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Minnesota Age Estimates April 1977

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Minnesota State Planning Agency
Office of State Demographer
101 Capitol Square Building
St. Paul, Minnesota 55101
December, 1978

Preface

The material in this report is based on findings from the Minnesota Household Survey, a statewide survey conducted in April, 1977. This survey was designed to provide current information on a broad range of demographic and labor force characteristics of the Minnesota population. It was conducted cooperatively because of the common needs and interests of several participants: the Office of State Demographer in the State Planning Agency, the Division of Vocational Education in the Department of Education, the Office of Statewide CETA Coordination in the Department of Economic Security, and the Environmental Quality Board's Copper-Nickel Project. The survey's principal aims were to:

1. Obtain an updated set of characteristics of the population of Minnesota. The last full set of characteristics is from the 1970 Census.
2. Learn more about people's perceptions of their needs for job training, in order to help plan for vocational education.
3. Obtain more information about the labor force, in order to assess employment and unemployment issues facing Minnesota.
4. Develop an updated set of characteristics for the East Range (from Virginia to Ely), in order to help meet the state's commitment to assess the impact of potential copper-nickel mining in northeast Minnesota.

The survey consisted of a statewide sample of approximately 4,530 households. Sample results have been expanded to agree with independent estimates of the population. The number of cases is sufficient to develop estimates of general demographic characteristics for the state, the seven-county Twin Cities metropolitan area (Region 11), and the balance of the state.

As in all sample surveys, the data in this report are subject to sampling variability and errors of response, including under-reporting and non-reporting. A detailed explanation appears in Appendix II.

This is the fourth publication based on Minnesota Household Survey data. The other reports, "Housing in Minnesota, 1977", "Educational Attainment in Minnesota, 1977" and "Minnesota Household Characteristics, 1977" are available upon request from the Office of State Demographer.

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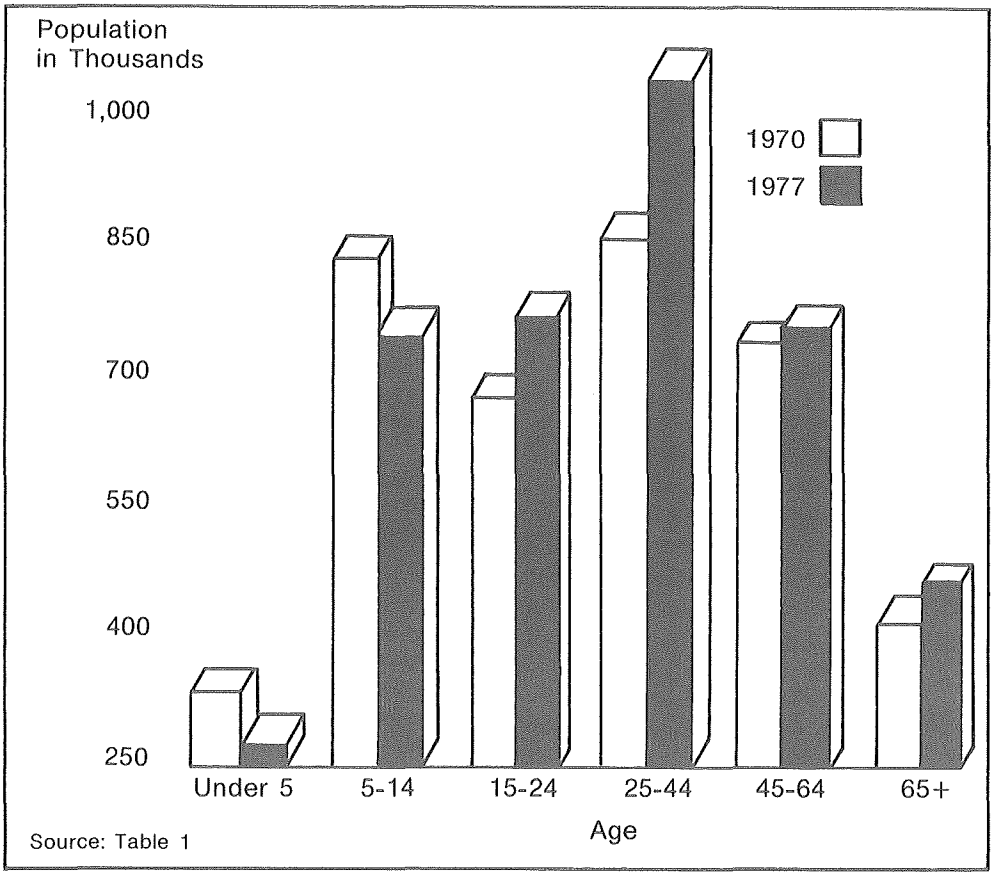
Figure 1
Minnesota Population by Age, 1970 and 1977



Source: Table 1

Highlights

Minnesota's population grew by 4 percent from 3,805,000 in 1970 to 3,962,000 in 1977.[1] Recent declines in the number of births and the movement of the post-war "baby-boom" generation into adulthood have caused the size of some age groups to increase sharply and others to decrease over the past seven years.

This report covers the age and sex composition of the Minnesota population. Highlights of the 1970 to 1977 period are as follows:

- The population 25 to 44 years old grew the fastest, increasing by 159,000 or 19 percent.
- In contrast, the 45 to 64 year-olds (many of whom were born during the low birth-rate years of the 1920s and 1930s) increased by only two percent.
- The pre-school age population (under 5 years) declined by 58,000 or 18 percent. The population 5 to 14 years decreased by 92,000 or 11 percent.
- The decline in the number of children under 5 years old was greater in the Twin Cities metropolitan area (Region 11) than in the balance of the state, 26 percent compared with 8 percent.[2]
- The elderly (65 years and over) increased by 45,000 or 11 percent.
- The dependency ratio (the number of persons under 18 and over 64 years per 100 persons 18 to 64 years) dropped from 89 in 1970 to 75 in 1977.
- The increase in the number of adults 25 to 44 years and 65 years and over has been greatest outside the Twin Cities metropolitan area.
- Minnesota continued to experience slight net outmigration in the 1970s of 10,000 persons or −0.2 percent.
- As in the 1960s, the largest component of outmigration is among young adults 15 to 24 years old. The net outmigration rate of males in this age group has remained around 10 percent, while the female net migration rate changed from +0.5 percent in the 1960s to −4 percent in the 1970s.
- The population grew most rapidly outside the Twin Cities metropolitan area: 6 percent in the balance of the state compared with 2 percent in the Twin Cities metropolitan area. Net inmigration contributed 46,000 to population growth in the balance of the state contrasted with the net outmigration of 56,000 from Region 11.

1. All 1977 data in this report are for April. Data in *Population Estimates for Minnesota Counties, 1977* are preliminary estimates for July 1, 1977.
2. Region 11 is the seven-county Twin Cities metropolitan area — Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington Counties. The balance of the state includes all other Minnesota counties.

Population Characteristics By Age, 1970 and 1977

Table 1
Minnesota Age Structure

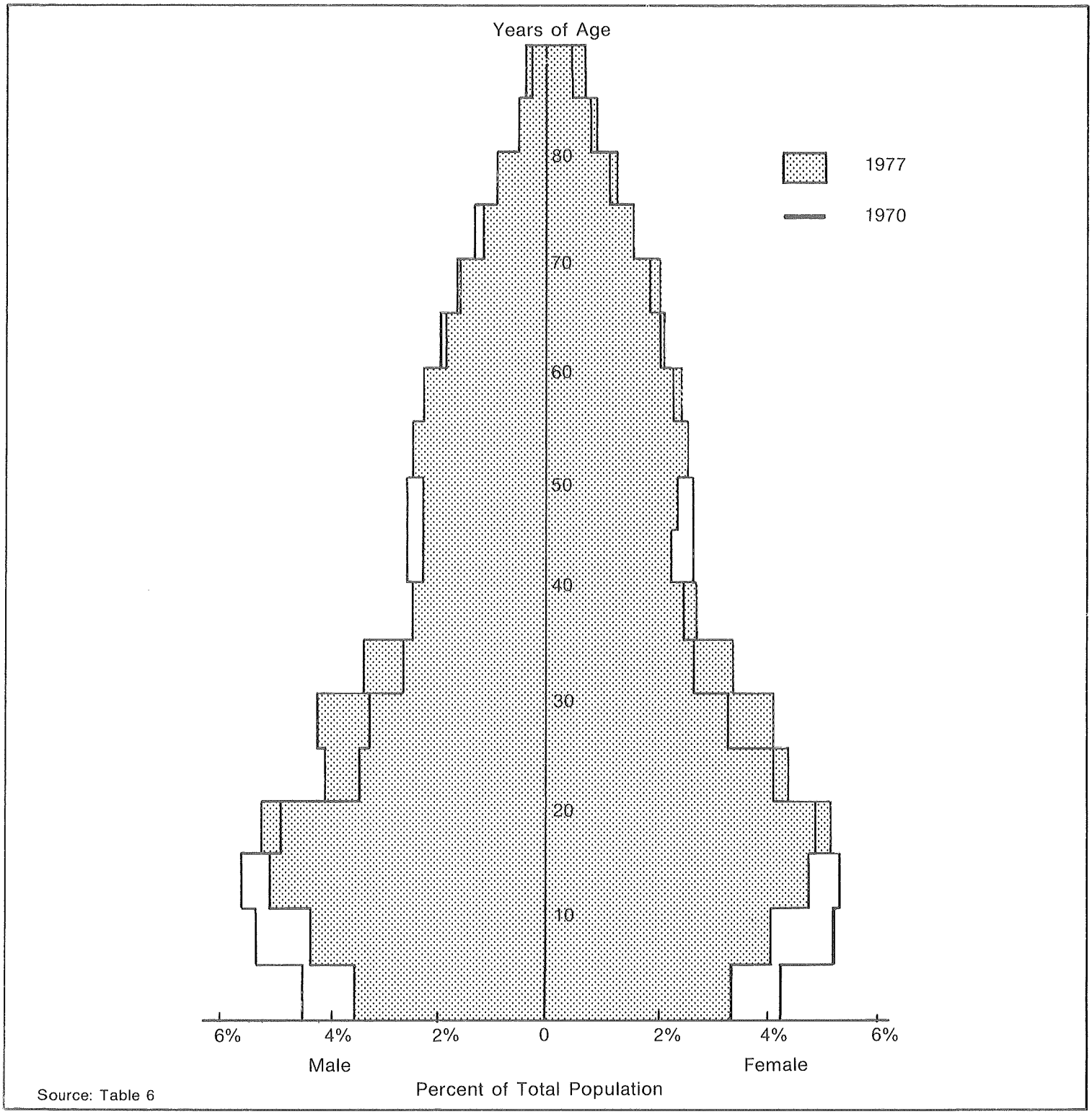
Age and Sex	Minnesota					
	Population		Percent Distribution		Change 1970-77	
	1970	1977	1970	1977	Number	Percent
Age						
All Ages	3,804,971	3,962,000	100.0	100.0	157,029	4.1
Under 5 years	331,771	273,793	8.7	6.9	−57,978	−17.5
5 to 14 years	819,318	727,249	21.5	18.4	−92,069	−11.2
15 to 24 years	665,442	753,523	17.5	19.0	88,081	13.2
25 to 44 years	851,858	1,011,027	22.4	25.5	159,169	18.7
45 to 64 years	729,325	744,468	19.1	18.8	15,143	2.1
65 years and over	407,257	451,940	10.7	11.4	44,683	11.0
Under 18 years	1,383,149	1,247,503	36.4	31.5	−135,646	−9.8
18 to 64 years	2,014,565	2,262,557	52.9	57.1	247,992	12.3
65 years and over	407,257	451,940	10.7	11.4	44,683	11.0
Dependency Ratio[a]	88.9	75.1	——	——	——	——
Child Dependency Ratio[b]	68.7	55.1	——	——	——	——
Aged Dependency Ratio[c]	20.2	20.0	——	——	——	——
Sex						
Male	1,863,810	1,940,483	49.0	49.0	76,673	4.1
Female	1,941,161	2,021,517	51.0	51.0	80,356	4.1
Region						
Region 11	1,874,380	1,920,000	49.3	48.5	45,620	2.4
Balance of the State	1,930,591	2,042,000	50.7	51.5	111,409	5.8
Region 3	329,603	337,000	8.7	8.5	7,397	2.2
Remainder of the State	1,600,988	1,705,000	42.1	43.0	104,012	6.5

a. Population under 18 and 65 and over per 100 population 18 to 64.
b. Population under 18 per 100 population 18 to 64.
c. Population 65 and over per 100 population 18 to 64.

Note: For 1977 age data by sex, see Table 4.

Figure 2

Minnesota's Age Structure: The baby-boom generation moves into young adulthood



Source: Table 6

Table 2
Age Structure of Region 11 and the Balance of the State[a]

Age and Sex	Minnesota					
	Population		Percent Distribution		Change 1970-77	
	1970	1977	1970	1977	Number	Percent
Region 11						
Age						
All Ages	1,874,380	1,920,000	100.0	100.0	45,620	2.4
Under 5 years	175,524	130,701	9.4	6.8	−44,823	−25.5
5 to 14 years	402,367	362,355	21.5	18.9	−40,012	−9.9
15 to 24 years	339,503	368,955	18.1	19.2	29,452	8.7
25 to 44 years	463,971	542,744	24.8	28.2	78,773	17.0
45 to 64 years	330,083	337,215	17.6	17.6	7,132	2.2
65 years and over	162,932	178,030	8.7	9.3	15,098	9.3
Under 18 years	684,196	609,100	36.5	31.7	−75,096	−11.0
18 to 64 years	1,027,252	1,132,870	54.8	59.0	105,618	10.3
65 years and over	162,932	178,030	8.7	9.3	15,098	9.3
Dependency Ratio[b]	82.5	69.5	—	—	—	—
Child Dependency Ratio[c]	66.6	53.8	—	—	—	—
Aged Dependency Ratio[d]	15.9	15.7	—	—	—	—
Sex						
Male	904,747	929,798	48.3	48.4	25,051	2.8
Female	969,633	990,202	51.7	51.6	20,569	2.1
Balance of the State						
Age						
All Ages	1,930,591	2,042,000	100.0	100.0	111,409	5.8
Under 5 years	156,247	143,092	8.1	7.0	−13,155	−8.4
5 to 14 years	416,951	364,894	21.6	17.9	−52,057	−12.5
15 to 24 years	325,939	384,568	16.9	18.8	58,629	18.0
25 to 44 years	387,887	468,283	20.0	22.9	80,396	20.7
45 to 64 years	399,242	407,253	20.7	20.0	8,011	2.0
65 years and over	244,325	273,910	12.7	13.5	29,585	12.1
Under 18 years	698,953	638,403	36.2	31.2	−60,550	−8.7
18 to 64 years	987,313	1,129,687	51.1	55.3	142,374	14.4
65 years and over	244,325	273,910	12.7	13.4	29,585	12.1
Dependency Ratio[b]	95.5	80.8	—	—	—	—
Child Dependency Ratio[c]	70.8	56.5	—	—	—	—
Aged Dependency Ratio[d]	24.8	24.2	—	—	—	—
Sex						
Male	959,063	1,010,685	49.7	49.5	51,622	5.4
Female	971,528	1,031,315	50.3	50.5	59,787	6.2

a. Region 11 is the seven-county Twin Cities metropolitan area — Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington Counties. Balance of the state is that portion of the state excluding Region 11.

b. Population under 18 and 65 and over per 100 population 18 to 64.

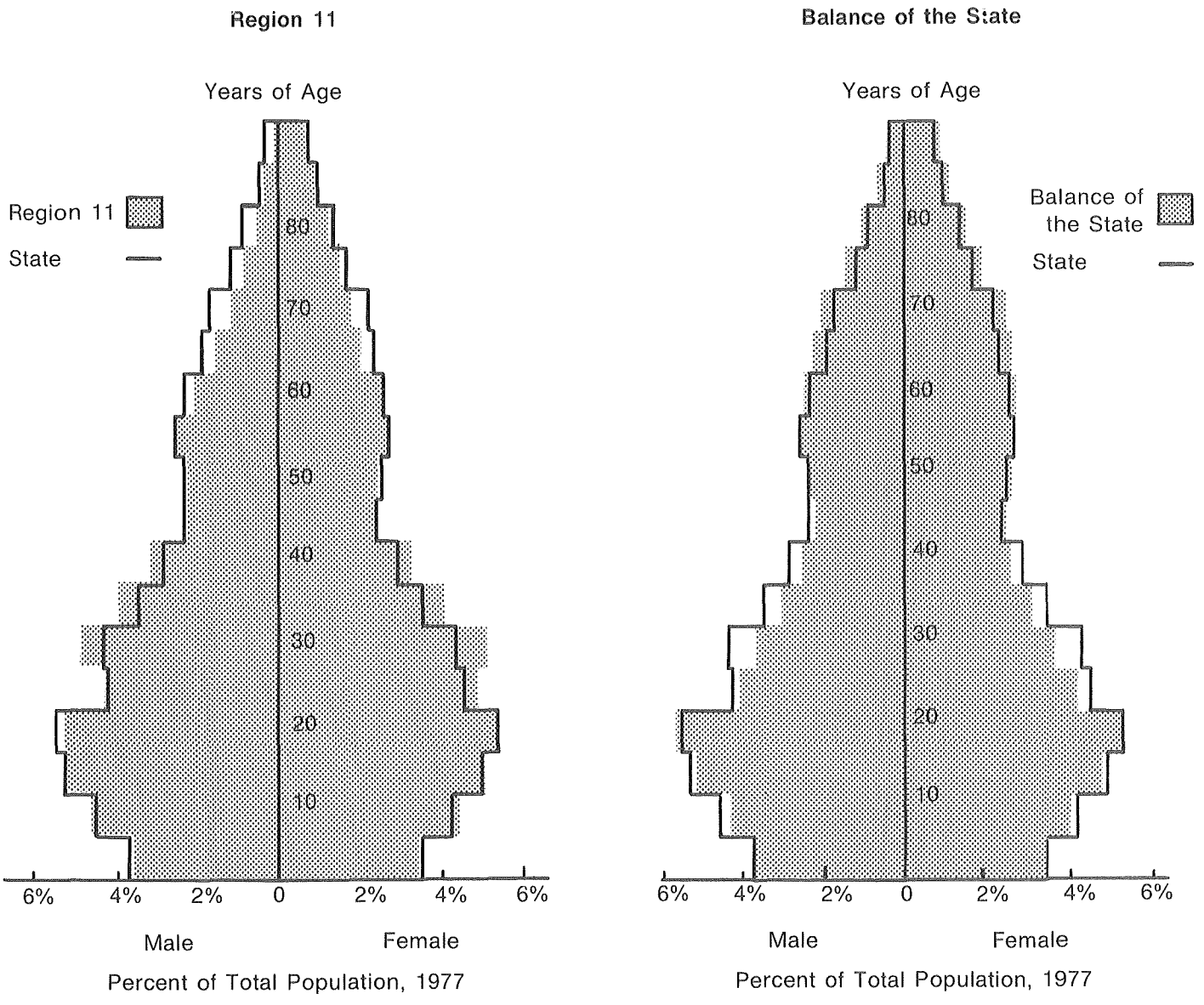
c. Population under 18 per 100 population 18 to 64.

d. Population 65 and over per 100 population 18 to 64.

Note: For 1977 age data by sex, see Table 4.

Figure 3

Larger proportion of 25 to 44 year-olds in the Twin Cities metropolitan area



Source: Table 6

Table 3
Age Structure of Region 3 and the Remainder of the State[a]

Age and Sex	Minnesota					
	Population		Percent Distribution		Change 1970-77	
	1970	1977	1970	1977	Number	Percent
Region 3						
Age						
All Ages	329,603	337,000	100.0	100.0	7,397	2.2
Under 5 years	25,155	23,052	7.6	6.8	−2,103	−8.4
5 to 14 years	70,461	52,949	21.4	15.7	−17,512	−24.9
15 to 24 years	54,539	63,313	16.6	18.7	8,774	16.1
25 to 44 years	67,271	78,180	20.4	23.2	10,909	16.2
45 to 64 years	73,927	77,178	22.5	22.9	3,251	4.4
65 years and over	38,250	42,328	11.6	12.6	4,078	10.7
Under 18 years	117,764	97,218	35.7	28.8	−20,546	−17.4
18 to 64 years	173,589	197,454	52.7	58.6	23,865	13.7
65 years and over	38,250	42,328	11.6	12.6	4,078	10.7
Dependency Ratio[b]	89.9	70.7	—	—	—	—
Child Dependency Ratio[c]	67.8	49.2	—	—	—	—
Aged Dependency Ratio[d]	22.0	21.4	—	—	—	—
Sex						
Male	163,181	166,797	49.5	49.5	3,616	2.2
Female	166,422	170,203	50.5	50.5	3,781	2.3
Remainder of the State						
Age						
All Ages	1,600,988	1,705,000	100.0	100.0	104,012	6.5
Under 5 years	131,092	120,040	8.2	7.0	−11,052	−8.4
5 to 14 years	346,490	311,945	21.6	18.3	−34,545	−10.0
15 to 24 years	271,400	321,255	17.0	18.9	49,855	18.4
25 to 44 years	320,616	390,103	20.0	22.9	69,487	21.7
45 to 64 years	325,315	330,075	20.3	19.4	4,760	1.5
65 years and over	206,075	231,582	12.9	13.6	25,507	12.4
Under 18 years	581,189	541,185	36.3	31.7	−40,004	−6.9
18 to 64 years	813,724	932,233	50.8	54.7	118,509	14.6
65 years and over	206,075	231,582	12.9	13.6	25,507	12.4
Dependency Ratio[b]	96.8	82.9	—	—	—	—
Child Dependency Ratio[c]	71.4	58.1	—	—	—	—
Aged Dependency Ratio[d]	25.3	24.8	—	—	—	—
Sex						
Male	795,882	843,888	49.7	49.5	48,006	6.0
Female	805,106	861,112	50.3	50.5	56,006	7.0

a. Region 3 comprises the seven-county area of northeastern Minnesota — Aitkin, Carlton, Cook, Itasca, Koochiching, Lake and St. Louis Counties. The remainder of the state is that portion of the state excluding Regions 3 and 11.

b. Population under 18 and 65 and over per 100 population 18 to 64.

c. Population under 18 per 100 population 18 to 64.

d. Population 65 and over per 100 population 18 to 64.

 Note: For 1977 age data by sex, see Table 5.

Detailed Age and Sex Structure, 1977

Table 4
Detailed Age and Sex Structure of Minnesota by Region[a]

Age and Region	Minnesota, 1977		
	Total	Male	Female
Minnesota			
All Ages	3,962,000	1,940,483	2,021,517
Under 5 years	273,793	140,846	132,947
5 to 14 years	727,249	373,115	354,134
15 to 24 years	753,523	373,757	379,766
25 to 34 years	605,159	301,662	303,497
35 to 44 years	405,868	201,977	203,891
45 to 54 years	390,848	192,843	198,005
55 to 64 years	353,620	169,199	184,421
65 to 74 years	264,741	116,781	147,960
75 to 84 years	144,094	55,834	88,260
85 years and over	43,105	14,469	28,636
Region 11			
All Ages	1,920,000	929,798	990,202
Under 5 years	130,701	67,372	63,329
5 to 14 years	362,355	185,281	177,074
15 to 24 years	368,955	179,552	189,403
25 to 34 years	336,498	167,201	169,297
35 to 44 years	206,246	102,805	103,441
45 to 54 years	185,491	90,609	94,882
55 to 64 years	151,724	70,597	81,127
65 to 74 years	103,719	42,113	61,606
75 to 84 years	57,409	19,419	37,990
85 years and over	16,902	4,849	12,053
Balance of the State			
All Ages	2,042,000	1,010,685	1,031,315
Under 5 years	143,092	73,474	69,618
5 to 14 years	364,894	187,834	177,060
15 to 24 years	384,568	194,205	190,363
25 to 34 years	268,661	134,461	134,200
35 to 44 years	199,622	99,172	100,450
45 to 54 years	205,357	102,234	103,123
55 to 64 years	201,896	98,602	103,294
65 to 74 years	161,022	74,668	86,354
75 to 84 years	86,685	36,415	50,270
85 years and over	26,202	9,620	16,583

a. Region 11 is the seven-county Twin Cities metropolitan area — Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington Counties. Balance of the state is that portion of the state excluding Region 11.

Table 5

Detailed Age and Sex Structure of the Balance of the State[a]

Age and Region	Balance of the State, 1977		
	Total	Male	Female
Region 3			
All Ages	337,000	166,797	170,203
Under 5 years	23,052	11,796	11,256
5 to 14 years	52,949	27,261	25,688
15 to 24 years	63,313	32,344	30,969
25 to 34 years	45,589	22,896	22,693
35 to 44 years	32,591	16,173	16,418
45 to 54 years	38,771	19,275	19,496
55 to 64 years	38,407	18,793	19,614
65 to 74 years	25,682	11,728	13,954
75 to 84 years	12,668	4,997	7,671
85 years and over	3,978	1,534	2,444
Remainder of the State			
All Ages	1,705,000	843,888	861,112
Under 5 years	120,040	61,678	58,362
5 to 14 years	311,945	160,573	151,372
15 to 24 years	321,255	161,861	159,394
25 to 34 years	223,072	111,565	111,507
35 to 44 years	167,031	82,999	84,032
45 to 54 years	166,586	82,959	83,627
55 to 64 years	163,489	79,809	83,680
65 to 74 years	135,340	62,940	72,400
75 to 84 years	74,017	31,418	42,599
85 years and over	22,225	8,086	14,139

a. Balance of the state is that portion of the state excluding Region 11 (Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington Counties), and is comprised of Region 3 and the remainder of the state.

Region 3 comprises the seven-county area of northeastern Minnesota — Aitkin, Carlton, Cook, Itasca, Koochiching, Lake and St. Louis Counties.

Remainder of the state is that portion of the state excluding Regions 3 and 11.

Table 6
Percent Distribution of Population by Age and Sex by Region, 1970 and 1977

Age and Sex	Minnesota, 1970	Minnesota by Region, 1977[a]				
		Total	Region 11	Balance of the State		
				Total	Region 3	Remainder of the State
Total Population	3,804,971	3,962,000	1,920,000	2,042,000	337,000	1,705,000
Percent Distribution	100.0	100.0	100.0	100.0	100.0	100.0
Males	49.0	49.0	48.4	49.5	49.5	49.5
Under 5 years	4.5	3.6	3.5	3.6	3.5	3.6
5 to 14 years	11.0	9.4	9.7	9.2	8.1	9.4
15 to 24 years	8.4	9.4	9.4	9.5	9.6	9.5
25 to 34 years	6.0	7.6	8.7	6.6	6.8	6.5
35 to 44 years	5.2	5.1	5.3	4.9	4.8	4.9
45 to 54 years	5.1	4.9	4.7	5.0	5.7	4.9
55 to 64 years	4.2	4.3	3.7	4.8	5.6	4.7
65 to 74 years	2.8	2.9	2.2	3.7	3.5	3.7
75 to 84 years	1.5	1.4	1.0	1.8	1.5	1.8
85 years and over	0.3	0.4	0.3	0.5	0.5	0.5
Females	50.0	51.0	51.6	50.5	50.5	50.5
Under 5 years	4.3	3.4	3.3	3.4	3.3	3.4
5 to 14 years	10.5	8.9	9.2	8.7	7.6	8.9
15 to 24 years	9.1	9.6	9.9	9.3	9.2	9.3
25 to 34 years	6.0	7.7	8.8	6.6	6.7	6.5
35 to 44 years	5.2	5.1	5.4	4.9	4.9	4.9
45 to 54 years	5.3	5.0	4.9	5.1	5.8	4.9
55 to 64 years	4.5	4.7	4.2	5.1	5.8	4.9
65 to 74 years	3.5	3.7	3.2	4.2	4.1	4.2
75 to 84 years	2.0	2.2	2.0	2.5	2.3	2.6
85 years and over	0.5	0.7	0.6	0.8	0.7	0.8

a. Region 11 is the seven-county Twin Cities metropolitan area — Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington Counties. Balance of the state is that portion of the state excluding Region 11, and is comprised of Region 3 and the remainder of the state.

Region 3 comprises the seven-county area of northeastern Minnesota — Aitkin, Carlton, Cook, Itasca, Koochiching, Lake and St. Louis Counties.

Remainder of the state is that portion of the state excluding Regions 3 and 11.

Net Migration

Table 7
Net Migration by Age and Sex, 1960-70 and 1970-77

Age and Net Migration	Minnesota					
	Total		Male		Female	
	1960-70[a]	1970-77	1960-70[a]	1970-77	1960-70[a]	1970-77
Net Migration[c]						
All Ages	−26,914	−9,519	−22,388	1,682	−4,526	−11,201
Under 5 years	6,611	−849	3,588	−131	3,023	−718
5 to 14 years	12,242	33,970	8,030	18,622	4,212	15,348
15 to 24 years	−36,159	−56,699	−37,843	−39,084	1,684	−17,615
25 to 44 years	16,520	15,420	18,616	24,986[b]	−2,096	−9,566
45 to 64 years	−11,827	−6,607	−5,503	−2,190	−6,324	−4,417
65 years and over	−14,301	5,246	−9,276	−521	−5,025	5,767
Net Migration Rate[d]						
All Ages	−0.7	−0.2	−1.2	0.1	−0.2	−0.6
Under 5 years	2.0	−0.3	2.2	−0.1	1.9	−0.5
5 to 14 years	1.5	4.9	2.0	5.3	1.1	4.5
15 to 24 years	−5.2	−7.0	−10.6	−9.5	0.5	−4.4
25 to 44 years	2.0	1.5	4.6	5.2[b]	−0.5	−1.9
45 to 64 years	−1.6	−0.9	−1.5	−0.6	−1.7	−1.1
65 years and over	−3.4	1.2	−5.0	−0.3	−2.1	2.2

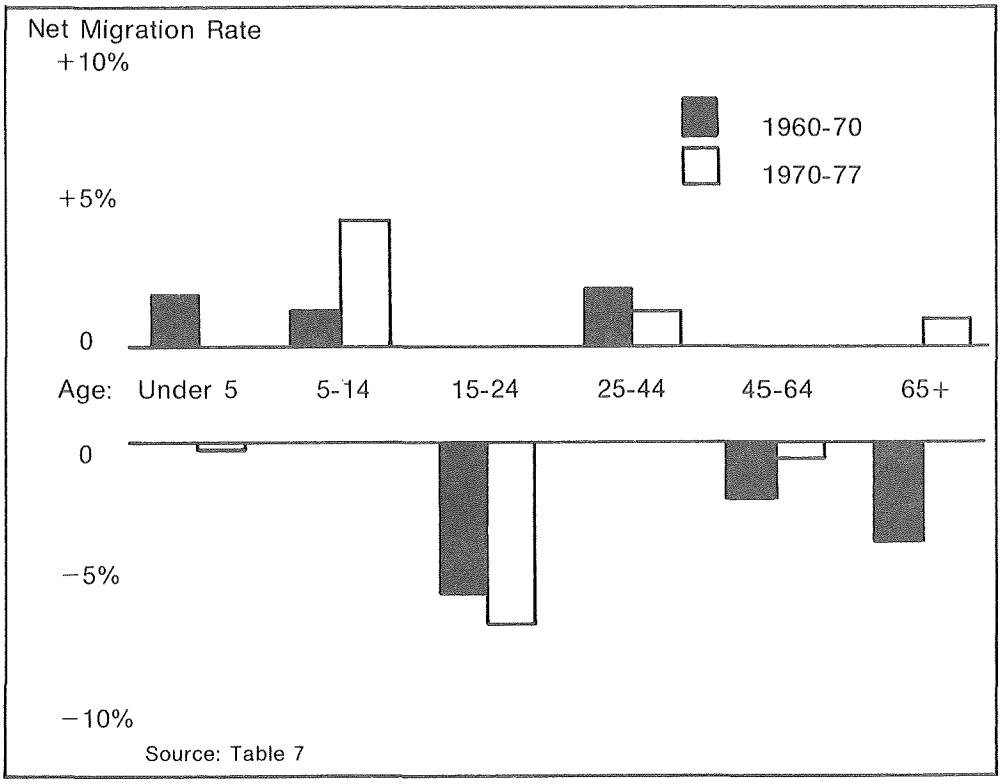
a. 1960-70 net migration data from Office of State Demographer, State Planning Agency.

b. The net inmigration of males 25 to 44 years old reflects the absence of young males in 1970 due to military service during the Vietnam Conflict.

c. Net migration is the difference between the expected number of survivors from a preceding census and the estimated or enumerated population at a later date.

d. The net migration rate results from dividing net migration by the expected population.

Figure 4
Continued outmigration among young adults



Source: Table 7

Table 8

Net Migration by Age and Sex, 1970-77, Minnesota by Region[a]

Age and Region	Net Migration, 1970-77[b]					
	Total		Male		Female	
	Number	Rate	Number	Rate	Number	Rate
Minnesota						
All Ages	−9,519	−0.2	1,682	0.1	−11,201	−0.6
Under 5 years	−849	−0.3	−131	−0.1	−718	−0.5
5 to 14 years	33,970	4.9	18,622	5.3	15,348	4.5
15 to 24 years	−56,699	−7.0	−39,084	−9.5	−17,615	−4.4
25 to 44 years	15,420	1.5	24,986[c]	5.2	−9,566	−1.9
45 to 64 years	−6,607	−0.9	−2,190	−0.6	−4,417	−1.1
65 years and over	5,246	1.2	−521	−0.3	5,767	2.2
Under 18 years	25,229	2.1	14,550	2.3	10,679	1.8
18 to 64 years	−39,994	−1.7	−12,347	−1.1	−27,647	−2.3
65 years and over	5,246	1.2	−521	−0.3	5,767	2.2
Region 11						
All Ages	−56,054	−2.8	−25,584	−2.7	−30,470	−3.0
Under 5 years	−3,076	−2.3	−1,552	−2.3	−1,524	−2.3
5 to 14 years	3,487	1.0	1,930	1.1	1,557	0.9
15 to 24 years	−17,922	−4.6	−16,783	−8.5	−1,139	−0.6
25 to 44 years	−6,917	−1.3	9,697[c]	3.7	−16,614	−5.7
45 to 64 years	−25,674	−7.1	−13,796	−7.9	−11,878	−6.3
65 years and over	−5,952	−3.2	−5,080	−7.1	−872	−0.8
Under 18 years	−9,217	−1.5	−4,519	−1.4	−4,698	−1.6
18 to 64 years	−40,885	−3.5	−15,985	−2.8	−24,900	−4.1
65 years and over	−5,952	−3.2	−5,080	−7.1	−872	−0.8
Balance of the State						
All Ages	46,535	2.3	27,266	2.8	19,269	1.9
Under 5 years	2,227	1.6	1,421	2.0	806	1.2
5 to 14 years	30,483	9.1	16,692	9.8	13,791	8.4
15 to 24 years	−38,777	−9.2	−22,301	−10.3	−16,476	−8.0
25 to 44 years	22,337	5.0	15,289[c]	7.0	7,048	3.1
45 to 64 years	19,067	4.9	11,606	6.1	7,461	3.8
65 years and over	11,198	4.3	4,559	3.9	6,639	4.5
Under 18 years	34,446	5.7	19,069	6.2	15,377	5.2
18 to 64 years	891	0.1	3,638	0.7	−2,747	−0.5
65 years and over	11,198	4.3	4,559	3.9	6,639	4.5

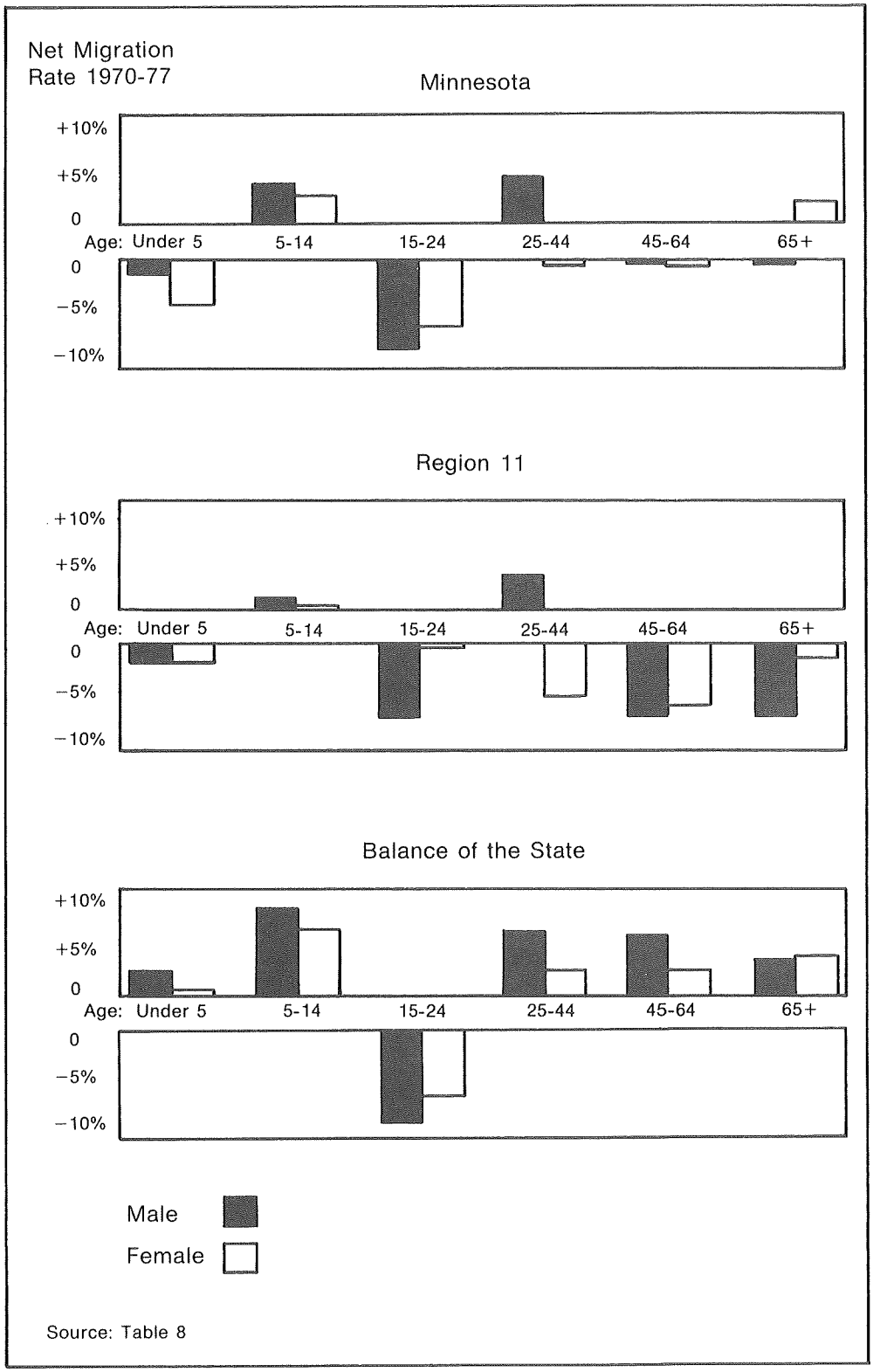
a. Region 11 is the seven-county Twin Cities metropolitan area — Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington Counties. Balance of the state is that portion of the state excluding Region 11.

b. See definition of net migration in Table 7.

c. The net inmigration of males 25 to 44 years old reflects the absence of young males in 1970 due to military service during the Vietnam Conflict.

Figure 5

Inmigration of children and middle-aged adults in the balance of the state



Source: Table 8

Table 9

Net Migration by Age and Sex, 1970-77, Balance of the State[a]

Age and Region	Net Migration, 1970-77[b]					
	Total		Male		Female	
	Number	Rate	Number	Rate	Number	Rate
Region 3						
All Ages	−2,715	−0.8	−43	0.0	−2,672	−1.5
Under 5 years	526	2.3	308	2.7	218	2.0
5 to 14 years	−1,163	−2.4	−524	−1.9	−639	−2.4
15 to 24 years	−9,728	−13.3	−5,055	−13.5	−4,673	−13.1
25 to 44 years	3,863	5.2	2,976[c]	8.2	887	2.3
45 to 64 years	5,207	7.2	3,065	8.8	2,142	5.8
65 years and over	−1,420	−3.2	−813	−4.3	−607	−2.5
Under 18 years	−1,068	−1.1	−509	−1.0	−559	−1.2
18 to 64 years	−227	−0.1	1,279	1.3	−1,506	−1.5
65 years and over	−1,420	−3.2	−813	−4.3	−607	−2.5
Remainder of the State						
All Ages	49,250	3.0	27,309	3.3	21,941	2.6
Under 5 years	1,701	1.4	1,113	1.8	588	1.0
5 to 14 years	31,646	11.3	17,216	12.0	14,430	10.5
15 to 24 years	−29,049	−8.3	−17,246	−9.6	−11,803	−6.9
25 to 44 years	18,474	5.0	12,313[c]	6.8	6,161	3.3
45 to 64 years	13,860	4.4	8,541	5.5	5,319	3.3
65 years and over	12,618	5.8	5,372	5.5	7,246	5.9
Under 18 years	35,514	7.0	19,578	7.6	15,936	6.4
18 to 64 years	1,118	0.1	2,359	0.5	−1,241	−0.3
65 years and over	12,618	5.8	5,372	5.5	7,246	5.9

a. Balance of the state is that portion of the state excluding Region 11 (Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington Counties), and is comprised of Region 3 and the remainder of the state.
Region 3 comprises the seven-county area of northeastern Minnesota — Aitkin, Carlton, Cook, Itasca, Koochiching, Lake and St. Louis Counties. Remainder of the state is that portion of the state excluding Regions 3 and 11.

b. See definition of net migration in Table 7.

c. The net inmigration of males 25 to 44 years old reflects the absence of young males in 1970 due to military service during the Vietnam Conflict.

Appendix I
Definitions and Explanations

Age

The age classification is based on the age of the person at the person's last birthday. Age data in this report have been adjusted for "age-heaping" (that is, the distributional problems resulting from misreporting of age), and include estimates of group quarters population. See Appendix II for a detailed explanation.

Balance of the State

Balance of the state refers to one of two major geographic divisions for which data are presented in this report. The balance of the state includes 80 of the state's 87 counties; it does not include the seven-county Twin Cities metropolitan area defined as Region 11 (Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington Counties). The balance of the state is further divided into two areas: Region 3 (Aitkin, Carlton, Cook, Itasca, Koochiching, Lake and St. Louis Counties) and the remainder of the state.

Dependency Ratio

The standard measure of dependency is based on the assumption that persons 18 to 64 years old are the "productive" segment of the population and persons under 18 years and 65 years and over are the "dependent" segment.
The formula is as follows:

$$\text{Dependency ratio} = \frac{\text{Dependent segment}}{\text{Productive segment}} \times 100$$

This ratio is a measure of the dependency load the productive population must bear.

The child dependency ratio is the number of persons under 18 years per 100 persons 18 to 64 years; the aged dependency ratio is the number of persons 65 years and over per 100 persons 18 to 64 years.

Migration

Migration data in this report are presented in two ways: net migration numbers and net migration rates.

Net migration is the difference between the expected number of survivors from a preceding census ("expected population") and the estimated or enumerated population at a later date. Net migration between 1970 and 1977 is the difference between the estimated state population of 1977 based on results from the Minnesota Household Survey and the 1977 expected state population (survived from 1970). The net migration rate results from dividing net migration by the expected population.

Region 3

Region 3 comprises the seven-county area of northeastern Minnesota — Aitkin, Carlton, Cook, Itasca, Koochiching, Lake and St. Louis Counties.

Region 11

Region 11 is the seven-county Twin Cities metropolitan area — Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington Counties.

Remainder of the State

Remainder of the state is the portion of the state excluding Region 3 (Aitkin, Carlton, Cook, Itasca, Koochiching, Lake and St. Louis Counties) and Region 11 (Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington Counties).

Appendix II
Source and Reliability of the Estimates

Introduction

The estimates in this report are based on data collected during April 1977 through direct interviews with persons living in housing units in Minnesota. Weighted sample results have been adjusted for "age-heaping" and expanded to agree with independent estimates of the population made by the Office of State Demographer using procedures described below. Independent estimates of the group quarters population were added to develop the final age-sex estimates of the total population.

Source of the Data

Approximately 4,530 occupied housing units were selected for interview in the Minnesota Household Survey. Within each household, a responsible person aged 16 or older was interviewed for demographic characteristics of all household members. From the listing of household members 16 years of age and over, one of them was objectively designated as the respondent for an in-depth interview on labor force status and interest in job training.[1] No substitution was made even if, after repeated calls, no one was at home, or the designated respondent for the individual interview was not at home or refused to be interviewed. Approximately 96 percent of the households were interviewed for household data; 98.8 percent of these were interviewed for individual labor force data. Of the 4,661 persons eligible for the short self-administered job-training questionnaire, 78 percent responded.

The Sample

The Minnesota state sample is designed to produce estimates of demographic and socio-economic characteristics for Minnesota's household population. The sample design is modeled after the proven multi-stage area probability designs which have long been used at the national level by the U.S. Bureau of the Census and University of Michigan's Survey Research Center.

The selection process is performed in two stages and assigns every year-round housing unit in Minnesota an equal probability of being selected for interview. In the first stage of selection, sample counties are chosen with a probability proportional to number of year-round housing units. Groups of year-round housing units referred to as "clusters" are then selected from each sample county.

The resulting sample is termed "complex" and is not "random" in the true sense of the term. Nonetheless, the sample does meet the statistically more important criterion of assigning to each element of the population an equal probability of selection. In selecting the year-round housing unit with equal probability, all items uniquely associated with the selected unit are also chosen with equal probability (children, telephones, microwave ovens, etc.).

Sources of Error

Sample data are subject to errors arising from several sources. Among these are noncoverage, response and reporting errors, nonresponse, coding error, and sampling error.

- **Noncoverage.** A bias is introduced by excluding persons living in institutions or group quarters from the data collection process. For purposes of this report, independent estimates of group quarters population have been included. A very small bias may exist because of failure to identify all housing units in the selected sample cluster.
- **Response and reporting error.** Variations in interviewers' wording of questions or faulty questionnaire design may cause errors by interviewers, respondents, or both. Although this study's interviewers were chiefly temporary workers, the majority were persons with survey experience. These interviewers participated in an intensive two-day training session, preceded by a home-study assignment. Moreover, timely editing of the completed questionnaires, supervisors' observation during enumeration, and a systematic reinterview by supervisory staff of part of their assignments permitted the interviewers to correct any errors or deficiencies.

  In spite of these controls, interviewers may not always have asked the questions in the prescribed fashion. This factor, in addition to the unwillingness of some respondents to report accurately, may result in some errors or lack of uniformity in the results.

  Of particular concern in age data is "age-heaping", that is, the well-documented distribution problem occurring as the result of the misreporting of age.[2] The concentration of people at regular intervals indicates the strong preference or avoidance shown for certain numbers. For example, preference is noticed for certain ages of special legal or cultural significance such as the age of eligibility to receive retirement pensions. The ages most affected in the Minnesota Household Survey are 39 to 40 years, 49 to 50 years, 59 to 60 years, 63 to 67 years and other decade or mid-decade intervals at ages over 65. Middle-age individuals tended to under-report age and persons 65 and older gave rounded numbers. In particular, women between the ages of 63 and 67 tended to report being 65 years old.

- **Nonresponse.** The Minnesota Household Survey enjoyed response rates in excess of 96 percent. Consequently, nonresponse bias should be virtually nonexistent for these data. The Vocational Education Supplement data with a 78 percent response rate has the potential for nonresponse bias depending on the assumptions one makes concerning the nature of the nonrespondent group.
- **Coding error.** The questionnaires used in this survey were almost entirely precoded, with appropriate

1. This procedure is described by Leslie Kish, "A Procedure for Objective Respondent Selection Within The Household", *American Statistical Association Journal,* September 1949, pp. 380-387.
2. George W. Barclay, *Techniques of Population Analysis* (New York, 1958), pp. 66.

responses being circled or recorded by the interviewer. Through a 100 percent check-coding process, detected errors were corrected. A 100 percent verification was also used throughout keypunching of the data. In addition, an elaborate computer editing process was designed to detect inconsistencies and inappropriate responses not found during the manual editing and coding stages.

Although there was close control of all phases of processing, some errors are inevitable in an operation of this type and magnitude. However, the net error is likely to be negligible.

- **Sampling Error.** With the described probability design used for this survey, sampling errors can be approximated from the sample itself. A measure of sampling variability indicates the range of difference that may be expected because only a sample of the population is surveyed.

  Sampling error, which should be distinguished from bias, is composed of several factors. The majority of the error results from the distributional properties of the sample itself. A portion of the error in the sample data results from the variability among interviewers and coders.

Age-heaping Adjustment

To compensate for the age-heaping in the Minnesota Household Survey, the following technique was used. The technique assumes the sample response bias is restricted to localized segments of the age distribution and is not significant for broad age groups.

First, the sample distribution was smoothed to eliminate the pronounced age heaps which resulted from response bias. Single year of age data were aggregated into five-year categories which were lagged two years from the standard intervals (e.g., 3 to 7, 8 to 12, 13 to 17, etc.). The intervals span the age breaks where the most serious age-heaping or under-reporting occurred. The totals of these lagged five-year groups were graduated back to single year of age using Beer's multipliers for polynomial graduation.[3] The smoothed single year of age sample distribution was reaggregated into the standard five-year categories.

Next, the sample and graduated sample results were averaged for the five-year age cohorts from 20 years to 85 and over. The averaging of these two forms of the sample data is an attempt to smooth out the points of age-heaping and yet retain the true population fluctuations which may have been captured in the sample results.

Expansion to Total Population

The adjusted sample results for the five-year cohorts were expanded to independent estimates of the total household population for three geographic divisions: the seven-county Twin Cities metropolitan area (Region 11), northeastern Minnesota (Region 3) and the remainder of the state.[4] Estimates of the non-household (group quarters) population, derived independently using total 1977 group quarters estimates and 1970 Census distributions, were added to produce five-year cohort estimates for the total population for each region.

The calculations were as follows for each region:

$$PopT_X = PopH_X + PopGQ_X$$

$$PopH_X = K \cdot N_X$$

$$PopGQ_X = r_X \cdot PopGQ$$

Where:

$PopT_X$ = Total population estimated for any five-year cohort (x)

$PopH_X$ = Household population estimate for any five-year cohort (x)

$PopGQ_X$ = Group quarters population estimate for any five-year cohort (x)

N_X = adjusted sample results for any five-year cohort (x)

K = $\dfrac{\text{Independent household population estimate}}{\text{Total of adjusted sample results}}$

r_X = Proportion of 1970 group quarters population in five-year cohort (x)

The resulting population estimates were divided into male and female categories using 1970 age-sex ratios for each five-year age group and controlled to independent estimates for the 0 to 4, 5 to 24, 25 to 44, 45 to 64, and 65 and over age subdivisions as well as a final control based on 1970 sex ratios. These controls were linear, adjusting each five-year age-sex estimate in proportion to its size relative to its respective control subdivision.

The five-year age-sex estimates for Minnesota were formed by adding the final estimates for the three regional units. This post-stratified estimation of the state age-sex distribution reduced the variance of these estimates over the standard unstratified product.

This report presents these data aggregated into ten-year age-sex groups for each region (see Tables 4 and 5). The aggregations were made because of continued evidence of age-heaping in the five-year age-sex groups. Ten-year age group data should serve the purposes of most users.

3. Nathan Keyfitz, *Introduction to the Mathematics of Population* (Reading, Massachusetts, 1968), pp. 232.
4. See Appendix I for complete definitions of these areas.