BERLIN: A DEMOGRAPHIC TALE OF TWO CITIES

Peer Just

March 1981
WP-81-26

INTERNATIONAL INSTITUTE FOR APPLIED SYSTEMS ANALYSIS
A-2361 Laxenburg, Austria

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, to the conclusion of its comparative study, and to the exploration of possible future work that might apply the newly developed mathematical methodology to other research topics.

This paper focuses on the population structure of East and West Berlin. Using the data base collected as part of the Comparative Migration and Settlement Study, the author compares the current patterns and future prospects of the two city populations.

Papers summarizing previous work on migration and settlement at IIASA are listed at the back of this paper.

Andrei Rogers
Chairman
Human Settlements
and Services Area

ABSTRACT

This paper reports on an analysis of urban growth of East and West Berlin. A brief historical overview, given at the beginning, is followed by a description of the current patterns of spatial population growth. The impacts of the age composition and the present demographic schedules are investigated using multiregional life tables and population projections. Some remarks about the future shares of the labor force and post-labor force population conclude this study.

CONTENTS

BERLIN: A DEMOGRAPHIC TALE OF TWO CITIES

1. INTRODUCTION

The purpose of this study is to show how multiregional demography and the computer programs based on this technique can be applied to the analysis of urban growth in a two-region system. This case study begins with two similar units which will be treated separately. For the multiregional analysis each of these units are then divided into a two-region system: West Berlin and the Federal Republic of Germany (FRG) and East Berlin and the German Democratic Republic (GDR). These two cities of Berlin were chosen for many reasons, the most important of which being their unusual history in the past decades and the availability of corresponding data sets for the same base period. To understand the relationship between East and West Berlin, a brief historical overview is given as background material for the following demographic analysis.

1.1 Berlin from Its Beginning to the End of World War II

Berlin is a relatively young town compared with other European cities, having begun early in the thirteenth century as two separate towns located on both banks of the Spree River.

In 1709 these independent administrations came together to form a united government and a new city, which grew rapidly due to commerce. Berlin then joined the great Hanseatic League and as a result, remained almost fully independent. In 1414, however, the Hohenzollern established their rule in the area, and at the end of the fifteenth century, Berlin became the capital of the Electorate of Brandenburg. By 1648 Berlin's population was only about 6000, and the town played a relatively unimportant role compared to such old commercial cities as Nuremberg and Frankfurt. The population increased considerably in the seventeenth century when Brandenburg became a Protestant refuge and more than 5000 Huguenot inmigrants moved to Berlin, thus making the total population around 25000.

The Prussian and Napoleonic wars, occurring at the end of the eighteenth and the beginning of the nineteenth century, caused a decline in population.

Berlin recovered quickly, however, and since 1809 there was a rapid population growth--mainly due to the extension of boundaries (Figure 1). In the second half of the nineteenth century, some villages and suburbs became a part of Berlin. The industrial growth and the need for a coordinated transportation system forced the government in 1920 to reorganize the entire urban area of Berlin and its suburbs. As a result, the new municipality of Berlin was formed. An idea of how rapid the population growth was is given in Table 1 which shows not only the number of people and size of Berlin in various years, but also the growth compared to the preceding year. [Note that the population figures since 1825 are based on the hectare (ha) size of Berlin in 1946 and not on the actual size at the given year. The new size of 87,810 ha has remained nearly unchanged since 1920.]

By 1939, Berlin had become the greatest industrial and commercial city on the continent and the sixth largest city in the world. But the city's good fortune was not destined to remain. During the Second World War, 32 percent of all flats

and most of the industrial plants were destroyed, and the population dropped from 4.3 million in 1939 to 2.8 million by the end of the war (Schroeder 1962).

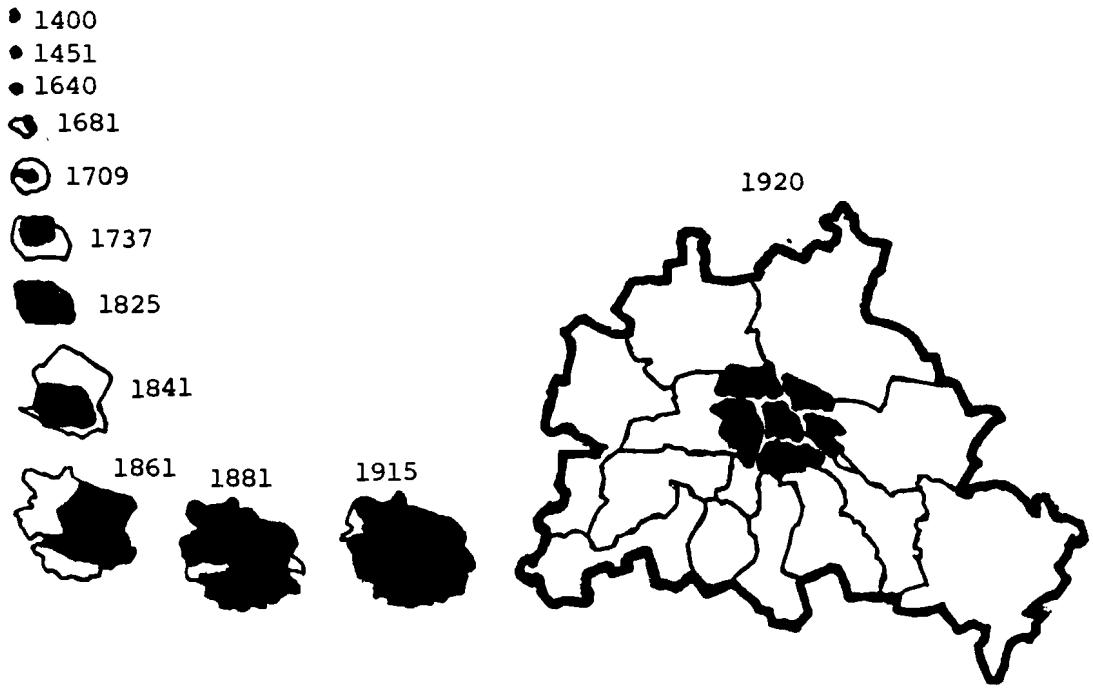


Figure 1. Growth in the size of Berlin from 1400 to 1920. (Source: *Berlin in Zahlen 1947*:17.)

1.2 Berlin after World War II

With the end of the war, Berlin lost its function as a capital and was divided into four sectors governed by four military commandants. The Soviet sector had an area of 403 km^2; the total area of the three Western Allies sectors was 481 km^2. Since Berlin was nearly in the middle of the Soviet zone of occupied Germany, the Allied Control Council instituted three air corridors for transit through the Soviet controlled air space, although most of the supply for Western sectors remained dependent upon the land and water routes of East Germany.

Table 1. Population and size of Berlin from 1600-1946.[a]

Year	Population	Growth (%)	Size (ha)	Growth (%)
1600	9,000	-	73	-
1648	6,000	-33.0	83	13.7
1681	10,000	+66.7	217	161.4
1709	57,000	470.0	626	188.4
1738	81,000	42.1	1,330	112.4
1772	133,500	64.8	1,330	0.0
1800	172,100	28.9	1,330	0.0
1809	160,000	7.0	1,330	0.0
1825	251,000	56.8	1,400	5.2
1843	401,000	59.7	3,510	150.7
1861	613,000	52.9	5,920	68.6
1881	1,321,000	115.3	6,061	2.4
1900	2,712,190	105.3	6,061	0.0
1915	4,026,000	48.4	6,572	8.4
1925	4,024,000	-0.05	87,846	1236.7
1933	4,242,501	5.4	88,347	0.5
1939	4,321,521	1.9	88,362	0.02
1945	2,807,405	-35.0	88,362	0.0
1946	3,187,470	13.5	88,994	0.7

[a] The population after 1825 is based on the number of hectares in Berlin in 1946.

SOURCES: *Berlin in Zahlen 1947*:51
Statistisches Jahrbuch der Stadt Berlin 1938:5
La Grande Encyclopédie: Vol. 3
Encyclopaedia Britannica: Vol. 3

In March 1948, the three Western Allies united their zones of Germany into a single economic unit and established a new currency--this caused the end of the Four-Power Control of greater Berlin. A new constitution for West Berlin came into force in 1950 and since 1955, all civilian traffic by road, rail, and water between West Berlin and the FRG was subject to control by officers of the GDR. Finally, in 1962, the USSR abolished the post of Soviet commandant in Berlin and the GDR passed an act incorporating East Berlin into its territory.

A map of the new east and west division of Berlin is given in Figure 2. Table 2 shows the change in population of the two cities since 1951. West Berlin has had a declining population since 1956 with the greatest loss of 6.25 percent being between 1971 to 1976. East Berlin had a substantial loss of 18.87 percent during the 1961-1966 five-year period, mainly because of outmigration, but has had a slightly growing population since the new dramatic outmigration policy was introduced in 1961.

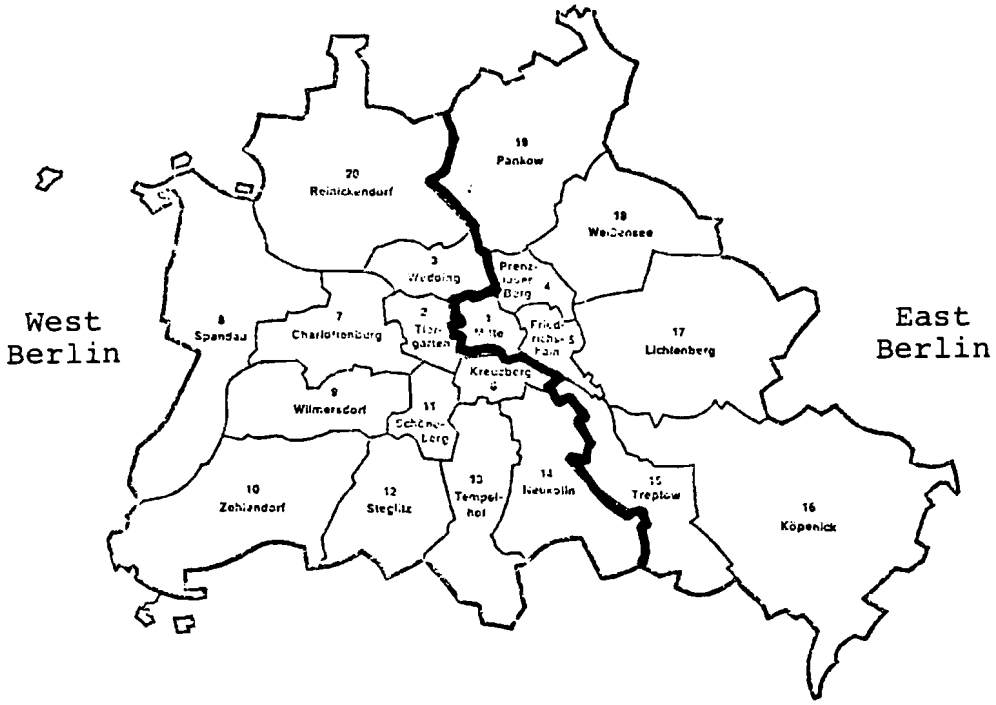


Figure 2. Sectors of Berlin after the Second World War. (Source: *Statistisches Jahrbuch 1978*:16.)

Today we are faced with two separate cities. On the one hand, East Berlin is integrated into the economic, political, and territorial system of the GDR. On the other hand, West Berlin is isolated from its natural hinterland and is only connected with the FRG by vital transit routes, which link it to the political and economic system of the FRG.

Table 2. Population of Berlin: 1951-1976.

Year	Berlin	West	East	Growth (%) West	Growth (%) East
1951	3,347,200	2,162,800	1,184,400	-	-
1956	3,352,700	2,221,800	1,310,900	2.70	10.68
1961	3,261,500	2,198,000	1,063,500	-1.07	-18.87
1966	3,270,400	2,191,200	1,079,200	-0.31	1.47
1971	3,184,700	2,098,600	1,086,100	-4.22	0.64
1976	3,068,400	1,967,300	1,101,100	-6.25	1.38

SOURCES: *Statistiches Jahrbuch 1978*:26
Bevölkerungsstatistisches Jahrbuch der DDR 1979:4

2. CURRENT PATTERNS OF SPATIAL POPULATION GROWTH

2.1 Data

The data used in this study are based on two data sets. The input for the multiregional population analysis for the FRG were taken from the population register of December 31, 1974. It is the same file that was used for the ninth volume of the migration and settlement series published at IIASA (Koch and Gatzweiler 1980). The 12 regions of the study, however, were aggregated into two regional units: West Berlin and the FRG.

The data for the GDR were provided by the Directorate of Statistics of the GDR. The base year for the analysis was 1975, one year later than the previous study. The five regions used for the fourth Migration and Settlement study (Mohs 1980) were reduced to two regions: East Berlin and the GDR. To make the results comparable, the 18 age groups of the FRG file were converted into 16 to match the number of age groups used for the GDR.

2.2 Fertility

During the first three decades of this century, fertility in Berlin slightly declined and then substantially increased after 1933, reaching a peak in 1941. With the end of World War II, however, fertility dropped below the level of 1933. Table 3 gives the crude birth and death rates for Berlin during the 1920 to 1975 period.

Table 3. Number of births and deaths per 1000 population: 1920-1975.

	West Berlin		East Berlin		Greater Berlin	
Year	Birth	Death	Birth	Death	Birth	Death
1920					16.5	14.4
1925					11.7	11.3
1930					9.9	11.3
1935					14.0	13.1
1938					14.9	13.2
1945	10.6	51.0	11.6	62.8	10.9	55.5
1947	7.0	19.2	10.0	21.3	9.6	19.9
1950	×	×	×	×		
1955	×	×	×	×		
1960	9.8	16.4	14.5	×		
1965	11.8	18.0	16.4	×		
1970	9.5	19.1	13.3	×		
1975	8.8	19.5	10.6	×		

× = data not available

Note: The calculations were done using data from:

a) *Statistiches Jahrbuch der Stadt Berlin 1938*
b) *Statistiches Jahrbuch Berlin 1978*
c) *Berlin in Zahlen 1947*
d) *Bevölkerungsstatistiches Jahrbuch der DDR 1979*

A postwar peak in fertility occurred in 1965. Since 1965, birth rates have been steadily declining in both parts of the city. The level of fertility in East Berlin, however, has been substantially higher than in West Berlin.

Table 4 shows the age-specific fertility rates for 1974 and 1975. The fertility rates were computed by dividing the annual number of births by the mid-year population in each age group. The gross reproduction rate (GRR) was then derived by multiplying the sum of the age-specific fertility rates by five--the age interval. The crude birth rate (CBR) was found by dividing the total number of births by the total mid-year population. Thus, the crude rate is influenced by the age composition.

Table 4a. Age-specific fertility rates for the FRG, West Berlin (1974), GDR, and East Berlin (1975).

	fertility rates			
	**********			
age	frg	w-berlin	gdr	e-berlin
0	0.000000	0.000000	0.000000	0.000000
5	0.000000	0.000000	0.000000	0.000000
10	0.000000	0.000000	0.000003	0.000000
15	0.013624	0.017323	0.009457	0.000027
20	0.047439	0.041419	0.040435	0.019656
25	0.046624	0.039222	0.071175	0.031739
30	0.024944	0.021102	0.026150	0.031480
35	0.010979	0.008723	0.009749	0.014232
40	0.003316	0.002236	0.004404	0.006581
45	0.000235	0.000144	0.000777	0.001414
50	0.000000	0.000000	0.000000	0.000000
55	0.000000	0.000000	0.000000	0.000000
60	0.000000	0.000000	0.000000	0.000000
65	0.000000	0.000000	0.000000	0.000000
70	0.000000	0.000000	0.000000	0.000000
75	0.000000	0.000000	0.000000	0.000000
gross	0.736062	0.650341	0.810752	0.775643
crude	0.010163	0.008967	0.010771	0.010691
m.age	26.9246	26.3337	27.5306	29.6155

Table 4b. Mean age of fertility rates taking the age composition into account using formula (2)*.

FRG	W.Berlin	GDR	E.Berlin
27.02	27.01	17.26	30.11

Generally the CBRs for the two urban areas are lower than those for the FRG and the GDR. The GDR and East Berlin exhibit a more uniform fertility pattern than the FRG and West Berlin. The mean age of childbearing varies between 27.6 and 29.6 in the GDR and East Berlin, respectively, and the values for West Berlin and the FRG are nearly the same at 26.3 and 26.9.

The mean age given in Table 4a is the mean age of the schedule that is not affected by the age composition. Formula (1)* was used in this case. Formula (2) is another way of calculating the mean age taking the age composition into account. These figures are shown below.

The differences between the result in Table 4a and 4b are due to the age composition of the fertile age groups.

---

* $$\bar{m}_1 = \frac{\sum_x (x + \frac{5}{2}) F(x)}{\sum_x F(x)} \qquad (1)$$

$$\bar{m}_2 = \sum_x (x + \frac{5}{2}) \cdot c(x)/100 \qquad (2)$$

where $c(x)$ is the percentage distribution and $F(x)$ are the age-specific fertility rates.

2.3 Mortality

From 1920 to 1930, mortality declined, but since 1930 it has increased. This was caused initially by the economic crisis beginning in the thirties and later by the heavy losses during the war and the postwar period (Table 3). The high crude death rates in West Berlin after the war were determined by the age structure of the population. In 1960, 17.4 percent of the population was older than 65 compared to 8.7 percent in 1938 (Schroeder 1962:79).

The age-specific mortality rates are presented in Table 5. These calculations were carried out in a manner analogous to the fertility rate calculations. The mean age is that of the schedule [formula (1)]. Applying formula (2) leads to a mean age of 69.94 for West Berlin and 69.69 for East Berlin.

Table 5. Age-specific mortality rates for FRG, West Berlin (1974), GDR, and East Berlin (1975).

	death rates			
age	frg	w-berlin	gdr	e-berlin
0	0.004418	0.004420	0.003619	0.003527
5	0.000431	0.000365	0.000413	0.000390
10	0.000293	0.000354	0.000349	0.000325
15	0.000926	0.000634	0.000791	0.000724
20	0.001019	0.001090	0.001039	0.000950
25	0.000967	0.001299	0.000834	0.000930
30	0.001295	0.001821	0.001297	0.001241
35	0.001803	0.002590	0.001637	0.001637
40	0.002577	0.003840	0.002307	0.002763
45	0.004706	0.006582	0.004042	0.004560
50	0.006309	0.008247	0.006542	0.007357
55	0.010325	0.012839	0.009439	0.011617
60	0.016459	0.018774	0.017713	0.020594
65	0.028506	0.031874	0.029430	0.033836
70	0.047610	0.050400	0.052065	0.057513
75	0.110116	0.115953	0.127331	0.133273
gross	1.191308	1.305668	1.297840	1.431409
crude	0.011510	0.018921	0.014275	0.015260
mage	68.9997	68.3907	69.3248	69.9519

Differences in mortality in East Berlin and the GDR are relatively insignificant if one looks at crude birth rates. The opposite can be observed for West Berlin where the CDR is considerably higher than in all the other regions. The variations between gross death rates and crude death rates again reflect the differences in the age composition of the population, which are shown in the percentage distribution tables in Appendix B.

In all four regions, the number of deaths exceeds the number of births. The highest difference is found in West Berlin, the lowest in the FRG.

2.4 Migration

After the war, West Berlin suffered a drastic loss of especially the younger population by outmigration. Until 1961 migration gains from East Berlin and the GDR partly compensated for this loss, and various financial grants given by the FRG for the encouragement of migration from the FRG to West Berlin helped somewhat to balance the age structure. Nevertheless, outmigration still continues to exceed inmigration.

The migration data used for this analysis do not include international migration. Only migration flows between the FRG and West Berlin or the GDR and East Berlin are taken into account. International migration, however, is an important factor for West Berlin. In 1977, 30,218 persons migrated from the FRG to West Berlin, but also 35,485 foreigners moved into the city. Discounting outmigration, the loss of 19,779 persons by internal migration was reduced by a gain of 4,129 persons by international migration (*Statistisches Jahrbuch* 1979).

East Berlin has been facing a more favorable situation. Since the heavy outmigration stopped in 1961, the highest migration gains of all regions in the GDR have been observed in East Berlin. This increase of population will continue because of the planned inmigration (Mohs 1980:14).

Table 6. Age-specific migration rates: 1974 and 1975.

age	frg to w-berlin	w-berlin to frg	gdr to e-berlin	e-berlin to gdr
0	0.000503	0.031965	0.001743	0.014301
5	0.000290	0.021439	0.000996	0.003632
10	0.000164	0.013733	0.000613	0.000400
15	0.000733	0.022437	0.002224	0.017100
20	0.002532	0.057666	0.002302	0.022216
25	0.001601	0.055113	0.002940	0.015355
30	0.000892	0.037331	0.001412	0.009021
35	0.000526	0.023965	0.000765	0.006118
40	0.000392	0.019331	0.000472	0.005043
45	0.000255	0.016402	0.000331	0.003591
50	0.000191	0.014332	0.000254	0.003730
55	0.000195	0.015991	0.000201	0.002123
60	0.000165	0.014547	0.000193	0.002216
65	0.000205	0.014630	0.000185	0.001946
70	0.000171	0.010366	0.000189	0.001723
75	0.000198	0.009229	0.000285	0.002504
gross	0.045311	1.900125	0.078349	0.624623
crude	0.000602	0.024239	0.001050	0.008305
m.age	29.9067	32.6323	25.5653	26.1810

Table 6 presents, for each region of origin, the age-specific outmigration rates by region of destination. For every age group the column for West Berlin shows a considerably higher outmigration than for the other three regions, the most remarkable differences being in the 30 to 34 age group. For a further analysis of these figures an age profile of migrants was calculated using a method developed at IIASA (Rogers, Castro, Raquillet 1977). The underlying function used for this analysis was

$$N(x) = a_1 e^{-a_1 x} + a_2 e^{-a_2 (x-\mu_2) - e^{-\lambda_2 (x-\mu_2)}}$$

and

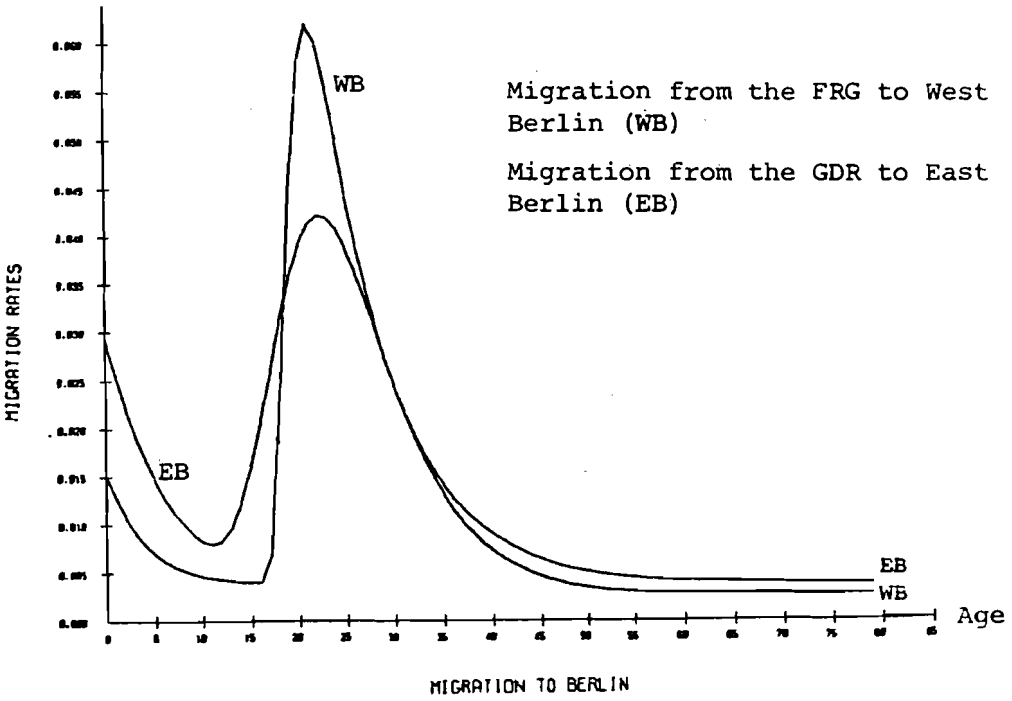
$$N_{ij}(x) = \frac{O_{ij}(x)}{\sum O_{ij}(x)} \quad , \quad O_{ij} = \text{outmigrants at age } x$$

$$\sum N_{ij}(x) = 1$$

The profile of the model schedule is defined by four of the seven parameters α_1, α_2, μ_2, and λ_2. Its level is determined by the remaining three parameters a_1, a_2, and c. The method to fit the model schedule to the data is described in Castro and Rogers (1979). The results of the parameter estimation are given in Table 7 and Appendix C shows the plotting of the curve for each region as well as the rates for each age group. Figure 3 gives the plottings of outmigration from East and West Berlin and of inmigration from the FRG and GDR.

Table 7. Parameters of the migration schedule.

Parameters	FRG	W.Berlin	GDR	E.Berlin
a_1	0.01318	0.01632	0.02910	0.02524
α_1	0.25564	0.18457	0.16109	0.11136
a_2	0.09613	0.05229	0.10509	0.06666
α_2	0.13748	0.11737	0.18138	0.11547
μ_2	19.28615	20.67937	23.50405	18.04604
λ_2	0.73059	0.37812	0.16385	0.25655
c	0.00382	0.00646	0.00272	0.00332



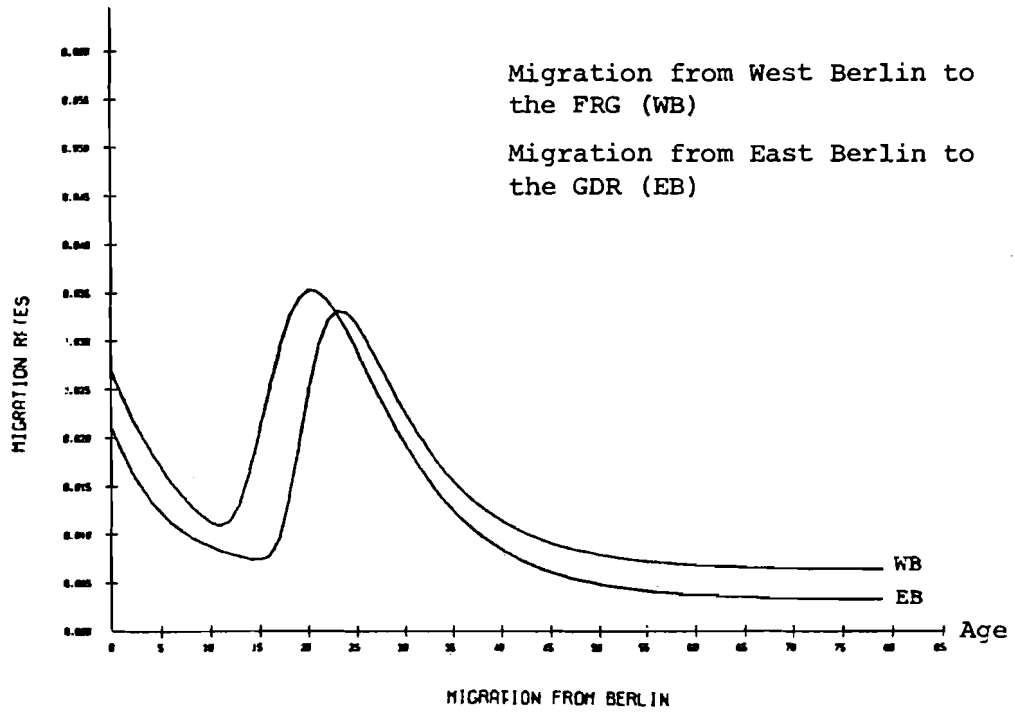


Figure 3. Outmigration from East and West Berlin and inmigration from the FRG and GDR.

The age patterns of the migrants vary considerably between the two parts of Berlin in the 0-29 years. At about age 18 a sharp increase of inmigration to West Berlin can be observed. The fact that West Berlin has an important university partly explains this migration gain. Also, young men who move to West Berlin are not required to serve in the FRG military forces.

Migration to East Berlin in 1975 is more equally distributed than that of West Berlin in 1974 over the ages of 15-29 years. The peak is at age 25-29. Mohs accredits this to the available choice of jobs offering good long-term prospects. The migration rate of the 0-5 year age group is relatively high compared with West Berlin because of this older-age migration peak. Often these migrants are recently married and have young children that fall within the first age bracket. The migration rates of the older age groups, however, are not significantly different in the two parts of the city.

Migration out of Berlin into the GDR or FRG shows a more uniform pattern. The outmigration peak is more obvious for East Berlin, however, in the 20-24 age group. The outmigration rates in the 20-24 and 25-29 age groups are nearly the same for East and West Berlin. The fact that West Berlin cannot provide jobs for all students finishing their education is the reason for the relatively high outmigration of the 25-29 year olds.

3. MULTIREGIONAL POPULATION ANALYSIS

Multiregional population analysis has been developed to study the simultaneous interaction between regional components of population change within a single multiregional model. The basic parameters for this analysis are the age- and region-specific rates of mortality, fertility, and migration. These rates for East and West Berlin as well as for the FRG and GDR were presented in the previous section. The model for examining the evolution of the multiregional population focuses on a closed system with given initial regional distribution of the population and fixed age-specific rates. Drawing on the results

generated by the computer program in Willekens and Rogers (1978) the analysis includes the multiregional life table, mobility, and fertility expectancies and the multiregional population projection.

3.1 The Multiregional Life Table

A life table describes a stationary population in which the number of births is equal to the number of deaths for a hypothetical cohort. The multiregional life table incorporates the migration between the regions into this concept. The computer program uses a birth cohort of 100,000 people for each region.

The first step is to calculate the age-specific transition probabilities from the observed rates (Table 8). Note that the word "transition" is used instead of "moves". Several interregional moves may be made in an age interval by a migrant making only one transition. Even stayers may make moves, but not transitions; the number of transitions, therefore, are usually less than the number of moves. A more accurate estimation, however, can be made if a smaller time interval is used for the calculations.

For example, the probability that a person of age 25 living in East Berlin will still be in this region five years later is 0.922279 and the probability that he will be living in the GDR at this time is 0.073090. The probability of dying in any region (0.004631) is obtained as a residual of unity minus the probability of survival.

The recursive application of these probabilities of migrating and dying to initial cohorts of 100,000 leads to the complete life histories of these cohorts in each region, as shown in Table 9. For example, of the 100,000 babies born in West Berlin, 97,814 will be alive at age five with 83,341 of them still living in West Berlin. The remaining 19,473 will have moved to the FRG.

Table 8. The age-specific probabilities of dying and migrating for the GDR and East Berlin, 1975.

region gdr

age	death	migration from gdr to gdr	migration from gdr to e-berlin
0	0.017933	0.978834	0.003233
5	0.002037	0.993061	0.004852
10	0.001744	0.995237	0.003019
15	0.003944	0.985485	0.010571
20	0.005180	0.981700	0.013120
25	0.004461	0.981500	0.014039
30	0.006461	0.986716	0.006823
35	0.008393	0.987872	0.003730
40	0.013937	0.983767	0.002296
45	0.020009	0.978146	0.001845
50	0.032187	0.966599	0.001214
55	0.046350	0.952699	0.000950
60	0.084833	0.914283	0.000874
65	0.137290	0.861918	0.000791
70	0.230353	0.769020	0.000727
75	1.000000	0.000000	0.000000

region e-berlin

age	death	migration from e-berlin to gdr	migration from e-berlin to e-berlin
0	0.017498	0.067558	0.914944
5	0.001901	0.042062	0.956037
10	0.001627	0.041007	0.957366
15	0.003620	0.081261	0.915110
20	0.004761	0.104037	0.891202
25	0.004631	0.073090	0.922279
30	0.006195	0.047937	0.945869
35	0.008154	0.029826	0.962019
40	0.013722	0.024533	0.961745
45	0.022522	0.017404	0.960073
50	0.036033	0.017343	0.946074
55	0.056393	0.010045	0.933561
60	0.097352	0.010083	0.892106
65	0.156112	0.008314	0.835574
70	0.251837	0.006535	0.742028
75	1.000000	0.000000	0.000000

Table 8 (continued) The age-specific probabilities of dying and migrating for the FRG and West Berlin, 1974.

region frg
****

age	death	migration from frg to frg	migration from frg to w-berlin
0	0.021850	0.975871	0.002279
5	0.002153	0.996477	0.001370
10	0.001456	0.997744	0.000790
15	0.004620	0.991931	0.003449
20	0.005085	0.983750	0.011165
25	0.004830	0.988195	0.006975
30	0.006460	0.989501	0.004039
35	0.008931	0.988568	0.002452
40	0.012308	0.985354	0.001838
45	0.023260	0.975550	0.001190
50	0.033473	0.965633	0.000389
55	0.050331	0.948731	0.000887
60	0.079048	0.920221	0.000730
65	0.133057	0.866087	0.000856
70	0.212732	0.786605	0.000663
75	1.000000	0.000000	0.000000

region w-berlin
****

age	death	migration from w-berlin to frg	migration from w-berlin to w-berlin
0	0.021857	0.144733	0.833410
5	0.001838	0.103494	0.894668
10	0.001759	0.066253	0.931988
15	0.003473	0.105629	0.890898
20	0.005391	0.249361	0.745248
25	0.006277	0.240098	0.753625
30	0.008848	0.169329	0.821823
35	0.012650	0.111722	0.875629
40	0.018728	0.098153	0.883119
45	0.032024	0.076607	0.891369
50	0.040161	0.068911	0.890928
55	0.061755	0.072671	0.865575
60	0.089305	0.064465	0.846230
65	0.147133	0.061144	0.791723
70	0.223552	0.040196	0.736252
75	1.000000	0.000000	0.000000

Table 9. Expected number of survivors at exact age x in each region.

INITIAL COHORT: FRG (1974) W. BERLIN (1974)

age	total	frg	w-berlin	total	frg	w-berlin
0	100000.	100000.	0.	100000.	0.	100000.
5	97815.	97587.	228.	97814.	14473.	83341.
10	97605.	97267.	338.	97630.	23048.	74582.
15	97461.	97070.	391.	97465.	27937.	69528.
20	97012.	96328.	684.	97094.	35056.	62038.
25	96518.	94933.	1585.	96531.	49955.	46625.
30	96050.	94193.	1857.	96047.	60561.	35487.
35	95425.	93518.	1906.	95342.	65934.	29408.
40	94561.	92662.	1898.	94378.	68466.	25912.
45	93338.	91482.	1856.	93016.	69877.	23139.
50	91151.	89387.	1764.	90650.	69941.	20709.
55	88038.	86437.	1651.	87476.	68964.	18512.
60	83635.	82130.	1505.	82862.	66777.	16085.
65	77009.	75675.	1334.	76147.	62487.	13660.
70	66743.	65622.	1121.	65823.	54954.	10869.
75	52553.	51664.	869.	51703.	43664.	8039.

INITIAL COHORT: GDR (1975) E. BERLIN (1975)

age	total	gdr	e-berlin	total	gdr	e-berlin
0	100000.	100000.	0.	100000.	0.	100000.
5	98207.	97883.	323.	93250.	6756.	91494.
10	98002.	96742.	1260.	98062.	10557.	87505.
15	97331.	96333.	1498.	97901.	14095.	83806.
20	97446.	95057.	2389.	97542.	20701.	76841.
25	96942.	93566.	3376.	97069.	28316.	68752.
30	96509.	92082.	4428.	96524.	32818.	63806.
35	95887.	91071.	4816.	96017.	35440.	60576.
40	95083.	90110.	4973.	95225.	36817.	58408.
45	93753.	88769.	4990.	93910.	37653.	56258.
50	91870.	86916.	4954.	91390.	37309.	54081.
55	88304.	84101.	4793.	88722.	37511.	51211.
60	84725.	80171.	4554.	84095.	36251.	47844.
65	77473.	73345.	4133.	76333.	33624.	42714.
70	66763.	63252.	3511.	65053.	29336.	35717.
75	51310.	48659.	2651.	49318.	22794.	26524.

Table 10 gives the average number of years expected to live in each region by a unit birth cohort (a single person of age zero). This measure depends on two components: the probability of surviving to age x and the average time spent in each region in a five-year interval by a person of age x at the beginning of the interval. For example, a person of age 20 born in the FRG is expected to live, on the average, 4.838 years of the following five years. He is expected to spend 4.781 years in the FRG and 0.057 in West Berlin. Note that the last age group is open, and therefore the figures no longer correspond to a five-year interval.

The calculations show that a person born in the FRG will live almost all his life in that region. The same is true for a GDR-born person who will, however, spend up to 0.25 years of the 4.72 years he is expected to live from age 40 to 44 in East Berlin. The cohorts for Berlin show a different pattern. Members of these cohorts are more likely to move to some other region. A person 75 years or older, born in East Berlin, will live as long in the GDR as in the region of birth. Starting with the age of 25, a person born in West Berlin will spend most of his life in the FRG. Having reached the age of 75, he is expected to live 4.01 of the remaining 4.66 years in the FRG.

The measure of the number of years lived beyond age x is the life expectancy. It is a conditional measure that applies to persons who have already reached age x.* Appendix D gives the expectation of life by place of birth for each age. A quick comparison shows that there are no substantial disparities between the regions.

---

*In the multiregional case the number of years lived beyond age x does not only depend on the mortality schedule of the region of birth but, due to the migration flows between the regions, also on the mortality schedules of all other regions.

Table 10. Average number of years lived in each region by a unit birth cohort.

INITIAL COHORT: FRG (1974) W. BERLIN (1974)

age	total	frg	w-berlin	total	frg	w-berlin
0	4.94538	4.93968	0.00570	4.94536	0.36183	4.58353
5	4.88549	4.87135	0.01414	4.88611	0.93302	3.94308
10	4.87665	4.86342	0.01323	4.87737	1.27461	3.60276
15	4.86182	4.83495	0.02687	4.86393	1.57481	3.28916
20	4.83824	4.78153	0.05671	4.84189	2.12529	2.71660
25	4.81419	4.72815	0.08604	4.81572	2.76292	2.05280
30	4.78685	4.69278	0.09407	4.78474	3.16237	1.62237
35	4.74963	4.65452	0.09512	4.74301	3.35999	1.38302
40	4.69747	4.60361	0.09387	4.68486	3.45856	1.22629
45	4.61223	4.52173	0.09050	4.59164	3.49544	1.09620
50	4.48096	4.39561	0.08536	4.45315	3.47263	0.98052
55	4.29307	4.21417	0.07890	4.25347	3.39354	0.86493
60	4.01609	3.94511	0.07099	3.97523	3.23160	0.74363
65	3.59379	3.53242	0.06137	3.54925	2.93603	0.61322
70	2.98190	2.93215	0.04974	2.93314	2.46546	0.47268
75	4.76661	4.68930	0.07681	4.66092	4.01240	0.64853

INITIAL COHORT: GDR (1975) E. BERLIN (1975)

age	total	gdr	e-berlin	total	gdr	e-berlin
0	4.95517	4.93459	0.02058	4.95625	0.16890	4.78736
5	4.90522	4.85314	0.05207	4.90731	0.43283	4.47448
10	4.89533	4.82639	0.06894	4.89999	0.61632	4.28277
15	4.88192	4.78474	0.09718	4.88608	0.86991	4.01617
20	4.85969	4.71556	0.14414	4.86526	1.22543	3.63932
25	4.83623	4.64113	0.19510	4.84231	1.52335	3.31396
30	4.80989	4.57880	0.23109	4.81601	1.70645	3.10956
35	4.77423	4.52951	0.24473	4.78104	1.80644	2.97460
40	4.72103	4.47197	0.24906	4.72339	1.85175	2.86664
45	4.64071	4.39212	0.24859	4.64501	1.88654	2.75848
50	4.51909	4.27542	0.24367	4.51529	1.88300	2.63230
55	4.34047	4.10681	0.23366	4.32042	1.84405	2.47637
60	4.05503	3.83791	0.21717	4.01032	1.74638	2.26394
65	3.60603	3.41493	0.19110	3.53477	1.57401	1.96076
70	2.95184	2.79776	0.15407	2.85929	1.30326	1.55603
75	4.01283	3.81576	0.19607	3.71096	1.82319	1.88776

Table 11. Expectation of life at birth (1974 and 1975).

	frg	w-berlin		gdr	e-berlin
frg	71.195959	42.025524	gdr	53.973104	22.277302
w-berlin	1.004412	29.844324	e-berlin	2.737217	49.001492
total	72.200373	71.869850	total	71.755320	71.278793

The expectation of life at birth is shown in Table 11. A baby born in West Berlin will live 42.02 years of the expected 71.86 years in the FRG and only 29.86 in the region of birth. On the other hand, a baby born in East Berlin will stay most of his lifetime in this region, but will also spend 22.27 years in the GDR.

Survivorship proportions, also life table statistics, are given in Table 12. They are used to generate the generalized Leslie matrix for the multiregional growth model. For example, the total survivorship proportion of 20-24-year-old people living in East Berlin is 0.995. That means 99.5 percent of all people aged 20-24 will survive to an age of 25-29. Of these, 90.5 percent will still be in this region five years later, the remaining 8.9 percent will move to the GDR. Total survivorship proportions among all regions have no significant variations.

3.2 Mobility and Fertility Analysis

The expected number of migrations an individual makes during his lifetime is given by the net migraproduction rate (NMR) matrix, which is derived from the life table population. To obtain these rates, the observed age-specific total outmigration rates are multiplied by the number of years lived in each region by a unit birth cohort (Tables 6 and 10). Summation

Table 12. Survivorship proportions.

region w-berlin

	total	frg	w-berlin
0	0.98803	0.12681	0.86122
5	0.99322	0.08594	0.91227
10	0.99736	0.08515	0.91221
15	0.99561	0.17311	0.82250
20	0.99425	0.24573	0.74852
25	0.99251	0.20979	0.78271
30	0.98932	0.14330	0.84602
35	0.98440	0.10296	0.88144
40	0.97476	0.08513	0.88963
45	0.96393	0.07278	0.89116
50	0.94935	0.07037	0.87898
55	0.92489	0.06829	0.85660
60	0.88321	0.06196	0.82125
65	0.81764	0.05043	0.76721
70	1.51557	0.16026	1.35531

region frg

	total	frg	w-berlin
0	0.98789	0.98602	0.00187
5	0.99819	0.99710	0.00109
10	0.99696	0.99485	0.00211
15	0.99515	0.98799	0.00716
20	0.99504	0.98592	0.00912
25	0.99436	0.93870	0.00565
30	0.99228	0.98897	0.00331
35	0.98911	0.98696	0.00215
40	0.98200	0.98048	0.00152
45	0.97169	0.97065	0.00104
50	0.95824	0.95736	0.00088
55	0.93568	0.93487	0.00081
60	0.89506	0.89428	0.00078
65	0.82995	0.82919	0.00075
70	1.59992	1.59672	0.00320

region gdr

	total	gdr	e-berlin
0	0.98992	0.98326	0.00665
5	0.99808	0.99414	0.00394
10	0.99716	0.99040	0.00675
15	0.99544	0.98367	0.01177
20	0.99518	0.98149	0.01368
25	0.99454	0.98399	0.01055
30	0.99257	0.98726	0.00532
35	0.98884	0.98583	0.00302
40	0.98305	0.98098	0.00207
45	0.97396	0.97244	0.00153
50	0.96085	0.95976	0.00108
55	0.93486	0.93396	0.00090
60	0.89010	0.88928	0.00082
65	0.81961	0.81887	0.00074
70	1.36596	1.36253	0.00343

region e-berlin

	total	gdr	e-berlin
0	0.99024	0.05572	0.93451
5	0.99824	0.04157	0.95667
10	0.99737	0.06059	0.93678
15	0.99580	0.09206	0.90374
20	0.99532	0.08945	0.90587
25	0.99458	0.06113	0.93346
30	0.99283	0.03915	0.95368
35	0.98907	0.02720	0.96187
40	0.93193	0.02100	0.96092
45	0.97078	0.01757	0.95321
50	0.95393	0.01399	0.93999
55	0.92348	0.00994	0.91355
60	0.87453	0.00903	0.86545
65	0.80031	0.00732	0.79299
70	1.24082	0.03050	1.21032

over all age groups lead to Table 13, which presents the average number of regional boundary crossings a person is expected to make during a lifetime.

Table 13. Net migraproduction rates.

Region of outmigration	Region of birth		Region of outmigration	Region of birth	
	FRG	W. Berlin		GDR	E. Berlin
FRG	0.042208	0.022238	GDR	0.072577	0.018615
W. Berlin	0.024186	0.821204	E. Berlin	0.018137	0.448234
Total	0.066394	0.843442		0.090719	0.466849

According to Table 13, a person born in West Berlin will outmigrate from any region on the average of 0.84 times during his lifetime, 0.82 times out of his region of birth, and 0.02 times out of the FRG. The results show that mobility, as measured by the net migraproduction rate, is highest for West Berliners with East Berliners following. This is only true with respect to the mobility between the corresponding two regions with intraregional migration excluded. The results will change if moves within a given region are taken into account.

The relative importance of each region as a region of origin is given in Table 14. The net migraproduction allocation denotes the fraction of the region-of-residence-specific net migraproduction rate of a region to its total net migraproduction rate,or stated another way, the fraction of the migrations out of region j made by a person who was born in region i. Of the total number of outmigrations a person born in West Berlin (region i) will make, 97.36 percent will be out of this region and 2.63 percent will be made out of the FRG (region j).

Table 14. Net migraproduction allocations.

Region of outmigration	Region of origin		Region of outmigration	Region of origin	
	FRG	W. Berlin		GDR	E. Berlin
FRG	0.635721	0.026365	GDR	0.800065	0.039874
W. Berlin	0.364279	0.973635	E. Berlin	0.199935	0.960126
Total	1.000	1.000		1.000	1.000

Analogous to migration's net migraproduction rates are fertility's net reproduction rates, which are obtained by multiplying the observed fertility rates by the number of years each birth cohort has lived in each region. They denote the number of children with which a person is expected to be replaced, according to given age-specific fertility and mortality rates for a particular year.

Table 15 gives the net reproduction rates by place of birth of parent and place of birth of child for 1974/1975. The net reproduction rate ranges from 0.678 in West Berlin to 0.784 in the GDR. A person born in West Berlin, for example, will be expected to have 0.678 children, 0.379 born in the FRG and only 0.299 in his home region. The column totals show that a person born in any of the four regions will be replaced by less than one person in the next generation. So fertility in all regions is below the replacement level.

As with the net migraproduction allocation, the net reproduction allocation is defined as the proportion of the total net reproduction rate that is accorded to a particular region. Table 16 shows that only a West Berlin-born person is more likely to have his children born in another region than his region of birth. A person born in East Berlin, for example, can expect 67.94 percent of his children also to be born in that region and 32.05 percent to be born in the GDR.

Table 15. Net reproduction rates.

Region of birth of child	Region of birth of parent		Region of birth of child	Region of birth of parent	
	FRG	W. Berlin		GDR	E. Berlin
FRG	0.697880	0.379268	GDR	0.753276	0.238460
W. Berlin	0.009227	0.299208	E. Berlin	0.031531	0.505524
Total	0.707107	0.678477	Total	0.784807	0.743984

Table 16. Net reproduction allocations.

Region of birth of child	Region of birth of parent		Region of birth of child	Region of birth of parent	
	FRG	W. Berlin		GDR	E. Berlin
FRG	0.986951	0.559000	GDR	0.959823	0.320518
W. Berlin	0.013049	0.441000	E. Berlin	0.040177	0.679482
Total	1.000000	1.000000	Total	1.000000	1.000000

3.3 Population Projection toward Stability

Multiregional life table statistics are independent of the observed age structure and regional distribution of the population. To study the short- and medium-term impacts of the population structure, a discrete model of multiregional population growth is used. The projection matrix is generated from the multiregional life table and observed fertility rates. The regional age schedules of fertility, mortality, and migration are assumed to remain at the levels of the base years. Appendix E gives the projection of multiregional population development as it was computed for the next 50 years. It contains the regional and total population, along with its proportional distributions across ages and regions. In addition, the mean

age (M.AG), the regional shares (SHA) of the total population, and the growth ratio (lam) of the previous period are also given.

The population of East Berlin is expected to grow from the 1.098 million figure of 1975 to a maximum of 1.218 in the year 2010. During the same period, the population of the GDR will decline from 15.033 million to 13.653 million. From 2010 on, both regions are expected to lose population. The intermediate growth of East Berlin shown in these projections is caused by the different age structure of the population and the migration gains in the fertile ages.

The population of West Berlin as well as of the FRG is expected to decline, with West Berlin losing 44.30 percent of its population from the year 1974 to 2024 and the FRG losing 22.71 percent. This decline is due to the three factors that determine population growth, which are all unfavorable for West Berlin. It has a low fertility rate, a heavy outmigration rate, and a high share of elderly people. The influence of the present elderly age profile, however, vanishes during the projection period. One should note that the results achieved by using a two-region aggregation cannot be equal to the results of the four-region case as used in Mohs (1980). Only in the case of identical mortality, fertility, and migration rates in all regions would both aggregations give the same result.

If one projects a population with a constant growth matrix for a long enough period of time, then the ultimate age and spatial distribution is independent of the current distribution, and is determined by the fundamental demographic parameters. All age groups and regions of this stable population will grow with the same stable growth rate. A total population which is distributed as the stable population and would lead, in the long run, toward the same population as the observed population, is called the stable equivalent. The concept of the stable equivalent enables one to separate the part of change due to the demographic schedules from the part of change due to the age and regional distribution of the initial population.

Table 17 shows a stable equivalent of 90.6 million for the FRG and 2.0 million for West Berlin. The percentage distribution gives the corresponding stable age composition for each region.

The stable population of all four regions will be older than the 1974-1975 population. The mean age of West Berlin increases by two years but that of the FRG by eight years. As a result of this, the mean age of the stable population is one year higher in the FRG than in West Berlin. The same is true for East Berlin and the GDR, however, their initial mean ages differ only by 0.01 years. West Berlin shows a loss in share terms of 1.0 percent. At the same time, East Berlin's share grew from 6.8 to 10.7 percent. Having reached stability the constant annual growth rate is -0.013 for FRG-West Berlin and -0.009 for GDR-East Berlin.

4. DIFFERENCES IN THE AGE STRUCTURE

4.1 Current Age Structure

The current age structure of the FRG and GDR has been influenced mainly by fertility and mortality since 1900. Migration does not play an important role because these regional units are too big to be influenced in their age structure by migration only from and to Berlin. Berlin, however, is a small region and migration has to be taken into account.

Appendix D gives the age profile of the four populations under consideration. The FRG and the GDR show a more uniform pattern than East and West Berlin. West Berlin has the most diverse age structure. The similarity between the GDR and the FRG is not surprising because these two regions have been subject to the same historical events until 1945. The age profile itself tells this history (Appendix E).

The low percentage of population in the 55-60 age group is due to the low number of births during the First World War. The share of people born between 1920 and 1934 was nearly the same in these three age groups if one looks at West Berlin and the FRG. In East Berlin and the GDR the percentage increased.

Table 17. Stable equivalent and percentage distribution for FRG-West Berlin and GDR-East Berlin.

stable equivalent to original population

age	total	frg	w-berlin
0	3861153.	3777821.	83332.
5	4066636.	3932595.	84039.
10	4327702.	4241321.	86381.
15	4599382.	4506335.	93547.
20	4880307.	4763889.	116418.
25	5177112.	5037910.	139202.
30	5488014.	5341493.	146521.
35	5805285.	5654283.	151003.
40	6121027.	5966134.	154892.
45	6407135.	6250570.	156565.
50	6636175.	6480485.	155690.
55	6778050.	6626056.	151994.
60	6759669.	6615168.	144501.
65	6448517.	6316502.	132015.
70	5704116.	5591068.	113048.
75	9719590.	9537141.	182449.
total	92780368.	90688768.	2091597.

stable equivalent to original population

age	total	gdr	e-berlin
0	1060067.	946117.	113950.
5	1097062.	979157.	117905.
10	1144694.	1022743.	121950.
15	1193291.	1066644.	126648.
20	1241829.	1109052.	132777.
25	1291970.	1150366.	141604.
30	1343265.	1192391.	150873.
35	1393865.	1236821.	157044.
40	1440932.	1279116.	161816.
45	1480627.	1315305.	165322.
50	1507000.	1340159.	166841.
55	1512539.	1347076.	165463.
60	1476247.	1316954.	159292.
65	1371069.	1225820.	145249.
70	1171829.	1050470.	121359.
75	1657472.	1500153.	157319.
total	21383756.	19078342.	2305414.

percentage distribution

age	total	frg	w-berlin
0	4.1616	4.1657	3.9841
5	4.3831	4.3915	4.0179
10	4.6645	4.6768	4.1299
15	4.9578	4.9690	4.4725
20	5.2601	5.2530	5.5660
25	5.5800	5.5552	6.6553
30	5.9151	5.8399	7.0052
35	6.2570	6.2348	7.2195
40	6.5973	6.5787	7.4055
45	6.9057	6.8923	7.4854
50	7.1526	7.1459	7.4436
55	7.3055	7.3064	7.2669
60	7.2857	7.2944	6.9086
65	6.9503	6.9659	6.3117
70	6.1480	6.1651	5.4049
75	10.4759	10.5163	8.7230
total	100.0000	100.0000	100.0000
m.ag	44.7312	44.7523	43.8128
sha	100.0000	97.7456	2.2544
lam	0.937974	0.937974	0.937973
r	-0.012807	-0.012807	-0.012807

percentage distribution

age	total	gdr	e-berlin
0	4.9573	4.9591	4.9427
5	5.1304	5.1323	5.1143
10	5.3531	5.3608	5.2897
15	5.5804	5.5909	5.4935
20	5.8073	5.8131	5.7594
25	6.0418	6.0297	6.1423
30	6.2817	6.2500	6.5443
35	6.5183	6.4829	6.8120
40	6.7384	6.7045	7.0189
45	6.9241	6.8942	7.1710
50	7.0474	7.0245	7.2359
55	7.0733	7.0603	7.1772
60	6.9036	6.9029	6.9095
65	6.4117	6.4252	6.3004
70	5.4800	5.5061	5.2641
75	7.7511	7.8631	6.8239
total	100.0000	100.0000	100.0000
m.ag	42.1511	42.1950	41.7878
sha	100.0000	89.2189	10.7811
lam	0.956569	0.956569	0.956559
% r	-0.003880	-0.003880	-0.003880

A peak can be observed for the two age groups 30 to 39, which represents the persons born during the Third Reich. The drop in the share of the population in the 15-29 age groups is caused by the low fertility in the post-war period. Only West Berlin had a higher percentage of population of this age group, due to inmigration as previously mentioned. A second peak was reached in the 1960s followed by a very low number of persons born between 1970 and 1974.

East Berlin follows the GDR pattern. For the 40-80-year age group, the profiles are nearly identical. The differences in the other age groups are mainly caused by migration. West Berlin's profile still has some similarities with the age structure of the FRG. The heavy migration flows within the past 30 years have influenced the age composition considerably. A very high percentage of the population is older than 65 (22.19%) but only 15.88 percent is between 0 and 15 years old. The corresponding values for the FRG are 14.01 percent (65+) and 21.94 percent (0 to 15 years).

4.2 Projected Age Structure

Appendix G shows the age profiles for the year 2024-2025. It is expected that there will be no differences between the age composition in the FRG and West Berlin by this time, and both regions are expected to have a high percentage of elderly people. The population of East Berlin and the GDR, on the contrary, are expected to have a higher percentage of young people. The profile for the 25-64 age groups are nearly the same for all four regions. Only the share of people in the last age group is higher in the FRG and West Berlin than in the other two regions. To trace the aging process it is useful to classify the age groups as follows

(1) pre-labor force age	0-14 years
(2) labor force age	15-64 years
(3) post-labor force age	more than 64 years
(4) non-labor force age	(1) + (3)

The percentage of young people aged 0 to 14 has been and is expected to decline in all regions (Table 18). The highest decline is observed in the FRG (-8%), the lowest in West Berlin (-3.5%). The share of people older than 65 has been decreasing in all regions but by 1995, a change is expected to take place that will lead to final values for the FRG and GDR higher than those of the base years, 1974 and 1975. In 2024, the FRG is expected to have 6 percent more people in the post-labor force ages than in 1974; West Berlin, however, will have less in these ages than in the initial 1974 year. The share of the labor force age group has a peak between 1995 and 2000. In the year 2024, West Berlin will have gained 7 percent in labor force population compared to 1974, and about 65.8 percent of the population of the GDR and FRG will be in the labor force ages in 2024/2025.

Table 19 presents the number of people aged 65 or more by every 100 people in the labor force age. These figures are of special interest for the pension system because they show how many people in retirement ages have to be maintained by every 100 persons between the ages of 15 and 64. This is a very important figure because the German pension system is not based on savings. The pensions for the older generation are paid entirely by the existing labor force.

Table 19 shows that in each successive year after 1979 through 1994, there will be less elderly people to be maintained by the labor force population than in 1974. In the long run, however, the expected number of elderly people will exceed the present rates, which will pose a problem for all four regions. This will bring about an especially serious problem for the FRG where the expected number of people 65+ per 100 persons in the labor force in 2024 is 31.15 rather than the 20.06 people expected for 1994. The projections for East and West Berlin will be 5 percent under those of the GDR and FRG.

Table 18. Data based on the projection.

FRG (in percent)					W. Berlin (in percent)			
Year	Age groups							
	0-14	15-64	64+	(1)+(3)	0-14	15-64	65+	(1)+(3)
1974	21.94	64.05	14.01	35.95	15.88	61.93	22.19	38.07
1979	18.63	65.31	16.06	34.69	14.86	62.58	22.56	37.42
1984	16.04	69.34	14.62	3.066	13.59	67.27	19.14	32.73
1989	16.04	69.28	14.68	30.72	13.78	70.05	16.17	29.95
1994	16.63	69.44	13.93	30.56	14.27	72.66	13.07	27.39
1999	15.93	67.89	16.18	32.11	13.93	72.21	13.86	27.79
2004	15.00	67.06	17.94	32.94	13.31	71.16	15.53	28.84
2009	14.06	66.79	19.15	33.21	12.56	69.74	17.70	30.26
2014	13.45	66.41	20.14	33.59	12.04	48.92	19.04	31.08
2019	13.52	66.31	20.17	33.69	12.09	68.61	19.30	31.39
2024	13.65	65.84	20.51	34.16	12.35	69.15	18.50	30.85
GDR (in percent)					E. Berlin (in percent)			
1975	21.25	62.37	16.38	37.63	21.29	62.58	16.13	37.42
1980	18.59	65.02	16.39	34.98	18.46	66.48	15.06	33.52
1985	17.67	68.48	13.85	31.52	17.27	70.61	12.12	29.39
1990	18.38	68.99	12.63	31.01	17.95	72.15	9.90	27.85
1995	18.78	69.03	12.19	30.97	18.73	71.89	9.38	28.11
2000	17.75	68.20	14.05	31.80	18.34	70.57	11.09	29.43
2005	16.53	67.38	16.09	32.62	17.19	69.07	13.74	30.93
2010	15.69	67.84	16.47	32.16	16.03	69.02	14.95	30.98
2015	15.46	67.99	16.55	32.01	15.60	69.61	14.79	30.39
2020	15.84	67.09	17.07	32.91	15.98	69.27	14.75	30.73
2025	15.85	65.71	18.44	34.29	16.31	68.42	15.27	31.58

Table 19. The number of 65+ year-old people expected to be living in the four regions for every 100 labor force residents.

Year	FRG	W. Berlin	Year	GDR	E. Berlin
1974	21.92	35.83	1975	26.26	25.78
1979	24.59	36.05	1980	25.21	22.65
1984	21.08	28.45	1985	20.22	17.16
1989	21.19	23.08	1990	18.31	13.72
1994	20.06	17.99	1995	17.66	13.05
1999	23.83	19.19	2000	20.60	15.71
2004	26.75	21.82	2005	23.88	19.89
2009	28.67	25.38	2010	24.28	21.66
2014	30.33	27.63	2015	24.34	21.25
2019	30.42	28.13	2020	25.44	21.29
2024	31.15	26.75	2025	28.06	22.32

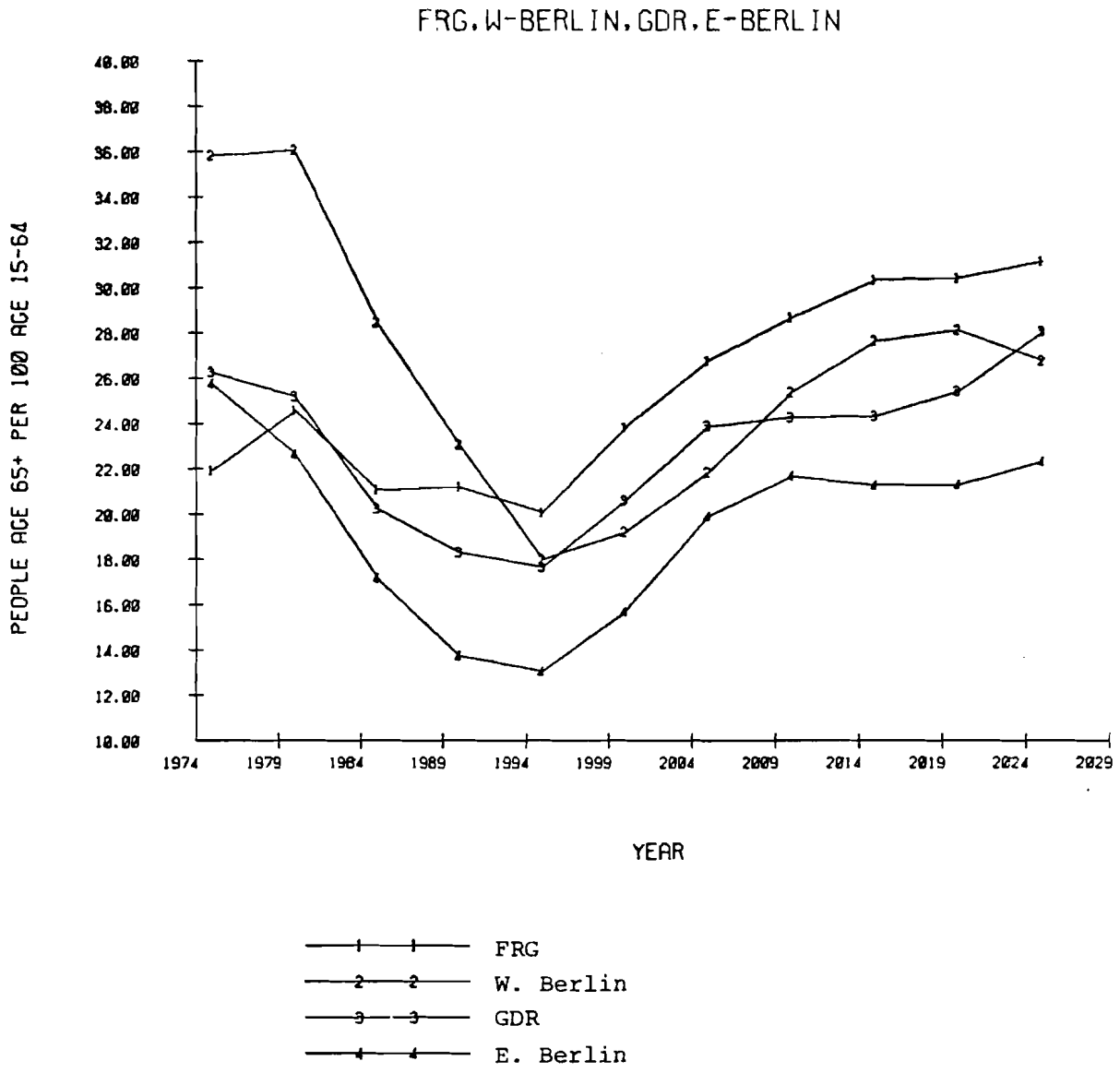


Figure 3. Plotting of data in Table 19.

In the short run, this rate is determined by the age composition of the population. After 15 years, the present fertility rate becomes influential, but the overall age structure remains the main factor.

5. CONCLUSION

As mentioned in a previous chapter all attempts of the government of the FRG to encourage inmigration to West Berlin failed to balance the age composition of West Berlin. Also for the future no significant change can be expected because the FRG itself will have a considerably higher share of people in the post-labor force ages. This process is mainly determined by the present age structure of the population. A fertility rate which is below replacement level causes a decline of the total population in all four regions. A trend toward a high share of elderly people can also be observed in the GDR and East Berlin, however it is more moderate.

In concluding this case study, I would like to mention a simulation program developed at IIASA that can be used in addition. In the program used for this study, the population is projected with a constant growth matrix. The simulation program provides the possibility to change the mortality, fertility, and migration rates in each projection step to fit new data. As mentioned in section 2.1, the input data are based on 1974-1975. In the meantime, the fertility rates were declining significantly in the FRG. To take this into account, the old rates were applied for the 1974 to 1979 projection and the new rates from that time on. The short-run projection is not affected by this change. Only in the long run, slight differences appear which do not alter the conclusions drawn from the program using a constant growth matrix.

REFERENCES

Berlin in Zahlen 1947 (1949) Hauptamt für Statistik von Gross Berlin.

Bevölkerungsstatistisches Jahrbuch der DDR 1979 (1979) Staatliche Zentralverwaltung für Statistik, Berlin.

Castro, L.J., and A. Rogers (1979) *Migration Age Patterns: Measurement and Analysis.* WP-79-16. Laxenburg, Austria: International Institute for Applied Systems Analysis.

Encyclopaedia Britannica Volume 3 (1973) London: William Benton.

Koch, R., and H.P. Gatzweiler (1980) *Migration and Settlement: Federal Republic of Germany.* RR-80-37. Laxenburg, Austria: International Institute for Applied Systems Analysis.

La Grande Encyclopedie Volume 3 (1973) Paris: Librairie Lavonsee.

Mohs, G. (1980) *Migration and Settlement: 4. German Democratic Republic.* RR-80-6. Laxenburg, Austria: International Institute for Applied Systems Analysis.

Rogers, A., L.J. Castro, and R. Raquillet (1977) *Model Migration Schedules and Their Application.* RM-77-57. Laxenburg, Austria: International Institute for Applied Systems Analysis.

Schroeder, K. (1962) *Struktur und Funktion einer geteilten stadt.* Bad Godesburg.

Statistisches Jahrbuch 1938 (1939) Statistisches Amt der Reichshauptstadt Berlin.

Statistisches Jahrbuch 1978 (1979) Berlin: Statistisches Landesamt.

Willekens, F., and A. Rogers (1978) *Spatial Population Analysis: Methods and Computer Programs.* RR-78-18. Laxenburg, Austria: International Institute for Applied Systems Analysis.

APPENDIX A: OBSERVED POPULATION, NUMBER OF BIRTHS, DEATHS, AND MIGRANTS BY AGE AND REGION (BOTH SEXES): 1974 AND 1975

observed population characteristics

region frg

age	population	births	deaths	migration from frg	migration from w-berlin	frg to
0	3400920.	0.	15026.	0.	1712.	
5	4318345.	0.	2077.	0.	1396.	
10	4941930.	0.	1450.	0.	309.	
15	4363352.	59452.	4043.	0.	3197.	
20	4137431.	196432.	4217.	0.	10683.	
25	3787265.	176579.	3663.	0.	6064.	
30	4463845.	111345.	5731.	0.	3930.	
35	4751972.	52172.	8569.	0.	2499.	
40	3775017.	12518.	9728.	0.	1431.	
45	3760743.	839.	17697.	0.	958.	
50	3630684.	0.	24721.	0.	695.	
55	2304308.	0.	23792.	0.	450.	
60	3416893.	0.	56270.	0.	563.	
65	3162652.	0.	90155.	0.	648.	
70	2435134.	0.	118316.	0.	425.	
75	2767635.	0.	304760.	0.	547.	
total	59068632.	609438.	690236.	0.	36107.	

region w-berlin

age	population	births	deaths	migration from frg	migration from w-berlin	w-berlin to
0	92538.	0.	409.	2953.	0.	
5	117959.	0.	43.	2532.	0.	
10	112942.	0.	40.	1551.	0.	
15	95020.	1646.	65.	2132.	0.	
20	137619.	5700.	150.	7936.	0.	
25	141605.	5554.	184.	7305.	0.	
30	177393.	3754.	324.	6650.	0.	
35	153267.	1337.	397.	3673.	0.	
40	105930.	237.	407.	2107.	0.	
45	104375.	15.	637.	1712.	0.	
50	107671.	0.	838.	1597.	0.	
55	87548.	0.	1124.	1400.	0.	
60	148344.	0.	2735.	2158.	0.	
65	155705.	0.	4963.	2273.	0.	
70	126369.	0.	6369.	1310.	0.	
75	169525.	0.	19657.	1563.	0.	
total	2034366.	18243.	38492.	49412.	0.	

observed population characteristics

region gdr

age	population	births	deaths	migration from gdr	migration from gdr to e-berlin
0	353751.	0.	3090.	0.	1438.
5	1076632.	0.	450.	0.	1072.
10	1266071.	4.	442.	0.	783.
15	1197532.	11325.	947.	0.	2664.
20	1189325.	43090.	1236.	0.	3332.
25	859163.	61151.	758.	0.	2534.
30	960265.	25111.	1245.	0.	1356.
35	1169712.	11404.	1973.	0.	895.
40	942968.	4153.	2647.	0.	445.
45	837736.	690.	3588.	0.	333.
50	795918.	0.	5207.	0.	202.
55	561177.	0.	5325.	0.	113.
60	808111.	0.	14313.	0.	156.
65	869064.	0.	25620.	0.	161.
70	736518.	0.	38347.	0.	139.
75	859199.	0.	109403.	0.	245.
total	15033192.	161928.	214606.	0.	15923.

region e-berlin

age	population	births	deaths	migration from e-berlin to gdr	migration from e-berlin to e-berlin
0	62653.	0.	221.	896.	0.
5	79009.	0.	30.	682.	0.
10	92259.	0.	30.	775.	0.
15	73156.	2.	53.	1251.	0.
20	72651.	1428.	69.	1614.	0.
25	66688.	5451.	62.	1024.	0.
30	90215.	2340.	112.	895.	0.
35	100196.	1426.	164.	613.	0.
40	76735.	505.	212.	387.	0.
45	62934.	89.	287.	226.	0.
50	48528.	0.	357.	181.	0.
55	33095.	0.	453.	33.	0.
60	56360.	0.	1171.	126.	0.
65	64747.	0.	2194.	126.	0.
70	52249.	0.	3005.	90.	0.
75	60299.	0.	8338.	151.	0.
total	1093174.	11741.	16758.	9120.	0.

APPENDIX B: PERCENTAGE DISTRIBUTIONS OF THE OBSERVED POPULATION BY AGE AND REGION (BOTH SEXES): 1974 AND 1975

percentage distributions
****

region frg

age	population	births	deaths	migration from frg to frg	migration from frg to w-berlin
0	5.6712	0.0000	2.1769	0.0000	4.7415
5	3.0348	0.0000	0.3009	0.0000	3.8663
10	3.2409	0.0000	0.2101	0.0000	2.2406
15	7.2769	9.7552	0.5357	0.0000	3.8542
20	6.8993	32.2399	0.6110	0.0000	29.5871
25	6.3154	23.9741	0.5307	0.0000	16.7945
30	7.4436	18.2703	0.8375	0.0000	11.0223
35	7.9241	8.5607	1.2415	0.0000	6.9211
40	6.2950	2.0540	1.4094	0.0000	4.1017
45	6.2712	0.1459	2.5639	0.0000	2.6532
50	6.0543	0.0000	3.5815	0.0000	1.9243
55	3.8425	0.0000	3.4469	0.0000	1.2463
60	5.6973	0.0000	3.1479	0.0000	1.5593
65	5.2738	0.0000	13.0516	0.0000	1.7947
70	4.1441	0.0000	17.1414	0.0000	1.1771
75	4.6151	0.0000	44.1530	0.0000	1.5149
total	100.0000	100.0000	100.0000	0.0000	100.0000
m.age	36.4720	27.0193	57.4612	0.0000	28.6353

region w-berlin

age	population	births	deaths	migration from w-berlin to frg	migration from w-berlin to w-berlin
0	4.5497	0.0000	1.0626	5.9364	0.0000
5	5.7933	0.0000	0.1117	5.2255	0.0000
10	5.5517	0.0000	0.1039	3.1389	0.0000
15	4.6707	9.0225	0.1689	4.3147	0.0000
20	6.7647	31.2449	0.3397	16.0609	0.0000
25	6.9607	30.4445	0.4780	15.7953	0.0000
30	3.7446	20.5773	0.3417	13.4533	0.0000
35	7.5339	7.3238	1.0314	7.4334	0.0000
40	5.2095	1.2991	1.0574	4.2641	0.0000
45	5.1306	0.0322	1.7343	3.4647	0.0000
50	5.2926	0.0000	2.3070	3.2320	0.0000
55	4.3035	0.0000	2.9201	2.9333	0.0000
60	7.2919	0.0000	7.2353	4.3674	0.0000
65	7.6537	0.0000	12.8935	4.6102	0.0000
70	5.2117	0.0000	16.5463	2.6512	0.0000
75	3.3331	0.0000	51.0678	3.1632	0.0000
total	100.0000	100.0000	100.0000	100.0000	0.0000
m.age	41.7529	27.0036	69.9431	33.3071	0.0000

percentage distributions
****

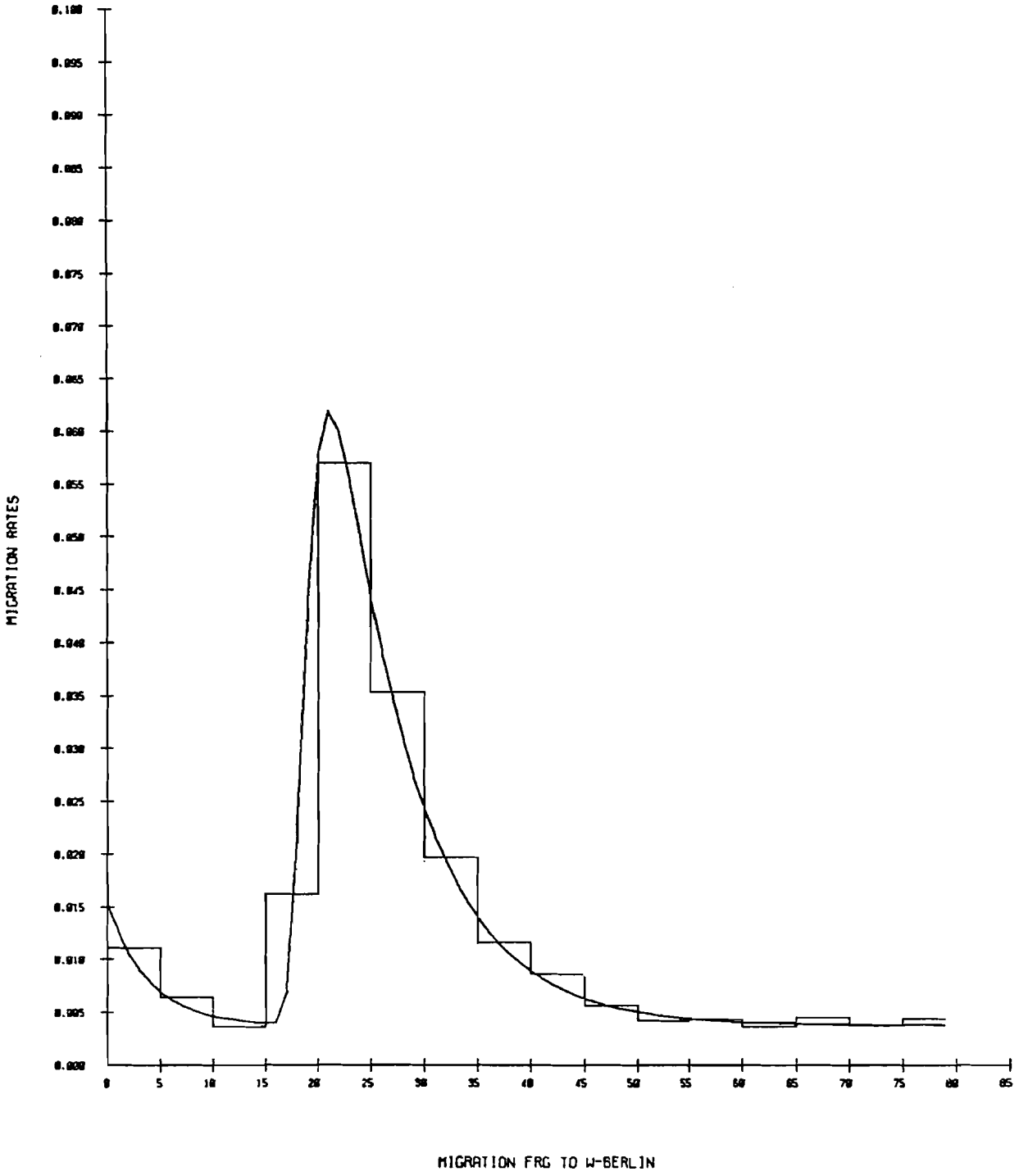
region gdr

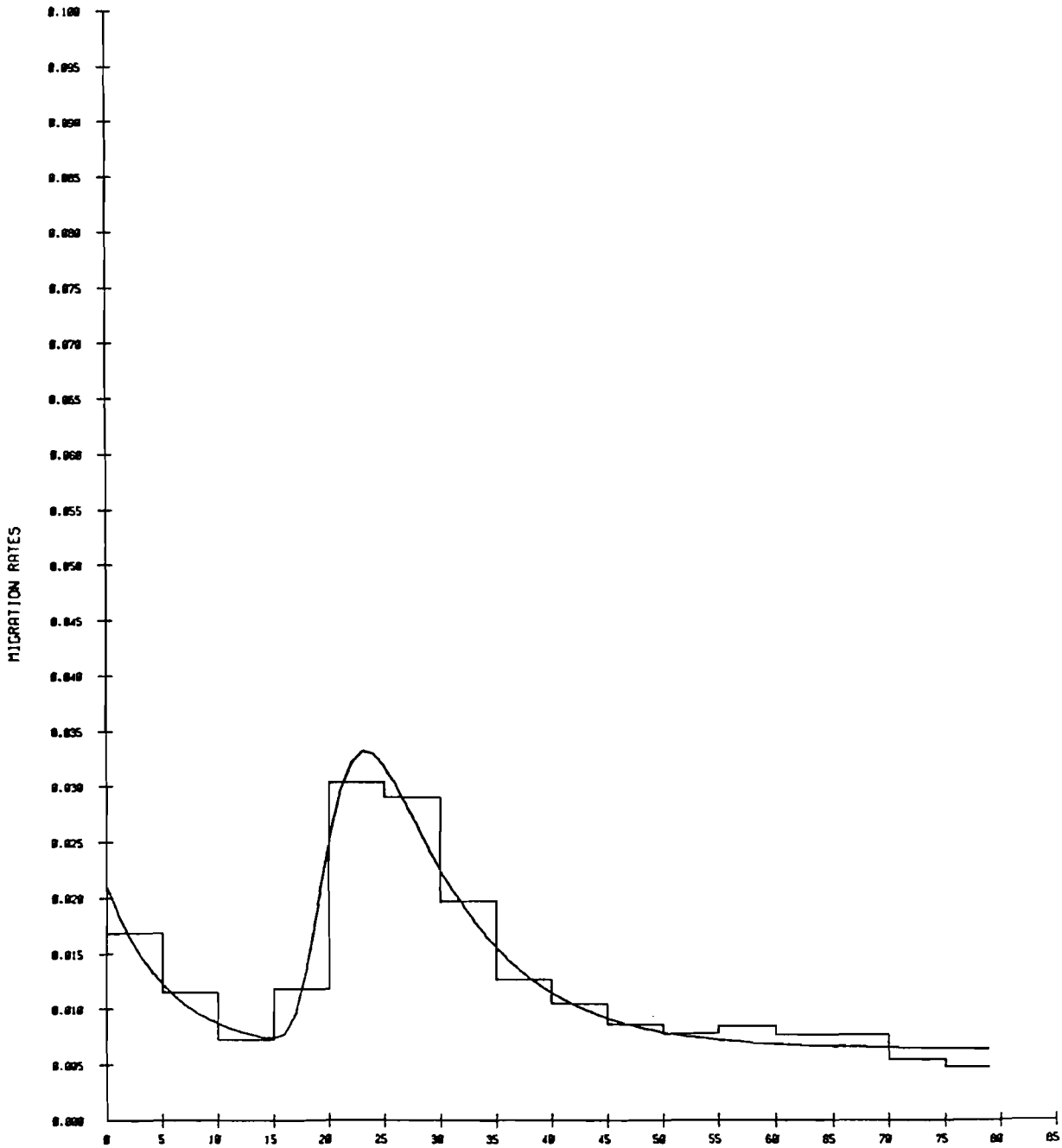
age	population	births	deaths	migration from gdr	migration to e-berlin
0	5.6791	0.0000	1.4393	0.0000	9.3450
5	7.1617	0.0000	0.2097	0.0000	6.7324
10	8.4218	0.0025	0.2060	0.0000	4.9174
15	7.9563	6.9933	0.4413	0.0000	16.7305
20	7.9113	29.6984	0.5759	0.0000	20.9257
25	5.7151	37.7643	0.3579	0.0000	15.9141
30	6.3876	15.5075	0.5801	0.0000	3.5160
35	7.7809	7.0426	0.9194	0.0000	5.6208
40	6.2726	2.5647	1.2334	0.0000	2.7947
45	5.9052	0.4261	1.6719	0.0000	2.1227
50	5.2944	0.0000	2.4263	0.0000	1.2636
55	3.7329	0.0000	2.4313	0.0000	0.7097
60	5.3755	0.0000	6.6713	0.0000	0.9797
65	5.7310	0.0000	11.9382	0.0000	1.0111
70	4.3993	0.0000	17.3686	0.0000	0.8730
75	5.7153	0.0000	50.9785	0.0000	1.5387
total	100.0000	100.0000	100.0000	0.0000	100.0000
m.age	37.1115	27.2649	59.6261	0.0000	24.6315

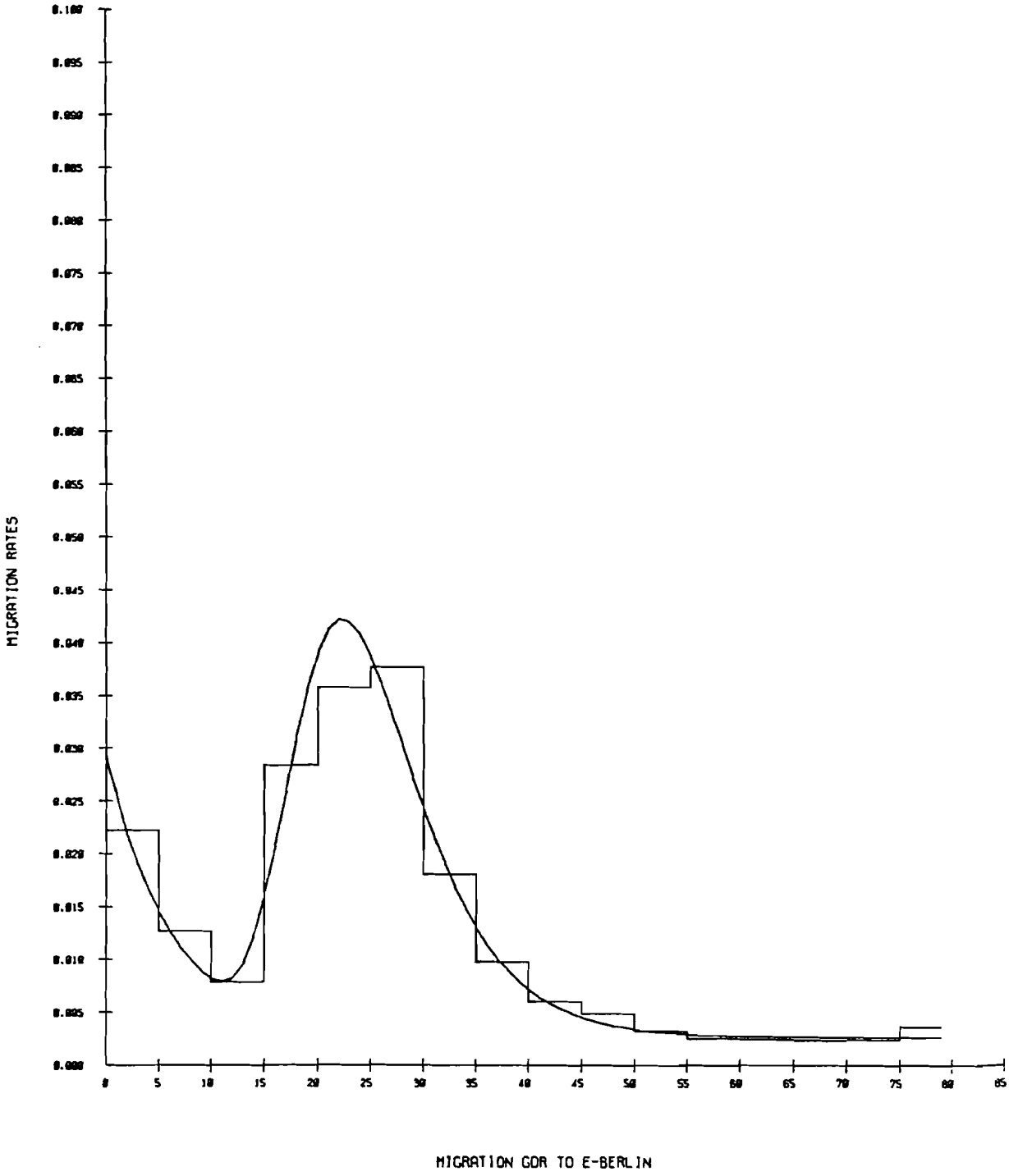
region e-berlin

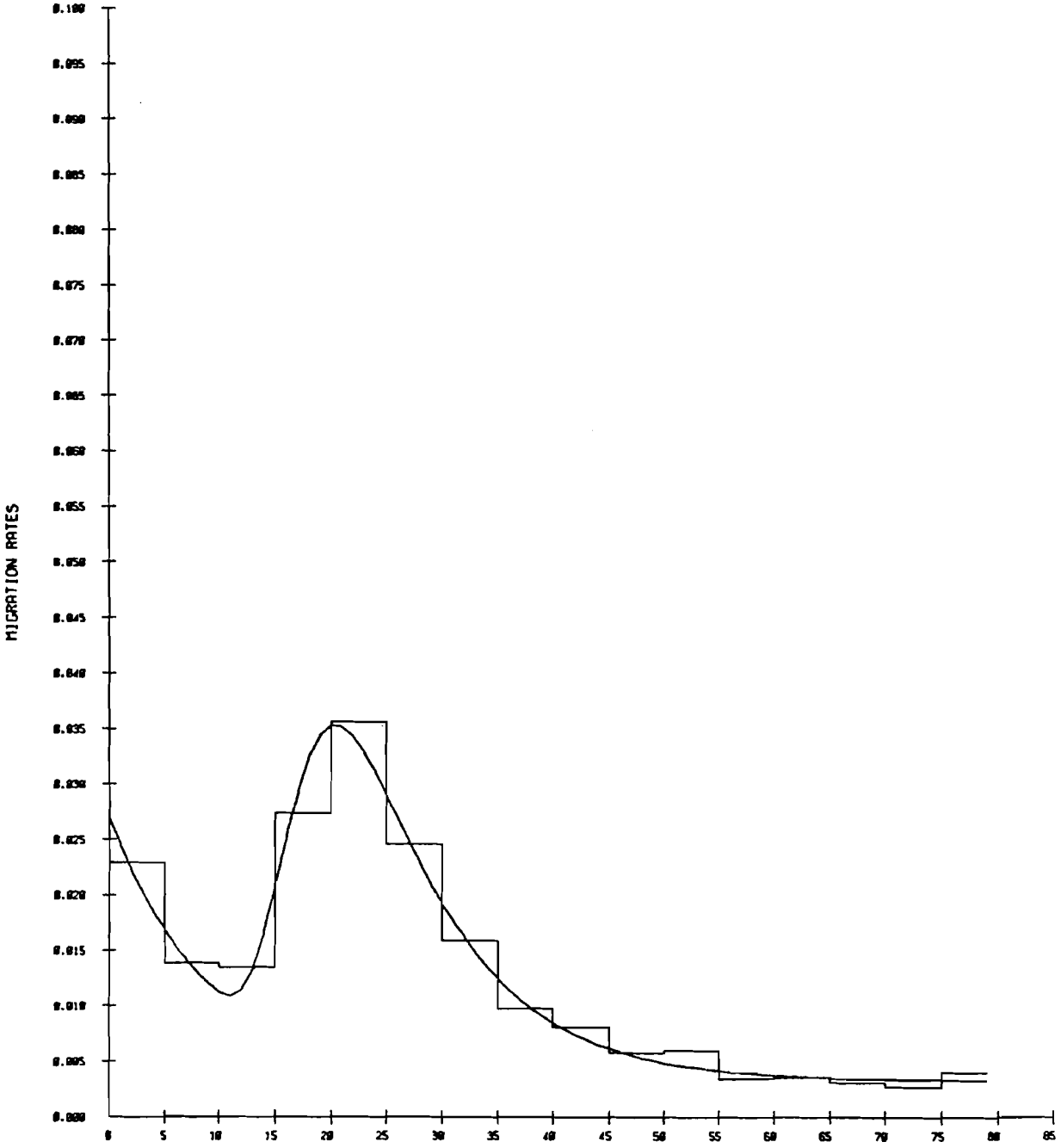
age	population	births	deaths	migration from e-berlin gdr	migration to e-berlin
0	5.7052	0.0000	1.3183	9.8246	0.0000
5	7.1946	0.0000	0.1790	7.4731	0.0000
10	3.4011	0.0000	0.1790	3.4973	0.0000
15	6.6616	0.0170	0.3163	13.7171	0.0000
20	6.6156	12.1625	0.4117	17.6974	0.0000
25	6.0726	46.4271	0.3700	11.2231	0.0000
30	8.2150	24.1337	0.6683	9.8136	0.0000
35	9.1239	12.1455	0.9786	6.7215	0.0000
40	6.9375	4.3012	1.2651	4.2434	0.0000
45	5.7303	0.7580	1.7126	2.4731	0.0000
50	4.4190	0.0000	2.1303	1.9846	0.0000
55	3.5509	0.0000	2.7032	0.9101	0.0000
60	5.1777	0.0000	6.9377	1.3816	0.0000
65	5.8959	0.0000	13.0923	1.3816	0.0000
70	4.7578	0.0000	17.9317	0.9368	0.0000
75	5.4903	0.0000	49.7553	1.6557	0.0000
total	100.0000	100.0000	100.0000	100.0000	0.0000
m.age	37.1221	30.1109	69.6921	25.3893	0.0000

APPENDIX C: MIGRATION SCHEDULES


MIGRATION RATES
MIGRATION FRG TO W-BERLIN


MIGRATION RATES
0.100
0.095
0.090
0.085
0.080
0.075
0.070
0.065
0.060
0.055
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
MIGRATION W-BERLIN TO FRG


MIGRATION RATES
0.100
0.095
0.090
0.085
0.080
0.075
0.070
0.065
0.060
0.055
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
MIGRATION GDR TO E-BERLIN



MIGRATION E-BERLIN TO GDR

APPENDIX D: EXPECTATION OF LIFE BY AGE AND PLACE OF BIRTH: 1974

expectations of life by place of birth

age	initial region of cohort frg		
	total	frg	w-berlin
0	72.20033	71.19597	1.00441
5	68.75734	67.73632	1.02102
10	63.90024	62.89150	1.00874
15	58.99045	57.99393	0.99152
20	54.25236	53.28395	0.96841
25	49.51699	48.60238	0.91461
30	44.74632	43.91682	0.82949
35	40.02296	39.28662	0.73635
40	35.36579	34.72330	0.64249
45	30.79621	30.24587	0.55033
50	26.47523	26.01093	0.46426
55	22.30899	21.92549	0.38350
60	18.36355	18.05398	0.30953
65	14.72863	14.48459	0.24404
70	11.60943	11.41931	0.18962
75	9.07361	8.92739	0.14622

age	initial region of cohort w-berlin		
	total	frg	w-berlin
0	71.86935	42.02552	29.84432
5	68.41904	42.59468	25.82526
10	63.54442	41.71432	21.83010
15	58.64775	40.47717	18.17058
20	53.86224	39.00985	14.85239
25	49.13490	37.01642	12.11848
30	44.39416	34.34558	10.04858
35	39.70895	31.28270	8.42125
40	35.08401	28.04214	7.04188
45	30.56120	24.73456	5.82664
50	26.29373	21.52426	4.76947
55	22.15633	18.33525	3.82158
60	18.25144	15.26087	2.99058
65	14.64050	12.36276	2.27773
70	11.54471	9.84134	1.70337
75	9.01486	7.76052	1.25434

expectations of life by place of birth
****

age	initial region of cohort	gdr	
***	**********		
	total	gdr	e-berlin
0	71.76533	68.97811	2.78722
5	68.03011	65.21296	2.81715
10	63.16707	60.39717	2.76990
15	58.27295	55.56368	2.70427
20	53.49353	50.87329	2.61524
25	48.75350	46.27336	2.48014
30	43.96606	41.67694	2.28912
35	39.23519	37.17222	2.06297
40	34.54534	32.72231	1.82303
45	29.99341	28.41528	1.58314
50	25.56369	24.21860	1.34509
55	21.33590	20.21988	1.11602
60	17.26260	16.36747	0.89513
65	13.64348	12.94491	0.69856
70	10.43189	9.90745	0.52444
75	7.82067	7.43855	0.38212

age	initial region of cohort	e-berlin	
***	**********		
	total	gdr	e-berlin
0	71.27330	22.27730	49.00150
5	67.50372	22.50215	45.00157
10	62.62335	22.10301	40.52444
15	57.72710	21.51068	36.21642
20	52.93079	20.69818	32.23260
25	48.17655	19.53661	28.63994
30	43.38673	18.04477	25.34201
35	38.64537	16.33165	22.26372
40	33.94584	14.62080	19.32504
45	29.30603	12.84300	16.54303
50	24.97719	11.07235	13.90484
55	20.77837	9.34539	11.43443
60	16.73556	7.66572	9.11334
65	13.23723	6.15746	7.07932
70	10.09931	4.80599	5.29382
75	7.52447	3.69677	3.82770

APPENDIX E: AGE-SPECIFIC MULTIREGIONAL POPULATION PROJECTIONS: FRG AND WEST BERLIN, 1974-2024; GDR AND EAST BERLIN, 1975-2025

multiregional population projection
****

year 1974

population

age	total	frg	w-berlin
0	3493458.	3400920.	92538.
5	4936305.	4818346.	117959.
10	5054872.	4941930.	112942.
15	4458872.	4363852.	95020.
20	4275050.	4137431.	137619.
25	3928871.	3787265.	141606.
30	4641743.	4463845.	177893.
35	4905239.	4751972.	153267.
40	3880997.	3775017.	105980.
45	3865118.	3760743.	104375.
50	3738355.	3630684.	107671.
55	2391856.	2304303.	87548.
60	3565237.	3416893.	148344.
65	3318357.	3162652.	155705.
70	2611503.	2485134.	126369.
75	2937160.	2767635.	169525.
total	62003000.	59968632.	2034366.

percentage distribution

age	total	frg	w-berlin
0	5.6343	5.6712	4.5487
5	7.9614	8.0348	5.7983
10	8.1526	8.2409	5.5517
15	7.1914	7.2769	4.6707
20	6.8949	6.8993	6.7647
25	6.3366	6.3154	6.9607
30	7.4863	7.4436	8.7446
35	7.9113	7.9241	7.5339
40	6.2594	6.2950	5.2095
45	6.2338	6.2712	5.1306
50	6.0293	6.0543	5.2926
55	3.8576	3.8425	4.3035
60	5.7501	5.6978	7.2919
65	5.3519	5.2738	7.6537
70	4.2119	4.1441	6.2117
75	4.7371	4.6151	8.3331
total	100.0000	100.0000	100.0000
m.ag	36.6453	36.4720	41.7529
sha	100.0000	96.7189	3.2811

year 1975

population

age	total	gdr	e-berlin
0	916404.	853751.	62653.
5	1155641.	1076632.	79009.
10	1358330.	1266071.	92259.
15	1270738.	1197582.	73156.
20	1261976.	1189325.	72651.
25	925851.	859163.	66688.
30	1050480.	960265.	90215.
35	1269908.	1169712.	100196.
40	1019703.	942968.	76735.
45	950670.	887736.	62934.
50	844446.	795918.	48528.
55	600172.	561177.	38995.
60	864971.	808111.	56860.
65	933811.	869064.	64747.
70	788767.	736518.	52249.
75	919493.	859199.	60299.
total	16131366.	15033192.	1098174.

percentage distribution

age	total	gdr	e-berlin
0	5.6809	5.6791	5.7052
5	7.1639	7.1617	7.1946
10	8.4204	8.4218	8.4011
15	7.8774	7.9663	6.6616
20	7.8231	7.9113	6.6156
25	5.7394	5.7151	6.0726
30	6.5120	6.3876	8.2150
35	7.8723	7.7809	9.1239
40	6.3212	6.2726	6.9875
45	5.8933	5.9052	5.7308
50	5.2348	5.2944	4.4190
55	3.7205	3.7329	3.5509
60	5.3620	5.3755	5.1777
65	5.7888	5.7810	5.8959
70	4.8896	4.8993	4.7578
75	5.7001	5.7153	5.4908
total	100.0000	100.0000	100.0000
m.ag	37.1122	37.1115	37.1221
sha	100.0000	93.1923	6.8077

year 1979

population

age	total	frg	w-berlin
0	3135482.	3052145.	83336.
5	3451165.	3365115.	86051.
10	4927374.	4814493.	112881.
15	5039543.	4926092.	113451.
20	4437276.	4327888.	109389.
25	4253731.	4113003.	140727.
30	3906432.	3774186.	132245.
35	4605393.	4440114.	165278.
40	4851113.	4705777.	145336.
45	3810364.	3710351.	100014.
50	3754892.	3657962.	96930.
55	3581276.	3483432.	97845.
60	2237070.	2160219.	76851.
65	3189335.	3064845.	124490.
70	2752140.	2630302.	121838.
75	4167543.	3988311.	179232.
total	62100132.	60214236.	1885895.

percentage distribution

age	total	frg	w-berlin
0	5.0491	5.0688	4.4189
5	5.5574	5.5886	4.5629
10	7.9346	7.9956	5.9856
15	8.1152	8.1809	6.0158
20	7.1454	7.1875	5.8004
25	6.8498	6.8306	7.4621
30	6.2905	6.2679	7.0123
35	7.4161	7.3739	8.7639
40	7.8118	7.8151	7.7065
45	6.1358	6.1619	5.3032
50	6.0465	6.0749	5.1398
55	5.7669	5.7851	5.1882
60	3.6024	3.5876	4.0750
65	5.1358	5.0899	6.6011
70	4.4318	4.3682	6.4605
75	6.7110	6.6235	9.5038
total	100.0000	100.0000	100.0000
m.ag	38.1290	38.0170	41.7041
sha	100.0000	96.9631	3.0369
lam	1.001567	1.004095	0.927018
r	0.000313	0.000817	-0.015156

year 1980

population

age	total	gdr	e-berlin
0	909119.	847339.	61780.
5	907185.	842953.	64232.
10	1153439.	1073612.	79828.
15	1354488.	1259512.	94976.
20	1264970.	1184761.	80209.
25	1255900.	1173813.	82087.
30	920301.	849485.	71317.
35	1042702.	951561.	91141.
40	1255764.	1155859.	99905.
45	1002330.	926640.	75690.
50	925717.	864372.	61345.
55	811049.	764573.	46476.
60	560634.	524504.	36130.
65	769022.	719149.	49873.
70	764109.	712122.	51987.
75	1070887.	1005123.	65764.
total	15968116.	14855378.	1112738.

percentage distribution

age	total	gdr	e-berlin
0	5.6933	5.7039	5.5521
5	5.6812	5.6744	5.7724
10	7.2234	7.2271	7.1740
15	8.4825	8.4785	8.5353
20	7.9218	7.9753	7.2082
25	7.8650	7.9016	7.3770
30	5.7665	5.7184	6.4091
35	6.5299	6.4055	8.1907
40	7.8642	7.7807	8.9783
45	6.2771	6.2377	6.8021
50	5.7973	5.8186	5.5130
55	5.0792	5.1463	4.1767
60	3.5110	3.5307	3.2470
65	4.8160	4.8410	4.4820
70	4.7852	4.7937	4.6720
75	6.7064	6.7661	5.9101
total	100.0000	100.0000	100.0000
m.ag	37.6238	37.6606	37.1321
sha	100.0000	93.0315	6.9685
lam	0.989880	0.988172	1.013262
r	-0.002034	-0.002380	0.002635

year 1984

population

age	total	frg	w-berlin
0	3247521.	3168478.	79042.
5	3097522.	3020048.	77474.
10	3444921.	3362739.	82183.
15	4912433.	4799305.	113127.
20	5015138.	4886565.	128573.
25	4415174.	4293842.	121332.
30	4229459.	4096061.	133399.
35	3875892.	3751519.	124373.
40	4554474.	4399223.	155251.
45	4762731.	4626292.	136439.
50	3701723.	3608732.	92991.
55	3597218.	3508791.	88428.
60	3349876.	3263255.	85521.
65	2001396.	1936598.	64797.
70	2645443.	2547626.	97816.
75	4392933.	4219377.	173556.
total	61243856.	59488452.	1755403.

percentage distribution

age	total	frg	w-berlin
0	5.3026	5.3262	4.5023
5	5.0577	5.0767	4.4135
10	5.6249	5.6528	4.6817
15	8.0211	8.0676	6.4445
20	8.1888	8.2143	7.3244
25	7.2092	7.2179	6.9119
30	6.9059	6.8355	7.5993
35	6.3286	6.3063	7.0851
40	7.4366	7.3951	8.8442
45	7.7767	7.7768	7.7725
50	6.0442	6.0663	5.2974
55	5.8736	5.8983	5.0375
60	5.4697	5.4855	4.9346
65	3.2679	3.2554	3.6913
70	4.3195	4.2826	5.5723
75	7.1729	7.0928	9.8870
total	100.0000	100.0000	100.0000
m.ag	38.7814	38.7039	41.2385
sha	100.0000	97.1338	2.8663
lam	0.986211	0.987947	0.930806
r	-0.002777	-0.002425	-0.014341

year 1985

population

age	total	gdr	e-berlin
0	977349.	910344.	67005.
5	899973.	836600.	63373.
10	905456.	840687.	64770.
15	1150177.	1068146.	82031.
20	1348346.	1247688.	100657.
25	1258830.	1170009.	88871.
30	1249049.	1160038.	89011.
35	913982.	841453.	72529.
40	1031091.	940554.	90537.
45	1234362.	1135967.	98395.
50	975991.	902428.	73563.
55	889050.	830452.	58597.
60	757689.	714541.	43148.
65	498456.	466756.	31700.
70	629334.	589253.	40081.
75	1037238.	971875.	65363.
total	15756422.	14626791.	1129631.

percentage distribution

age	total	gdr	e-berlin
0	6.2029	6.2238	5.9315
5	5.7118	5.7196	5.6101
10	5.7466	5.7476	5.7337
15	7.2997	7.3027	7.2617
20	8.5574	8.5302	8.9106
25	7.9896	7.9991	7.8672
30	7.9272	7.9309	7.8797
35	5.8007	5.7523	6.4206
40	6.5439	6.4303	8.0147
45	7.8340	7.7663	8.7104
50	6.1942	6.1697	6.5121
55	5.6425	5.6776	5.1873
60	4.8088	4.8852	3.8195
65	3.1635	3.1911	2.8062
70	3.9941	4.0286	3.5481
75	6.5830	6.6445	5.7862
total	100.0000	100.0000	100.0000
m.ag	37.5905	37.6379	36.9770
sha	100.0000	92.8307	7.1693
lam	0.986743	0.984613	1.015181
r	-0.002669	-0.003101	0.003013

year 1989

population

age	total	frg	w-berlin
0	3341962.	3263874.	78088.
5	3208204.	3134211.	73993.
10	3091918.	3017937.	73981.
15	3434477.	3352415.	82061.
20	4888644.	4761245.	127399.
25	4990153.	4849368.	140785.
30	4390027.	4270787.	119240.
35	4196423.	4070009.	126414.
40	3833108.	3715396.	117711.
45	4471360.	4326566.	144794.
50	4626846.	4500441.	126405.
55	3546304.	3461382.	84922.
60	3364895.	3286319.	78575.
65	2997306.	2923625.	73681.
70	1660252.	1609082.	51170.
75	4224252.	4083518.	140734.
total	60266128.	58626172.	1639956.

percentage distribution

age	total	frg	w-berlin
0	5.5453	5.5673	4.7616
5	5.3234	5.3461	4.5119
10	5.1304	5.1478	4.5112
15	5.6989	5.7183	5.0039
20	8.1118	8.1214	7.7684
25	8.2802	8.2717	8.5847
30	7.2844	7.2848	7.2709
35	6.9632	6.9423	7.7084
40	6.3603	6.3374	7.1777
45	7.4194	7.3799	8.8291
50	7.6774	7.6765	7.7073
55	5.8844	5.9042	5.1783
60	5.5834	5.6055	4.7913
65	4.9735	4.9869	4.4929
70	2.7549	2.7446	3.1202
75	7.0093	6.9653	8.5816
total	100.0000	100.0000	100.0000
m.ag	39.1750	39.1388	40.4631
sha	100.0000	97.2788	2.7212
lam	0.984035	0.985505	0.934233
r	-0.003219	-0.002920	-0.013606

year 1990

population

age	total	gdr	e-berlin
0	993511.	919630.	73881.
5	967516.	893841.	68675.
10	898258.	834335.	63923.
15	902896.	836544.	66352.
20	1144962.	1058256.	86706.
25	1341857.	1233601.	108255.
30	1252014.	1156710.	95304.
35	1239797.	1148742.	91055.
40	903802.	831499.	72302.
45	1013509.	924562.	88947.
50	1201910.	1106384.	95526.
55	937271.	867148.	70123.
60	830472.	776191.	54281.
65	673745.	635816.	37929.
70	407926.	382444.	25483.
75	854630.	804099.	50532.
total	15564078.	14414803.	1149275.

percentage distribution

age	total	gdr	e-berlin
0	6.3834	6.3798	6.4285
5	6.2163	6.2355	5.9755
10	5.7714	5.7880	5.5621
15	5.8012	5.8034	5.7734
20	7.3564	7.3414	7.5444
25	8.6215	8.5579	9.4195
30	8.0443	8.0245	8.2925
35	7.9658	7.9692	7.9223
40	5.8070	5.7684	6.2911
45	6.5118	6.4140	7.7394
50	7.7223	7.6753	8.3118
55	6.0220	6.0157	6.1015
60	5.3358	5.3847	4.7231
65	4.3288	4.4109	3.3003
70	2.6209	2.6531	2.2173
75	5.4910	5.5783	4.3958
total	100.0000	100.0000	100.0000
m.ag	37.4807	37.5441	36.6852
sha	100.0000	92.6159	7.3841
lam	0.987793	0.985507	1.017390
r	-0.002456	-0.002920	0.003448

year 1994

population

age	total	frg	w-berlin
0	3198817.	3124573.	74244.
5	3301502.	3228152.	73350.
10	3202399.	3131469.	70931.
15	3082543.	3008691.	73852.
20	3417846.	3326356.	91491.
25	4854287.	4725524.	138763.
30	4961725.	4824118.	137606.
35	4355793.	4240779.	115014.
40	4150139.	4029943.	120197.
45	3763252.	3652892.	110360.
50	4343659.	4210120.	133539.
55	4432495.	4317416.	115079.
60	3317293.	3241759.	75534.
65	3010844.	2943752.	67091.
70	2486694.	2427965.	58729.
75	2651958.	2577451.	74507.
total	58541248.	57010960.	1530287.

percentage distribution

age	total	frg	w-berlin
0	5.4642	5.4807	4.8516
5	5.6396	5.6623	4.7932
10	5.4703	5.4927	4.6351
15	5.2656	5.2774	4.8261
20	5.8394	5.8346	5.9787
25	8.3092	8.2888	9.0678
30	8.4756	8.4617	8.9922
35	7.4406	7.4385	7.5158
40	7.0893	7.0687	7.8545
45	6.4284	6.4074	7.2117
50	7.4198	7.3848	8.7264
55	7.5716	7.5730	7.5201
60	5.6666	5.6862	4.9359
65	5.1431	5.1635	4.3842
70	4.2478	4.2588	3.8373
75	4.5301	4.5210	4.8689
total	100.0000	100.0000	100.0000
m.ag	39.2274	39.2133	39.7537
sha	100.0000	97.3850	2.6140
lam	0.971379	0.972449	0.933127
r	-0.005808	-0.005588	-0.013843

year 1995

population

age	total	gdr	e-berlin
0	939040.	863395.	75646.
5	983518.	908355.	75163.
10	965673.	896432.	69241.
15	895718.	830202.	65516.
20	898803.	828992.	69811.
25	1139452.	1046427.	93025.
30	1334538.	1220469.	114069.
35	1242740.	1145702.	97038.
40	1225986.	1134938.	91049.
45	888398.	817199.	71199.
50	986837.	900640.	86197.
55	1154194.	1063205.	90989.
60	875421.	810577.	64844.
65	738355.	690740.	47615.
70	551474.	520927.	30548.
75	554023.	521869.	32154.
total	15374172.	14200069.	1174103.

percentage distribution

age	total	gdr	e-berlin
0	6.1079	6.0802	6.4428
5	6.3972	6.3968	6.4017
10	6.2811	6.3129	5.8973
15	5.8261	5.8465	5.5801
20	5.8462	5.8379	5.9459
25	7.4115	7.3692	7.9231
30	8.6804	8.5948	9.7154
35	8.0833	8.0683	8.2648
40	7.9743	7.9925	7.7548
45	5.7785	5.7549	6.0642
50	6.4188	6.3425	7.3415
55	7.5074	7.4873	7.7496
60	5.6941	5.7083	5.5228
65	4.8026	4.8643	4.0554
70	3.5870	3.6685	2.6018
75	3.6036	3.6751	2.7386
total	100.0000	100.0000	100.0000
m.ag	37.6575	37.7273	36.3129
sha	100.0000	92.3632	7.6369
lam	0.987793	0.985103	1.021604
r	-0.002455	-0.003002	0.004275

year 1999

population

age	total	frg	w-berlin
0	2845723.	2779510.	66213.
5	3160090.	3090311.	69779.
10	3295529.	3225082.	70447.
15	3192688.	3121379.	71309.
20	3067618.	2985339.	82279.
25	3400816.	3302011.	98805.
30	4836573.	4701249.	135324.
35	4923024.	4790641.	132383.
40	4307829.	4197312.	110516.
45	4074559.	3961510.	113048.
50	3655854.	3553713.	102151.
55	4161071.	4039978.	121093.
60	4146159.	4044103.	102057.
65	2968274.	2903715.	64559.
70	2498011.	2444323.	53688.
75	3973563.	3886188.	87375.
total	58507392.	57026364.	1481027.

percentage distribution

age	total	frg	w-berlin
0	4.8639	4.8741	4.4708
5	5.4012	5.4191	4.7115
10	5.6327	5.6554	4.7566
15	5.4569	5.4736	4.8148
20	5.2431	5.2350	5.5555
25	5.8126	5.7903	6.6714
30	8.2666	8.2440	9.1372
35	8.4144	8.4007	8.9386
40	7.3629	7.3603	7.4621
45	6.9642	6.9468	7.6331
50	6.2485	6.2317	6.8973
55	7.1120	7.0844	8.1763
60	7.0866	7.0916	6.8910
65	5.0733	5.0919	4.3591
70	4.2695	4.2863	3.6251
75	6.7916	6.8147	5.8996
total	100.0000	100.0000	100.0000
m.ag	40.8256	40.8242	40.8777
sha	100.0000	97.4687	2.5314
lam	0.999422	1.000270	0.967810
r	-0.000116	0.000054	-0.006544

year 2000

population

age	total	gdr	e-berlin
0	834810.	765586.	69224.
5	929597.	853159.	76438.
10	981645.	906160.	75485.
15	962943.	892026.	70917.
20	891657.	822677.	68981.
25	894473.	819895.	74583.
30	1133237.	1035360.	97877.
35	1324657.	1209384.	115273.
40	1228899.	1132104.	96795.
45	1205100.	1115258.	89842.
50	865041.	795925.	69116.
55	947606.	865508.	81997.
60	1077976.	993894.	84082.
65	778199.	721415.	56785.
70	604242.	565973.	38269.
75	749470.	710711.	38759.
total	15409557.	14205133.	1204424.

percentage distribution

age	total	gdr	e-berlin
0	5.4175	5.3895	5.7475
5	6.0326	6.0060	6.3464
10	6.3704	6.3791	6.2673
15	6.2490	6.2795	5.8880
20	5.7864	5.7914	5.7273
25	5.8047	5.7718	6.1924
30	7.3541	7.2886	3.1265
35	8.5963	8.5137	9.5708
40	7.9749	7.9697	8.0366
45	7.8205	7.8511	7.4593
50	5.6137	5.6031	5.7335
55	6.1495	6.0936	6.8080
60	6.9955	6.9957	6.9811
65	5.0501	5.0786	4.7147
70	3.9212	3.9843	3.1774
75	4.8637	5.0032	3.2181
total	100.0000	100.0000	100.0000
m.ag	38.9701	39.0622	37.8345
sha	100.0000	92.1839	7.8161
lam	1.002302	1.000357	1.025824
r	0.000460	0.000071	0.005099

year 2004

population

age	total	frg	w-berlin
0	2537475.	2478884.	58591.
5	2811271.	2749053.	62218.
10	3154372.	3087334.	67038.
15	3285533.	3214468.	71065.
20	3177226.	3096233.	80993.
25	3052332.	2963531.	88801.
30	3381437.	3285435.	96002.
35	4798845.	4668800.	130046.
40	4868802.	4741791.	127011.
45	4229479.	4124789.	104690.
50	3958337.	3853468.	104868.
55	3502279.	3409354.	92925.
60	3892128.	3785143.	106985.
65	3709342.	3622876.	86966.
70	2462711.	2410996.	51715.
75	3992095.	3911499.	80596.
total	56814168.	55403656.	1410510.

percentage distribution

age	total	frg	w-berlin
0	4.4663	4.4742	4.1539
5	4.9482	4.9619	4.4110
10	5.5521	5.5724	4.7527
15	5.7829	5.8019	5.0382
20	5.5923	5.5885	5.7421
25	5.3725	5.3490	6.2957
30	5.9517	5.9300	6.8062
35	8.4466	8.4269	9.2193
40	8.5697	8.5586	9.0046
45	7.4444	7.4450	7.4222
50	6.9672	6.9553	7.4343
55	6.1644	6.1537	6.5880
60	6.8506	6.8319	7.5848
65	6.5298	6.5391	6.1656
70	4.3347	4.3517	3.6664
75	7.0266	7.0600	5.7140
total	100.0000	100.0000	100.0000
m.ag	41.6843	41.6855	41.6358
sha	100.0000	97.5173	2.4827
lam	0.971060	0.971545	0.952386
r	-0.005873	-0.005774	-0.009757

year 2005

population

age	total	gdr	e-berlin
0	756845.	703609.	63236.
5	826416.	756629.	69786.
10	927828.	851340.	76487.
15	978871.	902039.	76832.
20	958577.	883988.	74589.
25	887367.	813622.	73745.
30	889599.	811327.	78272.
35	1124847.	1025999.	98847.
40	1309906.	1195379.	114527.
45	1207956.	1112599.	95357.
50	1173436.	1036095.	37341.
55	830695.	764867.	65828.
60	884947.	809257.	75690.
65	958193.	884609.	73585.
70	636722.	591159.	45563.
75	820582.	772323.	48259.
total	15182788.	13964843.	1217945.

percentage distribution

age	total	gdr	e-berlin
0	5.0508	5.0384	5.1920
5	5.4431	5.4181	5.7298
10	6.1110	6.0963	6.2800
15	6.4472	6.4594	6.3083
20	6.3136	6.3301	6.1242
25	5.8446	5.8262	6.0549
30	5.8593	5.8093	6.4266
35	7.4037	7.3470	8.1159
40	8.6276	8.5599	9.4033
45	7.9561	7.9671	7.8294
50	7.7287	7.7774	7.1712
55	5.4713	5.4771	5.4048
60	5.8286	5.7959	6.2145
65	6.3111	6.3345	6.0417
70	4.1937	4.2332	3.7410
75	5.4047	5.5305	3.9623
total	100.0000	100.0000	100.0000
m.ag	39.9183	40.0022	38.9569
sha	100.0000	91.9781	8.0219
lam	0.985284	0.933084	1.011227
r	-0.002965	-0.003412	0.002233

year 2009

population

age	total	frg	w-berlin
0	2383109.	2328911.	54197.
5	2506754.	2451663.	55091.
10	2806184.	2746418.	59767.
15	3144805.	3077140.	67665.
20	3269621.	3188162.	81459.
25	3161398.	3072548.	88850.
30	3034938.	2948681.	86258.
35	3355056.	3262963.	92092.
40	4745986.	4521298.	124688.
45	4780235.	4560044.	120191.
50	4108937.	4011346.	97590.
55	3792096.	3696518.	95578.
60	3276013.	3193665.	82348.
65	3482412.	3391600.	90812.
70	3077897.	3008450.	69447.
75	3935785.	3857969.	77815.
total	54861216.	53517368.	1343849.

percentage distribution

age	total	frg	w-berlin
0	4.3439	4.3517	4.0330
5	4.5693	4.5811	4.0995
10	5.1151	5.1318	4.4474
15	5.7323	5.7498	5.0352
20	5.9598	5.9572	6.0616
25	5.7625	5.7412	6.6116
30	5.5320	5.5098	6.4187
35	6.1155	6.0970	6.8529
40	8.6509	8.6351	9.2785
45	8.7133	8.7075	8.9438
50	7.4897	7.4954	7.2620
55	6.9122	6.9071	7.1122
60	5.9715	5.9575	6.1277
65	6.3477	6.3374	6.7576
70	5.6103	5.6214	5.1678
75	7.1741	7.2038	5.7905
total	100.0000	100.0000	100.0000
m.ag	42.4770	42.4789	42.4025
sha	100.0000	97.5505	2.4495
lam	0.965526	0.965954	0.952739
r	-0.006996	-0.006928	-0.009683

year 2010

population

age	total	gdr	e-berlin
0	755499.	693470.	62029.
5	759134.	695357.	63777.
10	824843.	755100.	69743.
15	925206.	847806.	77401.
20	974435.	894382.	80053.
25	953964.	874300.	79664.
30	882527.	805104.	77423.
35	883013.	804054.	78959.
40	1112321.	1014147.	98174.
45	1287570.	1175042.	112528.
50	1176201.	1083607.	92594.
55	1126891.	1043618.	83273.
60	775836.	715009.	60827.
65	786510.	720340.	66170.
70	783923.	724916.	59007.
75	864036.	806862.	57174.
total	14871911.	13653113.	1218798.

percentage distribution

age	total	gdr	e-berlin
0	5.0800	5.0792	5.0894
5	5.1045	5.0930	5.2328
10	5.5463	5.5306	5.7223
15	6.2212	6.2096	6.3506
20	6.5522	6.5508	6.5682
25	6.4145	6.4037	6.5363
30	5.9342	5.8969	6.3524
35	5.9375	5.8892	6.4735
40	7.4793	7.4280	8.0550
45	8.6577	8.6064	9.2327
50	7.9089	7.9367	7.5972
55	7.5773	7.6438	6.8324
60	5.2168	5.2370	4.9908
65	5.2886	5.2760	5.4291
70	5.2712	5.3095	4.8414
75	5.8099	5.9097	4.6910
total	100.0000	100.0000	100.0000
m.ag	40.6400	40.7175	39.7711
sha	100.0000	91.8047	8.1953
lam	0.979524	0.977678	1.000700
r	-0.004138	-0.004515	0.000140

year 2014

population

age	total	frg	w-berlin
0	2308956.	2257052.	51904.
5	2354257.	2303229.	51028.
10	2502218.	2449278.	52940.
15	2797673.	2737360.	60313.
20	3129574.	3051894.	77679.
25	3253334.	3163298.	90037.
30	3143388.	3056476.	86913.
35	3011261.	2928526.	82735.
40	3318094.	3229839.	88205.
45	4659647.	4541705.	117942.
50	4643981.	4532020.	111961.
55	3936471.	3847151.	89320.
60	3547160.	3462309.	84852.
65	2931245.	2861128.	70117.
70	2889095.	2816871.	72223.
75	4918538.	4814776.	103762.
total	53344892.	52052960.	1291931.

percentage distribution

age	total	frg	w-berlin
0	4.3284	4.3361	4.0176
5	4.4133	4.4248	3.9497
10	4.6906	4.7054	4.0973
15	5.2445	5.2588	4.6685
20	5.8667	5.8631	6.0127
25	6.0937	6.0771	6.9691
30	5.8926	5.8719	6.7273
35	5.6449	5.6261	6.4039
40	6.2201	6.2050	6.8274
45	8.7349	8.7252	9.1291
50	8.7056	8.7066	8.6662
55	7.3793	7.3908	6.9137
60	6.6495	6.6515	6.5673
65	5.4949	5.4966	5.4273
70	5.4159	5.4115	5.5903
75	9.2203	9.2493	8.0315
total	100.0000	100.0000	100.0000
m.ag	43.5157	43.5188	43.3919
sha	100.0000	97.5731	2.4218
lam	0.972361	0.972637	0.961356
r	-0.005606	-0.005549	-0.007880

year 2015

population

age	total	gdr	e-berlin
0	755244.	691689.	63555.
5	747902.	685320.	62582.
10	757689.	693936.	63754.
15	822513.	752080.	70433.
20	921015.	841087.	79928.
25	969745.	884991.	84756.
30	948762.	865172.	83589.
35	875993.	797876.	78117.
40	873181.	794806.	78375.
45	1093353.	996914.	96439.
50	1253687.	1144631.	109057.
55	1129511.	1041303.	88209.
60	1052540.	975524.	77016.
65	689622.	636392.	53230.
70	643352.	590347.	53005.
75	1063424.	989521.	73903.
total	14597537.	13381589.	1215948.

percentage distribution

age	total	gdr	e-berlin
0	5.1738	5.1690	5.2268
5	5.1235	5.1214	5.1468
10	5.1905	5.1857	5.2431
15	5.6346	5.6203	5.7925
20	6.3094	6.2854	6.5733
25	6.6432	6.6135	6.9703
30	6.4995	6.4654	6.8744
35	6.0010	5.9625	6.4244
40	5.9817	5.9395	6.4456
45	7.4900	7.4499	7.9311
50	8.5883	8.5538	8.9639
55	7.7377	7.7816	7.2543
60	7.2104	7.2900	6.3338
65	4.7242	4.7557	4.3777
70	4.4073	4.4116	4.3592
75	7.2850	7.3946	6.0778
total	100.0000	100.0000	100.0000
m.ag	41.3521	41.4390	40.3957
sha	100.0000	91.6702	8.3293
lam	0.931551	0.930113	0.997662
r	-0.003724	-0.004018	-0.000468

year 2019

population

age	total	frg	w-berlin
0	2215371.	2165872.	49500.
5	2281002.	2232083.	48919.
10	2349997.	2300927.	49071.
15	2494629.	2441170.	53459.
20	2784124.	2714923.	69201.
25	3113935.	3028019.	85965.
30	3234804.	3146449.	88354.
35	3118871.	3035226.	83645.
40	2978037.	2893350.	79236.
45	3257724.	3174351.	83373.
50	4526823.	4416990.	109834.
55	4449043.	4346632.	102411.
60	3682317.	3602705.	79612.
65	3173908.	3101525.	72383.
70	2431911.	2375963.	55947.
75	4616235.	4509324.	106911.
total	50708828.	49491008.	1217820.

percentage distribution

age	total	frg	w-berlin
0	4.3688	4.3763	4.0646
5	4.4982	4.5101	4.0169
10	4.6343	4.6492	4.0294
15	4.9195	4.9326	4.3897
20	5.4904	5.4857	5.6823
25	6.1409	6.1183	7.0589
30	6.3792	6.3576	7.2551
35	6.1505	6.1329	6.8684
40	5.8729	5.8573	6.5064
45	6.4244	6.4140	6.8461
50	8.9271	8.9248	9.0189
55	8.7737	8.7827	8.4094
60	7.2617	7.2795	6.5373
65	6.2591	6.2668	5.9436
70	4.7958	4.8008	4.5940
75	9.1034	9.1114	8.7789
total	100.0000	100.0000	100.0000
m.ag	43.7653	43.7682	43.6475
sha	100.0000	97.5934	2.4016
lam	0.950585	0.950782	0.942636
r	-0.010136	-0.010094	-0.011815

year 2020

population

age	total	gdr	e-berlin
0	733140.	668637.	64503.
5	747650.	683654.	63997.
10	746479.	683908.	62571.
15	755549.	691140.	64409.
20	818788.	746283.	72505.
25	916584.	832671.	83914.
30	964458.	876003.	88455.
35	941737.	857421.	84316.
40	866239.	788693.	77546.
45	858289.	781331.	76958.
50	1064579.	971130.	93448.
55	1203851.	1100101.	103749.
60	1054933.	973410.	81522.
65	935663.	868208.	67454.
70	564192.	521510.	42682.
75	872161.	805983.	66178.
total	14044290.	12850082.	1194208.

percentage distribution

age	total	gdr	e-berlin
0	5.2202	5.2034	5.4013
5	5.3235	5.3202	5.3589
10	5.3152	5.3222	5.2395
15	5.3798	5.3785	5.3935
20	5.8300	5.8076	6.0714
25	6.5264	6.4799	7.0267
30	6.8673	6.8171	7.4070
35	6.7055	6.6725	7.0604
40	6.1679	6.1376	6.4935
45	6.1113	6.0804	6.4443
50	7.5802	7.5574	7.8251
55	8.5718	8.5610	8.6877
60	7.5115	7.5751	6.8265
65	6.6622	6.7564	5.6485
70	4.0172	4.0584	3.5741
75	6.2101	6.2722	5.5416
total	100.0000	100.0000	100.0000
m.ag	41.3381	41.4273	40.3787
sha	100.0000	91.4968	8.5032
lam	0.962100	0.960281	0.932121
r	-0.007727	-0.008106	-0.003608

year 2024

population

age	total	frg	w-berlin
0	2068361.	2022332.	46029.
5	2188550.	2141873.	46677.
10	2276875.	2229806.	47069.
15	2342369.	2293253.	49616.
20	2482547.	2421104.	61443.
25	2770256.	2693709.	76547.
30	3096248.	3011845.	84403.
35	3209577.	3124414.	85162.
40	3084521.	3004253.	80269.
45	2923902.	2849010.	74892.
50	3164856.	3087252.	77604.
55	4336797.	4236358.	100439.
60	4161780.	4070551.	91229.
65	3294943.	3226754.	68189.
70	2633280.	2575413.	57866.
75	3886149.	3802710.	83439.
total	47921508.	46790636.	1130873.

percentage distribution

age	total	frg	w-berlin
0	4.3161	4.3221	4.0702
5	4.5669	4.5776	4.1276
10	4.7513	4.7655	4.1622
15	4.8890	4.9011	4.3874
20	5.1804	5.1743	5.4332
25	5.7808	5.7569	6.7688
30	6.4611	6.4359	7.4635
35	6.6976	6.6774	7.5307
40	6.4366	6.4206	7.0930
45	6.1014	6.0888	6.6225
50	6.6042	6.5930	6.8623
55	9.0498	9.0539	8.8816
60	8.6846	8.6995	8.0671
65	6.8757	6.8962	6.0293
70	5.4950	5.5041	5.1170
75	8.1094	8.1271	7.3783
total	100.0000	100.0000	100.0000
m.ag	43.9089	43.9201	43.4449
sha	100.0000	97.6402	2.3598
lam	0.945033	0.945437	0.928504
r	-0.011307	-0.011222	-0.014814

tolerance level for eigenvalue 0.1000e-05
number of iterations to reach stability 59

year 2025

population

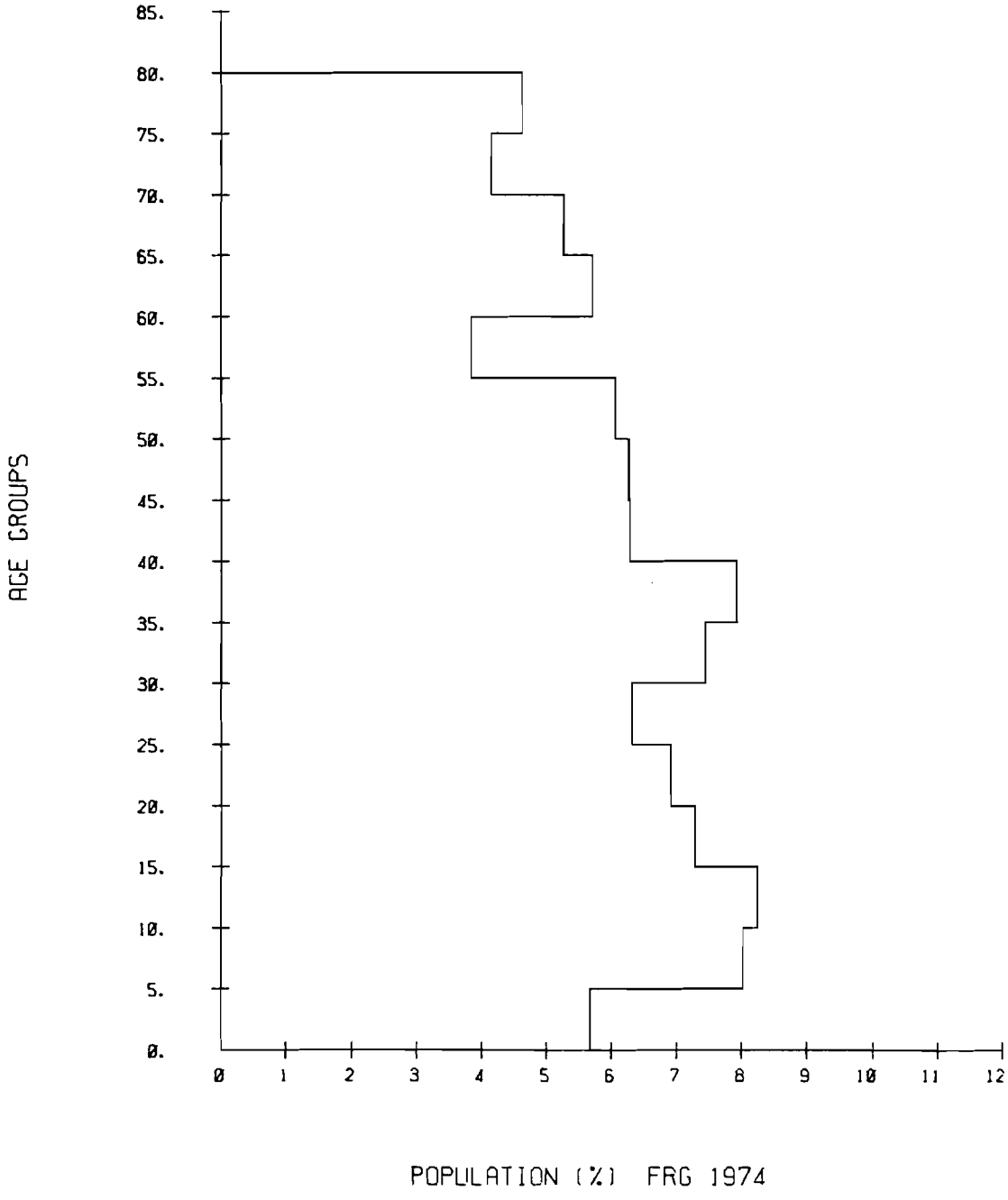
age	total	gdr	e-berlin
0	687598.	624999.	62599.
5	725769.	661041.	64729.
10	746227.	682310.	63917.
15	744370.	681137.	63233.
20	752127.	685783.	66343.
25	814849.	738957.	75392.
30	911586.	824469.	87117.
35	957318.	868304.	89014.
40	931251.	847562.	83689.
45	851466.	775317.	76149.
50	835697.	761147.	74551.
55	1022253.	933364.	88890.
60	1124253.	1028481.	95773.
65	937723.	866370.	71353.
70	765574.	711441.	54133.
75	765324.	711876.	53447.
total	13573385.	12402556.	1170829.

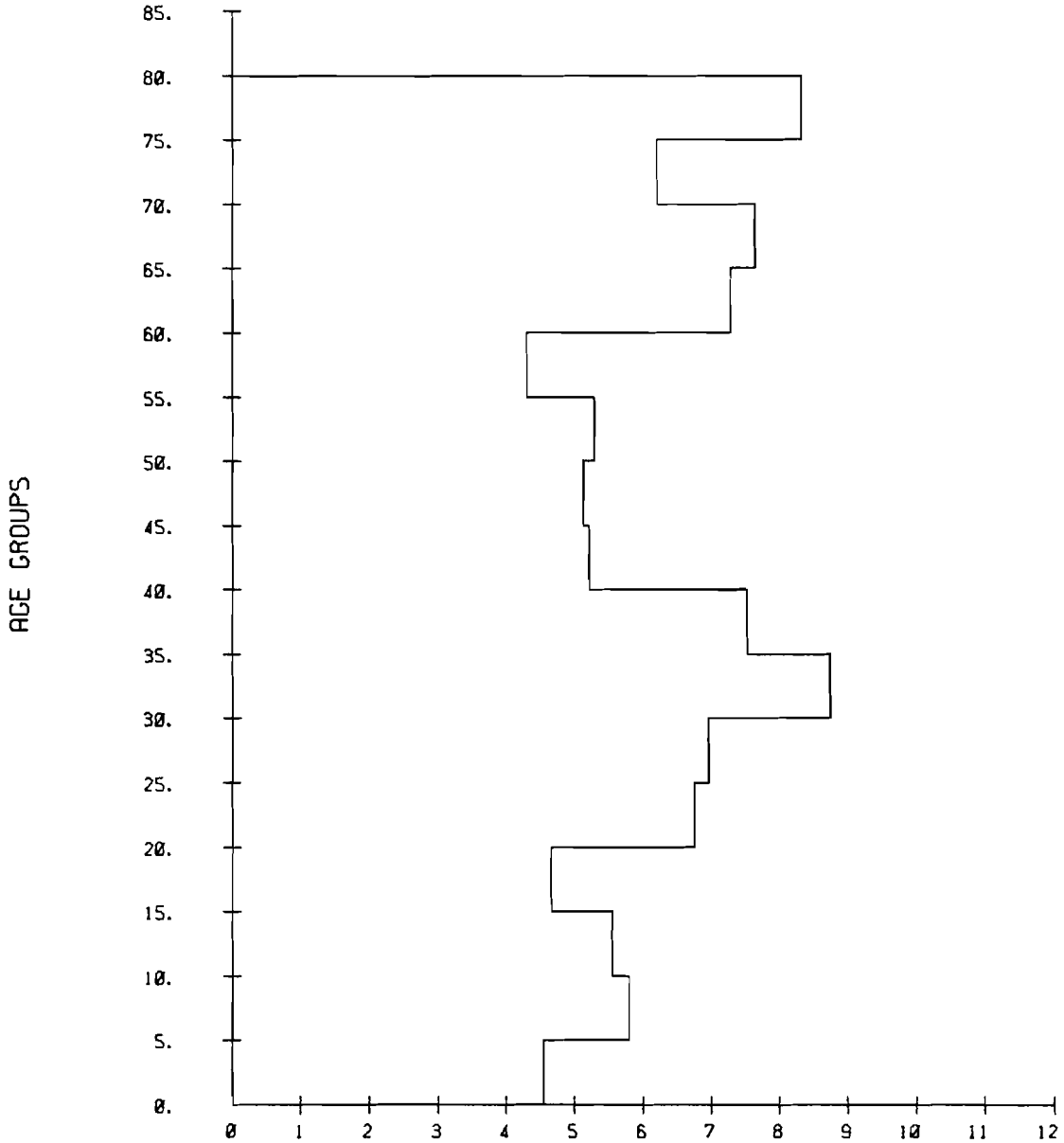
percentage distribution

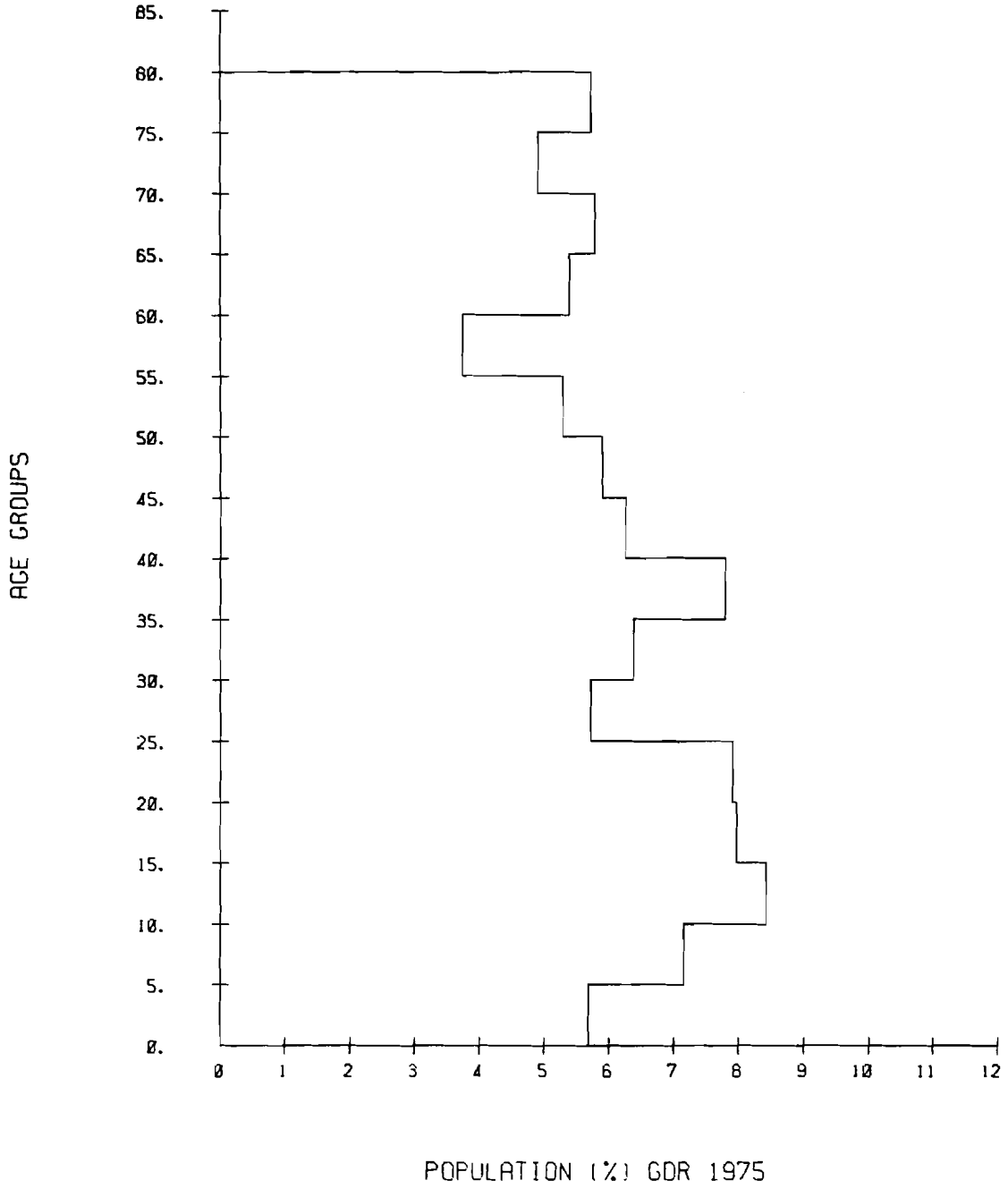
age	total	gdr	e-berlin
0	5.0658	5.0393	5.3466
5	5.3470	5.3299	5.5284
10	5.4977	5.5014	5.4591
15	5.4840	5.4919	5.4007
20	5.5412	5.5294	5.6664
25	6.0033	5.9581	6.4819
30	6.7160	6.6476	7.4406
35	7.0529	7.0010	7.6026
40	6.8609	6.8338	7.1478
45	6.2731	6.2513	6.5039
50	6.1569	6.1370	6.3673
55	7.5313	7.5256	7.5920
60	8.2828	8.2925	8.1799
65	6.9085	6.9354	6.0942
70	5.6403	5.7362	4.6235
75	5.6384	5.7398	4.5649
total	100.0000	100.0000	100.0000
m.ag	41.6572	41.7708	40.4538
sha	100.0000	91.3741	8.6259
lam	0.966470	0.965173	0.980423
r	-0.006821	-0.007090	-0.003954

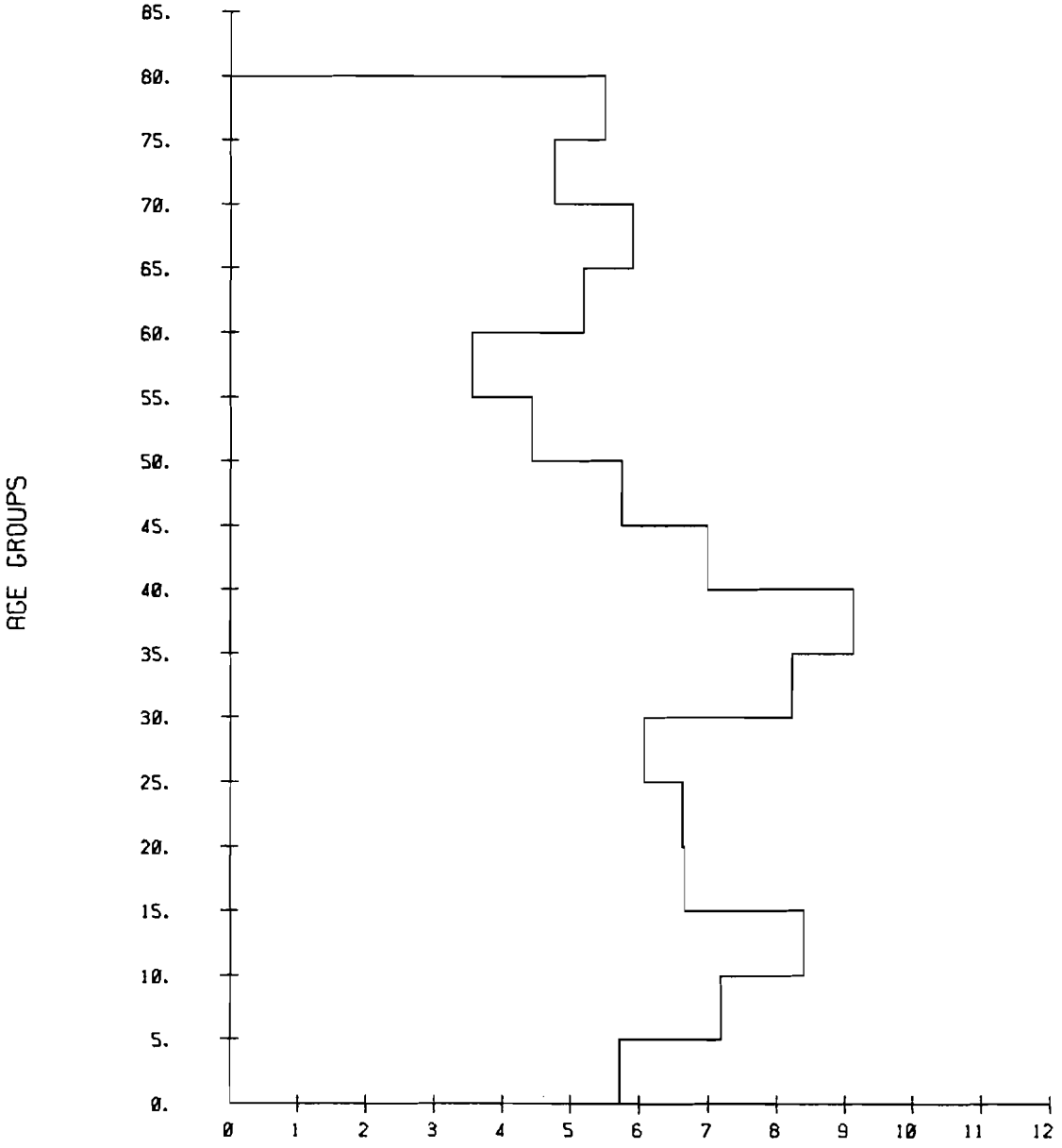
tolerance level for eigenvalue 0.1000e-06
number of iterations to reach stability 153

APPENDIX F: AGE COMPOSITIONS: FRG AND WEST BERLIN, 1974; GDR AND EAST BERLIN, 1975

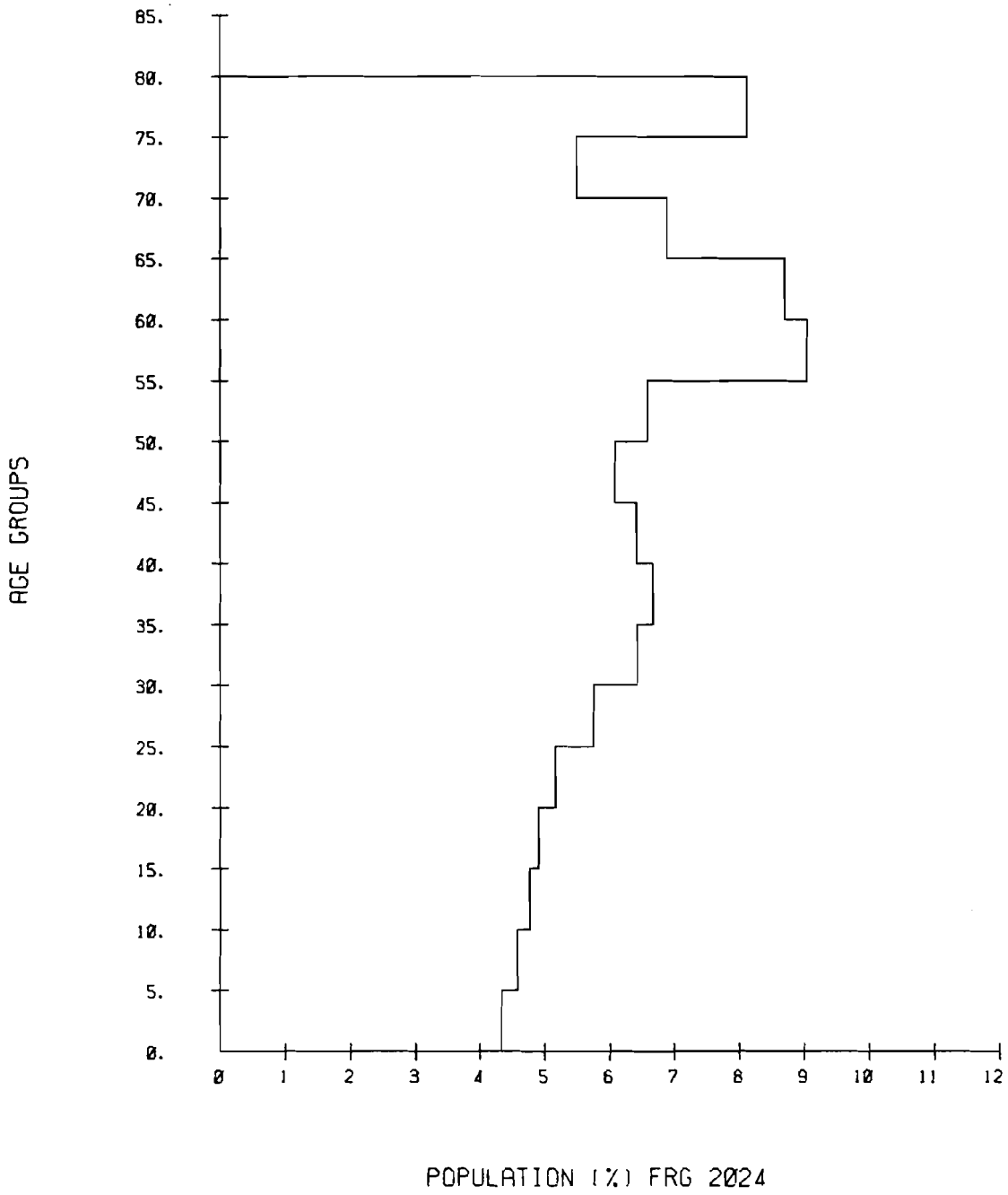

AGE GROUPS
85.
80.
75.
70.
65.
60.
55.
50.
45.
40.
35.
30.
25.
20.
15.
10.
5.
0.
0
1
2
3
4
5
6
7
8
9
10
11
12
POPULATION (%) FRG 1974

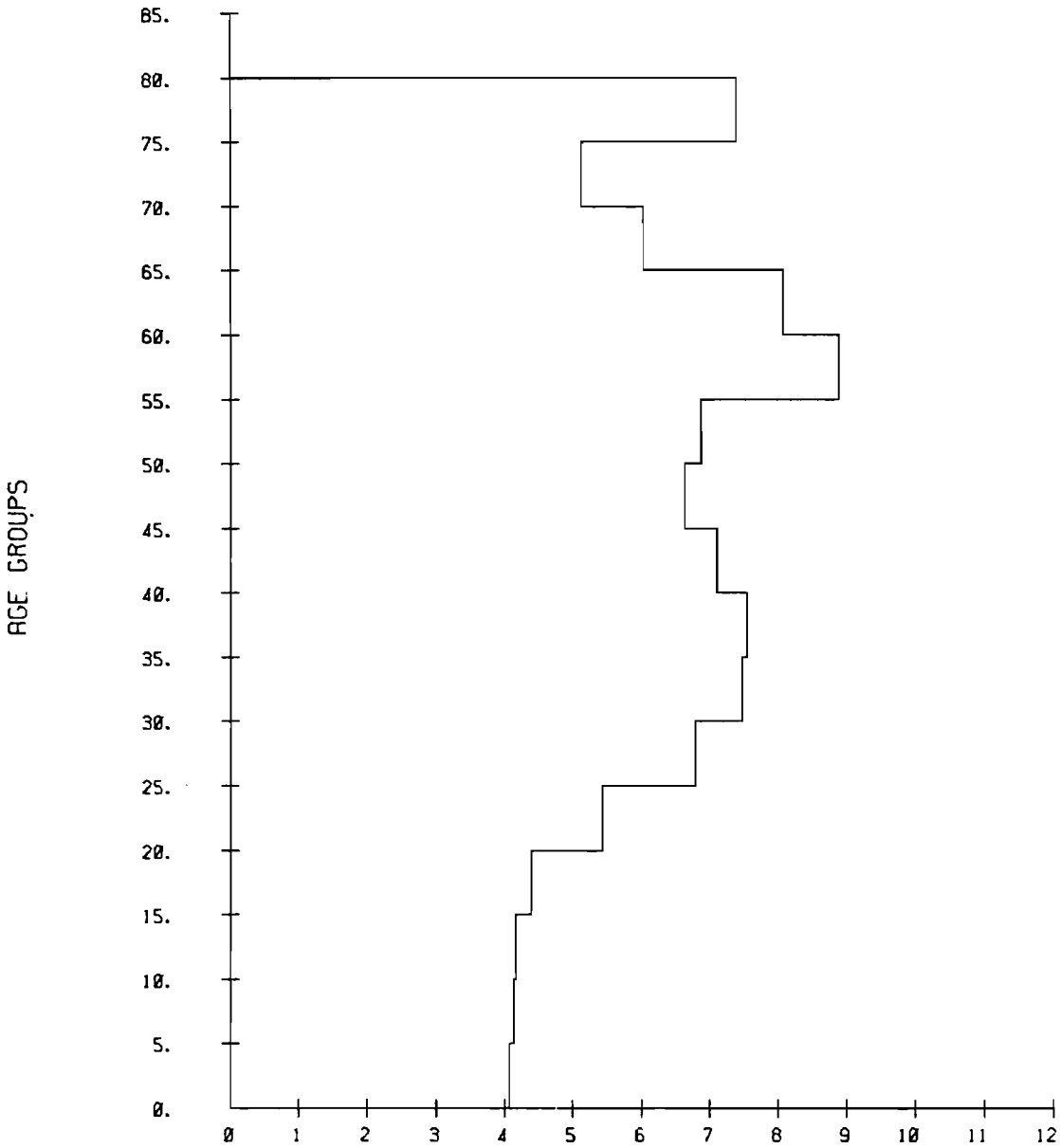

AGE GROUPS
85.
80.
75.
70.
65.
60.
55.
50.
45.
40.
35.
30.
25.
20.
15.
10.
5.
0.
0
1
2
3
4
5
6
7
8
9
10
11
12
POPULATION (%) W-BERLIN 1974

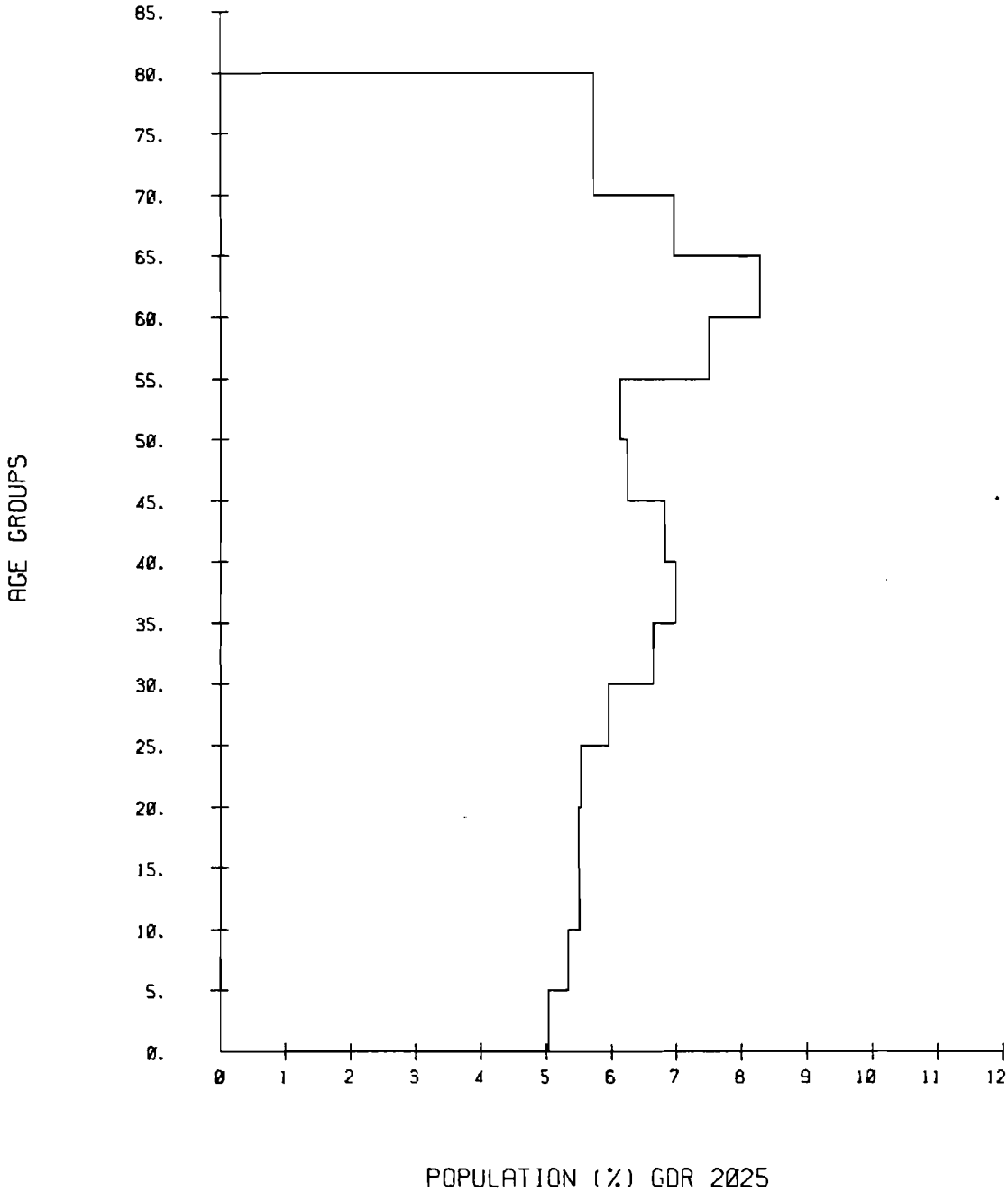

AGE GROUPS
85.
80.
75.
70.
65.
60.
55.
50.
45.
40.
35.
30.
25.
20.
15.
10.
5.
0.
0
1
2
3
4
5
6
7
8
9
10
11
12
POPULATION (%) GDR 1975

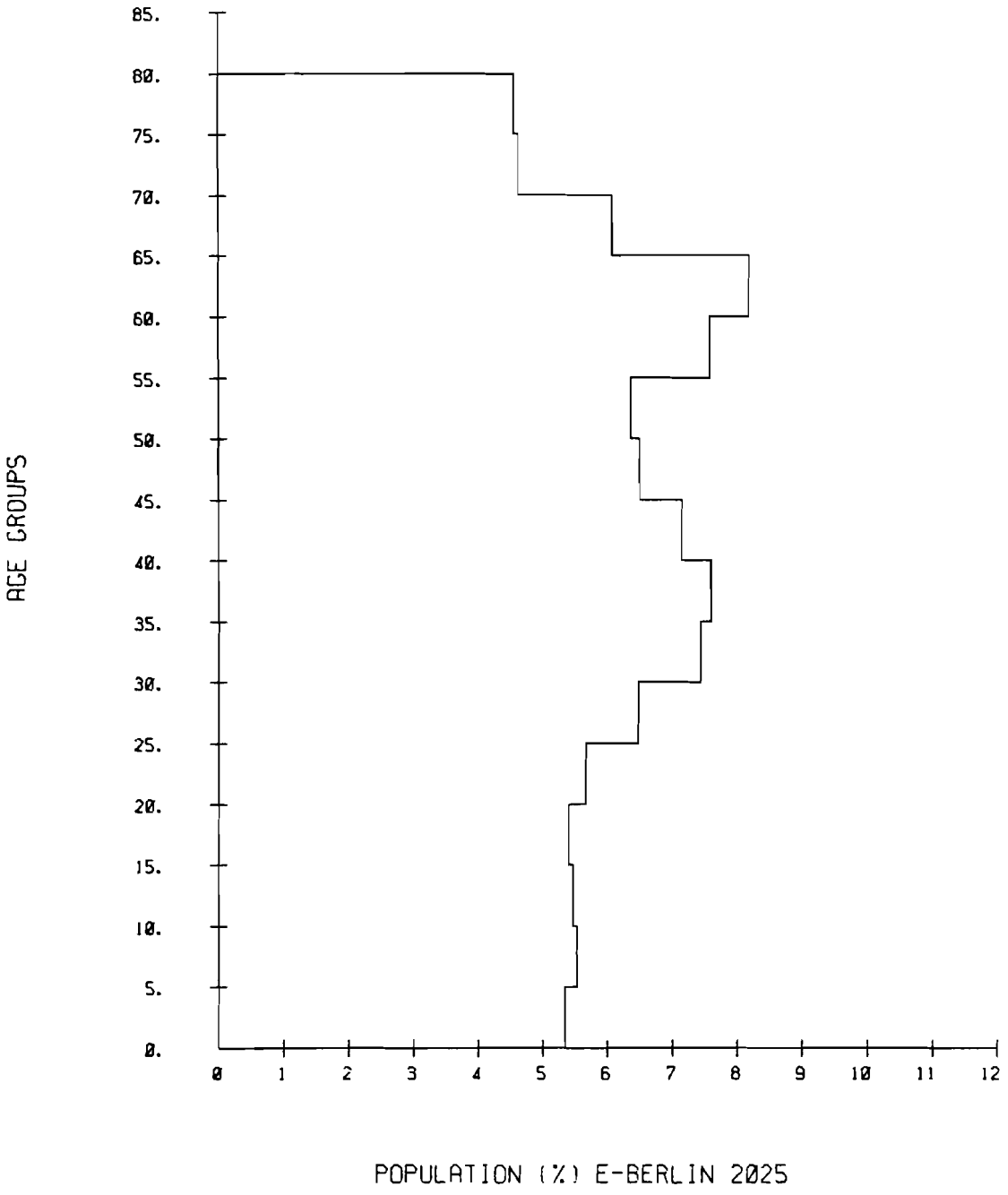

AGE GROUPS
85.
80.
75.
70.
65.
60.
55.
50.
45.
40.
35.
30.
25.
20.
15.
10.
5.
0.
0
1
2
3
4
5
6
7
8
9
10
11
12
POPULATION (%) E-BERLIN 1975

APPENDIX G: AGE COMPOSITIONS: FRG AND WEST BERLIN - 2024; GDR AND EAST BERLIN - 2025


AGE GROUPS
85.
80.
75.
70.
65.
60.
55.
50.
45.
40.
35.
30.
25.
20.
15.
10.
5.
0.
0
1
2
3
4
5
6
7
8
9
10
11
12
POPULATION (%) FRG 2024


AGE GROUPS
85.
80.
75.
70.
65.
60.
55.
50.
45.
40.
35.
30.
25.
20.
15.
10.
5.
0.
0
1
2
3
4
5
6
7
8
9
10
11
12
POPULATION (%) W-BERLIN 2024


AGE GROUPS
85.
80.
75.
70.
65.
60.
55.
50.
45.
40.
35.
30.
25.
20.
15.
10.
5.
0.
0
1
2
3
4
5
6
7
8
9
10
11
12
POPULATION (%) GDR 2025


AGE GROUPS
85.
80.
75.
70.
65.
60.
55.
50.
45.
40.
35.
30.
25.
20.
15.
10.
5.
0.
0
1
2
3
4
5
6
7
8
9
10
11
12
POPULATION (%) E-BERLIN 2025

SELECTED PAPERS ON MIGRATION AND SETTLEMENT
AT IIASA

Andrei Rogers, editor, *Migration and Settlement: Selected Essays*. RR-78-6. Reprinted from a special issue of *Environment and Planning A* 10(5):469-617.

Andrei Rogers and Frans Willekens, *Migration and Settlement: Measurement and Analysis*. RR-78-13.

Frans Willekens and Andrei Rogers, *Spatial Population Analysis: Methods and Computer Programs*. RR-78-18.

Andrei Rogers, *Migration Patterns and Population Redistribution*. RR-80-7. Reprinted from *Regional Science and Urban Economics* 9(1970):275-310.

Andrei Rogers, editor, *Essays in Multistate Mathematical Demography*. RR-80-10. Reprinted from a special issue of *Environment and Planning A* 12(5):485-622.

Nathan Keyfitz, *Multidimensionality in Population Analysis*. RR-80-33. Reprinted from *Sociological Methodology 1980*, K. Schuessler, ed., pp. 191-218.