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An Account of Sex Ratios and Internal Migration, at the District Level, in Pakistan: 1961 to 1981*

Introduction

FROM the population and development policy view point, one of the most important variables is the sex distribution of a population and its geographical distribution within a country. The sex composition of a population of an acea at a particular time is indicative of the fertility, mortality and migration experiences of the area in the past years. The balance of sexes affects the social and economic relationships in the country. Population redistribuion policies related to manpower supply and projections for geographic sub-divisions are of great significance for the effective development planning. A correct and complete count of population is required in Pakistan, where manpower statistics exist in an inconsistent and uncoordinated manner.

The major problem involved for the censuses (which are the major source of statistical information in Pakistan) is the differential completeness and coverage of the two sexes. This could be due to the mis-reporting of sexes for several reasons. [8]

For the purpose of the evaluation of the sex counts, Shryock and Seigel (1975) have noted that "The estimates of under/over enumeration in a given census for each sex may be merely relative to the coverage in the preceding

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census. We may measure the consistency of the counts of males and females at the successive censuses by comparing the number reported at a given census, or with number expected at the census on the basis of preceding census".

Estimates of under-enumeration of males and females can be made for a country easily and accurately when the birth, death and migration statistics are available. These are very difficult to get in many statistically developed countries and are very rare for developing countries, i.e., in the case of Pakistan, where vital registration systems are also incomplete and deficient. In the absence of such information, it has been suggested as important to evaluate the sex data, before putting it to practical uses.

The Purpose of the Study

The purpose of the present study is to analyse and compare the sex data from the Pakistani population censuses at the national, provincial and district levels. The population growth rates have been reviewed during the period from 1951 to 1981. The cross-sectional variations and inconsistencies in sex composition and population totals have been compared. An attempt to seek a 'plausible' explanation of district level differentials of sex data over time will also be made. Therefore, this study is limited to a purely demographic analysis undertaken to evaluate the sex composition in relation to the exaggerated inter-regional population growth rates. The significance of this exercise lies in providing a useful background material to the demographers, researchers and planners.

The Data

Since 1947, four population censuses have been conducted in Pakistan. The first population census was undertaken in 1951, the second in 1961, the third in 1972 and the fourth in 1981. The later three censuses provide population counts by sex, which are comparable by district boundaries after few preliminary adjustments are made (see Appendix); and are the basis for the present paper.[1]

Methods of Analysis

The evaluation of reported population totals at the district level has been

1. The geographic identity between the districts for 1961, 1972 and 1981 have been maintained (in this analysis) by the exclusion of the population of provincially Administered Tribal **Areas** (PATA) of NWFP, Centrally Administered Tribal Areas (CATA) and Federal Capital Territory of Islamabad. However, the population of Tribal Areas adjoining Hazara district have been included. Therefore, this study represents Pakistan comprising iis four major provinces i.e. NWFP (excluding Malakanad Division). Punjab, Sind and Baluchistan; representing about 93 percent of the total population of Pakistan.

carried out in two ways: one, by applying the internal consistency checks through comparisons of cross-section inter-censal growth rates for their reasonableness. The United Nations consider a rate of growth, outside the range of 0 to 3 percent, as anomalous in population counts. Two, by making comparisons of sex composition and internal migration in successive censuses.

A. Sex Ratio

This is a valuable device to measure the relative completeness of sex reporting in a given census. In general practice the sex ratio is defined as the number of males per 100 females. The greater the excess of males the higher the ratio and the greater the excess of females, the lower the ratio.

According to Shryock and Seigel (1975), the sex ratios of populations, in general, tend to fall in a range of 95 to 102. Under special circumstances, e.g., following historical war losses or heavy immigration the sex ratio tend to be more outside the range of 95 to 102 and within the range of 90 to 105; they are to be viewed as extreme and must be explained by historical circumstances; where they cannot be explained by historical circumstances, the accuracy of the data is Suspect. If methodology and procedures of conducting censuses, over time by cross-sections, were similar in the country then the major differences in the sex ratio must be explained by significant regional mobility of males and females. The cross sectional over time variations in sex ratio provide the ground for quantitative estimates of factors responsible for high ratios; one of such factors is sex-selective migration within a province or between the provinces. This involves both volume and sex composition of migrants.

B. National Growth Rate Method

This is a crude but fairly commonly used method (Shryock and Seigel, 1975 and Ueda, 1982). The indirectly estimated net migration rate for a sub-national (district) area Mi has been defined by Ueda (1982) as follows:

$$M_i = \frac{p'_{t+n} - p'_t}{p't} - \frac{p_{t+n} - p_t}{p_t} \times 100$$

where

p_t = the population of each area at the time *(t)* e.g. at the earlier census,

P_{t+n} = population of each area at the time *(t + n)* e.g. at the later census.

pt = the national total population at the time (0 e.g. at the earlier census.

p_{t+n} = the national total population at the time *(t* + n), e.g, at the later census.

Assuming that there is no big difference in the national increase rate and

among sub-national areas, any deviation of the population growth rate of each area from the national average can be attributable to the net effect of migration. For example, a rate of population growth in a place greater than the national average is assumed to show a degree of excess in moving in migrants into the place. A rate of population growth less than the national average, on the other hand, is supposed to represent a degree of excess in moving out migrants from the place. This method requires no vital statistics, on births and deaths. Barcley described the indirect measures as 'best suited' for the analysis of internal movements. This method yields quick and convenient indications of inter-provincial/ inter-district movements* (For other techniques: See Shryock and Seigel, 1975).

Findings

la the following sections, the time trend of the population size and changes for the country are reviewed. Patterns of sex composition, quality of sex reporting and a comparative analysis of sex selective net internal migration estimates have been conducted, for the period of 1961 to 1981.

I. THB POPULATION SIZE AND GROWTH IN PAKISTAN AND PROVINCES IN 1951 TO 1981

Since the 1951 census of Pakistan, the population has grown at a very rapid rate in the country. The percentage increases in the population as shown in Table 1, were much higher during the intercensal period of 1961-72, as compared with the 1972-81 census, at the province level as well as for the district level except for few districts in Baluchistan. However, the annual rate of growth remained fairly stable around 3 percent per annum. This means that the population doubling time is 23 years for Pakistan. Anyhow, the unrealistic figures for the provinces of Sind and Baluchistan in 1972, particularly the latter in 1972-81 need to be investigated thoroughly. A rate of growth of 7 percent per annum in Baluchistan is highly critical.[1]

An examination of age pyramid for Pakistani censuses showed an expanding base of population over time. It is difficult to determine, whether fertility has begun to decline in Pakistan (see Zaki and Zaki, 1983 for further details). It is estimated that 3 million babies arc born every year. Moreover, it is also suspect-

2. Errors in census data as well as in coverage will be reflected as errors in estimated net migration. This method does not relate to the accuracy of the statistics used.

3. The overall increase in the Population is attributable to the high fertility rate and declining mortality rate due to the improved health and medical care facilities. The 1981 census includes the roughly 2 million Pakistani workers abroad and over 2 million Afghan refugees who were living in Pakistan at the time of census.

TABLE *I*—POPULATION SIZE AND RATE OF GROWTH IN PAKISTAN AND PROVINCES: 1961-1981

Area	Population (in 000)			Percentage Change		Annual Rate of Growth (in Percent)	
	1961	1972	1981	*1961-72*	*1972-81*	1961-72	1972-81
Pakistan	42,880	65,309	84,253	52,3	28.3	3.6	3.1
NWFP	5,731	8,388	11,061	46.4	29.8	3.6	3.3
Punjab	25,462	37,610	47,292	47-7	25.3	3.3	2.7
Sind	8,367	14,156	19,029	69.2	33.9	4.6	3.6
Baluchistan	1,353	2,429	4,332	79.4	77.2	5.1	7.1

SOURCE: Pakistan Census Organization; (1) Provincial Reports of 1972 Census (2) Main Finding of 1981 Population Census.

'Federally administered Tribal Areas and Capital Territory of Islamabad have been included in Pakistan total. NWPP includes Malakand division.

ed in Pakistan that the rate of growth is exaggerated at the province/district level, due to the enumeration biases. However, most of the exaggerated growth differentials at the sub-national level could undoubtedly be considered due to the migration within the country.

II. PATTERN OF SEX COMPOSITION

A. Proportions by Sex in Pakistan and Provinces

It is revealed by Table 2 that in Pakistan, 53 percent of the total population are males and 47 percent are females. These proportions were almost stable throughout the census history of Pakistan. While one might expect the proportions of males and females to be roughly equal, the readers should be aware of the suspected phenomena of female under-enumeration in Pakistan and higher female mortality. (Zaki and Zaki, 1983). This phenomena would tend to inflate the sex ratios in the country.

B. Sex Ratios in Pakistan and Provinces

The sex ratios as given in Table 2, for the years of 1961, 1972 and 1981, reveal that these ratios were consistently higher in all the years while there does seem to be a tendency towards a decline. From 116 in 1961, it has declined to 111 in 1981 at Pakistan level. An observation of PGE (1962-65) PGS (1968-1971), HED (1973) exhibited the sex ratios in the range of 114-116 in the country. The survey data have also shown a declining tendency in 1975 (PFS)

TABLE 2—POPULATION DISTRIBUTION (IN PERCENT) BY SEX RATIOS AND SEX RATIO SCORES IN PAKISTAN AND PROVINCES: 1961-1981

Pakistan	Both Sexes	Males (Percent)	Females[1] (Percent)	Sex Ratio (Per 100 females)	Sex Ratio Score
Pakistan					
1961	42,880	54	46	116	5.0
1972	65,309	53	47	114	8.6
1981	84,253	53	47	111	6.1
NWFP					
1961	5,731	52	48	109	6.5
1972	*8,388*	52	*48*	*108*	*6.4*
1981	11,061	52	48	109	7.3
Punjab					
1961	25,462	53	47	114	5.5
1972	37,610	54	46	116	8.5
1981	47,292	53	47	111	5.6
Sind					
1961	8,367	55	45	123	6.0
1972	14,156	53	47	115	10.4
1981	19,029	53	47	111	6.4
Baluchistan					
1961	1,353	55	45	122	9.1
1972	2,429	53	47	113	13.2
1981	4,332	53	47	112	12.6

SOURCE: Population Census of Pakistan; as in Table-1.

1. Proportions by sex have been computed on the basis of the respective sex ratios.

and 1976 (PGS); where sex ratios were reported as 109 males for 100 females.

The sex ratios vary widely at the province level. It is clear from Table 2 that

they ranged from 108 to 123 in the four provinces. In 1961, they were 123 and 122 in Sind and Baluchistan; this figure for Punjab was 114; which left the NWFP far behind at 109 sex ratio, The sex ratios remained fairly stable and relatively lower in NWFP in the three years. They showed an increase in the Punjab from 114 in 1961 to 116 in 1972. They sharply declined in Sind and Baluchistan in 1972 as compared to 1961. However, over 1972-81, they declined considerably in Punjab, Sind and Baluchistan.

C. Quality of Sex Reporting in Pakistan and provinces, 1961, 1972 and 1981 Census, Based on Sex Ratio Scores (SRS)

The mean difference between the sex ratios of the successive age groups is called the sex ratio score (SRS). The lower the SRS, the better the overall quality of data (where ages are also taken into account). A quick glance at Table 2 shows a decline in (1981 over 1972) the SRS, and hence an improvement in the quality of data, in 1981, in Pakistan and all the provinces. These scores are greater in 1972 than in 1981, in Punjab, Sind and Baluchistan. In 1981, the quality of sex reporting appeared to be of better quality in Punjab and Sind relative to NWFP and Baluchistan. The above findings provide sufficient evidence to explore the sex ratios further in terms of the intervening factors i.e. internal migration being of the immense importance.

D. Sex Ratios in the Districts of Pakistan in 1961, 1972 and 1981

Roughly speaking at the district level the sex ratios range in 1961 was 102-135, in 1972 and 1981 it was 101-125.[4] A clearly declining trend over the census years 1961-72 and 1972-81 in all the four provinces except Baluchistan has also been observed. (See Table 3).

The decline in **sex** ratios was slight during 1961-72, but relatively greater during 1972-81. This tendency has been marked for the districts in the Punjab and Sind provinces, although the clustring around the province average is clear in all the regions. Hazara in NWFP, D. G. Khan in Punjab, Quetta, Loralai, Zhob, Kharan and Mekran in Baluchistan were the districts of increases in sex ratios over 1972-81,[5] whereas, in Sind all the districts experienced a decline. We have observed that 5 out of 10 districts in the province of Baluchistan have shown an increase in sex ratios, which may be indicative of the direction of movement in the province. With improved methodology and procedures the

4. This range for 1981 excludes the 4 extreme values; including those 4 **values** the range would be 98-127.

5. Jhelum in Punjab and Kachhi in Baluchistan had sex ratio values even below 100 **which** implies a deficit **of** the males in these districts.

TABLE 3—SEX RATIOS AND NET ESTIMATES OF INTERNAL MIGRATION BY SEX, BY PROVINCES AND DISTRICT IN PAKISTAN: 1961-72 AND 1972-81

Province / District	Sex Ratios per 100 Females			Estimates of Persons Migrated*			
				1961-1972		1972-1981	
	1961	1972	1981	Males	Females	Males	Females
Pakistan	116	115	111	—	—	—	—
NWFP	109	108	109	—119,375	—115,630	— 1,778	—160,040
Hazara	104	106	112	— 30,367	— 56,181	51,958	— 63,671
Mardan	108	108	105	- 17,179	- 18,095	— 65,841	— 71,419
Peshawar	117	111	111	— 46,307	— 4,851	22,857	— 18,129
Kohat	102	108	102	11,325	— 6,156	— 4,429	2,493
D. I. Khan	116	115	112	— 34,992	— 27,831	12,722	7,327
Bannu	110	109	105	— 1,856	~ 2,516	— 19,045	— 16,641
Punjab Province	114	116	111	—443,867	—762,095	—910,880	—713,077
Campbellpur	103	108	101	— 30,997	— 53,972	— 62,934	— 55.903
Rawalpindi	108	116	108	64,534	— 6.611	— 94,090	— 45,366
Jhelum	103	111	99	— 24,350	— 64,973	—126,397	— 74,542
Gujrat	111	114	109	— 47,756	— 72,579	—118,338	— 94,714
Sargodha	115	113	109	— 74,878	— 59,264	— 87,627	— 76,904
Mianwali	111	111	108	- 21,104	— 20,535	— 20,987	— 22,943
Lyallpur	115	115	110	88,335	66,148	—453.671	—384,178
Jhang	115	114	111	— 46,999	— 34,852	— 25,242	— 82,933
Lahore	121	118	115	— 14,126	11,959	— 92,039	63,269
Gujranwala	116	119	112	65,576	26,734	— 19,115	1,884
Sheikhupura	114	117	112	17,477	— 6,050	— 28,771	— 15,960
Sialkot	111	117	107	— 16,367	— 70,992	—208.403	—121,013
D. G. Khan	116	119	126	— 14,051	— 26,225	91,321	11,119
Muzaffgarh	115	US	112	40,514	16,870	57,057	67,453
Mullan	116	114	112	— 68,421	— 34,578	18,598	— 17,576
Sahiwal	114	118	115	—191,221	-221,970	79,168	56,405

Bahawalpur	119	120	113	— 21,858	— 27,227	35,285	36,306
Bahwalnagar	US	119	110	— 84,763	— 94,463	— 24,594	5,009
RahimYar Khan	119	124	113	— 83,414	— 84,509	— 14,178	37,510
Sind Province	123	115	111	558,452	856,074	339,233	316.400
Jacababad	123	114	103	20,953	37,723	32,531	62,146
Sukkur	120	113	113	64,953	88,714	— 13,231	— 41,806
Larkana	116	112	110	— 6,073	6,988	— 23,342	— 29,739
Nawabsbah	120	109	101	132,870	168,278	— 76,456	— 41,137
Khairpur	121	113	108	— 31,264	— 5,611	18,607	23,268
Hyderabad	124	112	107	102,446	182,790	32,634	16,194
Dadu	121	112	107	21,484	45,837	13,643	3,197
Tharparkar	119	115	111	— 58,144	— 35,032	97,058	88,099
Sanghar	123	115	109	11,616	26,845	8,433	16,064
Thatta	115	110	105	7\,403	73,559	— 54,429	— 67,834
Karachi	132	124	119	228,351	256,982	369,053	315,329
Baluchistan	122	113	112	159,782	207,783	638,527	509,653
Quetta	135	114	127	34,335	60,046	82,008	23.204
Sibi	122	111	104	20,025	32,720	56,982	62,275
Loralai	123	111	114	6,019	12,694	81,603	65,305
Zhob	123	106	116	15,009	23,451	80,967	55,805
Chagai	120	105	103	— 726	3,184	19,247	16,668
Kalat	121	115	105	44,997	43,635	130,079	136,324
Kachi	121	118	98	— 10,151	— 6,311	3,559	30,478
Kharan	113	113	120	9,368	8,273	17,630	11,533
Mekran	112	116	125	42,647	31,958	151,816	100,598
Lashela	113	112	113	— 1,742	— 1,867	14,636	7,463

SOURCE: *(a)* Population Census of Pakistan 1972, Provincial and District Census Reports.
(6) Housing and Population Census of Pakistan: 1980-81, Census Bulletin 1,1981.

1. A negative sign denotes out-migration and positive sign denotes in-migration in the areas.

1981 census data may represent a pattern closer to the true pattern of sex ratios in the districts of the country. If so, and if methodology and procedures were similar throughout the country, the decline in sex ratios of Punjab and Sind must be explained by internal migration of people.

III. PATTERNS OP INTERNAL NET MIGRATION ESTIMATES IN PAKISTAN

The purpose of the internal net migration analysis is to understand the amount and direction of migration over the intercensal period of 1961-1972 and 1972-81. This would eventually lead us to examine the extent to which these estimates of net migration are consistent with sex ratios as given in the censuses of 1961, 1972 and 1981,

A. Inter-Province Migration

Generally speaking in the areas where sex ratios were higher in 1961, they declined in 1972 and the areas where they were lower in 1961 experienced increases in 1972 (See Table 3). The comparison of the sex ratios and net internal migration estimates indicated that the areas which showed a decline in sex ratios had experienced cut-migration both for males and females over 1961-72; conversely the areas for which sex ratios increased over the intercensal period had received people. As a result of the greater female in-migration the sex ratios declined in Sind and Baluchistan during 1961-72. The higher sex ratios for Punjab in 1972 may have resulted by lot of female out-migration, which was almost double than males. However, the greater female cut-migration from Punjab, or in other words the greater female in-migration in Sind and Baluchistan, is conspicuous.[7] It could be suspected that the enumeration biases along with other factors have influenced the estimates. The different picture has been portrayed for the 1981 census.

The NWFP had maintained quite a balance of out-migrants during 1961-72 whereas over 1972-81 there were more female out-migrants relative to males which contributed *to* an increase in sex ratios in 1981. In Punjab, as compared to 1961-72, the our-migration rates were higher for males than for females in 1972-81, which lowered the sex ratio in 1981. Sind maintained a balance of recipients, although the rates were much lower particularly for females (it declined from about 23 percent in 1972 to 5 percent in 1981). The noticeable feature in the province of Baluchistan was the higher in-migration rates during

6. The number of persons moving-cut of a district or province will be representative of the out-migration and moving-in will of in-migration in an area.

7. Ho allowances **have** been made here for female migration due to marriage {See Irfan, 1983).

1972-81.[8] The balance of sexes, in 1972-81 as compared to 1961-72 situation, in the Sind and Baluchistan provinces does not seem to have affected the sex ratios markedly. Furthermore, the unreasonably high annual rate of growth (7.1 percent per annum) for the latter province in 1981 can not be explained only by the mortality-fertility interplay. Therefore, the sex composition picture that emerged in 1981, appeared to be associated with the phenomena of internal migration.

B. Inter-District Migration

In Table 3 we also presented the estimates of total number of persons migrated by sex and sex ratios for each district, for 1961-72 and 1972-81 inter-censal periods. The table shows that the majority of districts, which lost population due to the internal migration, during the two inter-censal periods belonged to provinces of NWFP and Punjab. About 19 of 25 districts in the said provinces experienced out-migration of both the sexes.

In NWFP males had out-numbered the females during 1961-72, e.g. Peshawar and D. I, Khan districts had lost more males. The reverse picture appeared in 1972-81 i.e., only 1,778 males moved out as compared to 160,040 females in this province. Mardan and Bannu were the districts of greater out-migration for both the sexes.

In Punjab province, females out-numbered males in 1961-72; Sahiwal, Bahawalnagar, R. Y. Khan and Gujarat were the districts of greater female outmigration. Opposite was the case for 1972-81; eleven of her 19 districts lost population; among them Faisalabad and Sialkot lost the maximum number of both the sexes. While Lahore and Gujranwala received more females.

Since there was a lot of outmigration from NWFP and Punjab, Sind and Baluchistan had received people, accordingly. More females had moved in than males during 1961-72. In Sind, the districts which registered a rise in population, through net migration were : Thatta for males, and Nawab Shah for females; Karachi had received 228 thousand males and 257 thousand females; Hyderabad was the second high migrant recipient district. In 1972-81, Karachi, being the district of greatest attraction, received about 684 thousand migrants of both the sexes. Tharparker was the second gaining district and Nawabshah was the biggest looser for this intercensal period.

During 1972-81 in Baluchistan province, slightly more males in-migrated than females, as compared the 1961-72; Kalat and Mekran were the main receivers in the later census. The marked variations have been observed among the rest of districts (see Table 3).

8. The migration rates must be studied together with the number of persons migrated (that depends on the population size of the area), otherwise they could **give** misleading estimates. These rates are given in [13],

IV. Comparison of Sex Ratios and Internal Migration Estimates in Pakistan

A. Inter-Province Comparison

In general, we have observed that for NWFP, the sex ratios were more or less stable throughout the three censuses of 1961, 1972 and 1981. Similarly, the migration estimates were fairly in balance for both the sexes. A very slight increase that occurred in sex ratio in 1972-81, over the 1961-72 period, can be accounted for the greater female outmigration (160,040) relative to the male (1,778) in 1972-81.[9] Sex ratio figure for Punjab had risen to 116 in 1972 from 114 in 1961. There was a reduction in sex ratio in 1981 to 111. Accordingly, the province lost more females during 1961-72, which led to the increase in sex ratio in 1972. The decline in sex ratio in 1981 could be due to the larger male outmigration; although the above fluctuations were not of extreme nature.

Sind and Baluchistan were the provinces of greater fluctuations in their population growth rates, sex ratios and viz-a-viz, internal migration figures. In these provinces, sex ratios were very high in 1961; they declined very sharply in 1972; from 123 to 115 in Sind and from 122 to 113 in Baluchistan. They further declined in 1981 as compared to 1972. The larger female in-migration probably from NWFP and Punjab during 1961-72, may have contributed to the decline of sex ratios of Sind and Baluchistan in 1972. During 1972-81, the male-female migration was more or less in balance. Even though it was slightly greater for males, it was not substantial enough to affect the sex ratios, which experienced a decline. However, the very high population growth rates (r) of 5.1 (1961-72) and 7.1 (1972-81) could be justified on account of total inmigration, particularly in Baluchistan province in the latest census.

B. Inter-district Comparison

In NWFP in Hazara district, for example the sex ratios had increased during the two intercensal periods, which appeared to have occurred because of the females who had moved out of the district, during 1961-72. In 1972-81, more males inmigrated to this district, whereas females outmigrated; this led to the increase in sex ratio. Kohat also experienced changes due to the migration phenomena, during 1961-72 and 1972-81.

An interesting situation emerged for Jhelum and D. G. Khan in Punjab over 1972-81. In Jhelum sex ratio was lowered below the level of 100 indicating a deficit of males in the district; this may have happened as a result of outmigration

9. The influence of Afghan refugees may have been quite uniform on the population of this area.

of 126 thousand males as compared to 75 thousand females. The upward turn in sex ratio of D. G. Khan may also have taken place because of the movers in the district, i.e. 91 thousand of males came in, relative to only 11 thousand of female.

The decline of sex ratios in Jaccobabad was wholly due to the relatively greater female inmigration during 1972-81; whereas in Nawab Shah, the greater male outmigration was responsible for the decline.

For Quetta district in Baluchistan, the sex ratio, in 1961 was 135, in 1972 it declined to 114; this could be due to the greater female inmigration, whereas during 1972-81 it shot up again to 127, might be as the result of greater male in migration. Similar phenomenon of tremendous differentials in sex ratios and sex selective migration are clear for the districts of Kalat, Kachhi, Kharan and Mekran, in both the censuses of 1972 and 1981[10].

C. 'Adjusted' Population Size and Sex Ratios in the Provinces and Districts of Pakistan in 1981

In order to search for 'factual' or plausible picture of population at the district level, the question, "what would have been the level of sex ratios, if there were no migration", has been addressed in this section. The reported 1981 population by sex and sex ratios have been 'adjusted' for internal migration and are given Table 4.[11]

The review of the sex ratios based on the 'adjusted' population of males and females exhibited a clearcut downward trend at the province level (except Punjab), as well as at the district level for 1981 census. It has also been observed by Table 4, that the adjustment of the population figures have produced a uniform growth rate of 3.1 percent per annum, for each of provinces.[12] The highly alarming growth rate (t) of 7.1 percent in Baluchistan have also been corrected for migration and is in line with other provinces and the country as a whole.

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10. Whatever socio-economic, demographic or other factors which influence peoples' decision to migrate should be studied as a separate subject in detail. Such efforts have been made through PIDE's studies (PIDE Research Reports No. 101 and 102, Afzal and Abbasi 1979 and PLM 1979).

11. The adjustment to the reported district level population by sex have been made in a manner described below: the estimated number of persons who had come to a district during 1972-81, have been subtracted from the 1981 population of the district and vice versa the estimated number of persons who had left, the district during 1972-81, have been added back to the 1981 population of the district. The population by sex was estimated by the authors, due to the non-availability of the sex break-up from the 1981 published census Bulletins.

12. It should have been the case, since the rate of growth (r) at the national level was 3.1 percent, and have been produced by the rate of growth at the district/province levels. This confirms the assumption that the rate of natural increase is the same for all areas in Pakistan,

TABLE 4—POPULAT ION SIZE, GROWTH AND SEX RATIOS (REPORTED AND ADJUSTED), IN 1981 CENSUS

Area	Total Population (000s')		Population Growth Rate per annum 1972-81		Sex Rate (males per 100 females)	
	Reported	Adjusted	Reported	Adjusted	Reported	Adjusted
Pakistan	78,738	78,731	3.1	3.1	—	—
N.W.F.P.	8,362	8,527	3.3	3.1	109	105
Punjab	47,115	48,742	2.7	3.1	111	112
Sind	18,966	18,310	3.6	3.1	111	111
Baluchistan	4,295	3,152	7.1	3.1	112	109

SOURCE : Main findings of 1981 census and present authors* adjustment.

(I) Excludes Malakand Division in NWFP, FATA and FCTI. The Difference in reported and adjusted total is due to the founding up of figures at several stages.

The district level sex ratios picture appeared to be refined after dealing with migration accounts. For 44 of the total (46) districts, they fell considerably below the level of 112 sex ratio for the district in NWFP, Sind and Baluchistan (except Karachi in Sind). They are much more evenly distributed in all the districts. They have slightly gone up in Punjab. After adjustments are made, the extreme fluctuations prevailing in Baluchistan have been smoothed to a reasonably acceptable level in Pakistan than reported.

The remaining inconsistencies could be genuinely blamed to the coverage and reporting biases in sex enumeration. However, an improvement in the quality of 1981 population census data is noticeable relative to the 1972 and 1961 censuses. A 38 percent decline in an age sex accuracy Index (in 1981 over 1972) marks an improvement in the latest data set, which is now available for Pakistan [Zaki and Zaki, 1983].

Findings of Previous Studies

Several evaluation studies done previously were related to the completeness and the reliability of census enumeration and vital registration system in Pakistan, for example, see Afzal [1974] Bean [1974], Krotki and Parveen [1976], Zaki and Zaki [1981 and 1983]. Rukanuddin [1967] using data from 1961 census and several demographic surveys among other factors, recognized the higher female mortality as a factor contributing to the higher sex ratios. In recent years, considerably low over all crude death rate has been reported for Pakistan e.g., 10/1000 was observed in 1978 PCS; this could possibly account for lowering the sex ratios down in 1981 census.

Afzal [1974], considered internal migration for the period of 1951-61, and found that the districts which received substantial number of migrants were in Sind province. Using life time migrant approach, he found larger outmigration in NWFP and Punjab for the same period. Burki's [1973], indirect estimates of provincial level migration are also confirmed by our findings for the 1961-72 period.[13] Irfan [PLM 1979 and 1981 census presented evidence similar to our findings at the province level. The greater female migration has been credited to the patriarchal marriage system in Pakistan by Irfan.[14]

Summary and Conclusion

The sex data from the Pakistani censuses of 1961, 1972 and 1981 have been evaluated in this study at the national, provincial and district levels. The inter-regional population size and growth rates were also compared.

The population totals by sex were analyzed and very high sex ratios were found in all the provinces. However, this analysis pointed towards a declining tread over 1961-72 and 1972-81 in the country. The sex ratios were relatively higher in Sind and Baluchistan than in NWFP and Punjab. Therefore, it has been concluded that the sex selective migration patterns affected the sex ratios in the country, particularly in Sind and Baluchistan.

Briefly, the NWFP and Punjab experienced out-migration over the inter-censal periods of 1961-72 and 1972-81. Sind and Baluchistan were the migrant receiving provinces; this could be the result of greater availability of economic opportunities. Moreover, a noticeable feature of internal migration was the higher migration rates for females than males; except in Punjab, where it was higher for females during 1972-81.

A very simple "adjustment" procedure was adopted to net out the effect of net internal migration, on the sex distribution, which smoothed the sex ratios as well as the interprovincial growth rates to a 'reasonably' prevailing level in the context of Pakistan.

The declining pattern of sex ratios were indicative of the better census cover-

13. The internal migration estimates, in relation to urbanization, were also considered by Afzal and Abbasi [2], for the period of 1951-73. While explaining the male-female differentials in the pace of urbanization, the authors found the sex ratios higher in the urban areas than in rural areas. The decline in the sex ratios of urban areas (in other words, the slower pace of urbanization) over the period of 1961-72 was explained in terms of the changing rural to urban migration pattern. The male selectivily in the rural to urban migration was previously held responsible for the higher sex ratios in urban areas. Whereas the decline in sex ratios of urban areas in 1972 was considered due to the rural to urban migration of both the sexes, which they have termed as the 'family migration". *In* addition to the above finding, the study has utilized different methods to look into the phenomena of urbanization and migration by sex.

14. The study has taken into account a number of other important factors see [5].

age by sex, particularly of females, in 1981 census. An analysis of the sex distributions by age group, at the sub-national levels might provide more meaningful understanding of the data. However, inspite of all the limitations, this exercise provides valuable basis for practical uses by the researchers, demographers and policy makers.

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APPENDIX

The total population of Pakistan, represents here the population of the 46 districts in 1961, 1972 and 1981. The population totals for Pakistan were obtained, by sex from the district census reports in 1961 and 1972. The 1981 census district total population was reported in census Bulletin I. The proportions by sex were estimated by the use of sex ratios, and accordingly the **sex** distributions were produced. The district population total were adjusted for geographic boundary changes which took place between 1961 and 1972 census, and between 1972 and 1981 censuses. To attain the geographic identity between districts certain adjustments of population figures were required, in all the three censuses. Therefore, the 1961 and 1981 population totals were adjusted to the 1972 geographic boundaries for the following districts : Hazara, Campbelpur, Rawalpindi, Lahore, Multan, Sahiwal, Sukkur, Khairpur, Hyderabad, Quetta/ Pishin, Sibi, Kalat, Kachhi, Kharan, Mekran and Lasbela. The above adjustments provided the comparative and identitical geographic boundaries for the three censuses.

Moreover, the Lasbela district was included in the province of Baluchistan in 1961. Karachi was a district of Baluchistan in 1961 was included in Sind. During 1972-81, the number of new districts have been formed, namely Kohistan, Mansehra, Abbotabad in NWFP; Kasur and Vehari in Punjab province, Shikarpur and Badin in Sind, Karachi (in Sind) have been divided into three districts i.e. Karachi East, Karachi West and Karachi South. Nasirabad Khuzdar, Kohlu Agency, Turbat, Gawadar and Punjgur are the newly formed districts in the Baluchistan province.

It is worthwhile to point out here that the footnotes in some of the District Census Reports of 1972 census were inadequate in specifying the changes, which took place between 1961-72, period. Therefore, it is suggested that 1981 census reports must take care of the changes thoroughly by labelling the Tables with proper footnotes or a separate reliable document be prepared to facilitate the researchers' work in following up the transferred populations by geographical boundary changes.