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1960-1990

by

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INTRODUCTION

This is the first report on population projections which have been compiled by the Demographic Section of the Pakistan Institute of Development Economics at the request of the Town Planning Directorate of Peshawar Region, Government of West Pakistan. The purpose of this report is to review briefly the available demographic data, the methodology and results of the population projections done for the Rawalpindi City and Cantonment Area, hereto referred as Rawalpindi City. Although the growth of Rawalpindi and Islamabad (the capital city of Pakistan) is quite interrelated, however, as the city of Islamabad is not under the jurisdiction of the Master Plan Project of the Town Planning Directorate we had to limit this study to Rawalpindi City only.

AVAILABLE DATA

One of the problems in preparing population projections at subnational levels is the nonavailability of relevant demographic data at those levels and also the estimation of the extent of net migration. There were four major sources of demographic data available to us - the decennial population censuses, the official vital registration system, Population Growth Estimation Project (PGE) and the Population Growth Survey (PGS). The birth and death statistics from the census and registration system are so inaccurate that it was not felt advisable to use them. However, the census data on population totals, age-sex distributions and intercensal population growth rates were utilized alongwith some demographic data from the Socio-Economic Survey of Rawalpindi City conducted by the Master Plan Project in collaboration with the Central Statistical Office.[1] Under certain broad assumptions these statistics were also used for the estimation of net intercensal migration. For fertility and mortality levels the PGE and PGS data were used. Two types of PGE data were available. One based on the LR system and the other based on the Chandra-Deming (CD) adjustments.[2] We have used the 1964-65 average of the LR and

1. Socio-Economic Survey, Rawalpindi, Master Plan Project, Rawalpindi and Central Statistical Office, Government of Pakistan, Karachi, 1969.

2. Report of the Population Growth Estimation Experiment - Description and Some Results for 1962 and 1963, Pakistan Institute of Development Economics, Karachi, 1968.

CD vital statistics for the PGE sample area in Rawalpindi City. Since the PGS fertility and mortality data have not been tabulated so far, we did some hand tallies in order to extract the relevant data for the PGS sample area in Rawalpindi City. Strictly speaking the unweighted PGE and PGS sample figures may not represent the true situation in Rawalpindi City, therefore, for comparative purposes we have also considered the fertility and mortality estimates for West Pakistan based on the 1964-1965 average of the LR and CD vital statistics of PGE.

METHODOLOGY

For projecting the population of Rawalpindi City from mid 1960 to mid 1990 we have used the component method[3] with special adjustments to account for the net internal migration into Rawalpindi City over the thirty years' period. For applying this method we required the age-sex distribution, the age specific fertility rates and the age-sex specific mortality and migration rates for the base year 1960 and all these statistics except the age-sex distribution for the terminal year 1990. The estimates for base year and the terminal year statistics were derived as described in the following paragraphs.

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3. United Nations, Methods for Population Projection by Sex and Age, United Nations, New York, 1965.

Base Year Population: Table 1 shows the proportionate age-sex

distribution for Rawalpindi City as reported in the 1961

Census.   Obviously, the census age-sex distributions could

have been affected by misreporting of ages and problems such

as the lack of coverage and age-sex selective under and in

some cases over-enumeration.   In the absence of any definite

evidence about substantial lack of coverage and over or

under-enumeration in Rawalpindi City we did not make any

adjustments in the total population.   However, in order to

remove some of the distortions in the age distributions
                                                        4
resulting from misreporting of ages we did smooth the age

distributions for males and females by the method of moving

averages.   The smoothed age distributions are presented in

the fourth and fifth columns of Table 1.   It is evident

that the process of smoothing did not make any substantial

changes in the age distributions.   In order to estimate the

mid 1960 age-sex distribution for Rawalpindi City we projected

the 1951 Census population of Rawalpindi City to the mid 1960

level by using the intercensal population growth rates

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4. Sultan S. Hashmi, Main Features of the Demographic
     Conditions in Pakistan, Asian Population Conference,
     New Delhi, 1963.
     Farhat Yusuf, "On the Extent of Digital Preference in
     Reporting of Ages in Pakistan", Pakistan Development Review,
     Vol. 7, No. 4, Spring 1967.

TABLE I-THE 1961 CENSUS ACTUAL AND SMOOTHED PROPORTIONATE AGE-SEX DISTRIBUTION AND THE ESTIMATED MID 1960 AGE-SEX DISTRIBUTION FOR RAWALPINDI CITY

Age group	Actual proportionate distribution*		Smoothed proportionate distribution		Estimated mid 1960 population	
	M	F	M	F	M	F
00-04	12.55	17.04	12.95	16.72	24,869	23,577
05-09	13.20	15.93	12.18	14.84	23,390	20,926
10-14	10.78	11.57	11.42	12.63	21,931	17,810
15-19	10.29	10.38	10.63	10.48	20,414	14,778
20-24	10.81	9.49	10.23	9.40	19,646	13,255
25-29	9.59	8.32	9.10	8.45	17,476	11,916
30-34	6.90	7.53	7.82	7.04	15,018	9,927
35-39	6.98	5.27	6.54	5.58	12,559	7,869
40-44	5.74	3.95	5.57	4.10	10,697	5,782
45-49	4.00	3.07	4.40	3.22	8,450	4,541
50-54	3.47	2.63	3.07	2.41	5,896	3,398
55-59	1.74	1.53	2.22	1.78	4,263	2,510
60-64	1.46	1.17	1.32	1.15	2,535	1,622
65-69	0.93	0.75	1.00	0.80	1,920	1,128
70-74	0.62	0.48	0.64	0.51	1,229	719
75-79	0.37	0.30	0.51	0.46	979	649
80+	0.54	0.59	0.40	0.43	768	606
ALL AGES	100.00	100.00	100.00	100.00	1,92,040	1,41,013

* The Census Organization gave the population figures for ten year age groups for ages 60 and over. These quinquenial age groups beyond this age were derived by using the formula given in United Nations op.cit.p. 15

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separately for males and females. The resulting population
totals were then distributed by using the smoothed
proportionate age distributions so as to get the mid 1960
age-sex distribution for Rawalpindi City presented in the
sixth and seventh columns of Table 1.

Base Year Fertility and Mortality Levels: Some alternate
estimates of various fertility and mortality measures for
Rawalpindi City are presented in the second and third columns
of Table II. As pointed out earlier the unweighted vital
statistics for the PGE and PGS sample areas may not necessarily
represent the true situation in the City. In order to
determine the mid 1960 fertility level in Rawalpindi City
we took the average of the total fertility rates (TFR) for
the PGE and PGS sample areas in Rawalpindi City and for
West Pakistan, which came to 6.2. Using the proportionate
distribution of the West Pakistan age specific fertility
rates (ASFR) given in the second and third columns of
Table III we estimated the ASFR corresponding to TFR of 6.2
thus arriving at an estimate of ASFR for Rawalpindi City for
the period 1960-1965. Further, Table II shows that the infant
mortality rates (IMR) in both PGE and PGS sample areas of
Rawalpindi City were higher (except for females in the PGE
sample area) than the rates prevalent in West Pakistan. This
rather seems odd, as Rawalpindi City being an urban area with
comparatively better medical and sanitation facilities is

TABLE II: ESTIMATES OF VARIOUS FERTILITY AND MORTALITY MEASURES
FOR RAWALPINDI CITY AND WEST PAKISTAN

| Parameters | Rawalpindi City | | West Pakistan[++] |
	PGE[*]	PGS[**]	
Crude birth rate	31	33	47
Crude death rate	8	15	17
Total Fertility rate	6.1	5.5	7.0
Infant mortality rates			
Males	156	261	123
Females	77	222	141

*   Based on the unweighted average of 1964–65 LR and CD
    estimates for the PGE sample area in Rawalpindi City.

** Based on the unweighted 1968 vital statistics for the
    PGS sample area in Rawalpindi City.

++ Based on the weighted average of 1964–65 LR and CD
    estimates for West Pakistan.

nature of complete households migrating to Rawalpindi City
rather than otherwise. Thus, we used a uniform migration
rate of 2.3 per cent per annum for all age and sex categories.
Assumptions for Future Population Growth: The following
assumptions were made with regard to the components of the
future population growth in Rawalpindi City:

(1) The TFR would decline linearly from 6.2 for the
period 1960-65 to 5.0 for the period 1985-90.
The corresponding ASFRs were calculated by using
the proportionate distribution of the West Pakistan
ASFRs given in the third column of Table III.

(2) The improvement in mortality conditions during
the period 1960-65 to 1985-90 will be such that
the expectation of life at birth for males will
increase by 7 years and for females the increase
will be 10 years. The corresponding model life
tables for the period 1985-90 were North level 17
for males and North level 15 for females. The
mortality levels for the intermediate periods
were interpolated linearly.

(3) The net migration rate would decline exponentialy
from 2.5 per cent for the period 1960-65 to 1.1
per cent per annum for the period 1985-90.

TABLE III: AGE SPECIFIC FERTILITY RATES (ASFR) FOR WEST PAKISTAN
AND FOR RAWALPINDI CITY

Age group	ASFRs of West Pakistan*	Percent distribution	ASFRs of Rawalpindi City for the period	
			1960-65	1985-90
15-19	114.0	8.22	101.9	82.2
20-24	258.5	18.64	231.1	186.4
25-29	323.8	23.36	289.7	233.6
30-34	329.7	23.78	294.9	237.8
35-39	219.6	15.84	196.4	158.4
40-44	88.1	6.35	78.7	63.5
45-49	52.7	3.80	47.1	38.0
ALL AGES	1386.4	100.00	1240.0	1000.0
TFR	6.9	-	6.2	5.0

* Based on the average of 1964-65 LR and CD weighted estimates for
PGE sample areas in West Pakistan.

likely to have lower mortality rates than West Pakistan as
a whole. Thus, we arbitrarily decided that the IMRs in
Rawalpindi City could be about 10 percent less than those
prevalent in West Pakistan. On the basis of the estimated
IMRs for Rawalpindi City the following model life tables[5] were
selected: North level 14 for males and North level 11 for
females.

Base Year Migration Levels: The net migration in West Pakistan
compared to the total population is so little that one can
safely assume that the population growth rate (PGR) and the
rate of natural increase (RNI) are identical. Applying the
intercensal PGR of West Pakistan (viz. 2.43 per cent per annum)
on the 1961 population of Rawalpindi City, we estimated that
the population of the City in mid 1968 should have been
4,06,434 persons. However, the mid 1968 population was
estimated at 4,76,125 persons in the Socio-Economic Survey of
Rawalpindi. The difference between these two figures gave us
an estimate of net in-migration into Rawalpindi City of the
order of 69,691 persons between the 1961 Census and the 1968
Survey. This yielded a net migration rate of 2.3 per cent
per annum. Further, it may be pointed out that most of the
migration into Rawalpindi City occurred as a result of shifting
of the capital from Karachi and was therefore more in the

5. Ansley J. Coale and Paul Demeny, Regional Model Life
    Tables and Stable Population, Princeton University Press,
    Princeton, 1964.

(4)   The sex ratio at birth was assumed to remain
      constant at 105 males per 100 females during
      the projection period.

RESULTS

Table IV presents the population of Rawalpindi City
from 1901 to 1961. It appears from the table that Rawalpindi
City experienced a slight decline in its population between
1901 and 1911 while the population increased at an accelerating
rate from 1911 to 1941 with a sudden decline in the rate during
1941-51. This drop may be the result of postindependence
population movements between India and Pakistan. Again the
population suddenly increased at a higher rate during the
decade 1951-61. This decade was important for Rawalpindi City
as in 1959 the City was declared as the interim capital of
Pakistan. It may further be noted from Table IV that since
1901 the population of Rawalpindi City doubled itself in less
than 40 years between 1901 and 1941 and again increased by
about 84 per cent between 1941 and 1961. The projected
population totals for Rawalpindi City for the period 1960-90
have been presented in Table V. This table shows that the
population of Rawalpindi City is likely to increase by more
than three times during the projection period.

Some future estimates of various demographic
parameters for Rawalpindi City are given in Table VI. The
table shows that the crude birth rate in Rawalpindi City

TABLE IV: PAST POPULATION TRENDS FOR RAWALPINDI
CITY: 1901-1961

Year	Population*	Percent change in population
1901	87,688	
		-1.37
1911	86,483	
		16.95
1921	1,01,142	
		17.94
1931	1,19,284	
		55.13
1941	1,85,042	
		28.20
1951	2,37,219	
		43.40
1961	3,40,175	

* The population totals are as on the census
date.

TABLE V: PROJECTED POPULATION TRENDS FOR
RAWALPINDI CITY: 1960-1990

Year	Population	Percent change in population
1960	3,33,053	
		24.61
1965	4,15,030	
		23.62
1970	5,13,051	
		22.23
1975	6,27,123	
		20.43
1980	7,55,216	
		18.31
1985	8,93,508	
		15.94
1990	10,35,972	

* The population totals are as on 01 July of each year.

TABLE VI —SOME DEMOGRAPHIC PARAMETERS OF RAWALPINDI CITY: 1960-1990

Year	Crude birth rate*	Crude death rate*	Rate of natural increase*	Net migration rate*	Population growth rate*	Expectation of life at birth**		Total fertility rate++	Gross reproduction rate++	Net reproduction rate++
						Males	Females			
1960-65	35.40	15.41	19.99	24.99	4.498	49.03	44.98	6.2	3.0	1.96
1965-70	34.72	14.47	20.25	23.08	4.333	50.39	46.79	6.0	2.9	1.95
1970-75	33.94	13.71	20.23	20.75	4.098	51.78	48.69	5.7	2.8	1.93
1975-80	32.92	13.02	19.90	17.97	3.787	53.21	50.66	5.5	2.7	1.92
1980-85	31.93	12.43	19.50	14.69	3.419	54.69	52.72	5.2	2.6	1.90
1985-90	31.04	11.87	19.17	10.86	3.003	56.22	54.87	5.0	2.4	1.87

* Rates are given per 1000 population

**Expectation of life is given in years

++Rates are given per woman

will decline by about 12 per cent, while the crude death rate
is expected to decline by around 23 per cent - this will
result in a decline of more than 4 per cent in the rate of
natural increase during the projection period. Further, as
the net migration rate has been assumed to decline by about
56 per cent the net effect of declines in fertility,
mortality and migration levels will result in the deceleration
of the rate of population growth by more than 33 per cent.
The improvement in mortality conditions will be such that
expectation of life at birth for males could increase by
7 years and for females by 10 years. The other measures of
fertility and reproduction also show declines of the order
of 5 to 20 per cent.

Tables A through C give the age-sex distribution
for Rawalpindi City, while age specific sex ratios and
abridged life tables have been presented in Tables D through
P.

TABLE A —ESTIMATED MID YEAR POPULATIONS FOR RAWALPINDI CITY : 1960-1990

AGE	BOTH SEXES						
	1960	1965	1970	1975	1980	1985	1990
ALL AGES	3,33,053	4,15,030	5,13,051	6,27,123	7,55,216	8,93,508	10,35,972
00-04	48,446	62,872	76,743	92,286	1,08,500	1,25,180	1,41,601
05-09	44,316	49,783	64,533	78,525	93,942	1,09,616	1,25,159
10-14	39,741	48,151	53,721	69,085	83,228	98,345	1,13,034
15-19	35,192	43,519	52,316	57,870	73,613	87,516	1,01,769
20-24	32,901	38,336	47,063	56,079	61,367	77,045	90,153
25-29	29,392	35,647	41,249	50,208	59,201	63,957	79,056
30-34	24,945	31,736	38,235	43,873	52,852	61,537	65,467
35-39	20,428	26,812	33,892	40,507	46,012	54,745	62,786
40-44	16,479	21,819	28,452	35,699	42,252	47,416	55,584
45-49	12,991	17,462	22,983	29,756	36,969	43,241	47,822
50-54	9,294	13,585	18,158	23,729	30,443	37,390	43,111
55-59	6,773	9,513	13,836	18,373	23,811	30,220	36,616
60-64	4,157	6,690	9,361	13,544	17,853	22,921	28,733
65-69	3,048	3,868	6,212	8,662	12,463	16,297	20,705
70-74	1,948	2,575	3,270	5,249	7,298	10,446	13,548
75-79	1,628	1,418	1,883	2,399	3,855	5,351	7,624
80+	1,374	1,264	1,134	1,279	1,557	2,285	3,204

TABLE B —ESTIMATED MID YEAR POPULATIONS FOR RAWALPINDI CITY: 1960-1990

AGE	1960	1965	1970	1975	1980	1985	1990
				M A L E S			
ALL AGES	1,92,040	2,36,417	2,88,863	3,49,201	4,16,155	4,87,458	5,59,785
00-04	24,869	32,712	39,852	47,831	56,128	64,637	72,981
05-09	23,390	25,937	34,011	41,236	49,154	57,153	65,031
10-14	21,931	25,537	28,120	36,556	43,855	51,602	59,065
15-19	20,414	24,083	27,828	30,358	39,022	46,180	53,454
20-24	19,646	22,259	26,063	29,844	32,199	40,838	47,553
25-29	17,476	21,297	23,959	27,808	31,500	33,544	41,875
30-34	15,018	18,908	22,881	25,518	29,304	32,767	34,348
35-39	12,559	16,191	20,246	24,293	26,810	30,396	33,464
40-44	10,697	13,451	17,228	21,368	25,379	27,662	30,888
45-49	8,450	11,346	14,179	18,021	22,134	25,973	27,892
50-54	5,896	8,830	11,787	14,622	18,410	22,348	25,846
55-59	4,263	6,028	8,981	11,906	14,641	18,229	21,822
60-64	2,535	4,209	5,926	8,779	11,546	14,056	17,274
65-69	1,920	2,362	3,910	5,480	8,067	10,515	12,653
70-74	1,229	1,628	2,002	3,307	4,615	6,751	8,717
75-79	979	899	1,194	1,471	2,428	3,377	4,910
80+	768	740	696	803	963	1,430	2,012

TABLE C —ESTIMATED MID YEAR POPULATIONS FOR RAWALPINDI CITY: 1960-1990

FEMALES

AGE	1960	1965	1970	1975	1980	1985	1990
ALL AGES	1,41,013	1,78,613	2,24,188	2,77,922	3,39,061	4,06,050	4,76,187
00-04	23,577	30,160	36,891	44,455	52,372	60,543	68,620
05-09	20,926	23,846	30,522	37,289	44,788	52,463	60,128
10-14	17,810	22,594	25,601	32,529	39,373	46,743	53,969
15-19	14,778	19,436	24,488	27,512	34,591	41,336	48,315
20-24	13,255	16,077	21,000	26,235	29,168	36,207	42,600
25-29	11,916	14,350	17,290	22,400	27,701	30,413	37,181
30-34	9,927	12,828	15,354	18,355	23,548	28,770	31,119
35-39	7,869	10,621	13,646	16,214	19,202	24,349	29,322
40-44	5,782	8,368	11,234	14,331	16,873	19,754	24,696
45-49	4,541	6,116	8,804	11,735	14,835	17,268	19,930
50-54	3,398	4,755	6,371	9,107	12,033	15,042	17,265
55-59	2,510	3,485	4,855	6,467	9,170	11,991	14,794
60-64	1,622	2,481	3,435	4,765	6,307	8,865	11,459
65-69	1,128	1,506	2,302	3,182	4,396	5,782	8,052
70-74	719	947	1,268	1,942	2,683	3,695	4,831
75-79	649	519	689	928	1,427	1,974	2,714
80+	606	524	438	476	594	855	1,192

TABLE D —AGE SPECIFIC SEX RATIOS FOR RAWALPINDI CITY: 1960-1990

AGE	1960	1965	1970	1975	1980	1985	1990
ALL AGES	136.19	132.36	128.85	125.65	122.74	120.05	117.56
00-04	105.48	108.46	108.03	107.59	107.17	106.76	106.35
05-09	111.77	108.77	111.43	110.58	109.75	108.94	108.15
10-14	123.14	113.02	109.84	112.38	111.38	110.39	109.44
15-19	138.14	123.91	113.64	110.35	112.81	111.72	110.64
20-24	148.22	138.46	124.11	113.76	110.39	112.79	111.63
25-29	146.66	148.41	138.57	124.14	113.72	110.29	112.63
30-34	151.28	147.40	149.03	139.92	124.45	113.89	110.38
35-39	159.60	152.45	148.36	149.83	139.62	124.83	114.13
40-44	185.00	160.74	153.36	149.11	150.42	140.03	125.08
45-49	186.08	185.50	161.06	153.57	149.20	150.41	139.95
50-54	173.51	185.69	185.02	160.55	153.00	148.57	149.70
55-59	169.84	172.95	184.97	184.12	159.66	152.02	147.51
60-64	156.29	169.68	172.51	184.24	183.08	158.56	150.75
65-69	170.21	156.89	169.84	172.25	183.50	181.87	157.15
70-74	170.23	171.83	157.93	170.33	172.04	182.72	180.42
75-79	150.85	173.22	173.39	158.53	170.17	171.11	180.95
80+	126.73	141.33	158.88	168.59	162.16	167.33	168.71

TABLE E — ESTIMATED ABRIDGED LIFE TABLE FOR RAWALPINDI CITY MALES: 1960-1965

x	$_nq_x$	l_x	$_nd_x$	$_nL_x$	T_x	$\overset{o}{e}_x$
0	0.1122800	100,000	11,228	92,140	4,903,161	49.03
1-4	0.0772300	88,772	6,856	340,690	4,811,021	54.20
5-9	0.0336300	81,916	2,755	402,693	4,470,331	54.57
10-14	0.0182700	79,161	1,446	392,190	4,067,638	51.38
15-19	0.0226100	77,715	1,757	384,183	3,675,448	47.29
20-24	0.0322100	75,958	2,447	373,673	3,291,265	43.33
25-29	0.0337400	73,511	2,480	361,355	2,917,592	39.69
30-34	0.0360000	71,031	2,557	348,763	2,556,237	35.99
35-39	0.0406000	68,474	2,780	335,420	2,207,474	32.24
40-44	0.0487900	65,694	3,205	320,458	1,872,054	28.50
45-49	0.0591300	62,489	3,695	303,208	1,551,596	24.83
50-54	0.0771400	58,794	4,535	282,633	1,248,388	21.23
55-59	0.0999100	54,259	5,421	257,743	965,755	17.80
60-64	0.1406900	48,838	6,871	227,013	708,012	14.50
65-69	0.2018900	41,967	8,473	188,653	480,999	11.46
70-74	0.2960000	33,494	9,914	142,685	292,346	8.73
75-79	0.4202800	23,580	9,910	93,125	149,661	6.35
80+	1.0000000	13,670	13,670	56,536	56,536	4.14

TABLE F —ESTIMATED ABRIDGED LIFE TABLE FOR RAWALPINDI
CITY FEMALES: 1960-1965

x	nq_x	l_x	nd_x	nL_x	T_x	$\overset{o}{e}_x$
0	0.1293000	100,000	12,930	90,949	4,497,822	44.98
1-4	0.1104000	87,070	9,613	328,093	4,406,873	50.61
5-9	0.0475300	77,457	3,682	378,080	4,078,780	52.66
10-14	0.0256500	73,775	1,892	364,145	3,700,700	50.16
15-19	0.0273500	71,883	1,966	354,500	3,336,555	46.42
20-24	0.0318100	69,917	2,224	344,025	2,982,055	42.65
25-29	0.0368300	67,693	2,493	332,233	2,638,030	38.97
30-34	0.0426600	65,200	2,781	319,048	2,305,797	35.37
35-39	0.0487800	62,419	3,045	304,483	1,986,749	31.83
40-44	0.0539600	59,374	3,204	288,860	1,682,266	28.33
45-49	0.0589600	56,170	3,312	272,570	1,393,406	24.81
50-54	0.0732700	52,858	3,873	254,608	1,120,836	21.21
55-59	0.0980200	48,985	4,802	232,920	866,228	17.68
60-64	0.1409500	44,183	6,228	205,345	633,308	14.33
65-69	0.2079900	37,955	7,894	170,040	427,963	11.28
70-74	0.3059100	30,061	9,196	127,315	257,923	8.58
75-79	0.4283300	20,865	8,937	81,983	130,608	6.26
80+	1.0000000	11,928	11,928	48,625	48,625	4.08

TABLE G —ESTIMATED ABRIDGED LIFE TABLE FOR RAWALPINDI CITY MALES:1965-1970

x	nq_x	l_x	nd_x	nL_x	T_x	$\overset{o}{e}_x$
0	0.1055720	100,000	10,557	92,610	5,038,452	50.39
1-4	0.0710560	89,443	6,355	344,427	4,945,842	55.30
5-9	0.0311420	83,088	2,588	408,970	4,601,415	55.38
10-14	0.0170440	80,500	1,372	399,070	4,192,445	52.08
15-19	0.0214200	79,128	1,695	391,403	3,793,375	47.94
20-24	0.0305440	77,433	2,365	381,253	3,401,972	43.93
25-29	0.0319620	75,068	2,399	369,343	3,020,719	40-24
30-34	0.0341280	72,669	2,480	357,145	2,651,376	36.49
35-39	0.0384780	70,189	2,701	344,193	2,294,231	32.69
40-44	0.0463080	67,488	3,125	329,628	1,950,038	28.90
45-49	0.0563140	64,363	3,625	312,753	1,620,410	25.18
50-54	0.0740480	60,738	4,498	292,445	1,307,657	21.53
55-59	0.0960820	56,240	5,404	267,690	1,015,212	18.05
60-64	0.1360520	50,836	6,916	236,890	747,522	14.71
65-69	0.1960960	43,920	8,613	198,068	510,632	11.63
70-74	0.2883000	35,307	10,179	151,088	312,564	8.85
75-79	0.4113920	25,128	10,337	99,798	161,476	6.43
80+	1.0000000	14,791	14,791	61,678	61,678	4.17

TABLE H — ESTIMATED ABRIDGED LIFE TABLE FOR RAWALPINDI CITY FEMALES: 1965-1970

x	$_n q_x$	l_x	$_n d_x$	$_n L_x$	T_x	$\overset{o}{e}_x$
0	0.1204160	100,000	12,042	91,571	4,679,392	46.79
1-4	0.1006660	87,958	8,854	333,239	4,587,821	52.16
5-9	0.0433820	79,104	3,432	386,940	4,254,582	53.79
10-14	0.0236160	75,672	1,787	373,893	3,867,642	51.11
15-19	0.0254060	73,885	1,877	364,733	3,493,749	47.29
20-24	0.0297080	72,008	2,139	354,693	3,129,016	43.45
25-29	0.0343940	69,869	2,403	343,338	2,774,323	39.71
30-34	0.0397740	67,466	2,683	330,623	2,430,985	36.03
35-39	0.0455020	64,783	2,948	316,545	2,100,362	32.42
40-44	0.0507060	61,835	3,135	301,338	1,783,817	28.85
45-49	0.0556560	58,700	3,267	285,333	1,482,479	25.26
50-54	0.0696600	55,433	3,861	267,513	1,197,146	21.60
55-59	0.0931720	51,572	4,805	245,848	929,633	18.03
60-64	0.1345580	46,767	6,293	218,103	683,785	14.62
65-69	0.1995820	40,474	8,078	182,175	465,682	11.51
70-74	0.2950980	32,396	9,560	138,080	283,507	8.75
75-79	0.4160820	22,836	9,502	90,425	145,427	6.37
80+	1.0000000	13,334	13,334	55,002	55,002	4.13

TABLE I — ESTIMATED ABRIDGED LIFE TABLE FOR RAWALPINDI CITY MALES: 1970-1975

x	nq_x	l_x	nd_x	nL_x	T_x	$\overset{o}{e}_x$
0	0.0988640	100,000	9,886	93,080	5,177,763	51.78
1-4	0.0648820	90,114	5,847	348,177	5,084,683	56.43
5-9	0.0286540	84,267	2,415	415,298	4,736,506	56.21
10-14	0.0158180	81,852	1,295	406,023	4,321,208	52.79
15-19	0.0202300	80,557	1,630	398,710	3,915,185	48.60
20-24	0.0288780	78,927	2,279	388,938	3,516,475	44.55
25-29	0.0301840	76,648	2,314	377,455	3,127,537	40.80
30-34	0.0322560	74,334	2,398	365,675	2,750,082	37.00
35-39	0.0363560	71,936	2,615	353,143	2,384,407	33.15
40-44	0.0438260	69,321	3,038	339,010	2,031,264	29.30
45-49	0.0534980	66,283	3,546	322,550	1,692,254	25.53
50-54	0.0709560	62,737	4,452	302,555	1,369,704	21.83
55-59	0.0922540	58,285	5,377	277,983	1,067,149	18.31
60-64	0.1314140	52,908	6,953	247,158	789,166	14.92
65-69	0.1903020	45,955	8,745	207,913	542,008	11.79
70-74	0.2806000	37,210	10,441	159,948	334,095	8.98
75-79	0.4025040	26,769	10,775	106,908	174,147	6.51
80+	1.0000000	15,994	15,994	67,239	67,239	4.20

TABLE J — ESTIMATED ABRIDGED LIFE TABLE FOR RAWALPINDI CITY FEMALES: 1970-1975

x	$_nq_x$	l_x	$_nd_x$	$_nL_x$	T_x	$\overset{o}{e}_x$
0	0.1115320	100,000	11,153	92,193	4,868,696	48.69
1-4	0.0909320	88,847	8,079	338,422	4,776,503	53.76
5-9	0.0392340	80,768	3,169	395,918	4,438,081	54.95
10-14	0.0215820	77,599	1,675	383,808	4,042,163	52.09
15-19	0.0234620	75,924	1,781	375,168	3,658,355	48.18
20-24	0.0276060	74,143	2,047	365,598	3,283,187	44.28
25-29	0.0319580	72,096	2,304	354,720	2,917,589	40.47
30-34	0.0368880	69,792	2,574	342,525	2,562,869	36.72
35-39	0.0422240	67,218	2,838	328,995	2,220,344	33.03
40-44	0.0474520	64,380	3,055	314,263	1,891,349	29.38
45-49	0.0523520	61,325	3,210	298,600	1,577,086	25.72
50-54	0.0660500	58,115	3,838	280,980	1,278,486	22.00
55-59	0.0883240	54,277	4,794	259,400	997,506	18.38
60-64	0.1281660	49,483	6,342	231,560	738,106	14.92
65-69	0.1911740	43,141	8,247	195,088	506,546	11.74
70-74	0.2842860	34,894	9,920	149,670	311,458	8.93
75-79	0.4038340	24,974	10,085	99,658	161,788	6.48
80+	1.0000000	14,889	14,889	62,130	62,130	4.17

TABLE K —ESTIMATED ABRIDGED LIFE TABLE FOR RAWALPINDI CITY MALES: 1975-1980

x	$_nq_x$	l_x	$_nd_x$	$_nL_x$	T_x	$\overset{o}{e}_x$
0	0.0921560	100,000	9,216	93,549	5,321,384	53.21
1-4	0.0587080	90,784	5,330	351,943	5,227,835	57.59
5-9	0.0261660	85,454	2,236	421,680	4,875,892	57.06
10-14	0.0145920	83,218	1,214	413,055	4,454,212	53.53
15-19	0.0190400	82,004	1,561	406,118	4,041,157	49.28
20-24	0.0272120	80.443	2,189	396,743	3,635,039	45.19
25-29	0.0284060	78,254	2,223	385,713	3,238,296	41.38
30-34	0.0303840	76,031	2,310	374,380	2,852,583	37.52
35-39	0.0342340	73,721	2,524	362,295	2,478,203	33.62
40-44	0.0413440	71,197	2,944	348,625	2,115,908	29.72
45-49	0.0506820	68,253	3,459	332,618	1,767,283	25.89
50-54	0.0678640	64,794	4,397	312,978	1,434,665	22.14
55-59	0.0884260	60,397	5,341	288,633	1,121,687	18.57
60-64	0.1267760	55,056	6,980	257,830	833,054	15.13
65-69	0.1845080	48,076	8,870	218,205	575.224	11.97
70-74	0.2729000	39,206	10,699	169,283	357,019	9.11
75-79	0.3936160	28,507	11,221	114,483	187,736	6.59
80+	1.0000000	17,286	17,286	73,253	73,253	4.24

TABLE L -ESTIMATED ABRIDGED LIFE TABLE FOR RAWALPINDI
CITY FEMALES: 1975-1980

x	nq_x	l_x	nd_x	nL_x	T_x	$\overset{o}{e}_x$
0	0.1026480	100,000	10,265	92,815	5,066,088	50.66
1-4	0.0811980	89,735	7,286	343,639	4,973,273	55.42
5-9	0.0350860	82,449	2,893	405,013	4,629,634	56.15
10-14	0.0195480	79,556	1,555	393,893	4,224,621	53.10
15-19	0.0215180	78,001	1,678	385,810	3,830,728	49.11
20-24	0.0255040	76,323	1,947	376,748	3,444,918	45.14
25-29	0.0295220	74,376	2,196	366,390	3,068,170	41.25
30-34	0.0340020	72,180	2,454	354,765	2,701,780	37.43
35-39	0.0389460	69,726	2,716	341,840	2,347,015	33.66
40-44	0.0441980	67,010	2,962	327,645	2,005,175	29.92
45-49	0.0490480	64,048	3,141	312,388	1,677,530	26.19
50-54	0.0624400	60,907	3,803	295,028	1,365,142	22.41
55-59	0.0834760	57,104	4,767	273,603	1,070,114	18.74
60-64	0.1217740	52,337	6,373	245,753	796,511	15.22
65-69	0.1827660	45,964	8,401	208,818	550,758	11.98
70-74	0.2734740	37,563	10,273	162,133	341,940	9.10
75-79	0.3915860	27,290	10,686	109,735	179,807	6.59
80+	1.0000000	16,604	16,604	70,072	70,072	4.22

TABLE M -ESTIMATED ABRIDGED LIFE TABLE FOR RAWALPINDI CITY MALES: 1980-1985

x	$n q_x$	l_x	$n d_x$	$n L_x$	T_x	$\overset{o}{e}_x$
0	0.0854480	100,000	8,545	94,019	5,469,341	54.69
1-4	0.0525340	91,455	4,804	355,732	5,375,322	58.78
5-9	0.0236780	86,651	2,052	428,125	5,019,590	57.93
10-14	0.0133660	84,599	1,131	420,168	4,591,465	54.27
15-19	0.0178500	83,468	1,490	413,615	4,171,297	49.98
20-24	0.0255460	81,978	2,094	404,655	3,757,682	45.84
25-29	0.0266280	79,884	2,127	394,103	3,353,027	41.97
30-34	0.0285120	77,757	2,217	383,243	2,958,924	38.05
35-39	0.0321120	75,540	2,426	371,635	2,575,681	34.10
40-44	0.0388620	73,114	2,841	358,468	2,204,046	30.15
45-49	0.0478660	70,273	3,364	342,955	1,845,578	26.26
50-54	0.0647720	66,909	4,334	323,710	1,502,623	22.46
55-59	0.0845980	62,575	5,294	299,640	1,178,913	18.84
60-64	0.1221380	57,281	6,996	268,915	879,273	15.35
65-69	0.1787140	50,285	8,987	228,958	610,358	12.14
70-74	0.2652000	41,298	10,952	179,110	381,400	9.24
75-79	0.3847280	30,346	11,675	122,543	202,290	6.67
80+	1.0000000	18,671	18,671	79,747	79,747	4.27

TABLE N —ESTIMATED ABRIDGED LIFE TABLE FOR RAWALPINDI
CITY FEMALES: 1980-1985

x	$_nq_x$	l_x	$_nd_x$	$_nL_x$	T_x	$\overset{o}{e}_x$
0	0.0937640	100,000	9,376	93,437	5,272,270	52.72
1—4	0.0714640	90,624	6,476	348,896	5,178,833	57.15
5—9	0.0309380	84,148	2,603	414,233	4,829,937	57.40
10—14	0.0175140	81,545	1,428	404,155	4,415,704	54.15
15—19	0.0195740	80,117	1,568	396,665	4,011,549	50.07
20—24	0.0234020	78,549	1,838	388,150	3,614,884	46.02
25—29	0.0270860	76,711	2,078	378,360	3,226,734	42.06
30—34	0.0311160	74,633	2,322	367,360	2,848,374	38.17
35—39	0.0356680	72,311	2,579	355,108	2,481,014	34.31
40—44	0.0409440	69,732	2,855	341,523	2,125,906	30.49
45—49	0.0457440	66,877	3,059	326,738	1,784,383	26.68
50—54	0.0588300	63,818	3,754	309,705	1,457,645	22.84
55—59	0.0786280	60,064	4,723	288,513	1,147,940	19.11
60—64	0.1153820	55,341	6,385	260,743	859,427	15.53
65—69	0.1743580	48,956	8,536	223,440	598,684	12.23
70—74	0.2626620	40,420	10,617	175,558	375,244	9.28
75—79	0.3793380	29,803	11,305	120,753	199,686	6.70
80+	1.0000000	18,498	18,498	78,933	78,933	4.27

TABLE 0 —ESTIMATED ABRIDGED LIFE TABLE FOR RAWALPINDI CITY MALES: 1985-1990

x	$_nq_x$	l_x	$_nd_x$	$_nL_x$	T_x	$\overset{o}{e}_x$
0	0.0787400	100,000	7,874	94,488	5,621,857	56.22
1-4	0.0463600	92,126	4,271	359,535	5,527,369	60.00
5-9	0.0211900	87,855	1,862	434,620	5,167,834	58.82
10-14	0.0121400	85,993	1,044	427,355	4,733,214	55.04
15-19	0.0166600	84,949	1,415	421,208	4,305,859	50.69
20-24	0.0238800	83,534	1,995	412,683	3,884,651	46.50
25-29	0.0248500	81,539	2,026	402,630	3,471,968	42.58
30-34	0.0266400	79,513	2,118	392,270	3,069,338	38.60
35-39	0.0299900	77,395	2,321	381,173	2,677,068	34.59
40-44	0.0363800	75,074	2,731	368,543	2,295,895	30.58
45-49	0.0450500	72,343	3,259	353,568	1,927,352	26.64
50-54	0.0616800	69,084	4,261	334,768	1,573,784	22.78
55-59	0.0807700	64,823	5,236	311,025	1,239,016	19.11
60-64	0.1175000	59,587	7,001	280,433	927,991	15.57
65-69	0.1729200	52,586	9,093	240,198	647,558	12.31
70-74	0.2575000	43,493	11,199	189,468	407,360	9.37
75-79	0.3758400	32,294	12,137	131,128	217,892	6.75
80+	1.0000000	20,157	20,157	86,764	86,764	4.30

TABLE P —ESTIMATED ABRIDGED LIFE TABLE FOR RAWALPINDI CITY FEMALES: 1985-1990

x	$_nq_x$	l_x	$_nd_x$	$_nL_x$	T_x	$\overset{o}{e}_x$
0	0.0848800	100,000	8,488	94,058	5,487,251	54.87
1-4	0.0617300	91,512	5,649	354,185	5,393,193	58.93
5-9	0.0267900	85,863	2,300	423,565	5,039,008	58.69
10-14	0.0154800	83,563	1,294	414,580	4,615,443	55.23
15-19	0.0176300	82,269	1,450	407,720	4,200,863	51.06
20-24	0.0213000	80,819	1,721	399,793	3,793,143	46.93
25-29	0.0246500	79,098	1,950	390,615	3,393,350	42.90
30-34	0.0282300	77,148	2,178	380,295	3,002,735	38.92
35-39	0.0323900	74,970	2,428	368,780	2,622,440	34.98
40-44	0.0376900	72,542	2,734	355,875	2,253,660	31.07
45-49	0.0424400	69,808	2,963	341,633	1,897,785	27.19
50-54	0.0552200	66,845	3,691	324,998	1,556,152	23.28
55-59	0.0737800	63,154	4,660	304,120	1,231,154	19.49
60-64	0.1089900	58,494	6,375	276,533	927,034	15.85
65-69	0.1659500	52,119	8,649	238,973	650,501	12.48
70-74	0.2518500	43,470	10,948	189,980	411,528	9.47
75-79	0.3670900	32,522	11,939	132,763	221,548	6.81
80+	1.0000000	20,583	20,583	88,785	88,785	4.31

ERRATA SHEET FOR RESEARCH REPORT NO. 88

Page 1, footnote, 9th line:
   Delete s from "assistances".

Page 4, Ist line:
   Should read as "Base Year Population:
   Table I shows the percent age-sex".

Page 5, Table I:
   Replace the word "proportionate" by
   the word "percent".

Page 5, Table I, footnote, 2nd line:
   Should read as "ages 60 and over. The
   quinquenial age groups beyond this age
   were derived by".

Page 6, 3rd and 15th line:
   Replace the word "proportionate" by
   the word "percent".

Page 8, page 9 and page 10:
   The numbering is wrong. They should be
   numbered as page 10, page 8 and page 9
   respectively.

Page 13, Table VI:
   The decimal in the sixth column should
   be shifted by one place to the left,
   that is, the figure 4.498 should read
   as 44.98 and so on