.7	15,332.5	42,495.9	15,870.6
15-59	20,146.9	45,845.5	134,040.0	38,085.0	149,053.4	35,657.7	164,240.3	37,312.9	170,701.1	38,263.3
60-85	24,322.9	17,468.7	31,409.4	17,595.1	38,576.3	17,167.2	41,297.9	14,399.8	50,265.7	13,855.8
TOTAL	86,929.3	89,288.8	219,066.9	80,183.9	243,006.6	75,769.7	266,356.3	75,208.5	285,620.3	76,260.4
					(percentage distribution)					
0- 4	9.22	9.74	8.40	10.04	7.96	10.33	8.10	10.85	7.76	10.84
5-14	13.49	19.29	16.07	20.52	14.82	19.95	14.73	15.50	14.88	20.81
15-59	64.28	51.39	61.19	47.50	61.35	47.06	61.67	54.50	59.76	50.18
60-85	13.01	19.58	14.34	21.94	15.87	22.66	15.50	19.15	17.60	18.17
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

4. POPULATION POLICY*

The problem of demographic policy is closely connected with the population growth processes and is conditioned by the economic development of society. The comparison of the economic limits of the population change with indices of demographic and economic development makes it possible to estimate the population growth rate that leads to a more optimal balance between the growth of the population and the growth of the economy. A recent study by Pankrat'eva (1977) finds that the demographic level in the USSR in 1960-1975 was below the balanced level. The approach of the population growth rates to their lower levels led to an increased attention to problems of demographic policy in the country during the past 15 years, particularly to the quantitative dependence of demographic indices on the entire complex factors influencing them. The estimation of total expenditures for the support of a demographic policy that is rational from the standpoint of the optimum process of the national economic development has been an important focus.

4.1 Fertility and Health Care

The demographic policy of the USSR is an integral part of the state's socioeconomic policy, and it is subordinate to the general problem of providing the national economy with the needed quantity and quality of manpower. The goals of this demographic policy are an improvement of the current demographic situation in the country, an anticipation of expected difficulties in the utilization of labor forces, and the attainment of an equilibrium between population reproduction and the production of material wealth.

Demographic policy is affected by economic, administrative, judicial, and ideological measures.† The economic measures include: child allowance, tax differentiation related to family

*This part of the study was written with the use of the following works: Pankrat'eva (1977), Rybakovskii (1973), and Khorev and Chapek (1978).

†See Valentei (1974).

size, dwelling space privileges, development of institutions and services for children, stimulation of migration for material benefits and for the benefits of society, bachelor taxes, improvement of conditions of work and labor protection, development of public health care, and so on. The administrative and judicial measures include: legislative acts determining the minimum age of marriage, the prohibition of abortion, contraceptive use, etc. The ideological measures include: the utilization of all possible means of mass information for the purpose of influencing the birth rate in the direction desired by society.

In the USSR demographic policy is implemented in many ways, including paid maternity leave; grants for the use of nurseries, kindergartens, sanatoria, boarding schools, and hospitals; free education in secondary schools, secondary professional educational institutions, and higher educational institutions; support payments to parents for their children, payment for leave connected with the care of sick children, and the development of public health care services.

The educational, rearing, and service cost allowances that come from the State budget are increasing from year to year in the USSR. These expenditures for the upbringing of children and their general education, State grants to mothers with many children, to single mothers, to expectant mothers, and also birth grants and free services in children's institutions, pioneer camps, and out-of-school grants increased by 5.6 milliard rubles, or 1.7 times between 1965-1975.* This increase of expenditures includes: kindergartens--more than two times; general educational schools of all kinds--1.5 times; higher educational institutions--two times; technical schools and schools for the training of medium-level specialists--more than two times; vocational education--2.5 times. Grants for pregnancy, maternity care, and child nursing increased by more than two times during this period of time; grants for children's institutions, pioneer camps, and out-of-school service costs increased by 1.9 times. These expenditures

*Without capital investment.

total 27.8 percent of the entire sum of the State budget expenditures intended for sociocultural affairs and science.*

In the USSR much attention is given to disease prevention among women and children through a wide network of maternity hospitals, maternity and child consultation clinics, dispensaries, hospitals, and the network of permanent out-of-school institutions. The number of beds (medical and obstetrical) for expectant mothers and women in childbirth increased by 1.5 times between 1940 and 1975. For this period of time the number of maternity consultation clinics, child polyclinics, and dispensaries grew by 2.6 times; the number of children attending out-of-school institutions by 5.9 times; the number of children in kindergartens and day nurseries by 10.5 times.

A considerable part of the program for social development in the USSR, adopted by the XXV Party Congress, is devoted to new demographic policy measures. These measures relate to the further improvement of the conditions of work and labor protection, the conditions of work and life among working women, social maintenance, and population health protection.

For the period of 1976-1980 the improvement of the working women's conditions will be achieved by granting paid leave for child upbringing until they reach the age of one year; providing women who have children with more ample opportunities for shorter working hours and with possibilities of working at home; expanding the network of out-of-school institutions and schools; increasing the number of camps, sports camps, sanitation and labor centers for juveniles and young people.

Further development of public health care and cultural facilities to promote increases in life expectancy and the improvement of population health plays a significant role in the demographic policy of the country. As we have seen, the decrease of the death rate is a significant factor increasing the population growth rate and, therefore, the potential quantity of labor force and the growth of population-related economic activity.

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*Central Statistics Office 1976b:745-746.

4.2 Migration

Migration within a country can have positive or negative effects on national economic development. For example, there can be an undesirable population redistribution from regions of labor shortage to regions of labor surplus, an excessive outward flow of rural population to cities, or an inadequate proportion of migrants moving to regions of new development. Thus, the need for a demographic policy is apparent.

The planned redistribution of labor is a particularly important component of demographic policy, and various regions have addressed the problem differently. The alternative approaches to this problem appear to be the result of social, economic, practical, and technical decisions made in accordance with the peculiarities of a particular region's history of development.

The problem of maintaining a stable labor force in the less developed regions of the country occupies a particular place in the decisionmaking focused on this problem. The stimulation of the material welfare of the population of the country's less developed regions is principally carried out by means of allocation of privileges, of which there are two kinds. First, there are privileges which release migrants from many expenditures (for example, the abolishment of debts, the repeal of obligatory deliveries and agricultural taxes, the reduction of rents on apartments reserved and temporarily left in the region of out-migration, exemption from service in the armed forces or a shortening of the call-up period, the free or lowcost transportation for persons and goods). Second, there are privileges in the form of supplementary incomes and advantages obtained by migrants (for example, wage and salary supplements, additional leaves without loss of pay, grants and large travelling expenses, and loans). This system of privileges aims to attract people to live permanently in less developed regions of the nation.

The policy of privileges for migration and population stabilization is carried out in concert with the pace of general economic development in the less developed regions. In addition to incentives, moral suasion plays an important role. The

enthusiasm and patriotism of the Soviet people shown in the process of developing new lands is well known: for example, the Komsomol calls in the 1930s, the development of the northern regions during the years of the war (when all privileges were cancelled), and the social calls by youth for working in the new regions today.

The rural migration to the urban areas poses an important problem concerning labor force redistribution in the country. This problem affects both the economic interests of agriculture, industry, and construction, and the broader interests of the population. It is impossible to study the problem of this migration, particularly the migration of the young, without also taking into consideration the existing cultural setting of the Soviet Union. Sociological research carried out in some regions of the country shows that today it is not only the level of wages that is important to the village youth, but also other factors such as the availability of jobs, the type of job, and the amount of leisure time. The growing contradictions between the village youth's demands and what the thousands of small villages are able to offer is the main force behind the migrations of the young to urban areas. According to the data, the out-migration is most intensive from rural settlements with less favorable cultural and welfare conditions. In some cases, this migration is so intense that the settlement disappears altogether.

The policy problem then is to reorganize the existing system of the rural settlements, eliminate the small villages, and encourage migration to regions that will foster acceptable working and living conditions. This rural settlement reconstruction requires long-term planning in which the industrial, housing, cultural, and welfare conditions would be sufficient to accommodate almost the entire rural population, considerably decreasing the number of existing villages.

At the same time much attention is being given to the problem of educating the village youth for the more sophisticated agricultural production requirements, particularly to produce young skilled machine operators, personnel of higher education

in the agricultural economy, and the improvement of conditions necessary for the residential stability of skilled workers' villages.

Migration in the USSR, however, is not restricted to rural-to-urban flows. Migration is also dependent to a large extent on general urban population mobility. Thus, the share of urban in-migration attributable to migration from other *urban* areas made up 60 to 65 percent in the 1960s.

The nation's urban migration policy is aimed at the restriction of growth in large cities, the more active development of the cities of a medium size, the construction of new regional centers, and the more uniform distribution of these cities throughout the country. All these measures should produce an equalization of urbanization levels, a more optimal migration process, and approach more closely desired levels of socioeconomic development in urban and rural areas throughout the USSR.

5. CONCLUSION

This report describes briefly the methods and possible uses of a multiregional population analysis carried out for the eight regions of the USSR. As is apparent, traditional data used in a multiregional population analysis make it possible to describe multiregional relations within the observed system and to estimate the influence of migration flows on the population distribution and structure.

The multiregional analysis may be divided into two parts. In the first part, the *measurement* of population characteristics is emphasized, using multiregional methods. The measures are based on age-specific fertility, mortality, and outmigration rates, and other demographic data. This part of the work also includes an analysis of multiregional life tables, including the estimation of the life histories of cohorts born in each region, the estimation of the life expectancy by age and region, the detailed analysis of the character of the population mobility in individual regions, and the quantitative estimation of the multiregional population relations. The results of the study would have been more interesting if, instead of the eight selected regions, a more detailed territorial structure of the country had been observed. For example, it would be interesting to carry out a similar study within the individual areas of such large regions as the RSFSR and the Kazakh SSR. In this case it would be important to analyze the population development according to the urban and rural areas of each region separately, keeping in mind the existing differences in the urban and rural population reproduction rates. Unfortunately, because of the vast amount of data needed for such an analysis, it would be very difficult to carry out such a study for a country as large as the USSR.

The second part of this work focused on population *projection* and an analysis of several demographic indices of projection by age and region, including a comparison of the observed population with the stable equivalent population. Population projection in this case means the population that will evolve from the original population during a fixed period of time, if the

age-specific birth, death, and migration rates remain fixed for the entire projection period.

However, it is necessary to point out that the potentialities of the program for calculating the future population are much greater than those referred to above. The program for carrying out the population projection allows one to generate also a future population on the basis of various hypotheses concerning fertility, mortality, and migration. These hypotheses may relate both to the indices of the development of the entire population as a whole and to the individual regional populations within the multiregional system. Thus, multiregional population analysis is useful not only for projection but it also can be used for developing some of the probable consequences of alternative demographic policies.

APPENDIX A: OBSERVED RATES

Table A1. Death rates.

age	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	0.008646	0.005649	0.004896	0.014126	0.009741	0.008787	0.004592	0.009536
5	0.000597	0.000486	0.000321	0.000682	0.000621	0.000565	0.000370	0.000714
10	0.000497	0.000405	0.000346	0.000561	0.000550	0.000442	0.000353	0.000586
15	0.000915	0.000696	0.000526	0.000878	0.001102	0.000586	0.000883	0.001455
20	0.001565	0.001158	0.000835	0.001467	0.001844	0.000973	0.001348	0.002923
25	0.002519	0.001584	0.001549	0.002440	0.002748	0.001476	0.001694	0.003155
30	0.001867	0.001458	0.001199	0.001893	0.001972	0.001132	0.002011	0.002550
35	0.004119	0.003645	0.002917	0.004181	0.004908	0.002560	0.003095	0.005121
40	0.004041	0.003295	0.003190	0.004204	0.004145	0.002850	0.003935	0.005081
45	0.008274	0.006887	0.005446	0.008744	0.009200	0.006688	0.006742	0.009314
50	0.010457	0.009968	0.009286	0.010721	0.011120	0.009728	0.010840	0.011967
55	0.009814	0.008885	0.009014	0.010410	0.012204	0.008770	0.009662	0.009212
60	0.015755	0.015537	0.013712	0.016034	0.017300	0.015003	0.014154	0.013842
65	0.025714	0.025006	0.020869	0.024104	0.025320	0.022817	0.023487	0.021003
70	0.039064	0.039236	0.034301	0.033462	0.036749	0.035689	0.039242	0.038365
75	0.064804	0.065090	0.056904	0.055511	0.060967	0.059197	0.065104	0.063643
80	0.099873	0.100315	0.087721	0.085544	0.093950	0.091239	0.100332	0.098084
85	0.170418	0.171170	0.149669	0.145969	0.160332	0.155675	0.171175	0.167365
gross	2.344697	2.302353	2.013499	2.104655	2.273872	2.120882	2.295092	2.319581
crude	0.008314	0.007960	0.005512	0.007052	0.006932	0.006306	0.008272	0.009934
m.age	76.2825	77.2938	77.3120	74.4151	75.3751	76.6023	77.3834	75.5283

Table A2. Fertility rates.

age	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
5	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
10	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
15	0.016749	0.017994	0.013857	0.018126	0.016741	0.016220	0.013535	0.021886
20	0.077330	0.084047	0.081721	0.119065	0.087264	0.100259	0.072186	0.145478
25	0.071825	0.064584	0.077331	0.126506	0.086992	0.112693	0.059174	0.107600
30	0.017628	0.020756	0.022514	0.047956	0.025231	0.029994	0.029552	0.041941
35	0.014791	0.017308	0.018578	0.053002	0.028780	0.028381	0.015591	0.044156
40	0.001807	0.001700	0.002614	0.015345	0.004758	0.005705	0.002832	0.012616
45	0.000187	0.000175	0.000279	0.003169	0.001119	0.000980	0.000246	0.002628
50	0.000008	0.000008	0.000007	0.001232	0.000194	0.000191	0.000006	0.000647
55	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
60	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
65	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
70	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
75	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
80	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
85	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
gross	1.001627	1.032857	1.084505	1.922009	1.255389	1.472112	0.965611	1.884760
crude	0.015878	0.016219	0.019443	0.027094	0.020540	0.020851	0.015819	0.019537
m.age	26.0671	26.0762	26.5601	28.3261	27.1369	27.0932	26.7488	27.4018

Tables A3 to A10. Out-migration rates.

Table A3.

	migration from rsfsr to							
age	total	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	0.047507	0.035415	0.002806	0.000402	0.000786	0.001181	0.000113	0.000394	0.006409
5	0.030559	0.022861	0.001771	0.000250	0.000495	0.000779	0.000079	0.000268	0.004054
10	0.026898	0.020344	0.001535	0.000215	0.000317	0.000556	0.000065	0.000256	0.003610
15	0.181833	0.136330	0.010096	0.001558	0.002623	0.003475	0.000753	0.001119	0.025879
20	0.273972	0.205031	0.013938	0.001967	0.004453	0.005579	0.001142	0.001556	0.040306
25	0.174132	0.131021	0.008612	0.001157	0.002927	0.003450	0.000821	0.001083	0.025060
30	0.047261	0.035452	0.002412	0.000274	0.000802	0.000973	0.000217	0.000336	0.006794
35	0.066764	0.050620	0.003014	0.000339	0.001060	0.001401	0.000272	0.000357	0.009701
40	0.031772	0.024242	0.001250	0.000156	0.000502	0.000638	0.000148	0.000195	0.004642
45	0.038148	0.028938	0.001659	0.000184	0.000613	0.000813	0.000173	0.000213	0.005554
50	0.028837	0.021773	0.001325	0.000129	0.000460	0.000649	0.000163	0.000185	0.004154
55	0.018456	0.013970	0.000863	0.000076	0.000280	0.000400	0.000089	0.000112	0.002666
60	0.023912	0.018183	0.001130	0.000107	0.000281	0.000464	0.000066	0.000188	0.003492
65	0.024863	0.018883	0.001162	0.000117	0.000293	0.000495	0.000067	0.000221	0.003625
70	0.023482	0.017692	0.001195	0.000126	0.000290	0.000477	0.000068	0.000252	0.003383
75	0.023482	0.017693	0.001195	0.000126	0.000290	0.000477	0.000068	0.000252	0.003383
80	0.023482	0.017693	0.001195	0.000127	0.000289	0.000476	0.000068	0.000251	0.003382
85	0.023480	0.017691	0.001195	0.000124	0.000290	0.000478	0.000067	0.000252	0.003383
gross	5.544190	4.169159	0.281762	0.037174	0.085254	0.113802	0.022191	0.037451	0.797397
crude	0.080276	0.060312	0.004113	0.000562	0.001253	0.001640	0.000328	0.000511	0.011558
m.age	31.8199	31.8896	30.8867	28.4907	30.6614	31.5841	31.2854	34.2681	31.9981

Table A4.

	migration from ukrmol to							
age	total	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	0.043831	0.006022	0.030589	0.000351	0.000272	0.000525	0.000085	0.000271	0.005716
5	0.029148	0.004077	0.020251	0.000229	0.000178	0.000363	0.000062	0.000194	0.003793
10	0.026900	0.003845	0.018622	0.000208	0.000120	0.000275	0.000053	0.000198	0.003578
15	0.193190	0.027644	0.131931	0.001621	0.001070	0.001841	0.000633	0.000925	0.027523
20	0.278418	0.042100	0.183662	0.002073	0.001887	0.002992	0.001015	0.001280	0.043410
25	0.140465	0.021811	0.091938	0.000989	0.001009	0.001500	0.000606	0.000732	0.021881
30	0.042222	0.006401	0.027945	0.000254	0.000301	0.000459	0.000178	0.000250	0.006434
35	0.061983	0.010286	0.039267	0.000354	0.000447	0.000744	0.000249	0.000296	0.010340
40	0.026211	0.004747	0.015722	0.000157	0.000201	0.000326	0.000133	0.000156	0.004769
45	0.030533	0.005183	0.019059	0.000171	0.000225	0.000380	0.000142	0.000156	0.005218
50	0.024622	0.004015	0.015703	0.000122	0.000171	0.000313	0.000140	0.000140	0.004017
55	0.015724	0.002550	0.010098	0.000071	0.000104	0.000190	0.000075	0.000084	0.002552
60	0.020865	0.003379	0.013453	0.000102	0.000105	0.000225	0.000056	0.000144	0.003403
65	0.020972	0.003414	0.013453	0.000108	0.000106	0.000233	0.000054	0.000164	0.003438
70	0.020370	0.003114	0.013453	0.000113	0.000104	0.000221	0.000056	0.000185	0.003124
75	0.020372	0.003115	0.013454	0.000113	0.000105	0.000220	0.000057	0.000184	0.003124
80	0.020362	0.003113	0.013454	0.000111	0.000103	0.000219	0.000058	0.000183	0.003122
85	0.020387	0.003118	0.013450	0.000117	0.000108	0.000225	0.000054	0.000189	0.003127
gross	5.182871	0.789674	3.427519	0.036318	0.033080	0.056252	0.018532	0.028661	0.792836
crude	0.074290	0.011249	0.049256	0.000538	0.000479	0.000799	0.000267	0.000387	0.011306
m.age	30.7447	31.4187	30.4063	28.1156	30.3021	31.1922	31.3591	33.9368	31.5133

Table A5.

	migration from belssr to							
age	total	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	0.050733	0.006596	0.002351	0.033854	0.000240	0.000466	0.000043	0.001322	0.005862
5	0.033899	0.004523	0.001576	0.022376	0.000163	0.000326	0.000033	0.000967	0.003936
10	0.031147	0.004261	0.001444	0.020352	0.000107	0.000247	0.000030	0.000994	0.003713
15	0.220306	0.028688	0.009529	0.148196	0.000914	0.001551	0.000379	0.004317	0.026731
20	0.280984	0.041042	0.012540	0.177923	0.001495	0.002368	0.000537	0.005472	0.039606
25	0.157118	0.024241	0.007167	0.096729	0.000909	0.001353	0.000341	0.003619	0.022759
30	0.045206	0.007497	0.002293	0.026206	0.000284	0.000436	0.000097	0.001339	0.007054
35	0.065504	0.011968	0.003207	0.036267	0.000426	0.000703	0.000139	0.001536	0.011258
40	0.032752	0.006141	0.001423	0.017867	0.000211	0.000343	0.000082	0.000910	0.005775
45	0.037224	0.006992	0.001805	0.020144	0.000243	0.000416	0.000086	0.000950	0.006588
50	0.030396	0.005898	0.001613	0.015772	0.000202	0.000371	0.000088	0.000925	0.005527
55	0.022693	0.004614	0.001278	0.011317	0.000156	0.000279	0.000058	0.000668	0.004322
60	0.032136	0.006221	0.001740	0.016559	0.000156	0.000338	0.000050	0.001208	0.005864
65	0.031524	0.005933	0.001637	0.016564	0.000147	0.000327	0.000041	0.001285	0.005590
70	0.029974	0.005146	0.001565	0.016573	0.000137	0.000305	0.000042	0.001386	0.004821
75	0.029949	0.005141	0.001561	0.016563	0.000147	0.000312	0.000037	0.001377	0.004811
80	0.029956	0.005155	0.001562	0.016560	0.000156	0.000312	0.000039	0.001367	0.004804
85	0.030060	0.005115	0.001574	0.016604	0.000157	0.000315	0.000079	0.001416	0.004800
gross	5.957810	0.925868	0.279323	3.632134	0.031258	0.053841	0.011004	0.155282	0.869099
crude	0.092477	0.013768	0.004219	0.057983	0.000477	0.000794	0.000170	0.002114	0.012951
m.age	32.7194	35.0485	34.0317	31.1490	33.7155	35.0623	33.9045	38.6128	35.1303

Table A6.

	migration from uzkitatu to								
age	total	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	0.020039	0.003662	0.000579	0.000069	0.011114	0.001143	0.000050	0.000063	0.003360
5	0.014250	0.002645	0.000409	0.000047	0.007842	0.000843	0.000037	0.000047	0.002378
10	0.012597	0.002798	0.000423	0.000049	0.006001	0.000716	0.000037	0.000054	0.002519
15	0.122377	0.024238	0.003598	0.000455	0.064021	0.005778	0.000651	0.000303	0.023333
20	0.230059	0.042663	0.005812	0.000672	0.125961	0.010854	0.001074	0.000488	0.042534
25	0.148907	0.027413	0.003608	0.000398	0.083111	0.006750	0.000686	0.000347	0.026594
30	0.043668	0.007975	0.001089	0.000101	0.024416	0.002045	0.000174	0.000119	0.007750
35	0.063078	0.012069	0.001440	0.000134	0.034208	0.003124	0.000242	0.000130	0.011732
40	0.030943	0.005979	0.000619	0.000064	0.016805	0.001470	0.000127	0.000071	0.005807
45	0.041686	0.007896	0.000905	0.000082	0.022786	0.002071	0.000167	0.000091	0.007688
50	0.029778	0.005617	0.000684	0.000052	0.016219	0.001566	0.000139	0.000072	0.005430
55	0.020352	0.003957	0.000486	0.000034	0.010872	0.001058	0.000072	0.000045	0.003826
60	0.023010	0.005110	0.000637	0.000051	0.010867	0.001219	0.000070	0.000083	0.004973
65	0.023482	0.005210	0.000636	0.000049	0.011087	0.001276	0.000053	0.000102	0.005068
70	0.022420	0.004852	0.000656	0.000061	0.010729	0.001227	0.000080	0.000098	0.004717
75	0.022415	0.004858	0.000654	0.000064	0.010725	0.001223	0.000075	0.000097	0.004719
80	0.022424	0.004859	0.000662	0.000068	0.010722	0.001232	0.000068	0.000091	0.004722
85	0.022429	0.004872	0.000643	0.000046	0.010709	0.001241	0.000092	0.000092	0.004734
gross	4.569569	0.883363	0.117706	0.012483	2.440964	0.224186	0.019489	0.011949	0.859429
crude	0.061099	0.011650	0.001592	0.000178	0.032973	0.002962	0.000270	0.000150	0.011323
m.age	34.7286	35.6127	34.7128	32.1893	34.0218	35.5264	32.8805	38.3308	35.6499

Table A7.

migration from kazakh to

age	total	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	0.046068	0.009369	0.002026	0.000279	0.001909	0.026312	0.000061	0.000137	0.005975
5	0.030812	0.006216	0.001315	0.000178	0.001244	0.017835	0.000044	0.000096	0.003885
10	0.024693	0.005698	0.001187	0.000158	0.000832	0.013124	0.000036	0.000094	0.003563
15	0.194448	0.045755	0.009562	0.001371	0.007903	0.098213	0.000534	0.000500	0.030611
20	0.306348	0.069533	0.013138	0.001749	0.012953	0.159320	0.000805	0.000676	0.048174
25	0.194403	0.045116	0.008124	0.001044	0.008629	0.100015	0.000574	0.000488	0.030412
30	0.054621	0.012390	0.002317	0.000251	0.002359	0.028630	0.000150	0.000156	0.008368
35	0.090042	0.020539	0.003341	0.000362	0.003658	0.047857	0.000217	0.000191	0.013877
40	0.040784	0.009593	0.001373	0.000160	0.001714	0.021247	0.000116	0.000103	0.006477
45	0.058188	0.013153	0.002071	0.000221	0.002456	0.031106	0.000155	0.000129	0.008896
50	0.045571	0.009936	0.001692	0.000155	0.001878	0.024966	0.000146	0.000115	0.006684
55	0.034007	0.007616	0.001279	0.000108	0.001367	0.018337	0.000096	0.000079	0.005125
60	0.040371	0.009684	0.001637	0.000148	0.001353	0.020794	0.000068	0.000133	0.006555
65	0.039855	0.009422	0.001576	0.000152	0.001319	0.020794	0.000071	0.000147	0.006376
70	0.039580	0.009171	0.001674	0.000167	0.001354	0.020795	0.000073	0.000167	0.006179
75	0.039576	0.009162	0.001680	0.000165	0.001349	0.020793	0.000076	0.000165	0.006185
80	0.039572	0.009176	0.001678	0.000162	0.001353	0.020788	0.000081	0.000162	0.006171
85	0.039538	0.009162	0.001691	0.000164	0.001363	0.020778	0.000055	0.000164	0.006162
gross	6.792383	1.553454	0.286804	0.034973	0.274960	3.558513	0.016786	0.018520	1.048372
crude	0.096067	0.021925	0.004146	0.000535	0.003977	0.050187	0.000245	0.000243	0.014808
m.age	35.4573	35.6850	34.5611	31.6785	34.1727	35.4691	34.0605	38.8338	35.7507

Table A8.

migration from grazarm to

age	total	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	0.011502	0.002850	0.000843	0.000075	0.000277	0.000186	0.005749	0.000075	0.001446
5	0.007617	0.001827	0.000529	0.000047	0.000166	0.000121	0.003961	0.000056	0.000909
10	0.007402	0.001892	0.000530	0.000047	0.000122	0.000101	0.003711	0.000058	0.000940
15	0.086582	0.015904	0.004371	0.000431	0.001215	0.000789	0.055086	0.000323	0.008463
20	0.149131	0.027031	0.006843	0.000615	0.002598	0.001428	0.095217	0.000507	0.014892
25	0.105621	0.018284	0.004485	0.000383	0.001822	0.000935	0.069539	0.000370	0.009804
30	0.025036	0.004491	0.001141	0.000082	0.000459	0.000239	0.016101	0.000110	0.002413
35	0.031841	0.006195	0.001378	0.000098	0.000575	0.000333	0.019829	0.000106	0.003327
40	0.017669	0.003212	0.000617	0.000048	0.000294	0.000165	0.011544	0.000065	0.001724
45	0.022926	0.004216	0.000900	0.000062	0.000382	0.000231	0.014788	0.000080	0.002268
50	0.020761	0.003340	0.000750	0.000043	0.000296	0.000196	0.014282	0.000067	0.001787
55	0.012068	0.002174	0.000499	0.000027	0.000173	0.000119	0.007877	0.000038	0.001162
60	0.011603	0.002811	0.000659	0.000043	0.000167	0.000142	0.006193	0.000074	0.001514
65	0.011697	0.002861	0.000652	0.000040	0.000178	0.000143	0.006207	0.000074	0.001542
70	0.011521	0.002658	0.000671	0.000047	0.000176	0.000149	0.006293	0.000102	0.001424
75	0.011500	0.002656	0.000664	0.000047	0.000178	0.000142	0.006295	0.000095	0.001423
80	0.011525	0.002648	0.000681	0.000050	0.000177	0.000151	0.006305	0.000101	0.001412
85	0.011483	0.002642	0.000661	0.000051	0.000152	0.000152	0.006300	0.000102	0.001423
gross	2.837423	0.538459	0.134374	0.011179	0.047032	0.028617	1.776385	0.012019	0.289357
crude	0.038527	0.007229	0.001836	0.000159	0.000646	0.000382	0.024240	0.000152	0.003883
m.age	33.0968	34.0434	33.1764	30.9601	32.1864	34.2193	32.6319	37.4455	34.0916

Table A9.

	migration from eslali to								
age	total	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	0.042481	0.003583	0.001062	0.000485	0.000122	0.000150	0.000041	0.031390	0.005647
5	0.032161	0.002619	0.000756	0.000342	0.000091	0.000110	0.000031	0.024172	0.004040
10	0.034115	0.002637	0.000743	0.000328	0.000058	0.000089	0.000025	0.026166	0.004070
15	0.194134	0.020131	0.005593	0.002728	0.000590	0.000642	0.000340	0.130813	0.033297
20	0.246764	0.027740	0.007080	0.003156	0.000869	0.000945	0.000479	0.158958	0.047537
25	0.107604	0.011281	0.002777	0.001181	0.000370	0.000373	0.000227	0.072596	0.018800
30	0.048675	0.004585	0.001169	0.000422	0.000155	0.000157	0.000094	0.034434	0.007658
35	0.047332	0.005645	0.001251	0.000447	0.000178	0.000195	0.000101	0.030117	0.009399
40	0.027590	0.002998	0.000583	0.000229	0.000086	0.000100	0.000066	0.018526	0.005004
45	0.029399	0.003426	0.000741	0.000261	0.000107	0.000119	0.000073	0.018932	0.005740
50	0.025448	0.002684	0.000619	0.000190	0.000080	0.000098	0.000061	0.017286	0.004430
55	0.017400	0.001914	0.000446	0.000124	0.000059	0.000070	0.000043	0.011555	0.003189
60	0.027353	0.002406	0.000555	0.000169	0.000063	0.000077	0.000014	0.020052	0.004017
65	0.026309	0.002156	0.000499	0.000160	0.000053	0.000071	0.000012	0.019745	0.003612
70	0.025048	0.001787	0.000443	0.000145	0.000051	0.000058	0.000022	0.019548	0.002993
75	0.025071	0.001791	0.000445	0.000152	0.000051	0.000064	0.000025	0.019546	0.002997
80	0.025043	0.001783	0.000432	0.000135	0.000054	0.000054	0.000027	0.019559	0.002999
85	0.025037	0.001796	0.000435	0.000163	0.000054	0.000054	0.000000	0.019540	0.002994
gross	5.034819	0.504814	0.128144	0.054089	0.015449	0.017136	0.008406	3.464669	0.842111
crude	0.070143	0.007248	0.001853	0.000801	0.000223	0.000246	0.000125	0.047546	0.012101
m.age	32.2217	30.8887	29.7660	27.5401	30.4648	30.5080	29.6711	32.8999	30.9972

Table A10.

	migration from rural to								
age	total	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	0.024653	0.009182	0.003318	0.000867	0.000752	0.001042	0.000175	0.000661	0.008656
5	0.014876	0.005591	0.001975	0.000509	0.000449	0.000648	0.000114	0.000425	0.005164
10	0.013981	0.005357	0.001849	0.000471	0.000314	0.000498	0.000101	0.000439	0.004951
15	0.177156	0.066268	0.022575	0.006296	0.004784	0.005746	0.002401	0.003562	0.065522
20	0.411892	0.154384	0.048035	0.012309	0.012174	0.014289	0.005353	0.007265	0.158082
25	0.198301	0.075431	0.022629	0.005536	0.006094	0.006755	0.002711	0.003998	0.075148
30	0.050072	0.018939	0.005921	0.001217	0.001533	0.001768	0.000616	0.001174	0.018903
35	0.062249	0.024239	0.006583	0.001351	0.001816	0.002281	0.000709	0.001073	0.024196
40	0.028009	0.011049	0.002609	0.000591	0.000828	0.000992	0.000356	0.000565	0.011021
45	0.034056	0.013280	0.003477	0.000704	0.001028	0.001269	0.000414	0.000608	0.013276
50	0.025336	0.009775	0.002729	0.000480	0.000764	0.000992	0.000362	0.000521	0.009712
55	0.014793	0.005746	0.001618	0.000259	0.000431	0.000559	0.000181	0.000287	0.005712
60	0.016480	0.006423	0.001817	0.000315	0.000374	0.000557	0.000128	0.000442	0.006425
65	0.015058	0.005850	0.001638	0.000300	0.000343	0.000521	0.000114	0.000441	0.005850
70	0.013065	0.004972	0.001527	0.000295	0.000309	0.000455	0.000106	0.000450	0.004951
75	0.013064	0.004972	0.001526	0.000295	0.000309	0.000455	0.000106	0.000449	0.004951
80	0.013064	0.004972	0.001527	0.000295	0.000310	0.000455	0.000106	0.000449	0.004951
85	0.013065	0.004973	0.001527	0.000295	0.000309	0.000455	0.000106	0.000451	0.004951
gross	5.695847	2.157009	0.664413	0.161927	0.164608	0.198684	0.070796	0.116304	2.162105
crude	0.062360	0.023594	0.007367	0.001828	0.001795	0.002182	0.000768	0.001276	0.023550
m.age	29.2727	29.4280	28.6629	27.0026	28.7574	29.3622	28.2475	31.0625	29.4435

Table A11.

Death rates.

age	urban	rural
0	0.008423	0.009536
5	0.000568	0.000714
10	0.000477	0.000586
15	0.000853	0.001455
20	0.001443	0.002923
25	0.002219	0.003155
30	0.001740	0.002550
35	0.003927	0.005121
40	0.003830	0.005081
45	0.007846	0.009314
50	0.010347	0.011967
55	0.009663	0.009212
60	0.015658	0.013842
65	0.025188	0.021003
70	0.038543	0.038365
75	0.063940	0.063643
80	0.098541	0.098084
85	0.168145	0.167365
gross	2.306749	2.319581
crude	0.007923	0.009934
m.age	76.4032	75.5283

Fertility rates.

age	urban	rural
0	0.000000	0.000000
5	0.000000	0.000000
10	0.000000	0.000000
15	0.016866	0.021886
20	0.082401	0.145478
25	0.075145	0.107600
30	0.021195	0.041941
35	0.018531	0.044156
40	0.002782	0.012616
45	0.000384	0.002628
50	0.000078	0.000647
55	0.000000	0.000000
60	0.000000	0.000000
65	0.000000	0.000000
70	0.000000	0.000000
75	0.000000	0.000000
80	0.000000	0.000000
85	0.000000	0.000000
gross	1.086910	1.884760
crude	0.017162	0.019537
m.age	26.4050	27.4018

Out-migration rates.

age	migration from urban to total	urban	rural
0	0.041804	0.036194	0.005609
5	0.027560	0.023917	0.003643
10	0.024866	0.021486	0.003380
15	0.177817	0.152175	0.025642
20	0.268277	0.227783	0.040494
25	0.160792	0.136978	0.023814
30	0.045425	0.038736	0.006689
35	0.064448	0.054600	0.009849
40	0.030367	0.025643	0.004724
45	0.036609	0.030993	0.005616
50	0.028324	0.024082	0.004242
55	0.018317	0.015547	0.002770
60	0.023625	0.019989	0.003635
65	0.024234	0.020520	0.003715
70	0.023097	0.019668	0.003429
75	0.023097	0.019667	0.003429
80	0.023095	0.019667	0.003428
85	0.023099	0.019669	0.003430
gross	5.324263	4.536578	0.787685
crude	0.076904	0.065547	0.011357
m.age	32.0778	32.0157	32.4353

age	migration from rural to total	urban	rural
0	0.024653	0.015997	0.008656
5	0.014876	0.009711	0.005164
10	0.013981	0.009029	0.004951
15	0.177156	0.111633	0.065522
20	0.411892	0.253811	0.158082
25	0.198301	0.123153	0.075148
30	0.050072	0.031168	0.018903
35	0.062249	0.038053	0.024196
40	0.028009	0.016989	0.011021
45	0.034056	0.020780	0.013276
50	0.025336	0.015624	0.009712
55	0.014793	0.009081	0.005712
60	0.016480	0.010055	0.006425
65	0.015058	0.009208	0.005850
70	0.013065	0.008114	0.004951
75	0.013064	0.008113	0.004951
80	0.013064	0.008114	0.004951
85	0.013065	0.008115	0.004951
gross	5.695846	3.533741	2.162105
crude	0.062360	0.038810	0.023550
m.age	29.2727	29.1682	29.4435

APPENDIX B: SINGLE-REGION LIFE TABLES

Table B1.

table - single region life table rsfsr mortality level = 69.44

age	p(x)	q(x)	l(x)	d(x)	ll(x)	m(x)	s(x)	t(x)	e(x)
0	0.957684	0.042316	100000.	4232.	4.894209	0.008646	0.976925	69.4403	69.4403
5	0.997017	0.002983	95768.	286.	4.781277	0.000597	0.997267	64.5461	67.3981
10	0.997517	0.002483	95483.	237.	4.768208	0.000497	0.996477	59.7648	62.5923
15	0.995434	0.004566	95246.	435.	4.751408	0.000915	0.993823	54.9966	57.7419
20	0.992204	0.007796	94811.	739.	4.722057	0.001565	0.989852	50.2452	52.9952
25	0.987482	0.012518	94072.	1178.	4.674137	0.002519	0.989086	45.5231	48.3920
30	0.990711	0.009289	92894.	863.	4.623123	0.001867	0.992518	40.8490	43.9738
35	0.979615	0.020385	92031.	1876.	4.554649	0.004119	0.979804	36.2258	39.3627
40	0.979997	0.020003	90155.	1803.	4.462665	0.004041	0.989837	31.6712	35.1297
45	0.959470	0.040530	88352.	3581.	4.328058	0.008274	0.954367	27.2085	30.7957
50	0.949048	0.050952	84771.	4319.	4.130555	0.010457	0.950536	22.8805	26.9910
55	0.952104	0.047896	80451.	3853.	3.926242	0.009814	0 938500	18.7499	23.3059
60	0.924212	0.075788	76598.	5805.	3.684778	0.015755	0.902590	14.8237	19.3525
65	0.879196	0.120804	70793.	8552.	3.325846	0.025714	0.852463	11.1389	15.7345
70	0.822057	0.177943	62241.	11075.	2.835160	0.039064	0.776534	7.8131	12.5529
75	0.721157	0.278843	51166.	14267.	2.201597	0.064804	0.670563	4.9779	9.7290
80	0.600408	0.399592	36898.	14744.	1.476310	0.099873	0.880562	2.7763	7.5242
85	0.000000	1.000000	22154.	22154.	1.299983	0.170418	0.000000	1.3000	5.8679

net reproduction rate 0.938230

net migraproduction rate 4.853773

Table B2.

table - single region life table ukrmol mortality level = 71.50

age	p(x)	q(x)	l(x)	d(x)	ll(x)	m(x)	s(x)	t(x)	e(x)
0	0.972147	0.027853	100000.	2785.	4.930369	0.005649	0.984681	71.4954	71.4954
5	0.997574	0.002426	97215.	236.	4.854841	0.000486	0.997776	66.5650	68.4722
10	0.997979	0.002021	96979.	196.	4.844045	0.000405	0.997253	61.7102	63.6326
15	0.996525	0.003475	96783.	336.	4.830737	0.000696	0.995378	56.8661	58.7564
20	0.994226	0.005774	96447.	557.	4.808409	0.001158	0.993172	52.0354	53.9526
25	0.992111	0.007889	95890.	756.	4.775576	0.001584	0.992422	47.2270	49.2514
30	0.992736	0.007264	95133.	691.	4.739388	0.001458	0.987357	42.4514	44.6231
35	0.981940	0.018060	94442.	1706.	4.679470	0.003645	0.982791	37.7120	39.9313
40	0.983657	0.016343	92737.	1516.	4.598939	0.003295	0.974975	33.0326	35.6198
45	0.966148	0.033852	91221.	3088.	4.483850	0.006887	0.958886	28.4336	31.1700
50	0.951370	0.048630	88133.	4286.	4.299502	0.009968	0.953890	23.9498	27.1746
55	0.956538	0.043462	83847.	3644.	4.101252	0.008885	0.941228	19.6503	23.4358
60	0.925221	0.074779	80203.	5997.	3.860211	0.015537	0.904606	15.5490	19.3871
65	0.882325	0.117675	74205.	8732.	3.491971	0.025006	0.853740	11.6888	15.7519
70	0.821343	0.178657	65473.	11697.	2.981235	0.039236	0.775686	8.1968	12.5193
75	0.720098	0.279902	53776.	15052.	2.312502	0.065090	0.669399	5.2156	9.6987
80	0.598993	0.401007	38724.	15529.	1.547986	0.100315	0.875404	2.9031	7.4969
85	0.000000	1.000000	23195.	23195.	1.355114	0.171170	0.000000	1.3551	5.8422

net reproduction rate 0.987480

net migraproduction rate 4.669429

Table B3.

table - single region life table belssr mortality level = 73.49

age	p(x)	q(x)	l(x)	d(x)	ll(x)	m(x)	s(x)	t(x)	e(x)
0	0.975817	0.024183	100000.	2418.	4.939543	0.004896	0.986970	73.4949	73.4949
5	0.998399	0.001601	97582.	156.	4.875179	0.000321	0.998335	68.5554	70.2543
10	0.998271	0.001729	97425.	168.	4.867061	0.000346	0.997822	63.6802	65.3630
15	0.997373	0.002627	97257.	255.	4.856462	0.000526	0.996606	58.8131	60.4719
20	0.995836	0.004164	97002.	404.	4.839979	0.000835	0.994064	53.9567	55.6245
25	0.992285	0.007715	96598.	745.	4.811249	0.001549	0.993150	49.1167	50.8467
30	0.994021	0.005979	95852.	573.	4.778291	0.001199	0.989783	44.3054	46.2226
35	0.985520	0.014480	95279.	1380.	4.729474	0.002917	0.984854	39.5271	41.4855
40	0.984179	0.015821	93900.	1486.	4.657842	0.003190	0.978701	34.7977	37.0584
45	0.973135	0.026865	92414.	2483.	4.558634	0.005446	0.964005	30.1398	32.6139
50	0.954622	0.045378	89931.	4081.	4.394545	0.009286	0.955259	25.5812	28.4452
55	0.955926	0.044074	85850.	3784.	4.197927	0.009014	0.945070	21.1866	24.6786
60	0.933713	0.066287	82067.	5440.	3.967333	0.013712	0.917835	16.9887	20.7011
65	0.900830	0.099170	76627.	7599.	3.641358	0.020869	0.872969	13.0214	16.9933
70	0.842041	0.157959	69028.	10904.	3.178792	0.034301	0.800385	9.3800	13.5888
75	0.750914	0.249086	58124.	14478.	2.544256	0.056904	0.703468	6.2012	10.6690
80	0.640283	0.359717	43646.	15700.	1.789803	0.087721	1.043230	3.6570	8.3787
85	0.000000	1.000000	27946.	27946.	1.867175	0.149669	0.000000	1.8672	6.6814

net reproduction rate 1.043803

net migraproduction rate 5.353656

Table B4.

table - single region life table uzkitatu mortality level = 68.27

age	p(x)	q(x)	l(x)	d(x)	ll(x)	m(x)	s(x)	t(x)	e(x)
0	0.931781	0.068219	100000.	6822.	4.829453	0.014126	0.963045	68.2745	68.2745
5	0.996598	0.003402	93178.	317.	4.650980	0.000682	0.996897	63.4450	68.0900
10	0.997198	0.002802	92861.	260.	4.636549	0.000561	0.996409	58.7940	63.3140
15	0.995618	0.004382	92601.	406.	4.619901	0.000878	0.994158	54.1575	58.4849
20	0.992692	0.007308	92195.	674.	4.592913	0.001467	0.990292	49.5376	53.7312
25	0.987875	0.012125	91521.	1110.	4.548326	0.002440	0.989220	44.9447	49.1084
30	0.990582	0.009418	90412.	851.	4.499297	0.001893	0.984973	40.3963	44.6804
35	0.979310	0.020690	89560.	1853.	4.431685	0.004181	0.979254	35.8970	40.0815
40	0.979197	0.020803	87707.	1825.	4.339747	0.004204	0.968322	31.4654	35.8755
45	0.957216	0.042784	85883.	3674.	4.202273	0.008744	0.952608	27.1256	31.5845
50	0.947794	0.052206	82208.	4292.	4.003119	0.010721	0.948512	22.9233	27.8845
55	0.949269	0.050731	77916.	3953.	3.797004	0.010410	0.936437	18.9202	24.2827
60	0.922919	0.077081	73964.	5701.	3.555655	0.016034	0.905358	15.1232	20.4468
65	0.886329	0.113671	68263.	7759.	3.219139	0.024104	0.867195	11.5676	16.9457
70	0.845607	0.154393	60503.	9341.	2.791622	0.033462	0.804675	8.3484	13.7984
75	0.756270	0.243730	51162.	12470.	2.246349	0.055511	0.709491	5.5568	10.8612
80	0.647636	0.352364	38692.	13634.	1.593764	0.085544	1.077130	3.3105	8.5559
85	0.000000	1.000000	25058.	25058.	1.716691	0.145969	0.000000	1.7167	6.8508

net reproduction rate 1.741488

net migraproduction rate 3.847300

Table B5.

table - single region life table kazakh mortality level = 68.55

age	p(x)	q(x)	l(x)	d(x)	ll(x)	m(x)	s(x)	t(x)	e(x)
0	0.952454	0.047546	100000.	4755.	4.881135	0.009741	0.974135	68.5508	68.5508
5	0.996899	0.003101	95245.	295.	4.754886	0.000621	0.997076	63.6697	66.8480
10	0.997253	0.002747	94950.	261.	4.740983	0.000550	0.995881	58.9148	62.0482
15	0.994506	0.005494	94689.	520.	4.721457	0.001102	0.992668	54.1738	57.2122
20	0.990821	0.009179	94169.	864.	4.686840	0.001844	0.988596	49.4524	52.5145
25	0.986352	0.013648	93305.	1273.	4.633393	0.002748	0.988258	44.7655	47.9778
30	0.990191	0.009809	92031.	903.	4.578988	0.001972	0.983009	40.1321	43.6071
35	0.975757	0.024243	91128.	2209.	4.501188	0.004908	0.977598	35.5531	39.0143
40	0.979486	0.020514	88919.	1824.	4.400355	0.004145	0.967386	31.0519	34.9215
45	0.955033	0.044967	87095.	3916.	4.256842	0.009200	0.950574	26.6516	30.6006
50	0.945904	0.054096	83179.	4500.	4.046442	0.011120	0.943417	22.3947	26.9237
55	0.940787	0.059213	78679.	4659.	3.817482	0.012204	0.929298	18.3483	23.3204
60	0.917085	0.082915	74020.	6137.	3.547577	0.017300	0.899792	14.5308	19.6309
65	0.880936	0.119064	67883.	8082.	3.192082	0.025320	0.857884	10.9832	16.1797
70	0.831716	0.168284	59800.	10063.	2.738436	0.036749	0.788019	7.7912	13.0286
75	0.735481	0.264519	49737.	13156.	2.157940	0.060967	0.686370	5.0527	10.1589
80	0.619596	0.380404	36581.	13915.	1.481144	0.093950	0.954427	2.8948	7.9135
85	0.000000	1.000000	22665.	22665.	1.413644	0.160332	0.000000	1.4136	6.2371

net reproduction rate 1.162659

net migraproduction rate 5.718589

Table B6.

table - single region life table grazarm mortality level = 71.51

age	p(x)	q(x)	l(x)	d(x)	ll(x)	m(x)	s(x)	t(x)	e(x)
0	0.957011	0.042989	100000.	4299.	4.892528	0.008787	0.976653	71.5067	71.5067
5	0.997178	0.002822	95701.	270.	4.778304	0.000565	0.997486	66.6141	69.6064
10	0.997793	0.002207	95431.	211.	4.766289	0.000442	0.997433	61.8358	64.7963
15	0.997072	0.002928	95220.	279.	4.754055	0.000586	0.996110	57.0695	59.9341
20	0.995146	0.004854	94942.	461.	4.735563	0.000973	0.993900	52.3155	55.1027
25	0.992649	0.007351	94481.	695.	4.706678	0.001476	0.993501	47.5799	50.3593
30	0.994358	0.005642	93786.	529.	4.676087	0.001132	0.990830	42.8732	45.7137
35	0.987282	0.012718	93257.	1186.	4.633208	0.002560	0.986570	38.1971	40.9589
40	0.985849	0.014151	92071.	1303.	4.570985	0.002850	0.976547	33.5639	36.4544
45	0.967111	0.032889	90768.	2985.	4.463781	0.006688	0.959934	28.9930	31.9417
50	0.952513	0.047487	87783.	4169.	4.284936	0.009728	0.954746	24.5292	27.9430
55	0.957090	0.042910	83614.	3588.	4.091025	0.008770	0.942717	20.2442	24.2114
60	0.927699	0.072301	80027.	5786.	3.856678	0.015003	0.910554	16.1532	20.1848
65	0.892073	0.107927	74241.	8013.	3.511715	0.022817	0.865716	12.2965	16.5631
70	0.836171	0.163829	66228.	10850.	3.040149	0.035689	0.793365	8.7848	13.2645
75	0.742173	0.257827	55378.	14278.	2.411948	0.059197	0.693762	5.7447	10.3736
80	0.628534	0.371466	41100.	15267.	1.673319	0.091239	0.991682	3.3327	8.1088
85	0.000000	1.000000	25833.	25833.	1.659401	0.155675	0.000000	1.6594	6.4236

net reproduction rate 1.385320

net migraproduction rate 2.515864

Table B7.

table - single region life table eslali mortality level = 71.70

age	p(x)	q(x)	l(x)	d(x)	ll(x)	m(x)	s(x)	t(x)	e(x)
0	0.977302	0.022698	100000.	2270.	4.943254	0.004592	0.987607	71.7032	71.7032
5	0.998151	0.001849	97730.	181.	4.881992	0.000370	0.998194	66.7599	68.3105
10	0.998237	0.001763	97549.	172.	4.873174	0.000353	0.996917	61.8780	63.4324
15	0.995596	0.004404	97377.	429.	4.858152	0.000883	0.994442	57.0048	58.5400
20	0.993283	0.006717	96949.	651.	4.831150	0.001348	0.992427	52.1466	53.7879
25	0.991565	0.008435	96297.	812.	4.794563	0.001694	0.990784	47.3155	49.1347
30	0.989996	0.010004	95485.	955.	4.750375	0.002011	0.987334	42.5209	44.5315
35	0.984646	0.015354	94530.	1451.	4.690209	0.003095	0.982597	37.7705	39.9562
40	0.980517	0.019483	93078.	1813.	4.608588	0.003935	0.973751	33.0803	35.5403
45	0.966850	0.033150	91265.	3025.	4.487617	0.006742	0.957207	28.4717	31.1968
50	0.947232	0.052768	88240.	4656.	4.295576	0.010840	0.949954	23.9841	27.1807
55	0.952827	0.047173	83583.	3943.	4.080598	0.009662	0.942494	19.6886	23.5556
60	0.931649	0.068351	79641.	5444.	3.845939	0.014154	0.911116	15.6080	19.5980
65	0.889076	0.110924	74197.	8230.	3.504095	0.023487	0.857187	11.7620	15.8524
70	0.821319	0.178681	65967.	11787.	3.003664	0.039242	0.775650	8.2579	12.5183
75	0.720047	0.279953	54180.	15168.	2.329793	0.065104	0.669348	5.2543	9.6978
80	0.598937	0.401063	39012.	15646.	1.559442	0.100332	0.875325	2.9245	7.4963
85	0.000000	1.000000	23366.	23366.	1.365019	0.171175	0.000000	1.3650	5.8420

net reproduction rate 0.925900

net migraproduction rate 4.481336

Table B8.

table - single region life table rural mortality level = 68.23

age	p(x)	q(x)	l(x)	d(x)	ll(x)	m(x)	s(x)	t(x)	e(x)
0	0.953431	0.046569	100000.	4657.	4.883578	0.009536	0.974422	68.2348	68.2348
5	0.996439	0.003561	95343.	340.	4.758667	0.000714	0.996155	63.3513	66.4455
10	0.997073	0.002927	95004.	278.	4.743226	0.000586	0.994516	58.5926	61.6741
15	0.992753	0.007247	94725.	686.	4.719112	0.001455	0.989135	53.8494	56.8478
20	0.985489	0.014511	94039.	1365.	4.667837	0.002923	0.984924	49.1302	52.2445
25	0.984351	0.015649	92674.	1450.	4.597466	0.003155	0.985830	44.4624	47.9770
30	0.987332	0.012668	91224.	1156.	4.532318	0.002550	0.981066	39.8649	43.7000
35	0.974720	0.025280	90069.	2277.	4.446502	0.005121	0.974817	35.3326	39.2286
40	0.974916	0.025084	87792.	2202.	4.334524	0.005081	0.964832	30.8861	35.1812
45	0.954489	0.045511	85589.	3895.	4.182086	0.009314	0.948342	26.5516	31.0221
50	0.941902	0.058098	81694.	4746.	3.966048	0.011967	0.948243	22.3695	27.3820
55	0.954976	0.045024	76948.	3465.	3.760778	0.009212	0.944291	18.4035	23.9168
60	0.933103	0.066897	73483.	4916.	3.551270	0.013862	0.917232	14.6427	19.9266
65	0.900223	0.099777	68567.	6841.	3.257337	0.021003	0.864569	11.0914	16.1759
70	0.824963	0.175037	61726.	10804.	2.816192	0.038365	0.779986	7.8341	12.6917
75	0.725465	0.274535	50922.	13980.	2.196589	0.063643	0.675301	5.0179	9.8541
80	0.606155	0.393845	36942.	14549.	1.483359	0.098084	0.901968	2.8213	7.6371
85	0.000000	1.000000	22392.	22392.	1.337942	0.167365	0.000000	1.3379	5.9750

net reproduction rate 1.731708

net migraproduction rate 5.061444

Table B9.

TABLE - SINGLE REGION LIFE TABLE URBAN MORTALITY LEVEL = 69,90

AGE	P(X)	Q(X)	L(X)	D(X)	LL(X)	M(X)	S(X)	T(X)	E(X)
0	0,958753	0,041247	100000,	4125,	4,896882	0,008423	0,977554	69,9038	69,9038
5	0,997164	0,002836	95875,	272,	4,786967	0,000568	0,997392	65,0069	67,8036
10	0,997620	0,002380	95603,	228,	4,774480	0,000477	0,996682	60,2200	62,9894
15	0,995742	0,004258	95376,	406,	4,758639	0,000853	0,994279	55,4455	58,1337
20	0,992810	0,007190	94970,	683,	4,731417	0,001443	0,990895	50,6869	53,3716
25	0,988965	0,011035	94287,	1040,	4,688335	0,002219	0,990146	45,9554	48,7400
30	0,991340	0,008660	93246,	807,	4,642137	0,001740	0,985972	41,2671	44,2559
35	0,980558	0,019442	92439,	1797,	4,577019	0,003927	0,980793	36,6250	39,6287
40	0,981034	0,018966	90642,	1719,	4,489110	0,003830	0,971373	32,0480	35,3567
45	0,961526	0,038474	88923,	3421,	4,360699	0,007846	0,955665	27,5588	30,9919
50	0,949570	0,050430	85501,	4312,	4,167273	0,010347	0,951156	23,1982	27,1320
55	0,952826	0,047174	81190,	3830,	3,963725	0,009663	0,939082	19,0310	23,4402
60	0,924657	0,075343	77359,	5828,	3,722262	0,015658	0,903933	15,0672	19,4769
65	0,881520	0,118480	71531,	8475,	3,364677	0,025188	0,854675	11,3450	15,8602
70	0,824221	0,175779	63056,	11084,	2,875705	0,038543	0,779103	7,9803	12,6559
75	0,724362	0,275638	51972,	14325,	2,240471	0,063940	0,674088	5,1046	9,8218
80	0,604682	0,395318	37647,	14882,	1,510274	0,098541	0,896427	2,8641	7,6079
85	0,408092	0,591908	22764,	13474,	1,353850	0,168145	0,000000	1,3539	5,9473

NET REPRODUCTION RATE 1,020133

NET MIGRAPRODUCTION RATE 4,670945

Table B10.

table - single region life table ussr mortality level = 69.32

age	p(x)	q(x)	l(x)	d(x)	ll(x)	m(x)	s(x)	t(x)	e(x)
0	0.956214	0.043786	100000.	4379.	4.890535	0.008953	0.976054	69.3196	69.3196
5	0.996803	0.003197	95621.	306.	4.773428	0.000640	0.997077	64.4291	67.3793
10	0.997352	0.002648	95316.	252.	4.759475	0.000530	0.996018	59.6556	62.5874
15	0.994681	0.005319	95063.	506.	4.740525	0.001067	0.992780	54.8962	57.7470
20	0.990868	0.009132	94558.	863.	4.706298	0.001835	0.989213	50.1556	53.0424
25	0.987542	0.012458	93694.	1167.	4.655531	0.002507	0.988767	45.4493	48.5082
30	0.990008	0.009992	92527.	925.	4.603237	0.002008	0.984249	40.7938	44.0886
35	0.978431	0.021569	91602.	1976.	4.530729	0.004361	0.978579	36.1906	39.5083
40	0.978731	0.021269	89627.	1906.	4.433677	0.004300	0.968921	31.6599	35.3241
45	0.958898	0.041102	87720.	3605.	4.295882	0.008393	0.952901	27.2262	31.0375
50	0.946648	0.053352	84115.	4488.	4.093551	0.010963	0.950075	22.9303	27.2607
55	0.953696	0.046304	79627.	3687.	3.889182	0.009480	0.941342	18.8367	23.6562
60	0.928387	0.071613	75940.	5438.	3.661049	0.014854	0.910046	14.9476	19.6833
65	0.890289	0.109711	70502.	7735.	3.331723	0.023216	0.859345	11.2865	16.0088
70	0.824587	0.175413	62767.	11010.	2.863099	0.038455	0.779538	7.9548	12.6735
75	0.724906	0.275094	51757.	14238.	2.231894	0.063793	0.674685	5.0917	9.8377
80	0.605407	0.394593	37519.	14805.	1.505826	0.098316	0.899152	2.8598	7.6223
85	0.000000	1.000000	22714.	22714.	1.353966	0.167760	0.000000	1.3540	5.9609

net reproduction rate 1.241681

net migraproduction rate 4.695543

APPENDIX C: PROBABILITIES OF DYING AND MIGRATING, AND EXPECTED NUMBER OF SURVIVORS AT EACH AGE

Tables C1.1 to C1.9. Probabilities of dying and migrating.

Table C1.1.

region rsfsr

age	death	migration from rsfsr to rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	0.042311	0.902439	0.013022	0.001891	0.003621	0.005332	0.000535	0.001864	0.028986
5	0.002985	0.959819	0.008596	0.001223	0.002420	0.003736	0.000391	0.001317	0.019513
10	0.002485	0.965724	0.007478	0.001054	0.001553	0.002684	0.000320	0.001258	0.017444
15	0.004665	0.812009	0.044928	0.007494	0.011728	0.014110	0.003803	0.005287	0.095976
20	0.008104	0.750334	0.061634	0.010065	0.019056	0.021587	0.005995	0.007614	0.115611
25	0.012538	0.815249	0.039785	0.005772	0.012899	0.014142	0.004066	0.005472	0.090078
30	0.009327	0.935737	0.011720	0.001365	0.003835	0.004561	0.001081	0.001664	0.030710
35	0.020472	0.906905	0.014223	0.001651	0.004917	0.006254	0.001338	0.001750	0.042490
40	0.020045	0.944545	0.006027	0.000761	0.002390	0.002992	0.000728	0.000953	0.021559
45	0.040566	0.917339	0.007841	0.000885	0.002835	0.003667	0.000829	0.001024	0.025015
50	0.051017	0.916689	0.006203	0.000607	0.002127	0.002939	0.000772	0.000874	0.018771
55	0.047879	0.931219	0.004080	0.000358	0.001309	0.001825	0.000422	0.000531	0.012376
60	0.075715	0.898417	0.005154	0.000488	0.001269	0.002042	0.000303	0.000869	0.015743
65	0.120602	0.853494	0.005052	0.000510	0.001263	0.002090	0.000296	0.000972	0.015722
70	0.177891	0.798594	0.004876	0.000517	0.001189	0.001902	0.000282	0.001037	0.013713
75	0.278769	0.700197	0.004353	0.000464	0.001069	0.001706	0.000252	0.000926	0.012264
80	0.399500	0.582257	0.003769	0.000407	0.000933	0.001482	0.000220	0.000799	0.010632
85	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

Table C1.2.

region ukrmol

age	death	migration from rsfsr to rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	0.028360	0.028019	0.910228	0.001673	0.001339	0.002430	0.000409	0.001321	0.026170
5	0.002442	0.019820	0.954348	0.001123	0.000906	0.001784	0.000311	0.000966	0.018299
10	0.002034	0.018761	0.957667	0.001024	0.000608	0.001354	0.000266	0.000984	0.017302
15	0.003744	0.124797	0.739914	0.007788	0.006001	0.008588	0.003360	0.004634	0.101175
20	0.006532	0.190973	0.631377	0.010565	0.011161	0.014318	0.005634	0.006853	0.122588
25	0.008474	0.102463	0.783643	0.005069	0.005686	0.007282	0.003185	0.004034	0.080163
30	0.007380	0.031267	0.924927	0.001272	0.001557	0.002265	0.000897	0.001270	0.029165
35	0.018288	0.048878	0.877447	0.001724	0.002281	0.003526	0.001241	0.001487	0.045128
40	0.016489	0.022973	0.933593	0.000765	0.001010	0.001580	0.000655	0.000774	0.022160
45	0.034089	0.024599	0.912536	0.000824	0.001109	0.001787	0.000690	0.000764	0.023603
50	0.048746	0.018857	0.910011	0.000577	0.001832	0.001460	0.000668	0.000672	0.018176
55	0.043509	0.012073	0.930057	0.000336	0.000502	0.000886	0.000359	0.000402	0.011875
60	0.074724	0.015439	0.891597	0.000465	0.000489	0.001012	0.000258	0.000669	0.015346
65	0.117550	0.014871	0.849710	0.000475	0.000473	0.001008	0.000240	0.000731	0.014941
70	0.178609	0.012728	0.793190	0.000464	0.000440	0.000896	0.000235	0.000767	0.012670
75	0.279834	0.011369	0.694956	0.000419	0.000397	0.000801	0.000211	0.000683	0.011329
80	0.400923	0.009828	0.577274	0.000360	0.000339	0.000691	0.000188	0.000585	0.009811
85	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

Table C1.3.

region belssr

age	death	migration from rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	0.024846	0.030596	0.011092	0.896848	0.001200	0.002224	0.000222	0.006110	0.026861
5	0.001641	0.021916	0.007677	0.942529	0.000835	0.001612	0.000168	0.004639	0.018984
10	0.001750	0.020722	0.007049	0.945844	0.000547	0.001220	0.000153	0.004771	0.017943
15	0.003030	0.128164	0.043017	0.694651	0.005393	0.007570	0.002355	0.016927	0.098894
20	0.005217	0.185556	0.057307	0.591571	0.009676	0.012276	0.003885	0.020271	0.114242
25	0.008357	0.111494	0.034182	0.733243	0.005363	0.006809	0.002145	0.015469	0.082939
30	0.006173	0.036307	0.011203	0.903990	0.001491	0.002177	0.000524	0.006252	0.031883
35	0.014969	0.056250	0.015137	0.851410	0.002211	0.003382	0.000754	0.006951	0.048936
40	0.016025	0.029438	0.006852	0.913587	0.001066	0.001667	0.000422	0.004268	0.026675
45	0.027451	0.032887	0.008567	0.893446	0.001213	0.001967	0.000442	0.004374	0.029654
50	0.045659	0.027400	0.007531	0.887230	0.000987	0.001731	0.000434	0.004211	0.024817
55	0.044142	0.021552	0.006000	0.903018	0.000747	0.001292	0.000284	0.003082	0.019883
60	0.066492	0.028042	0.007868	0.863579	0.000730	0.001512	0.000236	0.005384	0.026158
65	0.099599	0.025681	0.007120	0.835611	0.000662	0.001416	0.000187	0.005526	0.024199
70	0.158516	0.020991	0.006402	0.786925	0.000581	0.001242	0.000180	0.005605	0.019559
75	0.249873	0.018857	0.005739	0.701097	0.000563	0.001147	0.000143	0.005007	0.017574
80	0.360707	0.016497	0.005010	0.596449	0.000525	0.001006	0.000132	0.004338	0.015335
85	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

Table C1.4.

region uzkitatu

age	death	migration from uzkitatu to rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	0.067693	0.016957	0.002879	0.000361	0.891109	0.005121	0.000239	0.000330	0.015310
5	0.003399	0.012977	0.002091	0.000251	0.965214	0.004050	0.000188	0.000250	0.011580
10	0.002799	0.013741	0.002154	0.000256	0.964869	0.003450	0.000188	0.000283	0.012260
15	0.004515	0.111717	0.020902	0.003368	0.744031	0.022153	0.003374	0.002179	0.087761
20	0.007781	0.193464	0.037009	0.006136	0.588135	0.036765	0.005816	0.004214	0.120681
25	0.012272	0.125362	0.021454	0.003042	0.711099	0.025476	0.003576	0.002632	0.095086
30	0.009466	0.038617	0.005754	0.000590	0.899843	0.009319	0.000886	0.000681	0.034844
35	0.020804	0.056884	0.007543	0.000795	0.847830	0.013362	0.001216	0.000764	0.050803
40	0.020838	0.028708	0.003143	0.000344	0.912427	0.006746	0.000633	0.000382	0.026780
45	0.042769	0.036834	0.004528	0.000444	0.870903	0.009056	0.000809	0.000480	0.034176
50	0.052261	0.026147	0.003350	0.000269	0.885650	0.006939	0.000665	0.000368	0.024351
55	0.050662	0.018550	0.002357	0.000172	0.905308	0.004754	0.000347	0.000224	0.017624
60	0.076957	0.023145	0.002993	0.000247	0.868436	0.005270	0.000323	0.000404	0.022225
65	0.113614	0.022563	0.002859	0.000230	0.832816	0.005315	0.000239	0.000473	0.021891
70	0.154951	0.019944	0.002783	0.000267	0.797175	0.004882	0.000334	0.000431	0.019233
75	0.244523	0.017969	0.002492	0.000252	0.712362	0.004400	0.000284	0.000381	0.017337
80	0.353367	0.015698	0.002195	0.000234	0.608889	0.003895	0.000228	0.000314	0.015179
85	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

Table C1.5.

region kazakh

age	death	migration from kazakh to rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	0.047390	0.042311	0.009528	0.001340	0.008541	0.862863	0.000299	0.000710	0.027019
5	0.003101	0.029820	0.006442	0.000884	0.005970	0.934351	0.000221	0.000499	0.018712
10	0.002742	0.027494	0.005827	0.000784	0.004005	0.941258	0.000184	0.000490	0.017217
15	0.005428	0.186505	0.043251	0.006952	0.030071	0.611680	0.003045	0.003202	0.109867
20	0.009161	0.270538	0.060090	0.009706	0.043381	0.464967	0.005078	0.005159	0.131921
25	0.013478	0.185524	0.038367	0.005497	0.032360	0.612518	0.003229	0.003369	0.105658
30	0.009827	0.058131	0.011328	0.001275	0.010732	0.869673	0.000783	0.000867	0.037383
35	0.023998	0.091795	0.015658	0.001774	0.015614	0.790064	0.001116	0.001066	0.058914
40	0.020555	0.045022	0.006607	0.000787	0.007853	0.888378	0.000582	0.000540	0.029677
45	0.044758	0.059377	0.009670	0.001056	0.010717	0.833963	0.000757	0.000663	0.039039
50	0.054048	0.045001	0.007840	0.000727	0.008307	0.853203	0.000698	0.000571	0.029605
55	0.058758	0.034801	0.005943	0.000504	0.006135	0.869789	0.000454	0.000384	0.023232
60	0.082457	0.042662	0.007338	0.000665	0.005841	0.831279	0.000315	0.000631	0.028813
65	0.118793	0.039795	0.006782	0.000658	0.005488	0.800353	0.000312	0.000668	0.027150
70	0.168567	0.036601	0.006784	0.000686	0.005384	0.756260	0.000303	0.000713	0.024702
75	0.264917	0.032803	0.006099	0.000612	0.004851	0.667604	0.000286	0.000630	0.022197
80	0.380903	0.028586	0.005296	0.000526	0.004277	0.560317	0.000265	0.000536	0.019295
85	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

Table C1.6.

region grazarm

age	death	migration from grazarm to rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	0.042978	0.013318	0.004039	0.000375	0.001307	0.000899	0.929862	0.000377	0.006846
5	0.002824	0.008965	0.002624	0.000238	0.000828	0.000607	0.979118	0.000286	0.004511
10	0.002210	0.009303	0.002629	0.000239	0.000605	0.000507	0.979550	0.000295	0.004663
15	0.003083	0.073619	0.021100	0.002512	0.005822	0.004025	0.851879	0.001817	0.036143
20	0.005335	0.123690	0.033231	0.004086	0.011709	0.007612	0.779721	0.003136	0.051481
25	0.007779	0.084030	0.022034	0.002273	0.008300	0.004752	0.828786	0.002192	0.039854
30	0.005735	0.021880	0.005661	0.000434	0.002222	0.001202	0.950936	0.000569	0.011361
35	0.012971	0.029682	0.006713	0.000518	0.002719	0.001641	0.929754	0.000561	0.015440
40	0.014254	0.015566	0.003022	0.000244	0.001415	0.000813	0.956120	0.000330	0.008235
45	0.033052	0.019940	0.004327	0.000313	0.001785	0.001101	0.928540	0.000398	0.010543
50	0.047569	0.015649	0.003553	0.000211	0.001380	0.000923	0.922133	0.000326	0.008257
55	0.042951	0.010278	0.002376	0.000130	0.000811	0.000558	0.937231	0.000186	0.005478
60	0.072313	0.012851	0.003036	0.000198	0.000758	0.000644	0.902899	0.000351	0.006950
65	0.108004	0.012523	0.002881	0.000179	0.000778	0.000628	0.867824	0.000337	0.006846
70	0.163974	0.010952	0.002784	0.000201	0.000733	0.000615	0.814402	0.000429	0.005911
75	0.258030	0.009814	0.002469	0.000181	0.000667	0.000529	0.722651	0.000359	0.005300
80	0.371720	0.008514	0.002200	0.000168	0.000582	0.000490	0.611413	0.000331	0.004581
85	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

Table C1.7.

region eslali

age	death	migration from rsfsr	ukrmol	belssr	eslali to uzkitatu	kazakh	grazarm	eslali	rural
0	0.023229	0.017092	0.005216	0.002290	0.000642	0.000794	0.000206	0.924613	0.025918
5	0.001875	0.012903	0.003776	0.001661	0.000479	0.000580	0.000161	0.959093	0.019472
10	0.001780	0.013010	0.003706	0.001597	0.000308	0.000468	0.000127	0.959367	0.019636
15	0.004559	0.098885	0.029282	0.011992	0.004200	0.004498	0.002260	0.724715	0.119606
20	0.007287	0.147070	0.041065	0.014281	0.007723	0.006209	0.003794	0.638201	0.132370
25	0.008816	0.059795	0.016129	0.005715	0.002831	0.002840	0.001528	0.832778	0.069568
30	0.010028	0.023063	0.006051	0.002050	0.000887	0.000914	0.000510	0.922039	0.034458
35	0.015648	0.028259	0.006454	0.002126	0.001042	0.001152	0.000557	0.903501	0.041261
40	0.019546	0.014803	0.002927	0.001099	0.000465	0.000539	0.000338	0.937092	0.023192
45	0.033380	0.016663	0.003686	0.001237	0.000575	0.000636	0.000372	0.917555	0.025897
50	0.052801	0.012802	0.002998	0.000883	0.000412	0.000503	0.000305	0.909335	0.019961
55	0.047157	0.009131	0.002153	0.000578	0.000294	0.000344	0.000210	0.925371	0.014762
60	0.068393	0.011159	0.002602	0.000763	0.000303	0.000373	0.000073	0.898213	0.018122
65	0.110887	0.009543	0.002236	0.000699	0.000248	0.000330	0.000058	0.860267	0.015732
70	0.178642	0.007390	0.001851	0.000594	0.000220	0.000251	0.000093	0.798818	0.012140
75	0.279898	0.006608	0.001656	0.000560	0.000197	0.000244	0.000097	0.699871	0.010870
80	0.400995	0.005688	0.001392	0.000434	0.000182	0.000182	0.000089	0.581615	0.009424
85	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

Table C1.8.

region rural

age	death	migration from rsfsr	ukrmol	belssr	rural to uzkitatu	kazakh	grazarm	eslali	rural
0	0.046292	0.041498	0.015236	0.003925	0.003455	0.004710	0.000811	0.003056	0.881017
5	0.003543	0.026898	0.009550	0.002433	0.002199	0.003121	0.000557	0.002058	0.949640
10	0.002915	0.025878	0.008955	0.002257	0.001536	0.002408	0.000495	0.002126	0.953430
15	0.006623	0.245256	0.083867	0.022310	0.018500	0.020598	0.009416	0.013134	0.580296
20	0.011851	0.441021	0.137605	0.033486	0.036041	0.039061	0.016499	0.021010	0.263426
25	0.014659	0.270460	0.083729	0.019438	0.022440	0.023448	0.010255	0.015128	0.540443
30	0.012392	0.085522	0.026913	0.005435	0.006957	0.007894	0.002839	0.005318	0.846729
35	0.024814	0.106016	0.028849	0.005777	0.007971	0.009680	0.003195	0.004757	0.808941
40	0.024851	0.051281	0.012149	0.002709	0.003841	0.004542	0.001675	0.002629	0.896323
45	0.045199	0.059758	0.015767	0.003138	0.004606	0.005564	0.001895	0.002761	0.861312
50	0.057827	0.044146	0.012373	0.002141	0.003445	0.004390	0.001653	0.002360	0.871664
55	0.045082	0.026667	0.007536	0.001188	0.001992	0.002533	0.000848	0.001330	0.912825
60	0.067097	0.028943	0.008210	0.001394	0.001678	0.002448	0.000581	0.001999	0.887651
65	0.100176	0.025356	0.007131	0.001292	0.001487	0.002220	0.000501	0.001929	0.859908
70	0.175050	0.020148	0.006201	0.001190	0.001267	0.001820	0.000435	0.001831	0.792058
75	0.274554	0.018020	0.005543	0.001071	0.001141	0.001635	0.000390	0.001635	0.696011
80	0.393868	0.015622	0.004806	0.000936	0.000999	0.001423	0.000340	0.001417	0.580589
85	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

Table C1.9.

region urban
****

age	death	migration from urban	migration from rural	urban to
0	0.041317	0.933201	0.025483	
5	0.002842	0.979588	0.017569	
10	0.002385	0.981267	0.016349	
15	0.004400	0.900614	0.094986	
20	0.007617	0.876668	0.115716	
25	0.011235	0.902674	0.086091	
30	0.008721	0.961037	0.030242	
35	0.019570	0.937377	0.043054	
40	0.019034	0.959040	0.021925	
45	0.038565	0.936154	0.025281	
50	0.050506	0.930345	0.019149	
55	0.047160	0.939995	0.012845	
60	0.075271	0.908364	0.016365	
65	0.118321	0.865570	0.016109	
70	0.175773	0.810323	0.013904	
75	0.275630	0.711926	0.012445	
80	0.395308	0.593898	0.010794	
85	1.000000	0.000000	0.000000	

region rural
****

age	death	migration from urban	migration from rural	rural to
0	0.046371	0.072674	0.880954	
5	0.003544	0.046841	0.949615	
10	0.002915	0.043674	0.953411	
15	0.006627	0.413520	0.579853	
20	0.011846	0.725284	0.262870	
25	0.014616	0.445215	0.540168	
30	0.012385	0.140927	0.846689	
35	0.024790	0.166352	0.808858	
40	0.024841	0.078852	0.896307	
45	0.045176	0.093546	0.861278	
50	0.057821	0.070532	0.871647	
55	0.045070	0.042116	0.912814	
60	0.067096	0.045267	0.887637	
65	0.100174	0.039929	0.859897	
70	0.175050	0.032901	0.792049	
75	0.274554	0.029442	0.696004	
80	0.393869	0.025548	0.580583	
85	1.000000	0.000000	0.000000	

Tables C2.1 to C2.9. Expected number of survivors at exact age x in each region.

Table C2.1.

age	initial region of cohort rsfsr								
	total	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	100000.	100000.	0.	0.	0.	0.	0.	0.	0.
5	95769.	90244.	1302.	189.	362.	533.	53.	186.	2899.
10	95482.	86749.	2053.	298.	579.	849.	90.	306.	4559.
15	95244.	83975.	2665.	387.	705.	1048.	119.	417.	5929.
20	94791.	70349.	6333.	1066.	1671.	1992.	493.	848.	12039.
25	93991.	60550.	10285.	1853.	2937.	3091.	1058.	1413.	12805.
30	92843.	55202.	11832.	2045.	3338.	3221.	1314.	1793.	14099.
35	91965.	53690.	12067.	2026.	3374.	3230.	1367.	1853.	14357.
40	90064.	51499.	11894.	1931.	3327.	3126.	1414.	1876.	14998.
45	88242.	50029.	11651.	1859.	3258.	3045.	1428.	1867.	15106.
50	84696.	47504.	11335.	1769.	3100.	2864.	1410.	1827.	14886.
55	80298.	44721.	10851.	1642.	2936.	2692.	1375.	1756.	14325.
60	76518.	42372.	10422.	1522.	2770.	2486.	1326.	1680.	13939.
65	70865.	38881.	9672.	1364.	2505.	2216.	1223.	1592.	13413.
70	62703.	33879.	8549.	1184.	2174.	1911.	1084.	1451.	12471.
75	51683.	27576.	7056.	971.	1805.	1553.	901.	1233.	10587.
80	37441.	19698.	5106.	710.	1339.	1117.	665.	917.	7888.
85	22648.	11718.	3075.	442.	849.	676.	415.	568.	4904.

Table C2.2.

age	initial region of cohort ukrmol								
	total	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	100000.	0.	100000.	0.	0.	0.	0.	0.	0.
5	97164.	2802.	91023.	167.	134.	248.	41.	132.	2617.
10	96922.	4579.	86920.	270.	226.	414.	71.	225.	4218.
15	96719.	6185.	83319.	360.	286.	531.	96.	317.	5625.
20	96334.	17015.	62454.	1079.	909.	1254.	443.	731.	12448.
25	95609.	31062.	42409.	1916.	2081.	2387.	1014.	1319.	13420.
30	94570.	34380.	35838.	2090.	2522.	2599.	1261.	1688.	14192.
35	93722.	34895.	34018.	2067.	2591.	2642.	1315.	1753.	14442.
40	91835.	35435.	30874.	1971.	2612.	2611.	1366.	1784.	15181.
45	90044.	35256.	29270.	1898.	2583.	2566.	1382.	1780.	15308.
50	86542.	34344.	27293.	1805.	2486.	2437.	1367.	1746.	15063.
55	82087.	32930.	25287.	1675.	2374.	2308.	1335.	1682.	14495.
60	78290.	31547.	23799.	1553.	2251.	2142.	1289.	1610.	14100.
65	72521.	29339.	21540.	1390.	2045.	1919.	1190.	1529.	13568.
70	64194.	25893.	18583.	1208.	1783.	1663.	1055.	1396.	12613.
75	52890.	21312.	14974.	990.	1487.	1358.	878.	1189.	10703.
80	38291.	15392.	10580.	724.	1108.	981.	648.	886.	7971.
85	23137.	9259.	6218.	450.	706.	597.	405.	549.	4954.

Table C2.3.

age	initial region of cohort belssr								
***	**********								
	total	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	100000.	0.	0.	100000.	0.	0.	0.	0.	0.
5	97515.	3060.	1109.	89685.	120.	222.	22.	611.	2686.
10	97345.	5013.	1803.	84543.	207.	375.	40.	1013.	4351.
15	97164.	6766.	2406.	79984	263.	484.	57.	1393.	5813.
20	96833.	17732.	6081.	55781.	849.	1150.	331.	2489.	12421.
25	96174.	31177.	10052.	33710.	1965.	2228.	834.	3167.	13040.
30	95136.	34652.	11558.	25240.	2418.	2477.	1075.	3582.	14134.
35	94308.	35255.	11830.	22968.	2495.	2532.	1129.	3612.	14486.
40	92482.	35889.	11736.	19732.	2528.	2520.	1183.	3577.	15316.
45	90681.	35792.	11533.	18112.	2508.	2487.	1203.	3522.	15524.
50	87262.	34963.	11259.	16281.	2422.	2374.	1198.	3403.	15362.
55	82806.	33619.	10816.	14511.	2321.	2260.	1176.	3240.	14863.
60	78961.	32310.	10425.	13140.	2207.	2106.	1139.	3086.	14548.
65	73249.	30168.	9717.	11393.	2011.	1896.	1054.	2910.	14099.
70	65031.	26705.	8619.	9562.	1758.	1650.	937.	2632.	13168.
75	53746.	22027.	7133.	7562.	1469.	1352.	781.	2217.	11204.
80	39104.	15942.	5176.	5329.	1097.	980.	578.	1635.	8366.
85	23811.	9611.	3126.	3196.	701.	599.	362.	1003.	5213.

Table C2.4.

age	initial region of cohort uzkitatu								
***	**********								
	total	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	100000.	0.	0.	0.	100000.	0.	0.	0.	0.
5	93231.	1696.	288.	36.	89111.	512.	24.	33.	1531.
10	92915.	2848.	494.	63.	86022.	851.	42.	60.	2535.
15	92656.	4033.	708.	92.	83012.	1112.	60.	92.	3547.
20	92229.	13739.	2794.	467.	61915.	2657.	386.	324.	9947.
25	91469.	28109.	6483.	1189.	37193.	4248.	932.	825.	12490.
30	90340.	32669.	8280.	1453.	27281.	4302.	1186.	1188.	13980.
35	89473.	33434.	8654.	1469.	24836.	4279.	1239.	1267.	14294.
40	87598.	34220.	8774.	1434.	21430.	4099.	1290.	1319.	15032.
45	85796.	34177.	8692.	1396.	19738.	3975.	1306.	1332.	15180.
50	82279.	33530.	8590.	1347.	17414.	3724.	1296.	1324.	15055.
55	77975.	32260.	8317.	1262.	15587.	3480.	1267.	1289.	14513.
60	74249.	30991.	8047.	1176.	14210.	3206.	1224.	1242.	14152.
65	68742.	28905.	7533.	1061.	12429.	2849.	1131.	1190.	13644.
70	60894.	25575.	6713.	929.	10429.	2447.	1003.	1098.	12701.
75	50386.	21101.	5584.	768.	8378.	1982.	835.	944.	10794.
80	36732.	15277.	4073.	566.	6016.	1419.	617.	710.	8052.
85	22439.	9215.	2474.	355.	3693.	857.	386.	444.	5014.

Table C2.5.

age	initial region of cohort	kazakh						
	total	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	100000.	0.	0.	0.	0.	100000.	0.	0.	0.
5	95261.	4231.	953.	134.	854.	86286.	30.	71.	2702.
10	94966.	6741.	1531.	216.	1357.	80651.	52.	124.	4294.
15	94707.	8892.	2030.	286.	1650.	75949.	71.	179.	5650.
20	94199.	23269.	5713.	943.	3735.	46756.	392.	512.	12879.
25	93353.	37901.	9850.	1769.	5214.	22983.	947.	1091.	13598.
30	92189.	40845.	11458.	1981.	5322.	15157.	1208.	1482.	14737.
35	91308.	41058.	11713.	1967.	5236.	13567.	1263.	1557.	14947.
40	89377.	41128.	11593.	1881.	5008.	11242.	1316.	1600.	15609.
45	87558.	40664.	11372.	1814.	4832.	10238.	1333.	1605.	15701.
50	83999.	39419.	11092.	1731.	4524.	8845.	1322.	1584.	15483.
55	79612.	37632.	10637.	1608.	4231.	7783.	1293.	1533.	14895.
60	75806.	35981.	10231.	1493.	3965.	6909.	1250.	1472.	14506.
65	70178.	33365.	9508.	1339.	3561.	5887.	1154.	1404.	13961.
70	62121.	29349.	8414.	1164.	3067.	4844.	1024.	1287.	12972.
75	51252.	24090.	6951.	956.	2528.	3768.	853.	1101.	11007.
80	37186.	17348.	5035.	700.	1862.	2593.	630.	824.	8196.
85	22547.	10403.	3035.	436.	1172.	1502.	394.	513.	5092.

Table C2.6.

age	initial region of cohort	grazarm						
	total	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	100000.	0.	0.	0.	0.	0.	100000.	0.	0.
5	95702.	1332.	404.	38.	131.	90.	92986.	38.	685.
10	95431.	2144.	649.	61.	209.	149.	91046.	66.	1108.
15	95219.	2967.	889.	85.	263.	196.	89185.	97.	1537.
20	94914.	9550.	2822.	350.	790.	567.	76006.	275.	4555.
25	94343.	19526.	5617.	811.	1762.	1302.	57901.	615.	6809.
30	93449.	23791.	7150.	1015.	2219.	1602.	48168.	893.	8612.
35	92740.	24512.	7444.	1032.	2285.	1667.	45866.	955.	8979.
40	91166.	25275.	7513.	1015.	2301.	1694.	42720.	996.	9653.
45	89568.	25393.	7441.	992.	2280.	1689.	40888.	1008.	9877.
50	86253.	25116.	7361.	963.	2204.	1638.	38015.	1007.	9949.
55	81928.	24367.	7143.	906.	2113.	1578.	35099.	984.	9737.
60	78218.	23521.	6921.	847.	2007.	1479.	32919.	950.	9574.
65	72499.	22082.	6497.	768.	1827.	1342.	29739.	915.	9330.
70	64381.	19676.	5806.	675.	1597.	1177.	25822.	848.	8780.
75	53368.	16342.	4846.	562.	1336.	973.	21041.	735.	7534.
80	39029.	11911.	3546.	417.	999.	712.	15214.	556.	5673.
85	23961.	7235.	2162.	263.	639.	439.	9308.	351.	3565.

Table C2.7.

age	initial region of cohort eslali								
	total	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	100000.	0.	0.	0.	0.	0.	0.	100000.	0.
5	97677.	1709.	522.	229.	64.	79.	21.	92461.	2592.
10	97487.	2922.	889.	378.	117.	144.	37.	88688.	4311.
15	97306.	4118.	1244.	513.	153.	197.	51.	85100.	5929.
20	96852.	13492.	4130.	1552.	646.	702.	314.	61739.	14228.
25	96075.	26916.	8100.	2468.	1722.	1785.	825.	39902.	14357.
30	95035.	29933.	9472.	2530.	2131.	2048.	1045.	33677.	14199.
35	94110.	30613.	9767.	2491.	2204.	2108.	1097.	31209.	14622.
40	92306.	31164.	9723.	2345.	2232.	2109.	1144.	28357.	15232.
45	90444.	31106.	9574.	2249.	2213.	2086.	1161.	26563.	15392.
50	86982.	30437.	9376.	2129.	2139.	1999.	1154.	24559.	15188.
55	82425.	29285.	9026.	1970.	2050.	1908.	1130.	22712.	14645.
60	78562.	28133.	8703.	1824.	1949.	1778.	1094.	20786.	14294.
65	72904.	26242.	8113.	1630.	1775.	1601.	1010.	18741.	13791.
70	64662.	23205.	7197.	1412.	1551.	1394.	896.	16192.	12817.
75	53267.	19122.	5956.	1153.	1296.	1142.	746.	12997.	10855.
80	38551.	13828.	4323.	840.	968.	828.	551.	9143.	8070.
85	23284.	8330.	2611.	520.	618.	505.	345.	5347.	5007.

Table C2.8.

age	initial region of cohort rural								
	total	rsfsr	ukrmol	belssr	uzkitatu	kazakh	grazarm	eslali	rural
0	100000.	0.	0.	0.	0.	0.	0.	0.	100000.
5	95371.	4150.	1524.	392.	346.	471.	31.	306.	88102.
10	95038.	6415.	2339.	592.	542.	736.	131.	483.	83800.
15	94768.	8455.	3050.	760.	667.	917.	173.	656.	80090.
20	94173.	27309.	9463.	2419.	2131.	2381.	952.	1604.	47915.
25	93254.	45288.	14709.	3473.	3756.	3832.	1771.	2376.	18048.
30	92135.	45170.	15263.	3284.	3908.	3652.	1921.	2639.	16299.
35	91269.	44723.	15213.	3151.	3878.	3594.	1945.	2642.	16123.
40	89394.	43873.	14613.	2892.	3742.	3398.	1951.	2595.	16331.
45	87595.	43027.	14173.	2738.	3630.	3280.	1940.	2544.	16262.
50	84106.	41291.	13617.	2556.	3418.	3051.	1886.	2450.	15837.
55	79740.	39164.	12912.	2340.	3212.	2845.	1812.	2325.	15129.
60	76000.	37279.	12331.	2153.	3017.	2616.	1736.	2207.	14662.
65	70405.	34395.	11363.	1908.	2717.	2320.	1593.	2068.	14041.
70	62339.	30123.	9975.	1640.	2348.	1990.	1404.	1861.	12997.
75	51402.	24629.	8178.	1329.	1942.	1610.	1162.	1562.	10991.
80	37260.	17670.	5879.	961.	1435.	1152.	853.	1148.	8160.
85	22559.	10559.	3517.	592.	906.	695.	530.	703.	5057.

Table C2.9.

age	initial region of cohort urban		
***	**********	**********	**********
	total	urban	rural
0	100000.	100000.	0.
5	95868.	93320.	2548.
10	95594.	91535.	4059.
15	95364.	89997.	5367.
20	94932.	83272.	11660.
25	94160.	81459.	12701.
30	93059.	79186.	13874.
35	92197.	78055.	14141.
40	90319.	75520.	14799.
45	88514.	73593.	14920.
50	85001.	70291.	14711.
55	80601.	66432.	14169.
60	76829.	63043.	13787.
65	71159.	57890.	13269.
70	62980.	50637.	12343.
75	51919.	41439.	10480.
80	37620.	29810.	7810.
85	22760.	17904.	4856.

age	initial region of cohort rural		
***	**********	**********	**********
	total	urban	rural
0	100000.	0.	100000.
5	95363.	7267.	88095.
10	95030.	11246.	83784.
15	94759.	14694.	80065.
20	94164.	46342.	47822.
25	93244.	75311.	17933.
30	92136.	75965.	16171.
35	91273.	75284.	15989.
40	89404.	73230.	16174.
45	87608.	71505.	16102.
50	84123.	68446.	15676.
55	79759.	64785.	14975.
60	76029.	61528.	14502.
65	70425.	56546.	13879.
70	62344.	49499.	12845.
75	51395.	40533.	10862.
80	37241.	29176.	8065.
85	22531.	17534.	4997.

APPENDIX D: MULTIREGIONAL POPULATION PROJECTION

Table D1.

YEAR 1986

POPULATION

AGE	TOTAL	RSFSR	UKRMOL	BELSSR	UZKITATU	KAZAKH	GRAZARM	ESLALI	RURAL
0	26022744.	9412164.	3204353.	647610.	1661244.	992192.	941190.	458760.	8705230.
5	23103854.	7875500.	2761995.	531486.	1308491.	850767.	772939.	411025.	8590850.
10	19365608.	5647997.	2113228.	372539.	983297.	646311.	614688.	355453.	8632095.
15	22676256.	7493294.	2621190.	493813.	1047567.	754643.	735894.	404700.	9125155.
20	24623928.	10799499.	3556501.	723951.	1147662.	955314.	788958.	527084.	6124960.
25	21839172.	10920754.	3523758.	688593.	1046297.	892510.	716043.	532854.	3518364.
30	18578686.	9229941.	3011607.	561498.	848363.	751724.	599171.	484907.	3091479.
35	12266972.	5344869.	1934694.	324181.	477107.	440714.	338056.	362922.	2844429.
40	20428752.	8720734.	2898557.	455809.	722405.	712097.	613368.	416779.	5869003.
45	15581711.	6497108.	1957341.	310838.	506685.	474307.	474646.	346471.	5012315.
50	17767966.	7217122.	2274732.	327135.	546138.	534414.	493725.	352411.	6020289.
55	12443269.	4989101.	1716927.	232301.	348211.	329639.	315166.	252152.	4259772.
60	8227018.	3157514.	1063424.	130741.	228127.	202738.	189839.	154746.	2899892.
65	9968062.	3785465.	1286326.	132277.	247855.	207833.	221842.	174650.	3911814.
70	10419235.	3708498.	1240969.	129511.	247659.	211623.	219289.	183090.	4477595.
75	6721859.	2246228.	772304.	87162.	158170.	137925.	137338.	127071.	3055663.
80	4210212.	1278485.	450102.	54805.	94053.	77524.	80370.	80798.	1894076.
85	2648277.	844309.	295350.	40599.	71301.	54170.	57043.	54744.	1230760.
TOTAL	276271776.	109168584.	36683356.	6244849.	11694631.	9226444.	8309566.	5680618.	89263736.

PERCENTAGE DISTRIBUTION

AGE	TOTAL	RSFSR	UKRMOL	BELSSR	UZKITATU	KAZAKH	GRAZARM	ESLALI	RURAL
0	9,4193	8,6217	8,7352	10,3703	14,2052	10,7538	11,3266	8,0759	9,7523
5	8,3624	7,2141	7,5293	8,5108	11,1888	9,2210	9,3018	7,2356	9,6241
10	7,0096	5,1736	5,7607	5,9655	8,4081	7,0050	7,3974	6,2573	9,6703
15	8,2060	6,8640	7,1454	7,9075	8,9577	8,1791	8,8568	7,1242	10,2227
20	8,9129	9,8925	9,6951	11,5928	9,8136	10,3541	9,4946	9,2786	6,8616
25	7,9050	10,0036	9,6059	11,0266	8,9468	9,6734	8,6171	9,3802	3,9415
30	6,7248	8,4548	8,2097	8,9914	7,2543	8,1475	7,2106	8,5362	3,4633
35	4,3678	4,8960	5,2740	5,1912	4,0797	4,7766	4,0683	6,3888	3,1865
40	7,3872	7,9883	7,9016	7,2990	6,1772	7,7180	7,3815	7,3369	6,5749
45	5,6400	5,9514	5,3358	4,9775	4,3497	5,1407	5,7120	6,0992	5,6152
50	6,4313	6,6110	6,2010	5,2385	4,6871	5,7922	5,9416	6,2037	6,7444
55	4,5040	4,5701	4,6804	3,7199	2,9775	3,5728	3,7928	4,4388	4,7721
60	2,9255	2,8923	2,8989	2,0936	1,9507	2,1974	2,2846	2,7241	3,2487
65	3,6081	3,4675	3,5066	2,1182	2,1194	2,2526	2,6697	3,0745	4,3823
70	3,7718	3,3978	3,3829	2,0739	2,1177	2,2937	2,6398	3,2231	5,0161
75	2,4331	2,0576	2,1053	1,3957	1,3525	1,4949	1,6528	2,2369	3,4232
80	1,4515	1,1711	1,2270	0,8776	0,8042	0,8402	0,9672	1,4223	2,1219
85	0,9586	0,7734	0,8051	0,6501	0,6097	0,5871	0,6865	0,9637	1,3788
TOTAL	100,0000	100,0000	100,0000	100,0000	100,0000	100,0000	100,0000	100,0000	100,0000
M,AG	33,4701	34,3343	34,2417	30,5086	27,6634	30,4359	30,8036	34,3002	34,8932
SHA	100,0000	39,5149	13,2780	2,2604	4,2330	3,3396	3,0078	2,0562	32,3101
LAM	1,048879	1,106401	1,108324	1,156978	1,153635	1,113342	1,095609	1,133273	0,937544
R	0,039544	0,020222	0,020370	0,029162	0,028583	0,021473	0,018262	0,025022	-0,012898

Table D2.

YEAR 1994

POPULATION

AGE	TOTAL	RSFSR	UKRMOL	BELSSR	UZKITATU	KAZAKH	GRAZARM	ESLALI	RURAL
0	26618682.	9816194.	3441557.	717781.	1959595.	1062159.	1036803.	526863.	8057728.
5	26517548.	9746154.	3447000.	705981.	1797001.	1047841.	986946.	528002.	8258625.
10	25339250.	9247306.	3249684.	645169.	1592441.	989239.	900506.	495424.	8219781.
15	22944010.	8648097.	3035731.	597983.	1278644.	864457.	769128.	467391.	7286588.
20	19151118.	8310769.	2862925.	579472.	1003523.	753069.	645929.	459718.	4535714.
25	22278688.	10871816.	3630885.	726173.	1126864.	915060.	762311.	583614.	3662764.
30	24108404.	11822641.	3995565.	761288.	1162559.	961867.	780184.	655158.	3969230.
35	21286240.	10535343.	3480222.	628557.	990479.	825702.	688842.	563540.	3573553.
40	17931274.	8888172.	2849278.	499048.	791870.	687853.	577387.	476373.	3169292.
45	11462742.	5211173.	1819168.	293634.	448165.	406319.	326161.	346639.	2611484.
50	10868208.	8328629.	2736684.	416367.	672040.	644963.	573888.	407230.	5088387.
55	14113881.	6084315.	1840277.	278543.	468413.	429225.	434841.	326518.	4245749.
60	15880548.	6610329.	2089482.	284155.	490866.	463211.	442967.	329498.	5170040.
65	10635212.	4319520.	1478656.	191010.	293254.	271880.	266365.	228403.	3586123.
70	6260204.	2478065.	832945.	100973.	175957.	154891.	146699.	131154.	2239520.
75	6669591.	2551829.	867353.	92358.	171910.	143063.	149779.	129847.	2563451.
80	5477894.	1977925.	662563.	74039.	141099.	116685.	118984.	107243.	2279437.
85	4081711.	1388831.	473960.	64158.	119170.	91676.	92509.	87057.	1764160.
TOTAL	299629216.	126828824.	42799132.	7656701.	14683848.	10829279.	9780143.	6849665.	80281624.

PERCENTAGE DISTRIBUTION

AGE	TOTAL	RSFSR	UKRMOL	BELSSR	UZKITATU	KAZAKH	GRAZARM	ESLALI	RURAL
0	8,8839	7,7397	8,0412	9,3745	13,3453	9,8082	10,6885	7,6918	10,0368
5	8,8501	7,6845	8,0539	9,2204	12,2379	9,6760	10,1746	7,7084	10,2871
10	8,4569	7,2909	7,5929	8,4262	10,8448	9,1349	9,2834	7,2328	10,2387
15	7,6588	6,8187	7,0930	7,8099	8,7078	7,9826	7,9290	6,8236	9,0763
20	6,3916	6,5527	6,6892	7,5682	6,8342	6,9540	6,6590	6,7115	5,6498
25	7,4354	8,5720	8,4817	9,4842	7,6742	8,4499	7,8588	8,5203	4,5624
30	8,0461	9,3217	9,3356	9,9428	7,9173	8,8821	8,0422	9,5647	4,9441
35	7,1042	8,3067	8,1315	8,2092	6,7454	7,6247	7,1014	8,2273	4,4513
40	5,9845	7,0017	6,6573	6,5178	5,3928	6,3518	5,9524	6,9547	3,9477
45	3,8256	4,1088	4,2505	3,8350	3,0521	3,7528	3,3624	5,0607	3,2529
50	6,2972	6,5668	6,3942	5,4382	4,5767	5,9557	5,9163	5,9452	6,3382
55	4,7104	4,7973	4,3138	3,6379	3,1900	3,9636	4,4828	4,7669	5,2886
60	5,3001	5,2120	4,8821	3,7112	3,3429	4,2774	4,5666	4,8104	6,4399
65	3,5495	3,4058	3,4549	2,4947	1,9971	2,5106	2,7460	3,3345	4,4669
70	2,0893	1,9539	1,9462	1,3187	1,1983	1,4303	1,5123	1,9148	2,7896
75	2,2259	2,0120	2,0266	1,2062	1,1707	1,3211	1,5441	1,8957	3,1931
80	1,8282	1,5595	1,5481	0,9670	0,9609	1,0768	1,2266	1,5657	2,8393
85	1,3623	1,0950	1,1074	0,8378	0,8116	0,8464	0,9537	1,2710	2,1975
TOTAL	100,0000	100,0000	100,0000	100,0000	100,0000	100,0000	100,0000	100,0000	100,0000
M,AG	34,0686	34,7612	34,2132	30,9305	27,5767	31,0911	31,1723	34,6558	35,0863
SHA	100,0000	42,3286	14,2848	2,5554	4,9007	3,6142	3,2374	2,2860	26,7937
LAM	1,037333	1,066664	1,069134	1,089850	1,107770	1,071542	1,073192	1,085698	0,953724
R	0,007331	0,012987	0,013378	0,017208	0,020478	0,013820	0,014128	0,016445	-0,009476

Table D3.

YEAR 2004

POPULATION

AGE	TOTAL	RSFSR	UKRMOL	BELSSR	UZKITATU	KAZAKH	GRAZARM	ESLALI	RURAL
0	27441164.	10241120.	3648021.	754167.	2190923.	1113736.	1092688.	554099.	7846417.
5	25555388.	9452294.	3435197.	702935.	1940242.	1041710.	993023.	544907.	7445079.
10	25920764.	9608710.	3459387.	704833.	1859719.	1050554.	989712.	556633.	7699219.
15	26342658.	10366487.	3661982.	746277.	1703060.	1038313.	967276.	573913.	7285352.
20	25069000.	11376712.	3844450.	786854.	1455419.	1017208.	892761.	589077.	5106519.
25	22554194.	11045074.	3703463.	735793.	1203621.	929818.	767979.	594841.	3573608.
30	18751860.	9096838.	3135555.	595017.	952308.	747977.	626444.	536372.	3061349.
35	21715060.	10573778.	3576543.	658576.	1050628.	845222.	729320.	607244.	3676748.
40	23269418.	11398337.	3745054.	672456.	1073472.	882979.	751327.	639773.	4086022.
45	20233504.	9992911.	3280256.	555973.	901731.	746687.	654190.	540987.	3600768.
50	16600725.	8204913.	2629286.	438023.	706685.	605324.	534008.	445396.	3037090.
55	10393639.	4782200.	1659864.	253656.	399329.	353668.	298351.	314438.	2332133.
60	16862078.	7529024.	2475423.	353856.	590623.	546116.	511481.	375149.	4480398.
65	12053467.	5219916.	1594193.	227069.	387987.	346561.	364882.	290504.	3622355.
70	12375328.	5158954.	1635421.	216615.	375640.	345702.	340329.	275682.	4034986.
75	7113020.	2887430.	988772.	128265.	201185.	180382.	178958.	164368.	2383459.
80	3292005.	1304614.	439138.	55504.	98510.	82398.	79208.	74433.	1158208.
85	4046184.	1540335.	521823.	66512.	127603.	94167.	100236.	87676.	1507831.
TOTAL	319589472.	139760848.	47413828.	8652383.	17218688.	11968521.	10872157.	7765492.	75937536.

PERCENTAGE DISTRIBUTION

AGE	TOTAL	RSFSR	UKRMOL	BELSSR	UZKITATU	KAZAKH	GRAZARM	ESLALI	RURAL
0	8,5864	7,3276	7,6940	8,7163	12,7241	9,3055	10,0503	7,1354	10,3327
5	7,9963	6,7632	7,2451	8,1242	11,2682	8,7037	9,1336	7,0170	9,8042
10	8,1106	6,8694	7,2962	8,1461	10,8006	8,7776	9,1032	7,1680	10,1389
15	8,2427	7,4173	7,7234	8,6251	9,8908	8,6754	8,8968	7,3906	9,5939
20	7,8441	8,1401	8,1043	9,0941	8,4526	8,4990	8,2114	7,5858	6,7246
25	7,0572	7,9028	7,8109	8,5039	6,9902	7,7689	7,0637	7,6601	4,7060
30	5,8675	6,5089	6,6132	6,8769	5,5307	6,2495	5,7619	6,9071	4,0314
35	6,7947	7,5635	7,5432	7,6115	6,1017	7,0620	6,7081	7,8198	4,8418
40	7,2810	8,1556	7,9408	7,7719	6,2343	7,3775	6,9106	8,2387	5,3808
45	6,3311	7,1508	6,8340	6,4257	5,2369	6,2388	6,0171	6,9666	4,7417
50	5,1944	5,8707	5,5454	5,2625	4,1042	5,0576	4,9117	5,7356	3,9995
55	3,2522	3,4217	3,5008	2,9316	2,3192	2,9558	2,7442	4,0492	3,0711
60	5,2762	5,3871	5,2209	4,0897	3,4301	4,5629	4,7045	4,8310	5,9001
65	3,7715	3,7349	3,3623	2,6244	2,2533	2,8956	3,3561	3,7410	4,7702
70	3,8723	3,6855	3,4492	2,5035	2,1816	2,8884	3,1303	3,5501	5,3136
75	2,2257	2,0661	2,0854	1,4824	1,1684	1,5071	1,6460	2,1167	3,1387
80	1,0301	0,9335	0,9262	0,6415	0,5721	0,6885	0,7285	0,9585	1,5252
85	1,2661	1,1021	1,1006	0,7687	0,7411	0,7868	0,9228	1,1290	1,9856
TOTAL	100,0000	100,0000	100,0000	100,0000	100,0000	100,0000	100,0000	100,0000	100,0000
M,AG	34,4633	35,6113	34,8716	32,0210	28,0516	32,0070	31,9196	35,5720	34,4658
$MA	100,0000	43,7314	14,8359	2,7073	5,3878	3,7450	3,4019	2,4298	23,7610
LAM	1,032160	1,046592	1,049345	1,057968	1,077618	1,047576	1,055943	1,059763	0,977278
R	0,006331	0,009108	0,009633	0,011270	0,014951	0,009296	0,010887	0,011609	-0,004597

Table D4.

YEAR 2014

POPULATION

AGE	TOTAL	RSFSR	UKRMOL	BELSSR	UZKITATU	KAZAKH	GRAZARM	ESLALI	RURAL
0	30168248.	11399212.	4008500.	844607.	2562340.	1234996.	1264121.	619648.	8194827.
5	28428734.	10708959.	3878319.	796283.	2291194.	1169357.	1149406.	604359.	7830857.
10	26721646.	9999884.	3649547.	737247.	2068772.	1098530.	1042261.	582484.	7551899.
15	25387812.	10000361.	3602690.	731733.	1809825.	1022171.	966053.	579167.	6673811.
20	25646954.	11597667.	3960670.	815092.	1611050.	1050641.	958110.	623508.	5032217.
25	25895650.	12636748.	4207056.	846185.	1462663.	1067563.	924302.	686898.	4024233.
30	24552856.	11958652.	4094062.	774641.	1301955.	979239.	844216.	682062.	3919812.
35	21984282.	10708826.	3634468.	665335.	1104916.	857055.	734381.	616482.	3662618.
40	18099938.	8785520.	2948988.	525034.	871067.	686575.	601660.	519804.	3161282.
45	20641710.	10053680.	3320731.	581043.	950944.	763783.	690969.	579542.	3695017.
50	21544088.	10544443.	3467290.	588264.	952276.	778487.	694672.	596249.	3922409.
55	18354400.	9245345.	2942912.	474787.	789379.	643768.	592541.	493278.	3372390.
60	14833409.	7301824.	2350522.	365327.	608680.	505853.	473429.	400311.	2827463.
65	8864866.	4063342.	1405869.	202530.	325852.	280257.	250386.	272045.	2064584.
70	13122041.	5813490.	1914957.	264670.	446516.	400960.	391673.	309725.	3580049.
75	8060504.	3465300.	1049403.	151316.	262566.	226043.	243742.	205532.	2436602.
80	6509628.	2697088.	861998.	117758.	208946.	180550.	182778.	154839.	2105672.
85	4318611.	1726190.	588895.	88349.	147488.	114154.	119020.	107153.	1427363.
TOTAL	343132576.	152497744.	51989096.	9570208.	19776430.	13059982.	12125720.	8633087.	75480296.

PERCENTAGE DISTRIBUTION

AGE	TOTAL	RSFSR	UKRMOL	BELSSR	UZKITATU	KAZAKH	GRAZARM	ESLALI	RURAL
0	8,7920	7,4750	7,7872	8,8254	12,9565	9,4563	10,4251	7,1776	10,8569
5	8,2851	7,0224	7,4599	8,3208	11,5855	8,9537	9,4791	7,0005	10,3747
10	7,7876	6,5515	7,0198	7,7036	10,4608	8,4114	8,5955	6,7471	10,0051
15	7,3988	6,5577	6,9297	7,6459	9,1514	7,8267	7,9835	6,7087	8,8418
20	7,4744	7,6051	7,6183	8,5170	8,1463	8,0447	7,9015	7,2223	6,6643
25	7,5468	8,2865	8,1691	8,8419	7,3960	8,1743	7,6227	7,9566	5,3315
30	7,1547	7,8420	7,8672	8,0943	6,5834	7,4980	6,9622	7,9006	5,1921
35	6,4069	7,0223	6,9912	6,9522	5,5870	6,5625	6,0564	7,1409	4,8524
40	5,2749	5,7611	5,6723	5,4861	4,4046	5,2571	4,9619	6,0211	4,1882
45	6,0157	6,5927	6,3989	6,0714	4,8085	5,8483	5,6984	6,7130	4,8953
50	6,2786	6,9145	6,6693	6,1468	4,8152	5,9689	5,7289	6,9066	5,1966
55	5,3491	5,9315	5,6606	4,9611	3,9915	4,9293	4,8866	5,7138	4,4679
60	4,3229	4,7882	4,5212	3,8173	3,0778	3,8733	3,9043	4,6369	3,7460
65	2,5835	2,6645	2,7042	2,1163	1,6477	2,1459	2,0649	3,1512	2,7353
70	3,8242	3,8122	3,6834	2,7656	2,2578	3,0701	3,2301	3,5877	4,7430
75	2,3491	2,2724	2,0570	1,5811	1,3277	1,7308	2,0101	2,3807	3,2281
80	1,8971	1,7686	1,6580	1,2305	1,0565	1,3825	1,5074	1,7935	2,7897
85	1,2586	1,1319	1,1327	0,9232	0,7458	0,8741	0,9816	1,2412	1,8910
TOTAL	100,0000	100,0000	100,0000	100,0000	100,0000	100,0000	100,0000	100,0000	100,0000
M,AG	34,7709	36,2383	35,4646	32,8940	28,4084	32,6027	32,3202	36,4765	33,8069
SHA	100,0000	44,4428	15,1513	2,7891	5,7635	3,8061	3,5336	2,5160	21,9974
LAM	1,037457	1,043963	1,046643	1,049631	1,069909	1,043574	1,056135	1,052906	1,003704
R	0,007354	0,008605	0,009118	0,009688	0,013515	0,008530	0,018923	0,010311	0,000747

Table D5.

YEAR 2024

POPULATION

AGE	TOTAL	RSFSR	UKRMOL	BELSSR	UZKITATU	KAZAKH	GRAZARM	ESLALI	RURAL
0	31023466.	11630782.	4168198.	864878.	2785762.	1276938.	1331943.	644657.	8320308.
5	29892368.	11240555.	4093414.	841850.	2561905.	1239641.	1256918.	649174.	8008912.
10	29376866.	11093017.	4041128.	822309.	2410760.	1216361.	1204239.	648665.	7940386.
15	28243110.	11243359.	4040309.	820797.	2120342.	1143546.	1115597.	640325.	7116834.
20	26440736.	11944030.	4103658.	838445.	1742267.	1087078.	1000908.	643336.	5081011.
25	24958736.	12113194.	4094897.	812781.	1473478.	1031718.	909940.	669440.	3853287.
30	25117272.	12168504.	4179221.	792746.	1387016.	1003263.	892505.	707197.	3986823.
35	25242022.	12252077.	4163883.	763567.	1322497.	983987.	877899.	709859.	4166333.
40	23697226.	11533622.	3846361.	683340.	1182109.	899033.	808749.	663051.	4080959.
45	20898068.	10180649.	3378026.	586821.	994594.	774333.	695865.	587902.	3699878.
50	16758495.	8135670.	2713235.	459069.	768604.	605363.	555309.	482430.	3038814.
55	18725020.	9114705.	3019579.	495424.	829430.	658212.	624742.	526420.	3456507.
60	19250998.	9390994.	3095804.	489722.	817521.	651294.	615770.	534776.	3655117.
65	15642092.	7628033.	2487974.	376638.	638515.	508123.	495334.	429451.	3078020.
70	11523078.	5573528.	1802810.	268687.	453921.	368434.	361633.	322245.	2371020.
75	5923610.	2676379.	927384.	132272.	217828.	180103.	167365.	187102.	1433176.
80	6983304.	3022873.	999423.	141484.	245870.	206715.	209752.	172114.	1905073.
85	4900561.	2054395.	639715.	103316.	189410.	140320.	160884.	131425.	1481095.
TOTAL	364517056.	162998384.	55795028.	10294144.	22141838.	13974382.	13285350.	9349569.	76678360.

PERCENTAGE DISTRIBUTION

AGE	TOTAL	RSFSR	UKRMOL	BELSSR	UZKITATU	KAZAKH	GRAZARM	ESLALI	RURAL
0	8.5108	7.1355	7.4706	8.4016	12.5814	9.1377	10.0257	6.8950	10.8509
5	8.2005	6.8961	7.3365	8.1779	11.5704	8.8708	9.4609	6.9434	10.4448
10	8.0591	6.8056	7.2428	7.9881	10.8878	8.7042	9.0644	6.9379	10.3554
15	7.7481	6.8978	7.2413	7.9734	9.5762	8.1832	8.3972	6.8487	9.2840
20	7.2536	7.3277	7.3549	8.1449	7.8687	7.7791	7.5339	6.8809	6.6264
25	6.8471	7.4315	7.3392	7.8956	6.6547	7.3829	6.8492	7.1601	5.0253
30	6.8906	7.4654	7.4903	7.7009	6.2642	7.1793	6.7180	7.5640	5.1994
35	6.9248	7.5167	7.4628	7.4175	5.9728	7.0488	6.6080	7.5924	5.4361
40	6.5010	7.0759	6.8937	6.6381	5.3388	6.4334	6.0875	7.0918	5.3222
45	5.7331	6.2459	6.0543	5.7005	4.4919	5.5411	5.2378	6.2860	4.8252
50	4.5975	4.9913	4.8629	4.4595	3.4713	4.3319	4.1799	5.1599	3.9631
55	5.1369	5.5919	5.4119	4.8127	3.7460	4.7101	4.7025	5.6304	4.5078
60	5.2812	5.7614	5.5445	4.7573	3.6922	4.6606	4.6350	5.7198	4.7668
65	4.2912	4.6798	4.4591	3.6588	2.8838	3.6361	3.7284	4.5933	4.0142
70	3.1612	3.4194	3.2311	2.6101	2.0501	2.6365	2.7220	3.4466	3.0932
75	1.6251	1.6432	1.6621	1.2849	0.9838	1.2888	1.2598	2.0012	1.8691
80	1.8938	1.8545	1.7912	1.3744	1.1104	1.4792	1.5788	1.8409	2.4849
85	1.3444	1.2604	1.1465	1.0036	0.8554	1.0041	1.2110	1.4057	1.9316
TOTAL	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
M,AG	34.8833	36.6457	35.8756	33.4062	28.6418	32.8934	32.5018	37.0026	32.9213
SMA	100.0000	44.7163	15.3066	2.8240	6.0743	3.8337	3.6446	2.5649	21.0356
LAM	1.028076	1.030468	1.032617	1.033382	1.053574	1.031024	1.042998	1.036710	1.008089
R	0.805538	0.806003	0.806419	0.806567	0.810438	0.806111	0.808420	0.807210	0.801611

Table D6.

STABLE EQUIVALENT TO ORIGINAL POPULATION

AGE	TOTAL	RSFSR	UKRMOL	BELSSR	UZKITATU	KAZAKH	GRAZARM	ESLALI	RURAL
0	23178306.	8509388.	3037928.	624113.	2420366.	949965.	1168920.	468260.	5999365.
5	21974078.	8064680.	2937312.	595948.	2231727.	908445.	1092484.	464822.	5678659.
10	21280858.	7823110.	2859839.	573640.	2125357.	882033.	1044250.	461459.	5509160.
15	20589840.	8005596.	2882395.	579178.	1899954.	836731.	984314.	461476.	4941196.
20	19861786.	8812963.	3016248.	611073.	1557428.	818100.	898057.	474185.	3673734.
25	19093432.	9126073.	3070528.	603679.	1287379.	789901.	810223.	499584.	2906063.
30	18347066.	8759481.	3000126.	562695.	1150121.	734738.	751458.	506224.	2882222.
35	17554188.	8386140.	2846012.	516085.	1053001.	687092.	710600.	486880.	2868458.
40	16703913.	7993695.	2664864.	469167.	960086.	636547.	670401.	463770.	2845383.
45	15739119.	7538451.	2497612.	429952.	874045.	585860.	627753.	437789.	2747658.
50	14587217.	6991712.	2315101.	387473.	783663.	529705.	577773.	406660.	2595131.
55	13466287.	6455711.	2139251.	346129.	706180.	476366.	530855.	374900.	2436895.
60	12293348.	5882237.	1950153.	304449.	625677.	418163.	479715.	343490.	2289456.
65	10824217.	5146258.	1705861.	258915.	532108.	354647.	416603.	306746.	2103078.
70	9039959.	4244549.	1409653.	210957.	433993.	287691.	344123.	259712.	1818381.
75	6824037.	3186968.	1060338.	158482.	329116.	214392.	260739.	199816.	1414185.
80	4475407.	2067171.	688532.	104639.	219941.	139247.	172730.	132617.	950530.
85	3926785.	1759166.	585185.	98008.	215452.	123086.	160924.	117188.	866976.
TOTAL	269728928.	118753352.	40666936.	7435382.	19405596.	10372708.	11703923.	6865580.	54525532.

PERCENTAGE DISTRIBUTION

AGE	TOTAL	RSFSR	UKRMOL	BELSSR	UZKITATU	KAZAKH	GRAZARM	ESLALI	RURAL
0	8,5932	7,1656	7,4703	8,3939	12,4725	9,1583	9,9874	6,8204	11,0029
5	8,1467	6,7911	7,2229	8,0151	11,5004	8,7580	9,3343	6,7703	10,4147
10	7,8897	6,5877	7,0323	7,7151	10,9523	8,5034	8,9393	6,7213	10,1038
15	7,6335	6,7414	7,0878	7,7896	9,7908	8,0667	8,4101	6,7216	9,0603
20	7,3636	7,4212	7,4170	8,2185	8,0257	7,8870	7,6731	6,9067	6,7376
25	7,0787	7,6849	7,5504	8,1191	6,6341	7,6152	6,9227	7,2766	5,3297
30	6,8020	7,3762	7,3773	7,5679	5,9267	7,0834	6,4206	7,3734	5,2860
35	6,5091	7,0618	6,9983	6,9399	5,4263	6,6240	6,0715	7,0916	5,2608
40	6,1929	6,7313	6,5529	6,3108	4,9475	6,1367	5,7280	6,7550	5,2184
45	5,8352	6,3480	6,1416	5,7826	4,5041	5,6481	5,3636	6,3766	5,0392
50	5,4081	5,8876	5,6928	5,2113	4,0383	5,1067	4,9366	5,9232	4,7595
55	4,9925	5,4362	5,2604	4,6552	3,6391	4,5925	4,5357	5,4606	4,4693
60	4,5577	4,9533	4,7954	4,0946	3,2242	4,03.4	4,0988	5,0031	4,1989
65	4,0130	4,3336	4,1947	3,4822	2,7420	3,4190	3,5595	4,4679	3,8571
70	3,3510	3,5743	3,4663	2,8372	2,2364	2,7735	2,9402	3,7828	3,3349
75	2,5300	2,6837	2,6074	2,1315	1,6960	2,0669	2,2278	2,9104	2,5936
80	1,6592	1,7407	1,6931	1,4073	1,1334	1,3424	1,4758	1,9316	1,7433
85	1,4558	1,4814	1,4390	1,3289	1,1103	1,1866	1,3750	1,7069	1,5900
TOTAL	100,0000	100,0000	100,0000	100,0000	100,0000	100,0000	100,0000	100,0000	100,0000
M,AG	35,0985	37,0377	36,3491	34,0660	29,0110	33,2139	32,9577	37,6827	32,7423
SHA	100,0000	44,0269	15,0770	2,7566	7,1945	3,8456	4,3391	2,5454	20,2149
LAM	1,029701	1,029699	1,029699	1,029698	1,029700	1,029699	1,029745	1,029698	1,029699
R	0,005854	0,005853	0,005853	0,005853	0,005853	0,005853	0,005862	0,005853	0,005853

Table D7.

YEAR 1984

POPULATION

AGE	TOTAL	URBAN	RURAL
0	25933202.	17240802.	8690399.
5	23069486.	14485510.	8583976.
10	19365463.	10733225.	8632235.
15	22676004.	13548189.	9127814.
20	24623316.	18499324.	6123992.
25	21810708.	18326516.	3513691.
30	18581226.	15497576.	3083649.
35	12066914.	9225937.	2840977.
40	20408984.	14544174.	5864815.
45	15582644.	10570485.	5012159.
50	11769966.	11750969.	6018998.
55	12443269.	8183900.	4259370.
60	8027426.	5128515.	2898912.
65	9969281.	6056265.	3912017.
70	10419051.	5941274.	4477776.
75	6721822.	3666341.	3055481.
80	4009871.	2115866.	1894005.
85	2645108.	1414607.	1230501.
TOTAL	276158080.	186929296.	89228776.

PERCENTAGE DISTRIBUTION

AGE	TOTAL	URBAN	RURAL
0	9.3929	9.2252	9.7484
5	8.3537	7.7492	9.6202
10	7.0125	5.7419	9.6743
15	8.2112	7.2478	10.2297
20	8.9164	9.8964	6.8632
25	7.9005	9.8059	3.9378
30	6.7285	8.2906	3.4559
35	4.3696	4.9355	3.1839
40	7.3903	7.7836	6.5728
45	5.6427	5.6548	5.6172
50	6.4347	6.2863	6.7456
55	4.5059	4.3781	4.7755
60	2.9068	2.7436	3.2489
65	3.6096	3.2399	4.3843
70	3.7729	3.1784	5.0183
75	2.4340	1.9614	3.4243
80	1.4520	1.1319	2.1226
85	0.9578	0.7568	1.3790
TOTAL	100.0002	100.0000	100.0004
M.AG	33.8825	33.3984	34.8967
SHA	100.0004	67.6892	32.3108
LAM	1.048581	1.111588	0.957282
R	0.009488	0.021158	-0.012954

Table D8.

YEAR 1994

POPULATION

AGE	TOTAL	URBAN	RURAL
0	26461310.	18412272.	8049038.
5	26401622.	18154442.	8247179.
10	25258444.	17050916.	8207624.
15	22914546.	15635803.	7278742.
20	19150082.	14615241.	4534840.
25	22278140.	18617590.	3660550.
30	24109868.	20156054.	3953755.
35	21280868.	17726660.	3562209.
40	17934580.	14777171.	3157409.
45	11462284.	8857513.	2604771.
50	18869942.	13787686.	5082255.
55	14116721.	9872382.	4244339.
60	15881334.	10718126.	5163208.
65	10634649.	7050366.	3584283.
70	6260238.	4022104.	2238134.
75	6670735.	4107020.	2563714.
80	5078684.	3199266.	2279418.
85	4076014.	2312603.	1763411.
TOTAL	299250816.	219066944.	80183872.

PERCENTAGE DISTRIBUTION

AGE	TOTAL	URBAN	RURAL
0	8.8425	8.4049	10.0382
5	8.8226	8.2872	10.2853
10	8.4406	7.7834	10.2360
15	7.6572	7.1374	9.0776
20	6.3995	6.6716	5.6556
25	7.4446	8.4986	4.5652
30	8.0567	9.1981	4.9383
35	7.1141	8.0919	4.4426
40	5.9932	6.7455	3.9377
45	3.8303	4.0443	3.2485
50	6.3057	6.2958	6.3383
55	4.7174	4.5066	5.2933
60	5.3080	4.8926	6.4430
65	3.5538	3.2184	4.4701
70	2.0924	1.8360	2.7913
75	2.2291	1.8748	3.1975
80	1.6978	1.4604	2.8427
85	1.3621	1.0557	2.1992
TOTAL	100.0000	100.0000	100.0000
M.AG	34.1435	33.7415	35.0923
SHA	100.0000	73.2051	26.7949
LAM	1.0356445	1.0371204	0.9533591
K	0.0017236	0.0013757	-0.0009565

Table D9.

YEAR 2004

POPULATION

AGE	TOTAL	URBAN	RURAL
0	27183742.	19355850.	7827892.
5	25368412.	17938120.	7430292.
10	25769852.	18083256.	7686596.
15	26227036.	18955202.	7271834.
20	24987926.	19893702.	5094225.
25	22520844.	16957136.	3563707.
30	18751790.	15696275.	3055518.
35	21715496.	18047448.	3667048.
40	23271118.	19200966.	4070152.
45	20257124.	16671027.	3586094.
50	16645678.	13581591.	3024087.
55	10393825.	8069724.	2324102.
60	16865594.	12394276.	4471317.
65	12055643.	8436691.	3618952.
70	12376467.	8346062.	4030405.
75	7111723.	4729970.	2381752.
80	3291189.	2134015.	1157174.
85	4043311.	2535691.	1507620.
TOTAL	319776416.	243006656.	75769760.

PERCENTAGE DISTRIBUTION

AGE	TOTAL	URBAN	RURAL
0	8.5275	7.9652	10.3312
5	7.9581	7.3817	9.8064
10	8.0840	7.4415	10.1447
15	8.2274	7.8033	9.5975
20	7.8387	8.1865	6.7233
25	7.0648	7.0011	4.7033
30	5.8824	6.4592	4.0326
35	6.8121	7.4267	4.8410
40	7.3001	7.9014	5.3717
45	6.3484	6.8521	4.7329
50	5.2092	5.5890	3.9912
55	3.2605	3.3208	3.0673
60	5.2907	5.1004	5.9012
65	3.7813	3.4718	4.7762
70	3.8825	3.4335	5.3193
75	2.2309	1.9454	3.1434
80	1.0324	0.8782	1.5272
85	1.2683	1.0433	1.9897
TOTAL	100.0000	100.0000	100.0000
MEAN	34.5256	34.5431	34.4695
SHA	100.0000	76.2311	23.7689
LAM	1.031415	1.042731	0.976757
R	0.006186	0.009717	-0.004703

Table D10.

YEAR 2014

POPULATION

AGE	TOTAL	URBAN	RURAL
0	29739672.	21576386.	8163286.
5	28099198.	20296188.	7803009.
10	26475010.	18945544.	7529467.
15	25201586.	18545994.	6655592.
20	25496208.	20483642.	5012566.
25	25781298.	21776080.	4005217.
30	24472104.	20572036.	3900069.
35	21952872.	18306408.	3646464.
40	18099696.	14949708.	3149987.
45	20642316.	16960374.	3681943.
50	21547112.	17642522.	3904591.
55	18359928.	15003451.	3356477.
60	14839633.	12027254.	2812379.
65	8865652.	6810601.	2055051.
70	13121408.	9550592.	3570816.
75	8058233.	5624634.	2433599.
80	6506098.	4403566.	2102532.
85	4538767.	2683292.	1925475.
TOTAL	341564832.	266356304.	75208528.

PERCENTAGE DISTRIBUTION

AGE	TOTAL	URBAN	RURAL
0	8.7069	8.1006	10.8542
5	8.2266	7.6199	10.3752
10	7.7511	7.1129	10.0115
15	7.3783	6.9629	8.8495
20	7.4645	7.6903	6.6649
25	7.5480	8.1755	5.3255
30	7.1647	7.7235	5.1857
35	6.4271	6.8729	4.8485
40	5.2991	5.6127	4.1883
45	6.0435	6.3676	4.8956
50	6.3084	6.6237	5.1917
55	5.3752	5.6328	4.4629
60	4.3446	4.5155	3.7394
65	2.5956	2.5569	2.7325
70	3.8416	3.5856	4.7479
75	2.3592	2.1117	3.2358
80	1.9048	1.6533	2.7956
85	1.2615	1.0825	1.8954
TOTAL	100.0000	100.0000	100.0000
M.AG	34.8698	35.1689	33.8108
SHA	100.0000	77.9812	22.0188
LAM	1.036317	1.046136	1.002995
R	0.007135	0.009420	0.000598

Table D11.

YEAR 2024

POPULATION

AGE	TOTAL	URBAN	RURAL
0	30928469.	22157624.	8270776.
5	29403867.	21434158.	7966702.
10	28965766.	21061644.	7903962.
15	27915216.	20829860.	7085356.
20	26195132.	21144220.	5050911.
25	24774736.	20949210.	3825525.
30	24370768.	21010934.	3359834.
35	25131538.	20990660.	4140878.
40	23621858.	19567406.	4054451.
45	20868598.	17189344.	3679254.
50	16758990.	13733419.	3025571.
55	18727316.	15285902.	3441414.
60	19255518.	15621261.	3634247.
65	15545190.	12584999.	2960191.
70	11523599.	9165525.	2357986.
75	5919580.	4493541.	1426040.
80	6696685.	4997339.	1699346.
85	4861042.	3463055.	1478028.
TOTAL	361686704.	285620256.	76260448.

PERCENTAGE DISTRIBUTION

AGE	TOTAL	URBAN	RURAL
0	8.4084	7.7577	10.8454
5	8.1245	7.5044	10.4467
10	8.0042	7.3741	10.3644
15	7.7139	7.2929	9.2910
20	7.2386	7.4029	6.6232
25	6.8461	7.3346	5.0164
30	6.9005	7.3562	5.1025
35	6.9447	7.3491	5.4299
40	6.5275	6.8508	5.3166
45	5.7667	6.0184	4.8246
50	4.6311	4.8083	3.9674
55	5.1750	5.3518	4.5127
60	5.3210	5.4692	4.7656
65	4.2233	4.4062	4.0128
70	3.1845	3.2090	3.0920
75	1.6358	1.5735	1.8700
80	1.9058	1.7496	2.4906
85	1.3488	1.1915	1.9381
TOTAL	100.0000	100.0000	100.0000
M.AG	35.0212	35.5805	32.9272
SHA	100.0000	78.9266	21.0734
LAM	1.026626	1.031971	1.007100
R	0.005256	0.006294	0.001415

Table D12.

STABLE EQUIVALENT TO ORIGINAL POPULATION
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AGE	TOTAL	URBAN	RURAL
0	23802024.	17450764.	6351261.
5	22660502.	16651969.	6026534.
10	22026296.	16160101.	5866194.
15	21589244.	16128857.	5260388.
20	20700459.	16811558.	3891014.
25	19981522.	16922058.	3059463.
30	19271484.	16233653.	3037832.
35	18504832.	15474993.	3029839.
40	17672296.	14659565.	3012730.
45	16714985.	13797147.	2917838.
50	15551750.	12787420.	2764330.
55	14410485.	11807412.	2603073.
60	13290982.	10749059.	2451923.
65	11661619.	9402911.	2258708.
70	9739212.	7779282.	1959930.
75	7401697.	5871517.	1530180.
80	4865674.	3859659.	1006015.
85	4254259.	3311536.	942723.
TOTAL	253617443.	225819072.	57998376.

PERCENTAGE DISTRIBUTION

AGE	TOTAL	URBAN	RURAL
0	8.3864	7.7278	10.9538
5	7.9842	7.3652	10.3943
10	7.7607	7.1562	10.1144
15	7.5363	7.1424	9.0699
20	7.2964	7.4474	6.7088
25	7.0403	7.4936	5.2751
30	6.7901	7.1888	5.2378
35	6.5200	6.8528	5.2240
40	6.2266	6.4917	5.1945
45	5.8893	6.1098	5.0309
50	5.4795	5.6627	4.7662
55	5.0774	5.2285	4.4889
60	4.6512	4.7603	4.2276
65	4.1088	4.1639	3.8944
70	3.4315	3.4449	3.3795
75	2.6079	2.6001	2.6383
80	1.7144	1.6977	1.7294
85	1.4989	1.4665	1.6254
TOTAL	100.0000	100.0000	100.0000
M.AG	35.4923	36.1551	32.8629
SHA	100.0004	79.5649	20.4351
LAM	1.025920	1.025920	1.025920
R	0.005118	0.005118	0.005118

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