Mortality and health issues: mortality trends and patterns in Pakistan

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MORTALITY AND HEALTH ISSUES

Mortality Trends and Patterns in Pakistan

by
Mohammad Irfan

Report of a study undertaken in Pakistan
under the project on
Analysis of Trends and Patterns of Mortality
in the ESCAP region

ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC
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PREFACE

The ESCAP secretariat with financial support from the United Nations Fund for Population Activities initiated in 1984 the project "Analysis of trends and patterns of mortality in the ESCAP region". The first expert meeting under the project held at Bangkok in November 1984. Six researchers from the countries selected for indepth study (Bangladesh, China, Indonesia, Pakistan, Republic of Korea and Thailand) and several scholars from various research institutions and international agencies participated. The meeting reviewed the mortality situation in various countries of the region and prepared and adopted a study design for conducting the country studies. It was agreed that each country should follow a common design, which could be supplemented where appropriate with additional material, and that the basic source of information should be national compilations of data.

To achieve a reasonable degree of uniformity in the presentation, the country agreed to adopt, to the extent possible, the following structure for the study reports:

1. Country background
2. Mortality trends, age and sex patterns
3. Differential mortality
4. Causes of death and major health problems
5. Economic development and mortality change
6. Nutrition and health
7. Health services
8. Development of health and population policies
9. Health and mortality prospects
10. Bibliography, references

A series of meetings thoroughly examined different parts of the reports and made suggestion for amendments as required. Professor Lado T. Ruzicka, of the Australian National University and Ms. Penelope Kane, representing the International Union for the Scientific Study of Population (IUSSP), provided valuable assistance for the improvement of the reports. The volumes (listed below) prepared under the project present rich sources of information concerning mortality and health issues of the participating countries:

Analysis of Mortality Trends and Patterns in
  Bangladesh (ST/ESCAP/444)

Ashraf Uddin Ahmed
Institute of Statistical Research and Training
Dhaka University

Mortality Patterns and Trends of Population
  in China (ST/ESCAP/447)

Liu Zheng
Institute of Population Research
People's University of China

Mortality Transition in Indonesia 1950-1980
  (ST/ESCAP/448)

Budi Utomo and Meiwita B. Iskandar
Faculty of Public Health
University of Indonesia

Mortality Trends and Patterns in Pakistan
  (ST/ESCAP/457)

Mohammad Irfan
Pakistan Institute of Development Economics

The Trends and Patterns of Mortality and
  Health in the Republic of Korea
  (ST/ESCAP/449)

Kwon Tai-Hwan
Department of Sociology
Seoul National University

Levels and Trends of Mortality in Thailand
  (ST/ESCAP/456)

Yawarat Porapakkham
Faculty of Public Health
Mahidol University

The important findings of these studies and their detailed analysis from the regional perspective along with a set of recommendations, will be disseminated to and form the basis of discussion among health and social planners of the region in the Seminar on Mortality and Health Issues to be held at Beijing from 22 to 27 October 1986.

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COUNTRY PROFILE

Pakistan is located between latitudes of 24° and 37° N and longitude of 62° and 75° E. The area of the country is 310,000 square miles which constitutes four provinces — Punjab (the western part of undivided Punjab under the British Empire), North-West Frontier Province, Sind and Baluchistan. The country touches the Himalayan and Hindu Kush mountains in the north and extends to Arabian sea in the south. The longest boundary of the country is with India in the East and South-East, while Afghanistan is located on the North-West and the Islamic Republic of Iran is to the West of Pakistan. A narrow strip of Afghan territory separates Pakistan from Russia.

The land of the country presents a diversified relief. A large area in the north consists of Himalayan Karakoram and Hindu Kush ranges where some of the highest peaks of the world are located. The vast desert area of Baluchistan province lies in the south-west while the Indus basin, the largest alluvial plains in the world, is situated in east of the country. The desert of Thar, an extention of India's Rajasthan desert, lies in the south east.

Pakistan has a climate of sharp contrasts too. Climate of southern and western part is generally dry, with average annual rain-fall being around 5 inches. The north and north-eastern parts generally receive greater rain-fall with the average annual of around 16 inches. Over a large part of the country, maximum temperature ranges between 110 to 114°F during summer, while it hovers around 60-65°F during the coldest months of winter — January.

Rivers play an important part in the economy wherein a well planned net work of perennial canals have been developed for irrigation facilities. The major river of the country, Indus, flows across the entire country from north to south and ultimately falls into the Arabian sea. On its course from Gilgit to the Arabian sea it is joined by other rivers: Sutlej, Ravi, Chenab and Jhelum.

POPULATION

In terms of population Pakistan ranks as ninth among the most populous countries.

According to the latest population census (1981) Pakistan's population was 84.35 million, which yields an estimated population of 95 million in 1985. The population has been growing at a rate of 3 per cent during 1961-1981 while the growth rate for 1951-1961 is reported to be   per cent per annum. Acceleration in population growth rate during 1961-1981 period is attributable mostly to unchanging high birth rate and decline in mortality rate during 1961-1981 period.

DENSITY

Growing population reflected itself in rising density and man land ratio. The population per square kilometre doubled during 1961-1981 from 53 to 106. Population density exhibits wide variation across different provinces of the country. While Punjab sustains 230 persons per kilometre, the Baluchistan province represents a sparsely populated land — 12 persons per kilometre. For the remaining two provinces of Sind and the North-West Frontier Province the corresponding figures for 1981 are 135 and 148 persons respectively.

A rise in population pressure on arable land and cropped area is also discernible. As indicated in table A, the population density per square kilometre of arable land in rural areas has risen from 221 in 1961 to 365 in 1981. The population pressure on arable land and cropped acreage is highest in the North-West Frontier Province. Interestingly land man ratio is highest in most densely populated province of Punjab which simply is reflective of the fact that the fraction of total area under cultivation is the largest in Punjab.

AGE/SEX DISTRIBUTION

Consistent with high growth rate of population, a large fraction of the population falls under the younger age groups i.e. less than 15 years of age. Children below the age of 15 accounted for 42.2 per cent of the population in 1961. The corresponding figures for 1972 and 1981 censuses are 43.8 and 44.5 per cent respectively. It must be noted that a consistent

Table A. Density per square kilometre by arable land and cropped area per acre from various censuses of Pakistan, 1961-1972-1980

(Rural areas)

Area/province	Density by arable land per sq km			Density by cropped area (per acre)		
	1961	1972	1980	1961	1972	1980
Pakistan	220.51	295.41	365.51	0.868	1.082	1.216
North-West Frontier Province	427.75	632.31	884.46	1.602	2.358	2.967
Punjab	211.64	253.4	321.21	0.811	0.918	2.052
Sind	159.74	259.9	340.69	0.588	0.891	1.065
Baluchistan	94.36	227.5	367.35	0.663	1.304	1.909

rise may not be discernible by five year age groupings, because of age mis-reporting and over/under enumeration in the various censuses (see table L).

Females are significantly out-numbered by males in Pakistan, although the disparity appears to have narrowed down over the years. The male/female ratio obtained in 1951 census was 117 which slightly declined to 115 in 1961. The sex ratios yielded by the later censuses of 1972 and 1981 are 114 and 110 respectively. The uneven sex ratio may have been a statistical artifact such as under-enumeration of females and over enumeration of males. It can be a result of some other factors such as high female mortality and high male ratio at birth.

URBANIZATION

The definition of urban areas used in different census has varied in its content. According to the first population census of the country (1951) "A city or town is regarded as urban if it has a minimum of 5,000 inhabitants". In addition areas falling under Municipal and Town Committees were also treated as urban even if they had fewer than 5,000 inhabitants. In 1961 the census directors were empowered to use their discretion in treating a continuous collection of houses inhabited by not less than 5,000 persons as urban if the area had pronounced urban characteristics. The definitions used in 1972 and 1981 census were roughly that of 1961, however a shift towards administrative criterion such as Municipal and Town Committee is discernible.

Urban population of Pakistan, given the variation in the definitions used in different censuses, witnessed a four fold increase during 1951-1981 period. According to 1981 census 28.3 per cent of the population was residing in the urban areas. The pace of urbanization has not been uniform over the time period under consideration. During 1951-1961 urban population grew by 60 per cent in contrast to 20 per cent of the growth rate of rural population. For the next inter-censal period 1961-1972 the percentage growth in the urban and rural population were 72 and 47. The corresponding figures for the 1972-1981 inter-censal period are 46 and 23 per cent respectively. The resultant tempo of urbanization was highest (23.5) in 1951-1961. It experienced a dip in the subsequent inter-censal period of 1961-1972 and rose to 15.6 for the 1972-1981 period (see table M).

More than half of the urban population (53.4 per cent) of the country currently resides in large cities of sizes 500,000 and above. The number of cities in this size category has risen from 2 in 1951 to 8 in 1981. Seven out of these eight cities are located in two provinces Sind and Punjab. Karachi continues to be the most populous city with a population of 5.2 million. In 1981 it accounted for 22 per cent of the entire urban population.

The data on size distribution of cities and on the extent of primacy suggest that urban hierarchy is well developed and balanced compared to some other developing countries. In such a comparison Pakistan however appears to be over-urbanized. The expected urbanization at the GNP per capita of Pakistan would be about half of the current level.

Urban population growth can be attributed to natural population increase in urban areas, transformation of rural areas into urban and net rural-urban migration. A simple decomposition exercise along these lines indicates that roughly two thirds of urban population growth has been due to natural population growth. Nearly 6 per cent of the urban population growth can be accredited to rural transformation while 30 per cent has been due to net rural-urban migration. A large share of rural-urban migration originated in the less developed the North-West Frontier Province and settled in the economically prosperous province of Sind. The PLM data suggest that there was substantial rural-urban migration to Karachi and to major towns in the Punjab, and the North-West Frontier Province for the period 1972-1979.

LITERACY AND EDUCATION IN PAKISTAN

The definition of literacy as used in different censuses varied both in content and in the minimum age limit for literates. In the 1951 census, persons aged 5 years and above with the ability to read a clear print in any language were considered literates. As a consequence, a large number of Holy Quran readers without understanding it were labelled as literates. In 1961 census, "ability to read with understanding and write a short statement on every day life" was the criterion of literacy. However following UNESCO recommendations, a notable improvement in the definition of literacy was made in the 1972 census, wherein persons aged 10 and over with the ability to read and write with comprehension were regarded literates. Therefore, in order to have a meaningful comparison of literacy rates over-time, one must account for the differences in the definition of literacy used in different censuses. Table B presents the literacy rates adjusted accordingly to different criteria of literates.

As indicated by the table B based on 1972 definition, literacy rates in Pakistan show a gradual rise over-time, though still leaving about three-fourths of population as illiterates in 1981. The progress in case of females has been slower. The levels of literacy for female are considerably low, only 16 per cent in 1981. Literacy rates tend to vary widely across various provinces.

Table B. Literacy rates adjusted for different definitions of literacy in censuses of Pakistan

	1951			1961			1972			1981		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
1951 Definition[a] (Ages 5+)	18.9	22.6	14.7	28.2	30.3	25.8	—	—	—	—	—	—
1961 Definition[b] (Ages 5+)	13.1[d]	16.9	8.5	16.3	23.8	7.4	—	—	—	—	—	—
1972 Definition[c] (Ages 10+)	13.2[e]	17.0	8.6	18.4	26.9	8.2	21.7	30.2	11.6	26.2	35.1	16.0

Source: Population Census 1951, 1961, 1972 and 1981.

[a] The 1951 definition of literacy included those as literates "who could read a clear print in any language".

[b] The 1961 definition of literacy categorized those persons as literates "who were able to read a simple letter, in any language, understanding". (The information was obtained for population aged 5 and over).

[c] The 1972 definition for literacy included those as literates "who were able to read and write in some language with understanding". The information was obtained for population aged 10 and above.

[d] The number of total educated persons in 1951 (those who have passed at least Grade 1 at schools) are taken as total literates according to the 1961 criterion of literacy because the 1951 census does not provide separate information for those who are able to read with understanding and write.

[e] The number of total educated persons in 1951 (for ages 10 and above) are compared with the literates of 1972 census and are assumed to be able to read and write.

Sind has highest literacy rates (31.5 per cent) which is followed by Punjab (27.4). The corresponding figures for the North-West Frontier Province and Baluchistan are 16.3 and 10.3 respectively.

To get a further insight into the literacy status, table C presents literacy rates by age by urban-rural disaggregation. As expected, levels of literacy are alarmingly low in rural areas particularly for females. In urban areas, situation seems to be encouraging and progressive both for males and females, but females in rural areas give a dismal picture over the past two decades. The rural-urban differentials in literacy rates partly explain the provincial differentials discussed above.

ENROLLMENT

According to the 1981 census the percentage of students to population, enrollment ratio for 5-24 years is 14.8. Sharp difference exists between rural and urban areas wherein the ratio is 9.4 for the former and 27 for the latter. Over-all enrollment ratio is higher for males 19 per cent than for females 10 per cent. Inter sex differential in enrollment is wider in rural areas than in urban areas. The females in rural area are worst sufferer with 3.8 per cent enrollment ratio in sharp contrast to female in urban areas with 24.4 per cent of the same age group being in schools. This performance of urban females is better than males in rural areas (14.3 per cent) and slightly less than males in urban areas (30.2 per cent).

It is difficult to arrive at precise estimate of enrollment ratio by age group and level of education. While officially 5-9 years of age is specified for primary level (1-5 classes) enrollment, in actual practice the older age students may be found in this level of education. According to 1981 census for instance 62 per cent of the student population enrolled in primary classes belonged to 5-9 years of age group. Similarly 10-14 years of age group students account for 74 per cent of the students in the middle and high school in sixth to tenth classes. Enrollment ratios by age groups and level of education is detailed in table D. The enrollment ratio is highest for 10-14 age group (25.2 per cent) followed by 15-19 years (17 per cent). Only one-tenth of those belonging to age group 5-9 are reported to be enrolled in schools in 1981.

Table C. Literacy rates by age and sex for urban-rural areas in Pakistan

Age group	1961			1972			1981		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
All areas									
(10+)	18.4	26.9	8.2	21.7	30.2	11.6	26.2	35.1	16.0
10-14	28.2	38.7	15.2	24.8	31.4	16.4	26.0	31.3	19.6
15-19	26.9	38.4	13.2	32.2	42.0	20.3	36.6	45.0	26.6
20-24	23.4	34.9	10.3	28.4	40.0	15.7	35.0	45.9	22.8
25+	13.3	20.1	5.1	17.3	25.5	7.6	20.8	31.5	9.7
Urban areas									
(10+)	36.7	46.8	23.3	41.5	49.9	30.9	47.1	55.3	37.3
10-14	47.7	56.6	37.3	44.6	49.3	39.6	45.7	48.1	43.2
15-19	46.2	55.9	38.8	54.6	61.5	46.6	59.1	63.3	54.1
20-24	43.3	55.0	26.7	50.1	60.1	38.6	57.5	65.3	48.0
Rural areas									
(10+)	12.2	19.8	3.6	14.3	22.6	4.7	17.3	26.2	7.3
10-14	21.0	32.4	6.9	17.1	24.8	7.1	17.9	24.8	9.7
15-19	19.7	31.6	5.9	22.5	33.9	8.7	25.6	36.2	13.1
20-24	15.1	25.3	3.5	18.8	31.1	6.2	23.4	35.4	10.9
25+	8.2	13.4	2.2	11.1	18.2	2.9	13.2	22.7	4.3

Table D. Enrollment ratio by age group and level of education

Age group	Enrolled	Primary schools 1-5 classes	Secondary schools 6-10 classes	Post secondary institutions 10+ classes	Total
5-9	9.5	100	—	—	100
10-14	25.2	25.6	73.6	0.8	100
15-19	17.0	3.5	63.6	32.9	100
20-24	5.3	1.3	26.2	72.5	100

Source: Population Census 1981.

Note: Primary school enrollment refers to those students whose level of education is below primary.
Enrollment in secondary schools pertain to middle and high schools. The population of students who have passed middle and primary level.
Enrollment in post secondary institutions refers to those students who have already attained matric or higher level of education.

After adjusting the enrollment data for drop outs and those who completed it is difficult to reconcile the census data with the information one gets from Directorate of Education or any other survey data. These latter sets of data suggest that the enrollment data reported in census tend to under-estimate the age specific enrollment ratio.

Similarly the information on number of educational institutions as well as enrollments by level of education (provided in tables N and O) indicate manifold increase over the 1949-1984 period. Number of primary schools rose from 9,000 in 1949-1950 to 72,000 in 1983-1984. The corresponding growth in the primary school enrollment was roughly seven times during the same period. The percentage rise in institutions and enrollment in other levels of education was higher than primary partly because of modest base inherited in 1948-1949 and partly because of the fact that emphasis of educational expansion during the past has been more on higher levels of education than that of primary level.

EDUCATIONAL ATTAINMENT

According to 1981 census only 23 per cent of the population aged 10 years and above is educated — those having primary or higher level of education. The proportion of educated is higher among males (31.8 per cent) than females (13.6 per cent). Similarly rural areas lag much behind the urban areas. Only 14.9 per cent of the rural pupulation is reported as educated in 1981, in comparison to 43.4 per cent in urban areas.

Around 45 per cent of the total educated have only passed primary level of education. This is followed by middle level (22.7 per cent). Thus two thirds of educated do not have secondary level of education or matriculation. The total of engineering, medical and law graduates hardly accounts for 1 per cent of the educated population.

LABOUR FORCE AND EMPLOYMENT

There are two major sources of information on size and composition of the working population of the country. Past or concurrent censal surveys, such as Housing Economic and Demographic Survey of 1973 and 10 per cent sample survey conducted along-with the census of 1981. Labour force survey occasionally conducted by Federal Bureau of Statistics constitute the second major source of information on activity rates of population. Because of the difference in the concepts used for measuring labour supply and data collection procedure the two sources are rendered incomparable. It may be mentioned that 10 per cent sample survey of 1981 census used usual status approach rather than the current status used in the labour force survey. In addition while the 10 per cent count of 1981 was conducted on one day, the labour force survey collected the data through-out the year.

According to 10 per cent count of the 1981 census 27.6 per cent of the population is in labour force defined as employed plus unemployed. The population not in labour force is accounted by the children below 10 years of age, house wives, students and others. There is a wide variation between male and female labour force participation. While 50.6 per cent of the male population is in labour force, the female activity rate is very low 2.1 per cent only. Because of this low level of reported female activity rate, the over-all labour force participation of the country is low compared to other developing countries. Low female activity rates are generally a by-product of the inadequate concepts used to measure labour supply. Of special importance being the irrelevance of the notion of work with emphasis on pay and profit in a milieu where households economic activities dovetail with domestic work and blurr the border line between economic and non-economic activities. Female activity rates in Pakistan has been found to be very sensitive to wordings of the questionnaires, choice of enumerators and reference period.

Activity rates yielded by various labour force surveys conducted since 1970-1971 are provided in table E. The over-all activity rates fluctuates around a participation rate of 30 per cent for the period 1971-1982. The labour force survey data suggest a decline in the activity rate in early 1970s, an increase by the late 1970s and a decline again in 1982-1983. The labour force surveys suggest a higher level of female activity than provided by 1981 census (10 per cent count). In addition a rise in female activity is recorded by the labour force survey of 1978-1979 and 1982-1983. This may have been due to the substitution of male workers who emigrated to Middle East, by females.

Table E. Labour force participation rates

Source	Labour force as percentage of population	Crude rates		Refined activity rates	
		Male	Female	Male	Female
P. Census 1901	34.8	57.0	8.5	—	—
P. Census 1911	34.1	57.0	6.2	—	—
P. Census 1921	33.3	56.1	5.4	—	—
P. Census 1931	31.8	53.8	4.8	—	—
P. Census 1951	30.60	55.1	2.1	79.4	3.1
Manpower S. 1955	31.10	—	—	—	—
P. Census 1961	32.36	55.0	6.1	80.8	9.3
L.F.S. 1963-1964	32.60	—	—	—	—
L.F.S. 1964-1965	33.76	—	—	—	—
L.F.S. 1966-1967	33.43	57.62	6.71	86.7	10.3
L.F.S. 1967-1968	33.32	57.83	6.89	86.7	10.5
L.F.S. 1968-1969	29.49	52.40	4.36	79.0	6.6
L.F.S. 1969-1970	30.34	53.32	4.88	79.3	7.3
L.F.S. 1970-1971	30.41	53.13	5.43	80.0	8.1
L.F.S. 1971-1972	29.90	51.87	5.39	78.6	8.0
H.E.F.S. 1973	32.66	55.41	6.23	77.6	9.0
L.F.S. 1974-1975	29.50	52.08	4.27	76.7	6.3
L.F.S. 1978-1979	31.02	52.26	7.91	77.34	11.81
L.F.S. 1982-1983	30.41	51.52	7.23	75.17	10.75

Source: 1. Dimensions and Structure and Labour Force in Relation to Economic Development by Ghazi M. Farooq.

2. Labour Force Survey.

Note: Crude labour force participation is arrived by dividing the labour force of all ages with total population. In case of refined activity rate the denominator is working age population i.e. 10 years and over.

...ecific labour force participation ...me aged male (25-59 years) are ...e labour force while male activity ...or at younger (10-14 years) and ...over 60 years). Age work participa-...on for female is however flat. Female ...rticipation to a large extent depends ...d availability of self employment oppor-...s which are mostly available in rural areas. ...one finds a much higher level of female ...y (13 per cent) in rural areas than in urban ...4 per cent) in 1982-1983.

INDUSTRIAL AND OCCUPATIONAL COMPOSITION OF LABOUR FORCE

The structure of employment by industry and occupation at one digit level classification provided in table F reflects that the proportion employed in agriculture declined during the decade of 1970s. In absolute terms the employment in agriculture has increased though there has been a decline in the fraction employed in agriculture. In manufacturing the proportion of employed dropped from 15 per cent in 1970-1971 to 13.4 in 1982-1983. There has been a relative shift of employment from commodity producing sectors such as agriculture and manufacturing to service sectors. The share of employed labour force in services went up from 13 per cent in 1970-1971 to 17 per cent in 1982-1983.

UNEMPLOYMENT

In the absence of unemployment registration and prevailing work sharing norms, reported open unemployment has always been very low. Unemployed as a fraction of total labour force registered an increase from 1.7 to 3.9 per cent during 1971-1983. This otherwise modest change in unemployment however implies a rise in the number of unemployed from 400,000 in 1971 to over 1 million in 1982-1983. More than half of the unemployed (57 per cent) in 1982-1983 were illiterates. Degree holders and those with higher education account for 2 per cent of the unemployed. High school graduates account for 8 per cent of the unemployed while those who had primary but less than matriculates are one third of the total unemployment.

Table F-A. Structure of employment by major industry

Major industry division	1982-1983	1978-1979	1974-1975	1971-1972	1970-1971
Agriculture, forestry, housing and fishing	52.73	52.65	54.80	57.32	57.58
Manufacturing	13.44	14.52	13.63	12.47	14.99
Construction	4.80	4.92	4.20	3.41	3.60
Wholesale and retail trade etc.	11.94	11.08	11.09	9.89	10.88
Others	17.09	16.83	16.28	16.91	12.95

Table F-B. Structure of employment by major occupations

Major occupation groups	1982-1983	1978-1979	1974-1975	1971-1972	1970-1971
Professional, technical and related workers	3.08	3.05	3.01	2.01	2.44
Sales workers	10.23	10.11	9.98	12.05	10.29
Agricultural, animal husbandry and forestry workers, fishermen and hunters	52.82	52.64	54.70	57.22	52.46
Production and related workers, transport equipment operators and labourers	25.23	25.94	24.32	22.12	24.96
Others	8.64	8.26	7.99	6.60	4.85

Source: FBS, 1984.

ECONOMIC GROWTH

At the time of independence (1947) Pakistan was a traditionally back-ward primary producing country precariously depending on wheat and cotton. More than half of the national income originated in agriculture. Manufacturing accounted for 7 per cent of the GNP in 1949-1950, most of which being in small scale manufacturing. The socio-economic infrastructure was non-existing and under developed.

In order to achieve economic growth and structural transformation of the economy various five year plans were formulated and implemented with varying degrees of success. The GNP has risen from Rs. 2,380 million in 1949-1950 to Rs. 6,837 million in 1983-1984. This more than five fold increase in National income has doubled the per capita income from Rs. 351 to Rs. 746 (in constant prices of 1959-1960) during the said period. This economic growth has been accompanied by diversification of the economy wherein the share of agriculture in GDP has declined from 53 to 26 per cent, while that of manufacturing went up from 7 to 18 per cent. As indicated by table G, the economy of Pakistan has witnessed a substantial structural transformation during the past 38 years.

Both the structural transformation and economic growth did not occur at a uniform pace during the period under review. As reflected by table H, the annual per capita income growth rate was less than 1 per cent during the decade of 1950s. This was followed by the decade of 1960s wherein GNP grew at the rate of 6 to 7 per cent and per capita income rose at the rate of 3 to 4 per cent per annum. During the first seven years of the 1970s the per capita and GDP growth rate again dropped which were recovered in the latter sub period of the decade and in the early 1980s.

The uneven progress experienced over the time period is due to the conjuncture of various factors like international aid and trade opportunities, the stage in the development of the economy, the discovery of high yield varieties of seeds and worker's emigration to Middle East. For instance low growth in the decade of 1950s which coincides with Colombo Plan (1951-1955) and First Five Year Plan (1955-1960) was due to non-realization of the expected domestic saving and foreign aid which led to a short fall in intended level of investment. In addition, at that stage of economic development,

priority was accorded to infrastructure development such as roads, irrigation canals, electric generation, etc. The gestation period of these projects being long enough, their impact was felt during the later sub-periods (1960s). In addition to building of infrastructure there was an impressive growth in the large scale manufacturing during the decade of 1950s. The large scale manufacturing grew in response to the emergence of a vast domestic market due to partition of the sub-continent wherein areas constituting Pakistan were traditional suppliers of raw material but with very little processing capacity. Further impetus to industrial growth was provided by policy variables like over-valued exchange rate, tariff structure and licensing policies.

In an inter-temporal context the decade of 1960-1970 (the second and third Five Year Plans) presents a sharp contrast with the preceding and following decade. The growth of this period was neither attained in the 1950s nor sustained in the 1970s. Agriculture whose stagnation in the 1950s was responsible for over-all low performance of the economy, experienced a significant growth during this period. This agricultural break-through was made possible by greater availability of water through tube-well installation facilitated by increased availability of electricity — a lagged impact of 1950s investment in infrastructure. In addition rise in fertilizer use, introduction of high yield varieties had a major contribution towards growth in agriculture often described as Green Revolution. Similarly large scale manufacturing sector experienced a significant growth during this decade. In addition to the import substitution drive, initiated in the preceding decade, enhanced domestic demand and export opportunities acted as a source of growth for large scale manufacturing. Emergence of these prospectus and the resultant growth of large scale manufacturing can be attributed to policy variables like tariff structure, export bonus voucher scheme, and over-valued exchange rate.

Besides agriculture and large scale manufacturing, there was expansion in the rest of the economy too. This broad base growth led to a significant structural transformation and development of the economy specially during the first half (1960-1965) which coincided with Second Five Year Plan. Although economic growth tended to decelerate after 1965 war with India and reduction in inflow of foreign aid, the Third Plan (1965-1970) period can be regarded as successful in registering economic growth.

Table G. Structural changes in GDP-commodity sector (at constant factor cost of 1959-1960)

Years	Agriculture	Mining and Quarrying	Manufacturing	Construction	Electricity and gas distribution services	Transport storage and communication	Wholesale and retail trade	Banking and insurances	Owner-ship of dwellings	Public Admn and defence	Services
1949-1950	53.20	0.22	7.55	1.44	0.22	4.97	11.91	0.44	5.10	7.04	7.70
1954-1955	48.02	0.31	10.84	2.00	0.26	5.69	12.28	0.55	5.01	7.01	8.03
1959-1960	45.83	0.42	11.9	2.54	0.52	6.66	12.51	0.95	4.97	6.23	8.39
1964-1965	39.71	0.52	15.04	4.40	0.74	6.80	13.55	1.37	4.18	6.27	7.41
1969-1970	38.88	0.49	16.04	4.20	1.98	6.27	13.78	1.79	3.44	6.43	6.81
1974-1975	33.19	0.46	15.58	4.45	2.41	6.53	14.27	2.56	3.35	10.08	7.12
1978-1979	31.91	0.47	15.50	4.99	2.77	6.72	13.88	2.79	3.26	10.34	7.37
1979-1980	31.11	0.49	16.20	5.18	3.00	6.85	14.01	2.57	3.09	10.21	7.28
1982-1983	28.89	0.53	18.28	4.66	2.13	7.02	14.70	2.76	2.86	10.05	7.15
1983-1984	26.38	0.56	18.85	4.92	3.26	7.15	14.89	2.82	2.83	11.11	7.23

Source: Monthly Economic Statistics, May 1985.

Table H. Yearly growth rates

(At constant factor cost of 1959-1960)

Years	Commodity producing sector	Services sector	Gross domestic product (GDP)	Net factor income from abroad	Gross national product (GNP)	Population	Per capita income
1950-1955	2.7	3.9	3.1	4.0	3.2	2.45	0.7
1955-1960	3.0	3.1	3.1	1.9	3.0	2.46	0.5
1960-1965	6.5	7.3	6.8	1.5	6.8	2.82	3.8
1965-1970	7.1	6.1	6.7	0.5	6.8	2.90	3.8
1977-1978	2.9	6.1	4.2	5.9	5.0	3.16	1.8
1978-1983	6.4	6.5	6.4	8.8	6.5	3.07	3.4

Source: Monthly Economic Statistics, May 1985, Economic Adviser's Wing, Islamabad.

Pakistan had to face a new set of problems associated with international recession and inflation of 1970s and domestic turmoils leading to break up of the country and emergence of Bangladesh as an independent state. Furthermore Pakistan's development of the past two decades (1950-1970) was increasingly being criticized on the scores of efficiency and equity. In fact the economy had already started slowing down after 1965 war with India and the resultant reduction in the inflow of aid from abroad.

Policy responses of the People's Party regime were a massive devaluation, Nationalization of 10 basic industries, land reforms, and liberal wage policies. The government started heavy rather ambitious programme of investment in capital goods industry, needed to rectify the uneven industrial structure of the economy. The investment outlay being far in excess of the availability of funds — domestic saving and foreign aid — necessitated deficit financing which exerted upward pressure on domestic price level.

Alternating droughts and floods in the first half of the decade adversely affected agriculture growth. The manufacturing sector which, initially showed some recovery owing to devaluation leading to export boom, stagnated thereafter due to variety of internal and external factors. Little growth in these two sectors meant over-all stagnation. International factors like oil price likes and recession further jolted the ailing economy.

By the year 1977, when military took over the country, the economy started taking an up-turn. This improvement can be attributed to non-poliy variables like good weather resulting in significant growth in agriculture and emigration of Pakistani workers to Middle East which led to a relief toward domestic unemployment problem and access to foreign exchange. The governmental efforts to restore the confidence of private investors met with little success, consequently large scale manufacturing industries failed to register a significant growth except in the early years of 1980s which mostly was due to a significant upsurge in the activities of small scale manufacturing and in the nationalized sector. Whilst the over-all growth rate of the economy since 1979 appears respectable, there has been a shift of the economy from commodity producing to service sectors during this period.

Despite discontinuities the economic performance of the country has not been poor in comparison to its neighbouring countries. Still the country is however, critically poor with more than one third of the population failing to meet its nutritional requirement. In addition, the allocation of developmental outlay to social sectors, education and health, generally ranged between 6 to 7 per cent of the public sector development expenditure made during the past 38 years. The country has received around 23 billion US dollars as foreign aid during the period under review. Irrespective of its contribution to the growth and structural diversification of the economy, the country is facing debt servicing problem, which makes all the more difficult to increase the allocation of the social sectors.

FERTILITY LEVELS

The two fertility measures namely crude birth rate (CBR) and total fertility rate (TFR) derived from various sample surveys from the years 1962 to 1978 are presented in table I. The Population Growth Estimation Experiment 1962-1965 (PGE) Cross-sectional average estimate of 1962-1964 reveal a CBR figure of 39 births per 1,000 population whereas similar estimate from the longitudinal registration component of the same survey yield the figure of 43. The National Impact Survey (NIS) 1968 suggested a CBR of 39 for 1967-1968 which is roughly the same as averaged CS estimate, but lower than LR of PGE. The Pakistan Fertility Survey (PFS) 1975 yield a CBR of 40.5 for 1974-1975. Similarly, TFR estimates also exhibit no clear trend for the period under study.

The fluctuations in both the fertility measures are probably due to different methodologies, errors and sizes of the surveys for the period 1962-1978. The PGE cross-sectional figure of CBR, however, show a slightly lower rate compared to registration, thereby indicating the limitation of recording vital events linked to a specific reference period. The CBR and TFR figures of 1962-1964 and 1978 are reflective of little decline if any in fertility levels in Pakistan.

Table I. Crude birth rates (CBR), and total fertility rates (TFRs) for Pakistan: 1962 to 1978

Year	CBR	TFR
PGE 1962-1964 (CS)	39.2	6.47
PGE 1962-1964 (LR)	42.5	6.12
NIS 1967-1968 (CS)	39.0	–
PFS 1974-1975 (CS)	30.5	6.28
PFS 1974 (Calender Year)	38.4	–
PLM 1978 (Calender Year)	38.4	6.45

Note: PGE TFR rates are for the year 1964.

AGE AT MARRIAGE

The age at marriage is a major proximate determinant of fertility. In Pakistan, marriage is almost universal and starts relatively at younger age especially that of females. In order to discourage younger marriage, government introduced a Muslim Family Law Ordinance in 1961 where minimum age at marriage was fixed at 16 and 18 for females and males respectively. The nuptiality statistics of singulate mean age at marriage are presented in table J.

Table J. Singulate mean age at marriage from various censuses and surveys for Pakistan: 1951 to 1981

Year	Source	Male	Female	Difference
1951	Census	23.4	17.9	5.5
1961	Census	24.5	17.6	6.9
1964	PGE	25.4	19.4	6.0
1972	Census	26.2	20.0	6.2
1975	PFS	25.4	19.8	5.6
1979	PLM	25.6	20.2	5.4
1981	Census	25.4	20.8	4.6

Source: Naushin Mahmood and S. Mubashir Ali "Nuptiality Patterns in Pakistan". Studies in Population, Labour Force and Migration (PLM) Survey Report No. 2, PIDE, 1983.

The age at marriage for males exhibit an increase of two years in a period of 30 years from 1951 to 1981. This increase of two years for males was recorded upto 1964 with constant rate there after for the last 17 years. The apparent gain in 1972 census appears to be spurious when compared to later two surveys and the 1981 census. Similarly, the net gain in female age at marriage appears to be of the magnitude of three years during the last 30 years. The difference in age at marriage for both the sexes was 5.5 years in 1951 that bridged up to 4.6 years in 1981. This shortening of gap in difference of age at marriage was due to relative rise in female age at marriage which if continued would further narrow down the difference and effect the future fertility levels.

FAMILY PLANNING PRACTICE

The Pakistan Family Planning was launched at the national level during the Third Five Year Development Plan (1965-1970). During this period the programme was planned to reduce the CBR from 50 to 44 per 1,000 population.

Table K. Contraceptive use levels in Pakistan: 1967-1968 to 1979-1980

Year	Current use	Ever use
NIS 1967-1980	5.5	12.1
PFS 1975	5.2	10.5
PLM 1979-1980	4.2	6.0

Source: Ghulam Yasin Soomro and S. Mubashir Ali "Prevalence of Knowledge and Use of Contraception in Pakistan". Studies in Population, Labour Force and Migration (PLM) Survey Report No. 3, PIDE 1983.

To measure the programme performance after its three years operation, a knowledge, attitude and practice (KAP) type National Impact Survey (NIS) was conducted in 1967-1968.

The survey produced encouraging results. The prompted family planning knowledge was recorded upto 97 per cent and ever and current use levels at 12 and 6 per cent respectively. Another survey, PFS was conducted during 1975, after 10 years of programme operation, to measure fertility levels and programme performance. It may be mentioned that during this period (1965-1975) the programme under-went several administrative as well as operational changes aimed at enhanced performance. Despite all these strategic changes, the PFS results did not show any improvement over the NIS results. The unprompted family planning knowledge appeared to be 75 per cent and ever current use levels at 10 and 5 per cent respectively in 1967-1968.

These apparent differences in NIS and PFS results were probably due to methodological differences in both the surveys. The PLM survey conducted during 1979-1980 was the first survey of its kind that was planned, executed and analyzed outside the Population Division and could truly be regarded as an outside evaluation of the programme. However, one thing that needs an explanation is that the conditions were substantially different than those of the two previous surveys. The programme communication through popular media channels was stopped during 1977 and later on all programme activities were at stand-still upto 1980. On the other hand, the media projected adherence towards religious codes of life. The family planning knowledge level after a gap of approximately 4.5 years appeared to be only 29 per cent in 1979-1980. Similarly, the ever and current use information that was gathered from the women who reported knowledge appeared to be 6 and 4 per cent respectively. The knowledge and use levels appeared to be influenced due to the prevailing atmosphere. The solicited information on family planning aspect appeared to be under reported probably due to individual's behavioural tendency towards the adoption of prevailing attitude.

SON PREFERENCE

The rural population constitutes approximately 70 per cent where agriculture is the largest sector of economy. This imbalanced proportion of population distribution greatly influences the national statistics. Agriculture sector as pointed out earlier employs 55 per cent of the total labour force in Pakistan. This scenario makes Pakistan predominantly as an agrarian society. The reproductive attitudes and behaviour prevalent in rural population, therefore, be studied within the perspective of agrarian culture. Although the agricultural sector has been exposed to innovative methods of production, the role played by farm manpower is over-whelming.

The value of children in general and sons in particular is regarded as productive agents. Besides, sons carry family name, provide security and help parents in old age whereas daughters after marriage get absorbed into husbands family. The demographic surveys so far conducted in Pakistan have indicated that inclusion of a surviving son is the chief determinant of a completed family size. The presence of a son in the family size affects the attitudes regarding size of the family. The information gathered on this aspect in PFS and PLM revealed that married women who had two living children with zero son, 88 and 90 per cent wanted more children compared to 65 and 75 per cent with one living son respectively. This information reflects the importance of son within the sex composition of the family size that has greater implications for fertility levels and family planning programme. This however, needs further empirical evidence for any conclusive inference.

BREAST-FEEDING

Breast feeding is one of the natural methods of fertility regulation which prolongs post-partum-ammenorrhoea which directly affects the length of birth interval. The feeding practice have also important bearing on the general health of the infant. Breast feeding is almost universal in Pakistan with 94 and 93 per cent reporting of having breast fed infant in PFS and PLM. The mean duration of breast feeding has however, shown a decline of a couple of months. The mean duration of breast feeding has been recorded to 17 months in PFS and 19 months in PLM for women with all children and 19 and 22 months in PFS and PLM respectively for women with surviving children. The breast feeding practices by age of mothers revealed in both the surveys was that length of breast-feeding was higher among older women presumably high parity compared to younger women. This is reflective of a declining trend of breast-feeding in Pakistan.

Table L-A. Percentage distribution of population by age groups (5 years) sex and rural-urban Pakistan: 1961

Age groups	All Pakistan			Urban			Rural		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
0-4	16.27	15.59	17.28	15.54	14.38	17.6	16.64	16.00	17.36
5-9	16.41	16.32	16.50	15.08	14.3	16.0	16.8	17.0	16.6
10-14	9.65	9.91	9.36	10.5	10.2	10.9	9.4	9.8	8.9
15-19	8.96	9.05	8.85	10.0	10.0	9.8	8.7	8.7	8.5
20-24	7.82	7.72	7.93	9.4	9.9	8.8	7.3	7.0	7.7
25-29	7.71	7.49	9.97	8.3	8.5	8.1	7.5	7.2	7.9
30-34	6.42	6.28	6.58	6.7	6.9	6.5	6.4	6.1	6.6
35-39	5.28	5.32	6.24	5.4	5.7	5.1	5.2	5.2	5.3
40-44	4.84	4.91	4.76	4.8	5.1	4.4	4.9	4.9	4.9
45-49	3.84	3.98	3.67	3.6	3.8	3.3	3.9	4.0	3.8
50-54	3.72	3.91	3.49	3.4	3.6	3.1	3.8	4.0	3.6
55-59	2.04	2.12	1.95	1.8	1.9	1.7	2.1	2.2	2.6
60+	6.93	7.38	6.41	5.5	5.7	5.3	7.4	7.9	6.8
Grand total				100	100	100	100	100	100

Source: 1961 Population Census of Pakistan, Bulletin No. 3.

Table L-B. Percentage distribution of population by age and sex for Pakistan urban and rural areas for 1972

Age groups	All Pakistan			Urban areas			Rural areas		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
0-4	15.07	14.15	16.12	14.14	13.56	15.51	15.29	14.36	16.34
5-9	16.22	15.92	16.57	15.07	14.62	16.05	16.57	16.40	16.75
10-14	12.55	13.13	11.88	14.00	12.99	13.01	12.37	13.18	11.47
15-19	8.54	8.71	8.33	9.66	9.55	9.70	8.13	8.40	7.83
20-24	7.30	7.04	7.60	8.41	8.28	8.57	6.90	6.59	7.27
25-29	7.43	7.33	7.56	7.94	8.00	7.86	7.25	7.09	7.44
30-34	6.33	6.16	6.54	6.56	6.59	6.51	6.26	7.00	6.55
35-39	5.33	5.36	5.29	5.57	5.75	5.35	5.24	5.21	5.27
40-44	4.90	4.92	4.88	4.99	5.30	4.59	4.88	4.79	4.98
45-49	3.72	3.84	3.59	3.64	3.99	3.22	3.76	3.78	3.73
50-54	3.70	3.94	3.42	3.45	3.82	3.03	3.80	4.00	3.55
55-59	1.90	1.92	1.87	1.65	1.76	1.54	1.99	1.99	1.99
60+	6.9	7.55	6.33	5.40	5.80	4.95	7.55	8.19	6.84
Grand total	99.98	99.95	99.95	99.98	100.01		99.99	99.98	100.02

Source: Population Census of Pakistan 1972, Statistical Report of Pakistan.

Table L-C. Percentage distribution of population by age and sex for Pakistan, urban and rural areas for 1981

Age groups	All Pakistan			Urban areas			Rural areas		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
0-4	15.32	14.39	16.35	15.01	14.20	15.95	15.45	14.46	16.53
5-9	16.01	15.81	16.24	14.90	14.40	15.46	16.72	16.39	16.56
10-14	13.16	13.59	12.70	13.08	12.95	13.24	13.73	13.87	12.46
15-19	9.46	9.73	9.16	10.66	10.70	10.62	8.97	9.32	8.58
20-24	7.59	7.59	7.60	8.85	9.07	8.58	7.07	6.97	7.20
25-29	6.68	6.87	6.65	7.21	7.39	7.00	6.45	6.42	6.49
30-34	5.62	5.55	5.73	5.83	5.93	5.78	5.54	5.37	5.73
35-39	5.11	4.93	5.32	5.35	5.23	5.48	5.01	4.79	5.25
40-44	4.72	4.49	4.95	4.75	4.75	4.75	4.69	4.39	5.02
45-49	3.75	3.74	3.77	3.70	3.84	3.54	3.76	3.70	3.86
50-54	3.62	3.80	3.40	3.33	3.60	3.03	3.72	3.89	3.56
55-59	1.98	1.99	1.93	1.78	1.89	1.65	2.03	2.03	2.03
60+	6.99	7.70	6.21	5.55	6.05	4.97	7.57	8.37	6.71
Grand total	100	100	100	100	100	100	100		

Source: 1981 Census Report of Pakistan.

Table M. Population by province, rural-urban and intercensal growth rates

(000s)

Area/ province	Years				
	1961	1972	1981	1961-1972	1972-1981
PAKISTAN					
Total	42 880	65 309	84 253	52.31	29.01
Urban	9 654	16 594	23 840	71.89	43.67
Rural	33 226	48 716	60 413	46.2	24.01
PUNJAB					
Total	25 462	37 610	47 292	47.71	25.74
Urban	5 476	9 183	13 051	67.69	42.12
Rural	19 986	28 427	34 241	42.23	20.45
SIND					
Total	8 367	14 156	19 029	69.19	34.42
Urban	3 167	5 726	8 243	80.80	43.96
Rural	5 200	8 430	10 786	62.12	27.95
NWFP					
Total	5 731	8 389	11 061	46.37	31.86
Urban	758	1 196	1 665	57.78	39.21
Rural	4 973	7 193	9 396	44.64	30.63
BALUCHISTAN					
Total	1 353	2 428	4 332	79.44	78.38
Urban	228	399	677	75.00	69.67
Rural	1 125	2 029	3 655	80.36	80.14

Source: 1. Slade. E.H., 1951. *Census of Pakistan 1951*, Vol. 1, Reports and Tables.

   2. Mirza, Mujtaba, 1984, *Census Report of Pakistan 1981*, Population Census Organization, Statistics Division, Government of Pakistan, Islamabad.

   3. Akhtar, A.M., 1980. *Statistical Report of Pakistan 1972*, Population Census Organization, Statistics Division, Government of Pakistan.

Note: The figures may not add exact from rural-urban population because these are rounded off.

Table N. Number of educational institutions by kind, level and sex

Years	Primary schools		Middle schools		High schools		Secondary vocational institutions		Arts and science colleges		Professional colleges		University
	Total	Female	Total	Female	Total	Female	Total	Female	Total	Female	Total	Female	Total
1949-1950	9 411	1 586	3 134	172	469	89	59	25	46	9	19	2	2
1954-1955	14 162	2 474	1 517	196	747	148	90	40	77	19	24	1	4
1959-1960	17 901	3 260	1 974	281	1 069	203	100	35	126	32	40	5	4
1964-1965	32 589	8 021	2 701	589	1 622	367	145	58	225	62	45	5	6
1969-1970	41 290	11 170	3 560	860	1 995	520	190	90	290	85	59	5	7
1974-1975	51 744	15 673	4 713	1 266	2 898	770	301	141	361	96	83	8	10
1977-1978	59 278	16 246	5 528	1 358	3 705	878	242	82	445	123	95	8	15
1979-1980	59 616	16 856	5 779	1 370	3 890	914	248	84	491	137	101	8	16
1982-1983	69 058	20 507	5 979	1 595	4 037	1 122	263	96	500	154	101	8	16
1983-1984	72 093	21 360	6 136	1 635	4 180	1 167	266	98	514	161	102	8	20

Source: Monthly Economic Statistics, May 1985. Economic Adviser's Wing, Islamabad.

Note: Primary schools   1-5 classes.
       Middle schools   6-8 classes.
       Secondary/High schools   9-10 classes.

Table O. Enrollment in educational institutions by mind, levels and sex

Year	Primary schools (i-v) (Thousand)		Middle schools (vi-viii) (Thousand)		High schools (ix-x) (Thousand)		Secondary vocational (Thousand)		Arts and science colleges (Thousand)		Professional colleges (Numbers)		Universities (Numbers)	
	Total	Female	Total	Female	Total	Female	Total	Female	Total	Female	Total	Female	Total	Female
1949-1950	920	120	250	24	57	9	5	2	21	2	4 925	394	737	71
1954-1955	1 550	240	332	45	109	15	11	3	43	6	8 082	833	1 998	49
1959-1960	1 890	370	422	63	149	23	13	3	76	12	12 434	1 851	4 092	778
1964-1965	3 050	700	624	128	222	46	21	6	127	24	17 372	2 990	13 221	2 730
1969-1970	3 910	1 030	899	175	337	62	29	9	175	45	33 633	4 219	15 475	3 298
1974-1975	4 980	1 247	1 279	262	106	106	42	14	208	58	44 634	8 086	21 396	4 500
1977-1978	5 877	1 661	1 501	323	510	116	33	8	229	70	62 113	10 766	28 445	6 363
1979-1980	5 213	1 676	1 391	345	476	125	35	7	253	78	72 479	12 206	41 810	5 712
1982-1983	6 023	1 974	1 593	408	947	167	49	8	388	121	84 330	16 470	47 587	7 866
1983-1984	6 201	2 043	1 652	424	1 040	176	52	9	419	130	87 737	17 367	49 479	8 000

Source: Monthly Economic Statistics, May 1985, Economic Adviser's Wing, Islamabad.

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Table P. Foreign aid to Pakistan: 1948-1984

(U.S. millions)

Period	Grants	Loan	Total	Grant as percentage of total
1. Pre-Plan	218	121	337	64
2. First Plan (1955-1960)	578	497	1 075	54
3. Second Plan (1960-1965)	1 105	1 805	2 910	38
4. Third Plan (1965-1970)	704	2 233	2 937	24
5. 1970-1975	375	5 566	3 941	10
6. 1975-1980	972	5 201	6 173	16
7. 1980-1984	1 619	4 604	6 223	26
Total:	5 569	18 027	23 596	24

Source: Monthly Economic Statistics, May 1985, Government of Pakistan, Finance Division, Economic Adviser's Wing, Islamabad.

Table Q. Foreign trade

(Million Rs)

Years/months	Exports	Imports	Balance
1949-1950	535	912	−377
1954-1955	491	783	−292
1959-1960	763	1 806	−1 043
1964-1965	1 140	3 672	−2 532
1969-1970	1 609	3 285	−1 676
1974-1975	10 286	20 925	−10 639
1977-1978	12 980	27 815	−14 835
1979-1980	23 410	46 929	−23 519
1982-1983	34 442	68 151	−33 709
1983-1984	37 037	76 707	−39 670

Source: Monthly Economic Statistics, May 1985. Economic Adviser's Wing, Islamabad.

Table R. Gross national product (GNP)

(At constant factor cost of 1959-1960)

Years	Commodity sector	Services sector	Gross domestic product (GDP)	Net factor income from abroad	Gross national product (GNP)	Population (Million)	Per capita income (Rs)
1949-1950	7 789	4 609	12 398	−18	12 380	35.31	351
1954-1955	8 888	5 580	14 468	−4	14 464	39.87	363
1959-1960	10 313	6 513	16 826	−23	16 803	45.03	373
1964-1965	14 113	9 247	23 360	−61	23 299	51.76	450
1969-1970	19 913	12 423	32 336	2	32 388	59.70	542
1974-1975	22 094	17 299	39 393	258	39 651	69.98	567
1977-1978	25 044	19 978	45 022	2 675	47 697	76.60	623
1979-1980	28 543	22 437	50 980	3 152	54 132	81.36	665
1982-1983	34 072	27 341	64 413	4 084	65 497	89.12	735
1983-1984	34 614	29 529	64 143	4 394	68 537	91.88	746

Source: Monthly Economic Statistics, May 1985.

Table S. Health facilities

Years	Total beds	Registered doctors	Registered dentists	Registered nurses	Registered lady health visitors	Population per health facility		Hospitals	Dispensaries	M.C.H. centres	Rural health centres	Sub-health centres and basic health units	T.B. centres
						Per hospital bed	Per doctor						
1951	14 741	2 621	—	574	100	2 518	14 235	306	823	110	—	—	3
1960	22 100	6 485	—	1 929	230	2 090	7 124	343	1 195	358	—	—	—
1970	34 001	14 109	377	4 543	1 169	1 808	4 358	495	2 136	668	—	—	—
1975	36 466	17 625	638	6 375	1 627	1 887	3 986	518	2 910	696	134	373	89
1977	40 518	19 863	720	7 186	1 738·	1 867	3 806	528	3 220·	726	186	544	95
1980	47 412	23 594	911	9 098	2 009	1 742	3 371	602	3 466	812	317	736	98
1982	50 335	29 931	1 103	10 554	2 368	1 738	2 818	613	3 459	817	283	1 587	98
1983	52 161	33 584	1 203	11 070	2 562	1 709	2 654	626	3 551	794	302	1 982	97

Part One

I. INTRODUCTION

Estimation of mortality levels and trends in Pakistan is particularly difficult because, although the country has reasonably extensive census data, it is not so favourably endowed with other traditional sources of demographic data, such as vital registration. Officially a system of birth and death registration exists, but the coverage is so incomplete that practically no attempt has been made to tabulate the data. Even the accuracy of census counts is doubtful. However, the lack of conventional data in the form of complete counts in recent years has been compensated to a great extent by the data from several national socio-demographic sample surveys that have been undertaken since the early 1960s.

Utilizing the available data, an attempt is made in this report to document the mortality and levels and trends since the turn of the century. Realizing the limitation of the time series data from the censuses and relative quality and coverage differentials in various demographic surveys, we have wherever possible, tried to present both the direct and indirect estimates of mortality levels, trends and differentials.

After discussing the overall level and trends, the report presents inter-temporal variation in survival probability. This is followed by an examination of differentials in mortality both at national and sub-national level. In order to put these findings into proper context, in the beginning we have briefly discussed the data sources and their limitations.

DATA SOURCE

The data utilized for the present study have been extracted from various censuses current demographic surveys and from the pregnancy history data of three one-time surveys. The censuses are not designed to yield any direct data on mortality. Age structure of national censuses however, is a very useful source of indirect estimates of inter-censal mortality. In case of Pakistan the quality and coverage of the censuses have not been uniform which makes it very difficult to use data without some ingenious adjustments. For instance, the first

census of 1951[1] undertaken just after partition was regarded to be deficient in coverage, the 1961[2] census though considered to be better in coverage yielded unbelieveably low estimates of mortality compared with 1951 census. The 1972 census[3] was undertaken just after the seperation of East Pakistan and there is some evidence that it was subjected to over-enumeration at several places. Over-enumeration of 1972 census coupled with an inter-censal period of more than eleven years made the estimation of 1961-1972 inter-censal mortality quite difficult. Although the extent of enumeration in 1981 census as compared to 1972 census may not be problematic yet the inter-censal period of less than 9 years along with the defective 1972 census makes the inter-censal estimates of mortality difficult and uncertain.

The post-enumeration sample surveys of 1973[4] and 1981 census 10 per cent count[5] do however permit indirect estimates of child and infant mortality. The sampling framework of 1973 Housing, Education and Demographic (HED) Survey was based on the Population count of 1972 and at a time when the country was facing the severe floods. All these factors adversely affected the quality of HED enumeration. The population estimates derived from 1973 HED turned out to be on the lower side and there is every likelihood that the mortality estimates from HED will also be of dubious quality. The 1981 census was conducted under normal conditions. The quality of the data contained the count of the 1981 census' 10 per cent sample count is relatively better.

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[1] Pakistan Census Organization, *Census of Pakistan 1951*, Bulletin No. 4, Karachi, n.d.

[2] Pakistan Census Organization, *Census of Pakistan 1961*, Vol. 3, Karachi, n.d.

[3] Pakistan Census Organization, *Statistical Tables for Pakistan and Provinces 1972*, Government of Pakistan Islamabad, 1973, n.d.

[4] Government of Pakistan, *Housing, Education and Demographic Survey of Pakistan, 1973*, n.d.

[5] Population Census Organization while conducting the population census of 1981, administered a long questionnaire, seeking information on demographic and socio-economic characteristics, to 10 per cent of the households in the country. The data collected in this long questionnaire are therefore referred as 10 per cent count.

The direct estimates of mortality are available from the three current demographic surveys namely Population Growth Estimation Experiment (PGE), Population Growth Surveys, (PGS-I) and PGS-II. These national surveys were conducted during the period 1962-1965, 1968-1971 and 1976-1979.

The current demographic surveys, namely PGE and PGS which collected information on vital events for the period not exceeding one year prior to the survey, suffer from many limitations. PGE experiment which was launched with a view to collect data on vital events, yielded three estimates[6] of vital events using a thorough matching procedure. Controversy developed as to which estimate was the true estimate of vital events. Some preferred to use the (CD) Chandra-Deming estimates which represented much higher magnitude of vital rates, while others took the Registration estimate, being middle of the road estimates of the vital rates. However, there were some who thought that the enumeration estimates were better. In addition average of Chandra-Deming and Registration Estimates were also rated high by some. All these controversies could have been removed had PGE collected base population at different periods of time and matched them to arrive at a reasonable estimate of the denominator for the vital rates. Like other similar surveys, the quality

of enumeration of the PGE data started declining within four years of its enumeration.

Population Growth Survey (PGS) undertaken during 1968-1971 was designed to improve the methodology of PGE. Unlike PGE where only 12 sample clusters of about 1,000 households each were enumerated, PGS-I was designed to cover 14 sample indicators of about 200 households each.[7] It was a single system (in terms of PGS, CS only) survey, with two months overlapping coverage at each round. The vital events between the overlapping period of surveys were matched and missing event thus identified were included in the total count. Unlike PGE, which provided sample figures, matched and nonmatched figures as well as the matching procedures used, no figures of matched or nonmathched events were ever reported by PGS. During 1976-1979, a repeat survey similar to PGS was undertaken to yield estimates of vital rates for Pakistan, provinces and rural-urban areas. In order to enhance the efficiency of the sample, the number of sample indicators in this survey was and the population size of each cluster was decreased. Like the previous PGS no information is available about the matching procedure as well as the matching results. In the absence of the supportive evidence, the evaluation of the data quality is very difficult but the overall results suggest relatively poor coverage.

The retrospective surveys, namely National Impact Survey (NIS) 1968, Pakistan Fertility Survey (PFS) 1975 and Population, Labour Force and Migration Survey (PLM) 1979-1980, were designed mainly to collect data on fertility and to evaluate the impact of the Family Planning Programme. Two of the surveys, namely NIS and PFS, were undertaken by the Population Division. Great care was taken to train the interviewer and strict supervision was maintained thoughout the survey period. In PLM, which was a joint undertaking of PIDE/ILO, data collection was sub-contracted to the Federal Bureau of Statistics. The sample size of PLM is larger than NIS and PFS. Since the PLM was a relatively complicated operation involving four simultaneous surveys of Migration, Labour Force, Income Distribution and Fertility, the quality checks could have been less strict than for PFS. A thorough evaluation of the data contained in PLM is, however, currently underway.

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[6] During the course of its four years of operation Population Growth Estimation Project (PGE) collected vital events in the same areas through two simultaneous systems of data collection namely Longitudinal Registration (LR) and Cross-Sectional Survey (CS). LR was a continuous registration system wherein registrars were assigned the task of registering the vital events continually in their areas. However, under the CS system enumerators collected vital events occurring in their areas during the last one year through quarterly visits of each year. Vital events so obtained for the last one year in each sample area from the two systems were matched in the office. The remaining nonmatched events from the two systems were later on investigated in the field. These seperately yielded four types of vital events in each sample area, namely, vital events common to both LR and CS systems (matched), vital events caught by LP system but missed by CS system (LR nonmatched), vital events caught by CS system but missed by LR system (CS nonmatched) and vital events missed by both LR and CS system (fourth category). The fourth category was however estimated by applying the Chandra-Deming technique to the matched and nonmatched event in each sample area. Combining these three results in three types of estimates of vital events namely Chandra-Deming (CD), Registration (LR) and Enumeration (CS) were obtained for each PGE year where:

CD = Matched events + LR Nonmatched events + CS Nonmatched events + Fourth category

LR = Matched events + LR Nonmatched events

CS = Matched events + CS Nonmatched events.

[7] Initially a monthly enumeration was planned, however because of respondent fatigue and other administrative reasons, the enumerative period was changed to every quarter.

II. LEVELS AND TRENDS OF MORTALITY

A. CRUDE DEATH RATE (CDR)

The estimates of CDR in Pakistan since 1901 are presented in table 1. Since the mortality level for Pakistan before 1961 is not available, we have referred to studies which have been conducted on the Indian-subcontinent and assume that the same rates prevailed in regions now constituting Pakistan as were found in pre-independence India. As the table indicates, the death rate continued to remain high at around 40 per 1,000 population during the four decades 1881-1921. According to Davis[8] mortality remained high due to the two great famines of 1876-1978 and 1898-1900, and the influenza epidemic of 1918. During the subsequent decades the crude death rate declined sharply from 36 during 1921-1931 to approximately 23 during 1951-1961. This reduction in death rate appears to have been led by control of famines and mass killer diseases such as malaria, cholera, and small-pox. Needless to mention that this downward trend in mortality has also been associated with the introduction of chemo-therapeutic drugs.

Data pertaining to the post-1961 period on CDR are based on the current demographic survey and care needs to be taken in interpreting them. There are three types of estimates of death rates, namely CD, LR and CS based on PGE for each year from 1962 through 1965 as well as their averages. For each year these estimates are in the descending order of magnitude with CD attaining the highest value followed by LR and CS. The highest value of CD can be attributed to the exhaustive matching procedure for deaths adopted in PGE, but with no such procedure available for estimating the mid-year base population, the CDR thus obtained could be an overestimate. Although continuous registration of vital events in PGE sample areas remained of better quality, the element of under-registration was always present in the total estimates with its magnitude probably increasing for the latter years of the survey.

The cross-sectional estimates of death rates based on PGE tend to show the lowest CDR and

compare favourably with the cross sectional estimates of PGS 1968-1971 and 1976-1979. However, the CS estimates of death rates of PGE seems to be too low. There is no reason to believe that the mortality level in Pakistan improved so suddenly from about a CDR of 23 for the period 1951-1961 as suggested by Indian Census data, to a CDR of 11 for 1962-1965. In our view a more plausible level is that of based on average of LR-CD, which is about 16 deaths per 1,000 population. According to PGS-I and PGS-II the CDR has remained unchanged at around 10-11 per 1,000 population till 1979.

It is widely known that deaths are usually under-reported by the registration systems especially in developing countries where the registration systems are not very effective. Even in surveys and censuses where there is a question about recent deaths, the number of deaths of infants (under 1 year of age), children and adults recorded are often deficient and the death rates calculated are found to be on the low side. In case of Pakistan, infant and child deaths as well as adult deaths are found to be under-reported in the sample surveys.

For estimating the degree of under-enumeration of both infant and child and adult deaths, various techniques are available. Estimates of infant and child mortality can be derived from reports by mothers on the number of surviving children,[9] while the completeness of reporting of adult deaths can be obtained by either the Brass Technique or by the techniques developed by Preston and Hill[10] and Preston and Coale[11]. The sample surveys conducted in Pakistan gathered information on recent deaths but not on number of surviving and dead children,[12]

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[8] M. Naseem Iqbal, Farooqui and Ghazi Mumtaz Farooq, *Final Report of the Population Growth Estimation Experiment; 1962-65* Dacca, Pakistan Institute of Development Economics.

[9] Williams Brass, *op. cit.*

[10] K. Hill and S. Preston, "Estimating the completeness of death registration", *Population Studies,* 34(2), July 1980.

[11] Samuel Preston and Ansley J. Coale, and others, "Estimating the completeness of reporting of adult deaths in populations that are approximately stable", *Population Index,* 46(2) Summer, 1980.

[12] All three surveys were designed to cover current vital events and no attempt was made to correct information on mother's surviving and dead children.

Table 1. Levels and trends of crude death rate in Pakistan, 1881 to 1979

Region	Source	Year	Crude death rate
India	Census	1881-1891	41.3
India	Census	1891-1901	44.4
India	Census	1901-1911	42.6
India	Census	1911-1921	48.6
India	Census	1921-1931	36.3
India	Census	1931-1941	31.2
India	Census	1941-1951	27.4
India	Census	1951-1961	22.8
Pakistan	PGE (CB)	1962	19.0
Pakistan	PGE (LR)	1962	17.0
Pakistan	PGE (CS)	1962	12.0
Pakistan	PGE (CB)	1963	19.0
Pakistan	PGE (LR)	1963	16.0
Pakistan	PGE (CS)	1963	11.0
Pakistan	PGE (CB)	1964	20.0
Pakistan	PGE (LR)	1964	15.0
Pakistan	PGE (CS)	1964	13.0
Pakistan	PGE (CB)	1965	16.0
Pakistan	PGE (LR)	1965	12.0
Pakistan	PGE (CS)	1965	9.0
Pakistan	PGE (CD)	1962-1965	18.0
Pakistan	PGE (LR)	1962-1965	15.0
Pakistan	PGE (CS)	1962-1965	11.0
Pakistan	PGS-I (CS)	1968	12.0
Pakistan	PGS-I (CS)	1969	11.5
Pakistan	PGS-I (CS)	1970	10.5
Pakistan	PGS-I (CS)	1971	10.6
Pakistan	PGS-I (CS)	1968-1971	11.4
Pakistan	PGS-II (CS)	1976	11.5
Pakistan	PGS-II (CS)	1977	10.7
Pakistan	PGS-II (CS)	1978	10.0
Pakistan	PGS-II (CS)	1979	9.6
Pakistan	PGS-II (CS)	1976-1979	10.5

Source: Kingsley Davis, *The Population of India and Pakistan*, Princeton, Princeton University Press, New Jersey, 1961.

M. Naseem Iqbal Farooqui and Ghazi Mumtaz Farooq, *Final Report of the Population Growth Estimation Experiment; 1962-65*, Dacca, Pakistan Institute of Development Economics, July 1971.

Government of Pakistan, *Population Growth Survey, 1968*, Statistical Division, Karachi. n.d.
Government of Pakistan, *Population Growth Survey, 1969*, Statistical Division, Karachi. n.d.
Government of Pakistan, *Population Growth Survey, 1970*, Statistical Division, Karachi. n.d.
Government of Pakistan, *Population Growth Survey, 1971*, Statistical Division, Karachi. n.d.
Government of Pakistan, *Population Growth Survey, 1976*, Statistical Division, Karachi. n.d.
Government of Pakistan, *Population Growth Survey, 1977*, Statistical Division, Karachi. n.d.
Government of Pakistan, *Population Growth Survey, 1978*, Statistical Division, Karachi. n.d.
Government of Pakistan, *Population Growth Survey, 1979*, Statistical Division, Karachi. n.d.

"Pakistan, population growth estimation", *Report of the Population Growth Estimation Experiment 1962 and 1963* Karachi, Pakistan Institute of Development Economics, 1968.

Pakistan   PDS (CS)   1984   11.8
            "   6   1985   11.5
            "   1986   10.1
            "   1987   10.5
            "   1981   11.0

Table 2. Percentage of total deaths (age 5 and over) enumerated in various surveys, by residence and sex in Pakistan for the specified periods.

Period	Source	Sex	Per cent of death enumerated		
			Total	Urban	Rural
1962-1965	PGE (LR)	Both sexes	0.6997	—	—
		Male	0.7257	—	—
		Female	0.6695	—	—
1968-1971	PGS-I	Both sexes	0.5123	—	—
		Male	0.5459	—	—
		Female	0.4762	—	—
1976-1979	PGS-II	Both sexes	0.7183	0.7136	0.7196
		Male	0.7267	0.7105	0.7315
		Female	0.7088	0.7176	0.7065
1984-87	*PDS*	*Both sexes*	*0.5477*	*0.5000*	*0.5735*
		Male	*0.5424*	*0.6900*	*0.5716*
		Female	*0.5548*	*0.5120*	*0.5762*

Table 3. Unadjusted and adjusted death rates for Pakistan for various surveys

for what ?

Region	Source	Year	Crude death rates	
			Unadjusted	Adjusted
Pakistan	PGE (LR)	1962-1965	15.1	17.5
Pakistan	PGS-I	1968-1971	11.4	15.5
Pakistan	PGS-II	1976-1979	10.5	14.6
Pakistan	*PDS*	*1984-87*	*11.0*	*—*

thus indirect estimates of infant and child mortality cannot be obtained from these surveys. The degree of enumeration of adult deaths in 1961-1965 PGE (LR), 1968-1971 PGS-I and 1976-1979 PGS-Il surveys have, however, been worked out by the application of Preston and Coale techniques[13] and are presented in table 2.

It may be observed from table 2 that about 70 per cent of adult deaths were completely enumerated by 1962-1965 PGE (LR). The corresponding percentages for 1968-1971 and 1976-1979 were 51.2 and 71.8 respectively. As expected, female deaths compared to male deaths were less completely enumerated. Adjustment of deaths in these three samples on the basis of Preston and Coale technique yielded adjusted crude death rates which are given alongwith unadjusted death rates in table 3. The adjusted CDR suggested that mortality levels have not declined as fast as was suggested by the survey data. It seems that the levels are still in the range of 14-15 per 1,000 population. It should, however, be recognized that without independent confirmation, this is only a speculation.

[13] Samuel Preston and Ansley J. Coale and others, *loc. cit.*

B. INFANT MORTALITY[14]

In Pakistan the death rate among children (0-4 years) is observed to be very high contributing to nearly 58 per cent of total deaths in the country. Irrespective of sex around 65 per cent of all deaths occur among persons under 15 years of age. Next to deaths among infants under 1 year of age, the highest proportion of deaths seem to occur among children in the age group 1-4 years and those belonging to age 65 years and over (for details, see appendix table I).

Single year and four year average estimates of infant mortality rates by source and period of estimation are presented in table 4. Once again the rates prior to 1962 are based on the Indian census data. It should be mentioned that the data on infant deaths in Pakistan like other developing countries is considered to be deficient in coverage. An examination of PGE rates reveals that rates based on CD declined from 152 to 118, a decline of 22 per cent during 1962 to 1965 period. Similarly rates based on LR decline from 159 to 117, a decline of 26 per cent, where as rates based on CS declined by 34 per cent from 122 to 80 during the same period of time. Such a whereas rates based on CS declined by 34 per cent from 122 to 80 during the same period of time. Such a dramatic decline during the four years of PGE operation hardly makes sense. It appears that the extent of under-reporting of vital events (more so of deaths) in the surveys under-discussion has increased overtime during the period in question[15]. Similar analysis of PGS (I-II) rates also suggests of substantial death under enumeration of deaths during the period 1968-1971 and 1976-1979.

Notwithstanding the limited quality of data on infant mortality rates, the above table is indicative of a persistent decline since 1901 from its highest levels of 215 to its lower level of 94 during 1976-1979. In other words, during 1901-1906, 21.5 per cent live births born during a year did not live up to their first birthday. This percentage declined to around 14.3 per cent during 1962-1965, 11.3 per cent during 1968-1971 and 9.4 per cent during 1976-1979. Selecting a cut-off point at 1962-1965 PGE (LR), it can be observed that of what infant mortality rate has declined by around 34 per cent during 1901-1965. This figure is quite low when we compare the extent of decline in some of the other developing countries. Developing countries like Taiwan and Singapore had achieved a reduction of about 80 per cent in their mortality rate during the 25 year period from 1935-1939 to 1960-1964[16]. Similarly a decline of 60 per cent or more in the infant mortality rate was also reported in countries like Sri Lanka, Jamica, Malaysia, Mauritius etc., during the same period of time[17]. The pace of decline in infant mortality rate in Pakistan during 1901-1965 has been very slow, being less than one sixth of what was achieved in other developing countries of the world.

For the post 1965 period there are no comparable independent sources available to confirm the infant mortality rates as yielded by PGE and PGS for the period 1962-1979. However utilizing the pregnancy history information contained in two one-time surveys, the 1975 Pakistan Fertility Survey (PFS) and 1979 Population, Labour Force and Migration Survey (PLM), Alam and Cleland[18], Irfan and Alam[19]

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[14] Infant mortality may be defined as the number of infant deaths per thousand live births in one year. Another measure namely neonatal mortality rate indicates the number of deaths occurring within 28 days of birth per 1,000 live births in one year. Post-neonatal mortality rate expresses the deaths rate of infants dying from 28 days to under one year per thousand live births who have survived the neonatal period. Childhood mortality rate are expressed as age specific death rates at individual years of age or for age groups of 1-4 years, 5-9 years and 10-14 years. However, the number of deaths occurring in any year in these specified age groups are divided by the estimated mid-year populations in the corresponding age groups.

[15] Inspite of all the draw-backs in the PGS data, even if it may be assumed that the estimates of live births for CD, LR and CS categories of PGE tend to be accurate within a narrow range, then it is evident that infant deaths for PGE (CS) are grossly under-reported as compared to PGE (LR) and PGE (CD) estimates.

[16] United Nations, *The Determinant and Consequences of Population Trends: A Summary of Findings on Interaction of Demographic, Economic and Social Affairs, Population Studies,* No. 50, Vol. 1, New York, 1973.

[17] United Nations, *World Population Trends and Policies: 1976 Monitoring Report,* Vol. 1, *Population Studies,* No. 70, New York, 1980.

[18] Iqbal Alam and John Cleland, "The infant and child mortality" in *Fertility Determinants: Further Analysis of PFS Data* (ed. Iqbal Alam), London, World Fertility Survey, International Statistical Institute, 1984.

[19] Mohammad Irfan and Iqbal Alam, "Socio-economic correlates of mortality in Pakistan" in *Developments in the Analysis of Mortality and Causes of Death,* (eds. Herald Hansluwka and others), Bangkok, Mahidol University, Thailand, 1986.

Table 4. Levels and trends of infant mortality rates in Pakistan, 1901 to 1979

Region	Source	Year	Infant mortality rates		
			Both sexes	Male	Female
India	Census	1901-1906	215	—	—
India	Census	1906-1911	228	—	—
India	Census	1911-1916	204	—	—
India	Census	1916-1921	219	—	—
India	Census	1921-1926	174	—	—
India	Census	1926-1931	178	—	—
India	Census	1931-1936	174	—	—
India	Census	1936-1941	161	—	—
India	Census	1941-1946	161	—	—
India	Census	1946-1951	134	—	—
India	Census	1951-1961	139	—	—
Pakistan	PGE (CD)	1962	152	160	143
Pakistan	PGE (LR)	1962	159	161	156
Pakistan	PGE (CS)	1962	122	141	99
Pakistan	PGE (CD)	1963	137	146	138
Pakistan	PGE (LR)	1963	152	158	145
Pakistan	PGE (CS)	1963	103	116	89
Pakistan	PGE (CD)	1964	136	124	149
Pakistan	PGE (LR)	1964	141	127	157
Pakistan	PGE (CS)	1964	115	101	129
Pakistan	PGE (CD)	1965	118	119	117
Pakistan	PGE (LR)	1965	117	110	126
Pakistan	PGE (CS)	1965	80	86	73
Pakistan	PGE (CB)	1962-1965	136	137	135
Pakistan	PGE (LR)	1962-1965	143	140	146
Pakistan	PGE (CS)	1962-1965	105	111	98
Pakistan	PGS-I	1968	124	131	116
Pakistan	PGS-I	1969	111	115	108
Pakistan	PGS-I	1970	109	115	102
Pakistan	PGS-I	1971	106	114	96
Pakistan	PGS-I	1968-1971	113	119	106
Pakistan	PGS-II	1976	87	94	80
Pakistan	PGS-II	1977	100	110	89
Pakistan	PGS-II	1978	95	103	87
Pakistan	PGS-II	1979	95	101	88
Pakistan	PGS-II	1976-1979	94	102	86

Source: Same as for table 1.

and Sathar[20] have worked out infant mortality rates. The rates provided in table 5 based on these surveys indicate that infant mortality rates based on current demographic surveys (PGS) for the period 1968 to 1971 and 1976 to 1979 are lower than those based on pregnancy history data of one-time surveys (PFS and PLM). This phenomenon presumably is reflective of under

enumeration of deaths in the former category of surveys.

A comparison between PFS and PLM suggests a lower level of infant mortality levels in the latter than in the former survey. Whilst it can be conjectured that the deaths in PLM may have been under reported, the fact that PLM sample being twice in size of PFS, the difference in levels of infant mortality rates can partly be attributed to the sampling variability. Each survey data in isolation reveal a

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[20] Zeba A. Sathar, "Infant and child mortality in Pakistan, some trends and differentials", *Journal of Biosocial Sciences*, 17(3), July 1985.

Pakistan   PDS   1984   126·7   124*   125*
                         1985   115·9   120*   99*
                    9   1986   105·6   108*   96*
                         1987   103·9   118   89
* based on sample data   1984-87   113·0   118   89

Table 5. Levels and trends of infant and child mortality rates based on retrospective sample surveys: Pakistan, PFS 1975 and PLM 1979

Period	PFS 1975				PLM 1979			
	IMR	CMR*	NNMR	PNNMR	IMR	CMR*	NNMR	PNNMR
1950-1954	178	127	94	84	166	105	94	72
1955-1959	157	101	85	72	138	100	85	53
1960-1964	141	64	81	60	126	72	74	52
1965-1969	136	64	78	58	116	60	70	46
1970-1974	145	62	84	61	114	43	70	44
1975-1979	—	—	—	—	125	44	83	42

Source: As references in footnotes 18, 19 and 20.

IMR = Infant mortality rate

CMR = Child mortality rate

NNMR = Neonatal mortality rate

PNNMR = Post-neonatal mortality rate

*CMR is calculated as the difference between $5q_0$ and $1q_0$

declining trend in infant mortality rates except for a rise in the five year period immediately preceding each survey. For instance PFS data suggest a rise in infant mortality rate from 136 in 1965-1969 to 145 in 1970-1974 period. This pattern is not replicated by PLM for the same period which registeres a modest decline from 116 to 114. This casts doubt about the rise in infant mortality rates for the five year period preceding the surveys which can be regarded as supurious.[21]

Leaving aside the infant mortality rates for the five year preceding the surveys, the pregnancy history data reflect a decline in infant mortality rate, most of which has occurred prior to 1960-1964 period. Since 1965 the pace of reduction in infant mortality appears to have been slowed down considerably. The

PLM survey for instance suggests a marginal decline from 116 in 1965-1969 to 114 in 1970-1974 (table 5).

Indirect estimates of infant and child mortality rates based on children ever born and children surviving are presented in table 6. These estimates are derived by applying the Trussel's mortality coefficients[22] based on West Model Life Tables to the proportion dead of children ever born by age of mother reported in the four sample surveys namely NIS[23], HED[24], PFS[25], PLM[26] and the ten per cent[27] count of

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[21] Similarly a comparative study of PFS and PLM found that each survey in isolation indicates a recent decline in fertility wherein both the surveys show a higher Total Fertility Rates (TFR) and Total Marital Fertility Rates (TMFR) for period 5-9 years prior to the survey than for 0-4 years. Since overlapping birth histories from both the surveys failed to confirm this trend, the distortions are most probably due to misplacement of births in time (J.E. Potter, *The Validity of Measuring Change in Fertility by Analysing Birth Histories Obtained in Surveys*, Ph.D. Thesis, Princeton University, New Jersey, 1975).

[22] T. James Trussel, "A re-estimation of the multiplying factors for the Brass Technique for determining childhood survivorship rates", *Population Studies*, 29(1), March 1975.

[23] Training, Research and Evaluation Centre (TREC) *National Impact Survey Report*, Lahore, Pakistan Population Planning Council, 1974.

[24] Government of Pakistan, *Housing, Education . . .*, *op. cit.*

[25] Pakistan, Population Planning Council, *Pakistan Fertility Survey*, London, World Fertility Survey, 1976.

[26] Mohammad Irfan, "An introduction of studies in population, labour force and migration", *Research Report No. 18*, Islamabad, Pakistan Institute of Development Economics, 1981.

[27] Based on the unpublished census data.

Table 6. Indirect estimates of infant and child mortality rates by sex based on children ever-born and children surviving: Pakistan 1967-1968, 1972-1973, 1974-1975 and 1978-1979

Year	Source	Infant child mortality rates		
		Both sexes	Male	Female
Pakistan				
1965-1969	NIS	138 (78.7)	133 (65.8)	144 (91.7)
1969-1973	HED	101 (48.9)	119 (56.0)	83 (41.8)
1971-1975	PFS	148 (86.6)	145 (82.8)	151 (97.8)
1975-1979	PLM	125 (66.5)	155 (82.8)	94 (50.2)
1976-1981	Census	129 (71.4)	131 (64.6)	126 (78.2)
Urban areas				
1969-1973	HED	97 (46.7)	103 (45.5)	91 (48.0)
1975-1979	PLM	108 (54.5)	119 (56.0)	97 (53.0)
1976-1981	Census	117 (62.2)	119 (56.5)	114 (67.9)
Rural areas				
1969-1973	HED	113 (55.4)	123 (53.2)	103 (57.7)
1975-1979	PLM	129 (71.0)	142 (72.5)	116 (69.4)
1976-1981	Census	132 (74.2)	135 (67.8)	129 (80.7)

Note: Infant mortality rates for the two sexes are the weighted average of the two sexes based on sex ratio at birth of 1.05.

1981 population census of Pakistan. Since mortality between age 0 and 2 years ($_2q_0$) is regarded to be more accurately determined, the same were used therefore, to estimate the corresponding infant and child mortality rates from the West Model Life Tables. Besides the underlying assumption of the methodology used, the derived estimates tend to vary from one survey to another owing to the varying incidence of age mis-reporting and under-enumeration of children ever-born and dead. Moreover, different sample sizes and sampling errors are bound to influence the comparability of results. As the table indicates, rates from NIS, PLM and 1981 Census lie in between the two extremes of HED and PFS rates. The lowest rates from HED are caused by substantial under-reporting of ever-born and deceased children[28] whereas the high rates from PFS are attributable to both much better coverage and small sample size. Removing the two extreme cases it appears that infant mortality has declined somewhat during the period 1965-1981 and that the recent rate

(prior to 1981) lies in the range of 125 to 130 infant deaths per thousand live births.

The decomposition of infant mortality[29] rate into neonatal and post-neonatal is provided in table 7 for 1962-1965 and 1968-1971 period. Since with the improvement in preventive medicine and environmental conditions post-neonatal mortality tends to decline faster than neonatal, the ratio of neonatal to post-neonatal mortality tends to increase over-time. As table 7 indicates during 1962-1965, about 56 per cent of infant deaths occurred during the neonatal period with

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[28] Abdul Jaleel, *Levels and Differentials of Infant and Childhood Mortality,* M.Sc. Thesis, Australian National University, May 1982.

[29] Information on foetal deaths during prenatal period which can be divided into early, intermediate and late foetal deaths is not available. The data on still births, occuring after the twenty eight weeks of gestation, are available only for the 1962-1965 period from PGE registration data (see footnote 8). The still birth ratio derived from these figures stands at 20 per 1,000 live births. This ratio is much lower than that prevailed in other developing countries of the world for the early 1960s period. The countries like Trinidad and Mauritius had still birth rates of 27 and 66 respectively during that period (see footnote 17). This indicates that there has been considerable under-enumeration of still births in PGE survey. No relevant data are available on national level to measure the prenatal rates in Pakistan.

Table 7. Estimates of neonatal and post-neonatal mortality rates and per cent distribution of neonatal and post-neonatal deaths for Pakistan, 1962-1965 and 1968-1971

Age groups	(Per 1000 live births)		*1984-87*	Per cent distribution of death		*1984-87*
	1962-1965	1968-1971		1962-1965	1968-1971	
Total infants	135	113	*113*	100.0	100.0	*100.0*
Under 1 month	77	56	*61*	56.9	49.6	*54.0*
1-11 months	58	57	*52*	43.1	50.4	*46.0*
1-5 months	32	33	*35*	23.4	28.8	*31*
6-11 months	26	24	*17*	19.7	21.6	*15*

Source: M. Naseem Iqbal Farooqui and Ghazi Mumtaz Farooq, *Final Report of the Population Growth Estimation Experiment; 1962-65* Dacca, Pakistan Institute of Development Economics, July 1971.

Government of Pakistan, *Population Growth Survey, 1968*, Statistical Division, Karachi. n.d.

Government of Pakistan, *Population Growth Survey, 1970*, Statistical Division, Karachi. n.d.

Government of Pakistan, *Population Growth Survey, 1971*, Statistical Division, Karachi. n.d.

"Pakistan, population growth estimation," *Report of the Population Growth Estimation Experiment 1962 and 1963* Karachi, Pakistan Institute of Development Economics, 1968.

also Govt of Pak, Pak Dem Survey 1984, Bureau of Statistics 1987.

the ratio of neonatal to post-neonatal mortality rate being about 2:1. However, during 1968-1971 an equal number of deaths reported both for the neonatal and post-neonatal period, appears to be an artifact of the data, especially resulting from under-enumeration of neonatal deaths in PGS. Inter-temporal comparison between neonatal and post-neonatal rates borne out by pregnancy history data clearly reflect a sharper decline in the latter than the former. PLM survey for instance suggests a rise in the ratio of neonatal to post-neonatal deaths from 2:1 in 1950-1954 to 3:1 in 1970-1974. PFS similarly indicates a rise from 5:3 to 2:1 between 1950-1954 to 1965-1969. These observations appear to be consistent with declining trend in infant mortality.

C. AGE-SEX PATTERN OF MORTALITY

Data on age pattern of mortality are scanty in Pakistan, primarily because of inadequate registration system of vital events. No major mortality surveys have so far been undertaken to collect data on mortality in Pakistan. Three surveys namely PGE, PGS-I and PGS-II discussed earlier do, however, provide information which is utilized to study the age pattern of mortality in Pakistan.

Age sex specific death rates are calculated separately for the periods 1962-1965, 1968-

1971 and 1976-1979.[30] Since for 1962-1965 period three different data sets namely PGE (CD), PGE (LR) and PGE (CS) are available, in this study, only the age-sex-specific rates of PGE (LR) are used. As stated earlier, under-enumeration of deaths for the three periods in question are estimated by the method of Preston and Coale[31], wherein the age sex specific death rates for age 5 and over are adjusted. Because of the erratic pattern of age-sex-specific death rates due to age mis-reporting etc. it is necessary to graduate them by using Gompertz Curves[32] of the form:

$$M(X) = K.^{bx}$$

where K, a and b are constants and x is the age at death.

The Gompertz Curve fits fairly well to the two wings of the age curve of mortality. The left wing of the curve starts from age zero and reaches a low point somewhat around age 12, there-on right wing starts rising upto the terminal age. Since the left wing of the age curves of

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[30] Data for each four year period are pooled.

[31] Samuel Preston and Ansley J. Coale and others, *loc. cit.*

[32] Frederick E. Croxton, Cowden Dudley J. and Clean Sidney, *Applied General Statistics*, third edition, Englewood Cliffs, N.J., Princeton Hall, 1967.

mortality appears almost free from irregularity only the right wing of all curves are smoothened. For construction of abridged life tables, the probability[33] of dying between age x and x+n beyond age one is calculated by using Reed and Merrell[34] Method[35].

In order to study the inter-temporal pattern from 1947 onwards, life tables constructed by M.K.H. Khan[36] for the years 1950-1952 for Punjab are used as a reference with the assumption that the incidence of mortality in Pakistan during 1950-1952 was not different than the Punjab, a major province of the country.[37] It must be mentioned however, that the mortality rates at all ages provided in Khan's life table are presumably over-estimated. These tables together with those constructed for 1962-1965, 1968-1971 and 1976-1979 are used to

study the age pattern at four points in time during the three decades from 1950 to 1979. Table 8 displays the age sex specific mortality rates for the periods 1950-1952, 1962-1965, 1968-1971 and 1976-1979. Table 9 on the other hand shows percentage changes in age sex specific mortality rates overtime, while table 10 represents their sex ratios.

As depicted by the $_nq_x$ (probability of dying) values of table 8, the age curve of mortality in Pakistan is U-shaped with mortality dropping drastically from its high level at age zero to a minimum around age range 10-14, rising steadily through ages 5 to 30 and then sharply until reaching a maximum at old ages. Female suffer from lower level of mortality than males during infancy and at the other end of age distribution, beyond the reproductive age (50 years and above). For the remaining period of life, males have lower mortality than females. Female mortality continues to remain higher at all ages from early childhood till about the end of reproductive period. This pattern of age/sex differential in mortality appears to hold for the entire period under discussion, expect for the period 1962-1965 where estimated male infant mortality rate is lower than females which presumably stems from under-reporting of male infant deaths in that survey, as discussed earlier.

The age/sex differential in mortality is found in most of the developing countries. Generally early childhood (age under one year) mortality for males exceeds that of females and during the subsequent years of life till the end of reproductive period, female mortality continues to exceed male mortality. Although female infant mortality rate is lower than male but during childhood and younger ages this pattern is reversed. The excess female mortality in early childhood and younger ages (1-14) obtained in Pakistan results probably from the deep rooted cultural attitudes against female leading to their neglect, and under-nourishment. The data suggest that male mortality during early childhood (1-4 years) registered a much faster decline than female mortality in the comparable age groups during 1950-1979. The same is true also for children 5-9 year of age.

The case of excess female mortality during the reproductive[38] period (age 10-49) is also

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[33] In the case of 1968-1971 PGS-I data, five year age specific mortality rates are available only through age group 60-64. Mortality rates for ages 65-69, 70-74, 75-79 and 80-84 are therefore estimated by fitting a Makeham curve through the $q_x(1 - qx)$ function for ages 40-44, 45-49 . . . 60-64 and extrapolating the rates to ages 65-69, 70-74 and 80-84. The other columns of life tables are derived according to the procedure described in George W. Barclay, *Techniques of Population Analysis*, (New York, John Wiley and Sons, 1958). Since the probability of dying during infancy cannot be calculated because of the non-availability of adequate data, infant deaths per 1,000 live births during 1962-1965 and 1968-1971 are taken as an index of the probability of dying during infancy. This is based on the assumption that if number of births do not fluctuate much from year to year, these conventional infant mortality rates will represent rather well the probability of an infant dying during first year of his life.

[34] The method consists in converting the relevant crude death rates into the probability of dying within the same age group by means of an exponential developed by the authors. The probabilities either can be read from the tables developed by authors or calculated from the exponential by means of an electronic calculator.

[35] J. Lowell Reed and Margaret Merrell, "A short method for constructing an abridge life table" *American Journal of Hygiene* 30(2), September 1939, Reproduced in U.S. Bureau of the Census, *Handbook of Statistical Methods, for Demographers*, 1951, pp. 12-27.

[36] M.K.H. Khan, "Abridged life tables for males and females in former provinces of the Punjab", *Journal of Medical Research*, 1(1), July 1958.

[37] As the $_nq_x$ values in Khan's life tables (see footnote 36), beyond age 20 are given in age groups of 10, the same were therefore taken for comparative purposes into five year age groups under the assumption that deaths are evenly distributed for each age interval. Khan's life tables are then recalculated and any discrepancy that could arise in these tables would be purely accidental.

[38] Usually the reproductive period for female is taken as 15-49 years but since in Pakistan girls may get married below the age 15 and some may have children before age 15, we have extended the reproductive ages to include women aged 10-14.

Table 8. Age-sex-specific mortality rates for Pakistan for the periods 1950-1952, 1962-1965, 1968-1971 and 1976-1979

Age	Male				Female			
	1950-1952	1962-1965	1968-1971	1976-1979	1950-1952	1962-1965	1968-1971	1976-1979
0	218.5	140.0	120.5	123.3	196.4	146.0	107.0	110.8
1-4	162.1	65.7	62.5	37.6	144.6	95.5	72.3	44.8
5-9	47.4	14.9	15.0	22.9	42.0	25.7	22.0	16.5
10-14	36.1	10.3	14.9	10.2	36.9	17.8	31.6	14.8
15-19	49.2	15.0	15.0	11.9	50.7	26.9	32.3	16.2
20-24	51.5	15.3	15.1	14.2	60.2	28.5	33.4	17.9
25-29	54.3	20.1	15.2	17.1	64.0	30.7	34.9	20.1
30-34	70.8	24.9	19.8	21.0	80.7	33.5	37.1	22.9
35-39	76.3	30.0	20.1	26.2	87.8	37.3	40.5	26.8
40-44	87.3	39.5	25.0	33.3	89.6	42.7	45.9	32.1
45-49	95.7	49.3	34.6	43.2	98.4	50.3	54.6	39.5
50-54	138.7	67.9	49.3	57.3	122.4	61.6	69.6	50.2
55-59	161.1	91.0	86.7	77.6	139.5	78.8	97.7	66.2
60-64	262.8	122.6	131.3	107.6	214.9	106.5	150.6	90.9
65-69	356.6	170.1	187.5	152.5	273.8	153.1	218.8	130.5
70-74	497.5	239.0	269.9	220.4	403.0	236.0	316.1	196.2
75-79	616.9	340.8	344.1	322.2	674.9	386.8	439.3	307.0
80-84	727.3	481.4	427.7	469.5	810.9	643.3	559.9	489.3

Table 9. Percentage changes[a] in age-sex-specific mortality rates for Pakistan for the periods 1950-1952, 1962-1965, 1968-1971 and 1976-1979

Age	Male			Female			
	1962-1965	1968-1971	1976-1979	1950-1952	1962-1965	1968-1971	1976-1979
0	64.1	55.2	56.4	100.0	74.3	54.5	56.4
1-4	40.5	38.5	23.2	100.0	66.0	50.0	31.0
5-9	31.6	31.7	48.2	100.0	61.2	52.4	39.3
10-14	28.6	41.4	28.2	100.0	48.1	85.6	40.1
15-19	30.5	30.5	24.2	100.0	53.1	63.8	31.9
20-24	29.6	29.3	27.5	100.0	47.4	55.4	29.7
25-29	36.9	28.0	31.5	100.0	47.9	54.4	31.4
30-34	35.2	28.0	29.6	100.0	41.5	46.0	28.4
35-39	39.3	26.4	34.3	100.0	42.5	46.1	30.5
40-44	45.2	28.6	38.1	100.0	47.7	51.2	35.8
45-49	51.5	36.2	45.1	100.0	51.2	55.5	40.1
50-54	48.9	35.5	41.3	100.0	50.3	56.9	41.0
55-59	56.5	53.8	48.2	100.0	56.5	70.0	47.4
60-64	46.6	49.9	40.9	100.0	49.5	70.1	42.3
65-69	47.7	52.6	42.8	100.0	55.9	79.9	47.6
70-74	48.0	54.2	44.3	100.0	58.6	78.5	48.7
75-79	55.2	55.8	52.2	100.0	57.3	65.1	45.5
80-84	66.2	58.8	64.6	100.0	79.3	69.0	60.3

Source: Same as for table 8.

[a] The bases for percentage changes are the 1950-1952 mortality rates for each sex.

Table 10. Sex-ratio[a] of mortality rates for Pakistan for the periods 1950-1952, 1962-1965, 1968-1971 and 1976-1979

Age	1950-1952	1962-1965	1968-1971	1976-1979	1985-89
0	111.3	95.9	112.7	111.3	121.8
1-4	112.1	68.8	86.4	84.0	87.7
5-9	112.9	58.3	68.4	138.5	84.1
10-14	97.7	58.2	47.3	68.7	23.5
15-19	97.1	55.7	46.4	73.8	85.4
20-24	85.6	53.5	45.2	79.4	87.4
25-29	84.8	65.4	43.6	85.3	81.9
30-34	87.8	74.5	53.4	91.4	71.2
35-39	86.8	80.2	49.6	97.6	106.4
40-44	97.5	92.5	54.5	103.7	152.8
45-49	97.2	97.9	63.4	109.3	118.3
50-54	113.3	110.3	71.8	114.0	131.9
55-59	115.5	115.5	88.7	117.2	158.3
60-64	122.3	115.2	87.2	118.4	158.4
65-69	130.2	110.1	85.7	116.8	155.5
70-74	123.5	101.3	85.4	112.3	151.6
75-79	91.4	88.1	78.3	104.9	
80-84	89.7	74.8	76.4	95.9	

Source: Same as for table 8.

a (Male/female) x 100.

evident from the tables 8-10. Interestingly that although both male and female mortality in reproductive period has been declining during the period 1950-1971, the rate of decline is much faster for males as compared to females. Because of this faster decline of male mortality in the ages 10-49, female mortality in these age ranges by the end of 1979 has been widen, and is about twice as high as male mortality. Thus, except for the periods of infancy (less the one year) and old age, females tend to experience excess mortality and the differences between male and female mortality in those ages are continuously widening. The mortality situation in Pakistan can be compared with that experienced by Northern and Western Europe before year 1920. These parts of Europe had experienced excessive female mortality in the reproductive ages as well as in some younger age groups[39]. Stolnitz[40] has observed that mortality differentials tend to be less favourable to females in non-industrial and developing countries of the world than in the industrially advanced countries. Reliable data on maternal mortality are not available. How-

[39] United Nations, *The Determinant and Consequences . . . , op. cit.*

[40] J.C. Caldwell, "Education as a factor of mortality decline: An examination of Nigerian data", *Population Studies*, 33(3), November 1979.

ever, Awan[41] has reported the maternal mortality rate in Pakistan to be 6-8 per 1,000 live births.

D. EXPECTATION OF LIFE BY SPECIFIC AGES

Life expectancy at birth, a summary measure of mortality, and unaffected by the age structure of a population, is often regarded a better tool than the crude death rate for inter-temporal investigation of mortality in a community as well as for international comparisons. Since mortality data for Pakistan before 1947 are not available, Indian data for the said period are utilized. Levels of expectation of life at birth from different sources is summarized in table 11.

It is obvious from the table that there was no addition to longevity during the course of the 40 years between 1881 and 1921. During all these years mortality conditions deteriorated due to famines and epidemics. There was an

Table 11. Levels and trends of life expectancy at birth by sex for Pakistan, 1881 to 1979

Region	Source	Year	Life expectancy at birth	
			Male	Female
India	Census	1881	23.7	25.6
India	Census	1891	24.6	25.5
India	Census	1901	23.6	24.0
India	Census	1911	22.6	23.3
India	Census	1921	19.4	20.9
India	Census	1931	26.9	26.6
India	Census	1941	32.1	31.4
Pakistan Punjab		1950-1952	32.9	34.4
Pakistan	PGE (LR)	1962-1965	52.4	48.7
Pakistan	PGS-I	1968-1971	53.6	47.6
Pakistan	PGS-II	1976-1979	56.1	57.0
Pakistan Rural	PGS-II	1976-1979	55.1	54.8
Pakistan Urban	PGS-II	1976-1979	60.5	58.4

Source: Kingsley Davis, *The Population of India and Pakistan*, Princeton, Princeton University Press, New Jersey, 1961.

M.K.H. Khan, "Abridged life tables for males and females in former provinces of the Punjab", *Journal of Medical Research*, 1(1), July 1958.

Warren C. Robinson, "Recent mortality trends in Pakistan" in *The Demography of Pakistan*, (ed. Warren C. Robinson), Karachi, Pakistan, Institute of Development Economics, 1965. *Iqbal Afzal et al, Some Differentials in infant and child Mortality Risks in Pakistan 1962-86, later presented at Fall (and Meeting)/PSDE*

A. Awan, "Health services, health status and national levels" in *Pakistan Women*, (ed. Nasra Shalhi), Islamabad; Pakistan Institute of Development Economics, 1985.

Pakistan IDS 1984-86 57.1 58.6
1984-87 56.0 56.7
1984-86 58.3 60.7

x Average of 1984, 85, 86.

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addition of 6 to 7 years to overall life expectancy during the decade 1921-1931 which happened to be the first decade in the region which was free of famines or epidemics. Further addition to longevity of about 5 and 2 years respectively were achieved during the periods 1931-1941 and 1941-1951. The single largest increase in longevity of 14 and 19 years occurred during the period 1950-1952 to 1962-1965 followed by a gain of about 4 to 8 years during the period 1962-1965 to 1976-1979.

The increase in longevity of 14 and 19 years during a period of about 12 years (1950-1952 to 1962-1965) seems quite spectacular and does not appear to be convincing. Presumably mortality during the period 1950-1952 was not as high as predicted by Khan[42] in his life tables. The vital registration data in this case have been over-adjusted as compared to its base population. An examination of Khan's life tables indicates that infant mortality rates implied by the author are too high as compared to infant mortality rates available for the same periods of time in the region. It is because of this reason that overall level of mortality during the period 1950-1952 looks too high. However, if infant mortality rates in Khan's life table were replaced by appropriate infant mortality rates of the said period, reasonable gains in longevity during the period 1950-1952 to 1962-1965 still emerges. Khan's comparison of 1950-1952 average for age cohorts beyond age 5 compares favourably with those obtained from 1931-1941 Indian life table which tends to suggest that 1950-1952 mortality conditions may have prevailed around the period 1931-1941. If that approximates the reality then gains in expectation of life at birth decrease to about 11 years as compared to 14-19 implied by comparing Khan's estimate with PGE 1962-1965 data.

Male-female difference in life expectancy reflected by the table indicates that prior to 1921 female enjoyed higher longevity than male. It is not clear whether this is due to the underlying assumption used in the construction of life tables or the result of the differential enumeration of sexes in the census as of the said period. For the subsequent period there is reversal of differential by sex. Males have on the whole enjoyed larger gains in life as compared to female during the period 1931-1971. This phenomenon, as stated earlier, is mainly due to the higher female mortality at young and reproductive ages.

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[42] M.K.H. Khan, *loc. cit.*

Regarding rural-urban differences it may be observed that as expected urban life expectancy is higher for both males and females as compared to their counterparts in rural areas. Males in urban areas live on the average 2 years longer as compared to females whereas in rural areas sex differential in life expectancy appears to have narrowed considerably.

Table 12 yields expectancy of life at birth of males and females for the provinces of Pakistan for the period 1976-1979. Punjab and Sind seem to enjoy somewhat more longevity in life as compared to NWFP whereas Baluchistan has the lowest life expectancy. Punjab and Sind being socio-economically better developed enjoy lower overall mortality whereas Baluchistan being least developed has the highest overall mortality. Females in Punjab and Sind live slightly longer as compared to NWFP where males live longer.

Table 12. Expectation of life at birth by sex for the four provinces of Pakistan, 1976-1979

Region	Source	Life expectancy at birth	
		Male	Female
Punjab	PGS-II	56.4	57.5
Sind	PGS-II	56.0	57.3
North West Frontier Province	PGS-II	56.5	54.4
Baluchistan	PGS-II	52.5	52.0

Another method of studying changes in age-sex pattern of mortality is through the examination of changes of expectation of life at specified ages. The drawback of this method consists in the presentation of cumulative mortality rather than individual mortality at specified ages. Appendix table II provides expectation of life at specified ages by sex. Adult mortality denoted by expectation of life at age 5 shows continuous improvement during the period 1950-1979. During the period 1950-1971 improvement in adult mortality for males increased by about 17 years whereas that of females by around 10 years. This large increase as stated earlier is not real but rather a consequence of data employed by Khan in his life tables. However, during 1971-1979 a sudden increase of 8 years for females due to large improvement of female mortality beyond reproductive ages seems to be dubious, and may be outcome of "new" PGS-II methodology employed during 1976-1979.

III. MORTALITY DIFFERENTIALS

A. CRUDE DEATH RATE

1. Regional differentials

Urban-rural differentials in CDR given in table 13 suggest that rural rate tends to be higher than urban. However, as discussed earlier around 71 per cent of adult deaths (table 2) are found to have been enumerated in both the urban and rural areas of Pakistan during 1976-1979, the adjusted rates magnify the rural-urban differentials because the CDR for rural areas rises from 11.4 to 15.8 whereas the urban rate has increased from its present level of 8.2 to 11.4 for 1976-1979. Whilst the unadjusted rates indicate that rural areas record a decline during 1968-1971 to 1976-1979, the urban areas register stagnation.

2. Provincial differentials

The other differential that can be studied in the case of CDR is with respect to the four provinces of Pakistan. Table 14 presents a series of CDR from PGS-II for the years 1976 to 1979 and four year averages. Since the yearly rates fluctuate sometimes widely it would be appropriate to concentrate solely on the average rates for the provinces. Under the assumption that the province of Punjab is socio-economically more developed, a low CDR is expected for its population. On the contrary Punjab seems to record the highest CDR followed by NWFP, Sind and Baluchistan. A more appropriate procedure here would be to estimate the completeness of death enumeration for the four provinces of Pakistan by applying the Preston and Coale technique to the average age-sex specific population and death figures for the years 1976-1979. Table 15 displays the extent of enumeration of deaths by sex for the four provinces of Pakistan. Interestingly enough the extent of under-enumeration appears to be positively co-related with the population size of the province. Punjab with largest population size has recorded the highest percentage of adult deaths whereas Baluchistan with smallest population size records the lowest percentage of adult deaths. As expected females are less completely enumerated than males. Table 16 yields the adjusted crude death rate along with the unadjusted ones for the four provinces. NWFP and Baluchistan record the highest CDR (13.5). The present pattern of CDR seems to be in agreement with the usual perception that the provinces of NWFP and Baluchistan are economically less developed and that the public health facilities in these provinces also are least developed. Sind being highly urbanized is more likely to have greater medical facilities and hence the lowest CDR.

Table 13. Levels and trends of crude death rate for the urban and rural areas of Pakistan, 1968 to 1979

Region	Source	Year	Crude death rate	
			Urban	Rural
Pakistan	PGS-I	1968	9.7	12.9
Pakistan	PGS-I	1969	7.8	12.8
Pakistan	PGS-I	1970	7.3	11.7
Pakistan	PGS-I	1971	7.0	11.8
Pakistan	PGS-I	1968-1971	8.2	12.4
Pakistan	PGS-II	1976	8.8	12.6
Pakistan	PGS-II	1977	8.2	11.7
Pakistan	PGS-II	1978	8.0	10.8
Pakistan	PGS-II	1979	7.7	10.4
Pakistan	PGS-II	1976-1979	8.2	11.4

Source: Government of Pakistan, *Population Growth Survey, 1968*, Statistical Division, Karachi. n.d.

Government of Pakistan, *Population Growth Survey, 1969*, Statistical Division, Karachi. n.d.

Government of Pakistan, *Population Growth Survey, 1970*, Statistical Division, Karachi. n.d.

Government of Pakistan, *Population Growth Survey, 1971*, Statistical Division, Karachi. n.d.

Government of Pakistan, *Population Growth Survey, 1976*, Statistical Division, Karachi. n.d.

Government of Pakistan, *Population Growth Survey, 1977*, Statistical Division, Karachi. n.d.

Government of Pakistan, *Population Growth Survey, 1978*, Statistical Division, Karachi. n.d.

Government of Pakistan, *Population Growth Survey, 1979*, Statistical Division, Karachi. n.d.

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Table 14. Levels and trends of crude death rate for provinces of Pakistan by urban and rural residence, 1976 to 1979 *and 1984 to 1987*

Province	Source	Year	*PDS*	Crude death rate		
				Total	**Urban**	**Rural**
Punjab	PGS-II	1976	*1984*	12.2 *11.7*	10.6 *9.7*	12.7 *13.1*
		1977	*85*	11.4 *11.1*	8.8 *8.7*	12.4 *13.0*
		1978	*86*	10.3 *9.5*	9.0 *7.7*	10.8 *11.3*
		1979	*87*	10.6 *10.5*	9.5 *8.2*	11.0 *11.5*
		1976-1979	*1984-1987*	11.2 *10.7*	9.5 *8.6*	11.7 *12.2*
Sind	PGS-II	1976	*1984*	9.7 *10.6*	6.0 *8.3*	12.4 *13.6*
		1977	*1985*	10.4 *11.0*	7.2 *9.4*	12.8 *13.2*
		1978	*1986*	9.2 *10.3*	6.2 *8.9*	11.4 *12.2*
		1979	*1987*	7.3 *11.2*	4.8 *7.2*	9.2 *15.1*
		1976-1979	*1984-1987*	9.2 *10.8*	6.1 *8.4*	11.5 *13.5*
NWFP	PGS-II	1976	*1984*	12.7 *9.7*	9.2 *8.8*	13.3 *10.2*
		1977	*1985*	8.7 *10.2*	8.3 *10.2*	8.8 *10.2*
		1978	*1986*	11.2 *9.1*	10.8 *9.8*	11.3 *8.6*
		1979	*1987*	10.3 *8.8*	7.8 *6.9*	10.8 *9.2*
		1976-1979	*1984-1987*	10.7 *9.4*	9.0 *8.9*	11.0 *9.5*
Baluchistan	PGS-II	1976	*1984*	8.6 *15.7*	5.3 *13.4*	9.2 *17.7*
		1977	*1985*	7.0 *9.7*	7.0 *7.0*	7.0 *11.8*
		1978	*1986*	7.3 *9.0*	5.3 *4.8*	7.6 *12.3*
		1979	*87*	5.7 *11.1*	8.1 *6.9*	5.2 *11.8*
		1976-1979	*1984-87*	7.1 *11.4*	6.5 *8.0*	7.3 *13.4*

Source: Government of Pakistan, *Population Growth Survey, 1976*, Statistical Division, Karachi. n.d.

Government of Pakistan, *Population Growth Survey, 1977*, Statistical Division, Karachi. n.d.

Government of Pakistan, *Population Growth Survey, 1978*, Statistical Division, Karachi. n.d.

Government of Pakistan, *Population Growth Survey, 1979*, Statistical Division, Karachi. n.d.
Government of Pakistan, Pakistan Demographic Survey, 1984, Bureau of Statistics 1987

Table 15. Percentage of total deaths enumerated by sex in the four provinces of Pakistan: Population Growth Survey, 1976-1979 *and Pakistan Demographic Survey 1984-87*

Provinces	Percent of deaths enumerated		
	Male	Female	Both sexes
Punjab	0.7373	0.7939	0.7628
Sind	0.7456	0.6134	0.6188
NWFP	0.6100	0.6084	0.6092
Baluchistan	0.4219	0.3881	0.4058

Table 16. Unadjusted and adjusted death rates for the four provinces of Pakistan

Region	Source	Year	Crude death rate	
			Unadjusted	Adjusted
Punjab	PGS-II	1976-1979	11.2	14.6
Sind	PGS-II	1976-1979	9.2	13.5
NWFP	PGS-II	1976-1979	10.7	17.6
Baluchistan	PGS-II	1976-1979	7.1	17.6

B. DIFFERENTIALS IN INFANT MORTALITY

1. Sex differentials

Sex differentials in infant mortality rates are provided in table 4. As stated earlier, in majority of the cases higher infant mortality for males is reported as compared to females. This phenomenon of higher infant mortality in Pakistan is consistent with that observed in other developing areas of the world. Some fluctuation in the general pattern like that observed for the year 1964 for LR and CD may be due to sampling and non-sampling variability.

In order to analyze trend in sex differentials in infant mortality, recourse has to be taken to data obtained from PGS-I and PGS-II. It may be observed from table 4 that the gap between the sexes has widened during the period 1969-1971 to 1976-1979 owing to a greater decline of female mortality during this period,

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Table 17. Levels and trends of infant mortality rates by sex for the urban and rural areas of Pakistan, 1968 to 1979

Region	Source	Year	Infant mortality rate		
			Both sexes	Male	Female

Urban areas

Region	Source	Year	Both sexes	Male	Female
Pakistan	PGS-I	1968	138	163	112
		1969	85	82	88
		1970	85	84	87
		1971	88	100	76
		1968-1971	103	113	92
Pakistan	PGS-II	1976	73	82	63
		1977	78	87	68
		1978	84	101	73
		1979	62	65	59
		1976-1979	74	89	66

Rural areas

Region	Source	Year	Both sexes	Male	Female
Pakistan	PGS-I	1968	121	124	119
		1969	118	143	113
		1970	116	124	106
		1971	110	118	101
		1968-1971	116	122	110
Pakistan	PGS-II	1976	92	98	86
		1977	108	118	96
		1978	101	106	92
		1979	106	114	98
		1976-1979	101	109	93

Source: Same as for table 13.

more so in urban areas (table 17) than in rural areas. A similar pattern is observed for four provinces (table 18).

2. Regional differences

Infant mortality rates by urban-rural break-down tends to show higher overall infant mortality rate in rural areas (table 17). This is because most of the medical facilities in Pakistan are located in urban centres whereas in rural areas traditional Dais and Hakims provide medical services to the populus. Larger decline in urban mortality as compared to rural mortality seems to be the case in Pakistan (table 18). In the case of four provinces of Pakistan (tables 18 and 19) Punjab and NWFP tend to record

higher infant mortality rates followed by Sind with Baluchistan scoring the lowest mortality rate. The differentials are coincidently the same from both the current demographic survey PGS-II and retrospective survey PLM. These results are somewhat puzzling because the Punjab and Sind provinces are more developed than NWFP and Baluchistan provinces. Interestingly the recent 10 per cent count of the 1981 census (table 20) tends to replicate a similar pattern of provincial differentials wherein Punjab province registers highest mortality rate. Pending detailed investigation our conjecture is that death enumeration is more complete and better covered in Punjab than NWFP and Baluchistan province both in the surveys and in 10 per cent count of the 1981 census.

Table 18. Levels and trends of infant mortality rates by sex for the four provinces of Pakistan, 1976 to 1979 and 1984 to 1987

Region	Source	Year	Infant mortality rate		
			Both sexes	Male	Female
Punjab	PGS-II	1976	89	92	86
		1977	105	115	95
		1978	107	118	96
		1979	100	108	91
		1976-1979	100	109	89
Sind	PGS-II	1976	73	92	52
		1977	101	111	91
		1978	78	93	62
		1979	56	54	57
		1976-1979	77	88	65
NWFP	PGS-II	1976	134	163	100
		1977	91	108	71
		1978	103	89	118
		1979	111	107	115
		1976-1979	110	117	101
Baluchistan	PGS-II	1976	66	97	35
		1977	41	33	49
		1978	104	99	111
		1979	54	58	50
		1976-1979	64	72	56

Source: Same as for table 14.

Table 19. Infant and child mortality rates for the four provinces of Pakistan based on Retrospective Survey: PLM 1979

Region	IMR	CMR	NNMR	PNNMR
Punjab	126	47	82	45
Sind	101	40	63	38
NWFP	116	44	71	45
Baluchistan	84	67	31	53

Source: As references in footnote 20.

Table 20. Infant mortality rates by sex for the four provinces of Pakistan based on 10 per cent count of 1981 population census of Pakistan

Region	Infant mortality rate		
	Both sexes	Male	Female
Punjab	136	139	133
Sind	113	116	111
NWFP	121	124	118
Baluchistan	117	120	115

Source: As references in footnote 20.

3. Demographic factors

Such demographic variables as mother's age at birth, order of birth, and preceding birth interval constitute some of the important associates of infant mortality. The association between infant mortality and mother's age at birth as shown in table 21 indicates a U-shaped relationship. The risk of death is higher at younger and older ages than in the middle age groups. The trend is sharper for neonatal mortality rates than for post-neonatal rates. The PLM results are at variance with those of PFS in that the latter did not suggest lower survival probability at older maternal ages. The PLM

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Table 21. Infant death by mother's age at birth: PLM 1979

Mother's age	Years prior to survey		
	0-4	5-9	10-14
Less than 20 years			
Neonatal mortality rate	103.0	118.6	105.4
Post-neonatal mortality rate	51.0	58.1	46.7
Infant mortality rate	154.0	176.7	152.0
20-29 years			
Neonatal mortality rate	68.6	63.4	66.9
Post-neonatal mortality rate	41.6	43.2	50.0
Infant mortality rate	110.2	106.7	116.9
30-39 years			
Neonatal mortality rate	83.8	58.4	62.1
Post-neonatal mortality rate	46.6	44.9	32.4
Infant mortality rate	130.3	103.3	94.5
40 or more years			
Neonatal mortality rate	112.5	77.4	
Post-neonatal mortality rate	62.6	56.7	
Infant mortality rate	175.1	134.1	

results are consistent with those found in other countries.[43]

The relation between birth order and the probability of survival of a child generally mirrors that of the association between mother's age and infant mortality. As shown in table 22 according to PLM there is an inverse association between risk of death and birth order up to the fourth child, thereby reversing the direction of association that suggests a lower probability of survival at higher order births. By contrast, the PFS data fail to exhibit any systematic association between birth order and infant mortality rate beyond the secondary birth. Both surveys, however, show that first births are at highest risk of death.

The influence of preceding birth interval on the infant mortality rate in Pakistan is well

[43] Shea Oscar Rutstein, *Infant and Child Mortality Levels, Trends and Demographic Differentials,* Comparative Studies, Cross-national Summaries, Hague, International Statistical Institute, World Fertility Survey, 20 July 1982.

Table 22. Infant and child mortality by birth order: PLM 1979

Birth order	PLM (0-15 years before survey)		PFS (0-5 years before survey)	
	IMR	NNR	IMR	NNR
1	142	96	175	110
2	109	70	146	86
3	102	63	123	70
4	99	61	128	74
5	104	61	129	67
6	118	74	136	76
7 +	136	83	129	71

documented. The negative association of the length of the preceding interval with mortality of the index child was found to persist despite controls for age, education and residence of mother, birth order and survival status of the preceding child. Table 23 shows the association between length of previous interval and the infant mortality rate, controlling for the

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Table 23. Infant mortality rates by length of preceding interval and by survival status of previous child (births 10 years before survey): PLM 1979

Length of previous interval (years)	Survival status of previous child	
	Survived 2 years	Did not survive two years
Under 2 years	112	316
2-3	78	220
3-4	56	216
4 +	51	112
Neonatal rates		
Under 2 years	66	217
2-3	47	135
3-4	30	153
4 +	32	77
Post-neonatal rates		
Under 2 years	47	98
2-3	31	85
3-4	27	62
4 +	18	34

survival status of the older sibling. For a specific survival status there is a negative association between infant mortality rate and length of the preceding birth interval. However, holding constant the preceding birth interval, there appears to be a positive association between survival probabilities of siblings but it is difficult to determine whether this correlation is due to genetic factors or to selectivity arising from the distribution of privilege and economic opportunities.

4. Socio-economic factors

Parental characteristics such as education and social status in the community influence the survival probabilities and health status of household members. How socio-economic factors affect mortality is not very obvious, however. To clarify the effects of socio-economic differentials on mortality, a closer scrutiny is needed of the nature of the interaction between an individual's capacity to derive benefits from health services and the existence and delivery of these services. To the extent that resources are allocated for purposes of development, the distribution of health facilities reflect the influence of certain communities, classes and regional power groups. A disproportionate allocation to urban areas in the developing world, therefore, may reflect an urban-biased development strategy, which results in higher infant mortality in rural areas.

Within a community the availability of a service designed to reduce the public's exposure to disease may have a differential impact even if the service is free and available to all. Differential participation may be explained either by differences in individual behaviour such as risk-taking or by discrimination or neglect on the part of government officials responsible for the delivery of these services. In a village, landlords or the well-to-do will receive better services than the labourer, whose goodwill government servants least need. These services, being free, with no cost to the consumer other than travelling time, are often regarded as having an impact separate from that of household behaviour. In the cultural setting, where the human agent takes account of socio-economic status in the administration of these services, the association between benefitting from the services and household socio-economic status cannot be ruled out, even though this association may emanate from the supply side.

Equally it is very difficult to identify whether a facility is truly free. To the extent that the chances of being admitted to hospital or to a bed in a ward depend upon the patient's visit to a doctor's private clinic, it can hardly be considered free access. In addition to these "free" services, the subsidized services are expected to be demanded differentially by people with different abilities and attitudes. Differentials in mortality and morbidity are therefore products of a variety of factors on both the supply and the demand side.

Systematic variation in mortality across socio-economic groups in Pakistan has been the subject to earlier studies. In a suburb of Lahore, family income was found to be the only independent variable besides duration of marriage that acquired statistical significance in the explanation of the dependent variable — child mortality. In a recent study of a low-income area of Karachi, family income and duration of breastfeeding were found to be the significant explanatory variables of child mortality. In addition to these small area studies, the mortality determinants were assessed on the basis of

national data by Ali Khan and Sirageldin. In the framework of a simultaneous equation estimation, births, deaths, income and participation of females in the labour force were endogenously explained. Time taken to reach a medical facility was the only significant variable in the rural areas mortality equations. In the case of urban areas, time, female age, age at marriage and family structure (nuclear or extended) emerged as significant. It was interesting that parental education failed to qualify as a significant explanatory variable of child mortality in the above-mentioned analyses of infant and child mortality. However, the studies based on PFS 1975 data found educational level of both mother and father to be an important factor influencing infant mortality. Bivariate relationships between a few socio-economic variables and infant mortality as shown by PLM data are briefly discussed below.

PARENTAL EDUCATION

The relation between mother's level of education and infant mortality (proportion of infants who died) yielded by PLM data is shown in tables 24 and 25. The proportions of infants who died appear to be inversely related to level of education, but major change is associated with mothers who have matriculation and higher education. The pattern of differential is similar for mortality based on all births and births during the 10 years prior to the survey (Panel B). The probability of survival of infants born to mothers with a higher level of education (10 classes or higher) is two and a half times the average and slightly less than double the probability for the next lower education level (1-9 years of classes). Indeed the recent mortality differential between illiterates and that of 1-9 years of mother's education is marginal. A closer focus on PLM data reveals that these differen-

Table 24. Proportion of infants deaths by mother's education for Pakistan and urban/rural residence (all births): PLM 1979

Mother's level of education	Pakistan	Urban	Rural
No schooling	11.93	10.56	12.33
1-9 classes	9.47	8.69	10.64
10 + classes	4.63	4.63	*

* Few observations.

Table 25. Mother's education and proportion of infants died to births 10 years before survey: PLM 1979

Mother's level of education	Pakistan	Urban	Rural
No schooling	11.64	10.42	11.70
1-9 classes	9.82	9.33	10.52
10 + classes	4.99	4.99	*

* Few observations.

tials by educational level of mother are not only carried over to childhood mortality ($_4q_1$) but also are enhanced.

Various explanations of the effect of mother's education on infant mortality are found in the literature. Educated mothers may be more efficient in producing health capital than illiterate mothers. Female education may indicate a household's social status or it may act independently, as suggested by Caldwell. All these influences may have operated simultaneously in Pakistan, but it must be noted that females with matriculation and higher education, associated with substantially lower infant mortality, exhibit higher labour force participation than average; they are employed mostly in professional and other white-collar occupations. This possible linkage between female education, participation in the labour force and infant mortality merits further investigation.

Similarly, the relation between infant mortality and education of father or head of household (in the case of an extended family) shown in table 26 reflects a negative association, particularly marked in the case of post-graduate education. The difference between illiterates and the educational category of "10-14 classes passed" is also substantial, but the category "1-9 classes passed" shows only a slight gain over illiterates in survival probability. Infant mortality differentials by father's educational level exhibit a similar pattern for rural and urban areas.

Educational level of head of household has often been regarded as a valid proxy of income and wealth status of household. In societies where wage employment dominates, this may be justifiable, but in developing countries like Pakistan, where more than two thirds of national income is derived from self employment, the relation between education and income may not be very close. Other information besides that on

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Table 26. Education of head of household and proportion of infants (0-11 months) died: PLM 1979

Educational level of Head of Household	Pakistan	Urban	Rural
No schooling	12.47	10.70	12.87
1-4 classes	11.98	10.79	12.53
5-9 classes	11.10	10.10	11.64
10-14 classes	8.31	7.43	10.19
14+ classes	3.86	3.86	*

* Few observation.

education of the head of household is needed to assess the effect of household economic position on infant survival probability. In the following sections, information on household income, land, tenurial status and occupation of the head of household available from the PLM survey is used to determine the influence of these variables on the infant mortality rate.

HOUSEHOLD INCOME

A higher level of income is expected to be associated with a higher expenditure on food, shelter and sanitation and this can have a positive influence on survival of household members. These possible links between household income and infant mortality may be difficult to assess from cross-sectional data because of the incongruence between the temporal reference of the data on current income and mortality — a life-cycle phenomenon. Moreover, a household's income may very well partly reflect past mortality. The consequences of infant mortality on the size and structure of family, and the resultant dependency load and earning potentials at different phases of the family life cycle, are not very well explored in the literature. In addition, income data collected by means of surveys are generally affected by measurement errors. The bivariate association between household income and infant mortality provided in tables 27 and 28 therefore, needs to be interpreted with caution. The table indicates a positive influence of household income on the survival probabilities of infants. The lowest income group has an infant mortality rate which is 75 per cent higher than that of the highest.

This differential is slightly narrowed (64 per cent) in the case of births during the 10 years prior to the survey. It is of interest that the infant mortality differentials are sharper in urban areas than in rural areas; the relative gain associated with the two higher income groups is less visible in rural areas. Rural-urban differentials persist after controlling for income level of the household and tend to become larger for higher income groups. As regards recent mortality experience, rural/urban differentials for the two lower income groups are minimal.

It is difficult to explain the variation between rural and urban areas in the direction and level of the effect of household income on infant mortality. The possibly greater measurement error in income and recall error in mortality in rural than in urban areas, and the greater availability of health facilities in urban areas, may have some influence on the relation between income and mortality. In addition it may be recalled that it is the permanent, not the current,

Table 27. Household income and proportion of infants died to all births: PLM 1979

Income group (Rs. per month)	Pakistan	Urban	Rural
1-500	16.4	11.30	17.0
501-1,200	11.7	11.0	12.0
1,201-2,800	9.8	8.0	11.0
2,800+	9.4	7.0	*

* Few observations.

Table 28. Household income and proportion of infants (0-11 months) died (births 10 years before Survey): PLM 1979

Income Group (Rs. per month)	Pakistan	Urban	Rural
1-500	13.4	13.55	13.37
501-1,200	12.25	10.67	11.40
1,201-2,800	9.41	8.11	10.29
2,800+	*	*	*

* Few observations.

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income which is expected to influence household behaviour. The computation of permanent income on the basis of information on current income age, and education of earners, as done in many research studies, is not attempted here because of the predominance of self-employment, in which the role of assets in the determination of income is of paramount importance.

OCCUPATION OF FATHERS

There is little information on assets, apart from data on area cropped by a household in a rural farming population. For urban and rural non-farming households, the occupation of fathers or heads of households is used instead as an indicator of socio-economic status. The bivariate relation between infant mortality and father's occupation shown in table 29 reveals that children born to fathers in white-collar occupations enjoy a substantially higher survival probability than those of the blue collar workers in urban areas; the latter have a mor-

tality rate that is 32 per cent higher than that of infants belonging to the former group. When occupation as a variable is controlled the employment status of fathers or heads of households appears to have some influence. Lower infant mortality is associated with employers, but a substantial difference occurs only in the case of employers in the occupational group of professionals, a very small and select group. The standard occupational classification used in the table is very aggregative in that primary school teachers are included with engineers and classified as professional despite the wide difference in their income and socio-economic status. In the case of rural areas, where this classification would be less relevant, the classification is based on the usual occupations, which can be regarded as more suitable proxies of income and socio-economic status in the non-farming population.

The relations between usual occupation of head of household and infant mortality in rural non-farming households, presented in table 30 indicate that the major differentials

Table 29. Proportion of infants died by employment status and occupation of head of household by urban/rural residence (all births): PLM 1979

Occupational group	Employers	Self-employed	Employees	Total
Professional/ administrative	N.A.	12.44	8.69	8.69
Clerical, sales and services	11.29	10.07	10.39	10.39
Production worker and others	9.51	12.18	11.38	11.48

Table 30. Proportion of infants died to all births by usual occupation and employment status of head of household — rural non-farm population: PLM 1979

Usual occupational categories	Employers	Self-employed	Employees	Others and not working	Total
Kamees, cottage and handicraft workers	13.6	15.11	12.8	14.05	15.00
Industrial workers and other employees	*	6.35	15.08	11.74	14.77
Shopkeepers	15.82	11.47	13.38	*	11.71
Landlords and other rentier class	11.74	10.98	*	13.94	12.05
Undefined categories	13.11	12.57	11.87	11.38	11.97

* Few observations.

appear between the kamees and handicraft workers and the remaining groups. Kamees who are generally at the bottom of the ladder in rural areas, have 20 per cent higher infant mortality than average. The remaining three groups — shopkeepers, rentier class, and other — are indistinguishable.

LANDHOLDING

The relations between landholding, tenurial status and infant mortality for the farm population in rural areas, presented in table 31, fail to reflect any substantial differential across either land-size categories or tenurial status of fathers except for the noticeably higher mortality associated with landless agricultural labour, which indicates a 25 per cent higher infant mortality than the rest of the classes. The difference between the survival probabilities of infants of the owner operator and share-cropper is very little. However, data on land pertain to the operational holding and not to ownership. Also, the absence of systematic variation appears to be partly due to the age structure of females. For instance, a detailed examination of the data indicates that infant mortality is associated with land size of 5-10 hectares (12.6 to 25 acres), which is lower than that associated with larger farm sizes, is due to the disproportionate share of younger mothers in this group. Also, the quality of land, such as its accessibility to irrigation facilities and tractors, is not controlled.

The above results suggest that the groups generally regarded as lowest in the class-ridden rural areas — agricultural landless labourers and kamees — experience around 20-25 per cent higher infant mortality rates than average.

COMMUNITY VARIABLES

In the case of all births (table 32) the presence of a health facility in rural areas such as hospital or dispensary is not associated with a substantial lower mortality. In the case of recent births (10 years prior to survey), which also coincides with the continued existence of these health facilities, some mortality differentials appear. The gain in survival probability of an infant living in a village with a hospital or dispensary over that of an infant living in a village without these facilities is little — 5 to 12 per cent — compared with the differentials associated with education, income or occupation.

Table 32. **Proportion of infants died by presence or absence of medical facility in the village rural areas: PLM 1979**

	Yes	No
Hospital	12.01	12.29
Dispensary	11.98	12.39

Table 31. **Infant mortality by cropped area and tenurial status of household: rural areas (all births): PLM 1979**

Cropped area (hectares)	Total	Owner	Tenurial status sharecropper cropper	Agricultural landless labour
Less than 5 hectares	13.07	13.53	12.09	
5-10 hectares	11.23	11.67	9.70	
10 hectares and above	12.44	12.44	*	
Total	12.92	12.84	11.37	15.46

* Few observations.

IV. MORTALITY AND CAUSES OF DEATH

Reliable data on the incidence of diseases are not available in Pakistan. Hospital and clinical statistics do however, provide some indication of the pattern of morbidity. The incidence of diseases thus derived, however, is not nationally representative as a large proportion of population does not have access to hospitals. Keeping this caveat in view, the hospital-based data reflect that 25 to 30 per cent of total diseases are due to disorders of the gastro-intestinal system. These diseases are comprised of dysentery and diarrhoea caused by waterborne parasites and viruses. The incidence of tuberculosis and malaria, though vastly diminished in recent years, is still notable. Total morbidity due to communicable diseases is estimated at around 30 per cent.[44]

Information on causes of sickness as collected in health institutions such as, hospitals, dispensaries, clinics etc. is presented in table 33. The data are collected under the system recommended by the WHO in the Sixth Revision of International Statistical Classification of Diseases, as injurie- and causes of death, 1948. Unfortunately the data presented here are limited to Punjab province because, despite the obligation of all provincial health directorates to compile information on in-patients and out-patients in their area, this is the only province which has published annual reports. Nearly two thirds of the country's population live in Punjab province.

It is clearly gastro-intestinal and waterborne diseases which are most common. These are followed by respiratory diseases, malaria and communicable diseases. The information available reveals that 294 persons out of a thousand seek treatment, annually (29.4 per cent). Out of these 3.3 per cent were admitted in hospitals while the remainder were outpatients. The distribution of patients by age and sex was as follows:

| | Adults | | Children |
	Male	Female	Both sexes
Indoor patients	42	44	14
Outdoor patients	36	35	29

[44] *Health and Health Related Statistics of Pakistan* 2nd Ed. Planning Commission, Government of Pakistan, September 1978.

Table 33. **Health-institutions – based data of sickness**

	Disease	Percentage of total
1.	Gastro-intestinal including parastic diseases	23-30
2.	Respiratory diseases	15-20
3.	Fevers	10-15
4.	Diseases of the skin and areolar tissue	5-10
5.	Malaria	5-8
6.	Diseases of the eye	5-6
7.	Injuries general and local	4-6
8.	Diseases of the ear and nose	4-6
9.	Diseases of genito-urinary tract	3-5
10.	Dental diseases	3-5
11.	Diseases of the heart and circulatory system	3-4
12.	Diseases of bones, joints, muscles, etc.	2-3
13.	Diseases of nervous system	2-3
14.	Tuberculosis (T.B) of all forms	1.5-3
	(80 per cent TB of lungs)	
15.	Infectious/communicable diseases	1.5-2.5
16.	Deficiency diseases	1-2
17.	Diseases of lymphatic system	0.75-1
18.	Tumours	0.5-1
19.	Other diseases	1.5-2

Source: Health and Health Related Statistics of Pakistan (second edition) Planning Commission, Government of Pakistan, Islamabad, September 1978.

Note: Patient records of reporting public hospitals and dispensaries 1973.

The limited morbidity information available for other provinces indicate that TB varied across provinces and constitutes somewhere between 1.5 to 3 per cent of diseases. Malaria which claims 5 to 8 per cent of diseases is reported to be less prevalent in NWFP.

The mortality data presented above are of extremely limited use. Besides being based on institutions they primarily relate to Punjab province. However, morbidity patterns can be indirectly deduced through the available evidence on causes of death. Table 34 contains the breakdown of main causes of death for Punjab and Baluchistan. In this area, apart from the institution-based data presented above, national mortality patterns can be deduced for 1971 from the PGS-I (table 35).

Table 34. Institution-based breakdown of main causes of death for Punjab and Baluchistan

Diseases	Percentage	Diseases	Percentage
Punjab		**Baluchistan**	
Injuries	16.96	Tuberculosis	25.86
Gastro-intestinal	11.83	Water-born	15.56
Nervous system	9.74	Gastro-intestinal	11.59
Circulatory system	8.74	Respiratory	10.27
Genito-urinary tract	8.19	Circulatory system	7.29
Respiratory	7.42	Infectious and communicable	5.30
Tuberculosis	7.23	Injuries	3.97
Fever	4.68	Labour causes	3.97
New born-infants	3.41	Fevers	3.31
Water-born	3.27	Blood	2.98

Source: *Pakistan Country Health Problem,* Pakistan WHO, Islamabad, April 1979.

Note: The total of percentages will not be 100 because minor causes of death are excluded.

Table 35. Main causes of deaths in Pakistan, urban and rural areas

Name of disease	Pakistan	Urban areas	Rural areas
All causes	100.00	100.00	100.00
Infective and parasitic diseases	53.84	67.64	62.05
Malaria	10.44	7.86	10.96
Congenital anomalies, birth-injury, and prenatal causes	7.36	5.64	7.71
Tuberculosis (all forms)	5.55	2.86	6.09
Bacillary dysentery and amoebiasis	2.51	2.88	2.44
Accidents, poisoning and violence	1.88	1.05	3.03
Diseases of heart and circulatory system	1.79	3.92	1.35
Peptic ulcer, appendicitis, obstruction and hernia	1.20	1.09	1.22
Diabetes mellitus	1.14	0.75	1.22
Complications of pregnancy and child birth	1.13	1.39	1.08
Tumours	0.34	0.00	0.41
Unknown causes	2.85	4.91	2.444

Source: Statistical Division, *Population Growth Survey, 1971,* Karachi, 1974.

1. deaths by cause are available only for Pakistan and not for U/R areas
2. "Children diseases" are not included in the above list
3. Likewise "circulatory system diseases" and part of digestive system diseases are not mentioned in the above list of causes of death.

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Table 36. Causes of infant deaths in Pakistan, urban and rural

Causes of death	Pakistan	Urban areas	Rural areas
All causes	100.00	100.00	100.00
Infective and parasitic diseases	59.68	67.09	58.05
Congenital anomalies, birth-injury, difficult labour and causes of prenatal mortality	20.10	15.53	21.35
Malaria	8.69	7.42	8.99
Tuberculosis of all forms	3.08	0.00	3.75
Bacillary dysentery and amoebiasis	2.06	2.55	1.50
Accidents, poisoning and violence	0.47	0.88	0.38
Diseases of heart and circulatory system	0.31	0.00	0.37
Peptic ulcer, appendicitis, intestinal obstruction and hernia	0.31	0.00	0.37
Unknown causes	5.30	6.53	5.24

Source: Statistical Division, *Population Growth Survey, 1971*, Karachi, 1974.

The data suggests that the cause of death pattern is slightly different across urban and rural areas: whereas in the urban areas 68 per cent of deaths are due to infective and parasitic diseases, followed next by malaria which claimed 8 per cent of lives and 6 per cent deaths due to congenital, birth injury and perinatal causes — in rural areas, infectious and parasitic diseases were cause of a slightly lesser proportion of deaths and malaria of a larger share. Also TB was more prevalent in the rural areas.

Since it has already been pointed out that infant mortality is high in Pakistan and claims over 50 per cent of total deaths annually, we examine in table 36 the causes of infant deaths.

According PGS-I in 1971 the infective and parasitic diseases claimed the greatest proportion of lives in infancy (54 per cent) followed by congenital anomalies, birth injuries, difficulties in labour and prenatal causes (about 20 per cent) and malaria following next in importance.

The communicable diseases are undoubtedly the largest cause of sickness and claimant of death in Pakistan. On the basis of institutions data, 16.6 per cent of total cases treated were

Table 37. Channels of infections of communicable diseases in Punjab and Baluchistan

Channel of infection	Punjab	Baluchistan
— Inhalation (tuberculosis)	18.98	16.67
— Ingestion (mainly enteric fever and dysentry	14.42	10.84
— Inoculation/vaccination	55.26	48.69
— Others	11.34	23.80
Total	100.00	100.00

for such diseases. The proportion falling into different types is given in table 37.

National surveys have been conducted to collect morbidity rates due to incidences of the six major preventable diseases amongst children under 15 years of age. These are presented in table 38. The provincial breakdown presented in table 38 bears some interesting findings and shows that the rate of incidence of measles, polio and petussis are highest in Baluchistan. This is not surprising in the light of the fact

Table 38. Morbidity rates for measles, polio, pertussis, diphtheria, tetanus and tetanus neonatorum among children under 15 years in Pakistan and by province

Provinces	Measles	Polio	Pertussis	Diphtheria	Tetanus	Tetanus neonatorum
Punjab	3 115	55.03	526.57	24.39	108	36
Sind	2 198	87.42	1 013.43	24.28	42	23
NWFP	2 707	61.66	1 129.50	116.84	364	175
Baluchistan	3 796	119.04	14 121.56	7.00	154	77
Unknown	2 834	38.81	756.91	140.70	155	68
Total	2 888	64.72	756.86	41.76	139	53

Source: Pakistan Country Health Profile, Pakistan-WHO, Islamabad, April 1979.

Table 39. Fatality rates for measles, polio, pertussis, diphtheria, tetanus and tetanus neonatorum among children under 15 years in Pakistan and the four provinces

(Annual rates per 100,000 cases)

Provinces	Measles	Polio	Pertussis	Diphtheria	Tetanus	Tetanus neonatorum
Punjab	50.7	10.63	7.50	18.76	107	35
Sind	30.8	17.80	4.85	17.80	41	21
NWFP	58.4	22.71	22.71	113.59	341	175
Baluchistan	336.6	105.04	12.04	–	154	77
Unknown	9.7	14.55	67.92	111.60	111	24
Total	58.5	18.44	18.09	34.5	138	49

Source: Pakistan data and study results, Ministry of Health Government of Pakistan, 1978.

that it is the least developed province, with vast mountaneous hinterland yet to be connected with roads. Punjab, being more prosperous in general, overall has lower incidences of these illnesses. Diphtheria, tetanus and tetanus neotarum, seem to be more prevalent in the NWFP which again is less prosperous than Punjab and Sind.

The fatality rates of the same six diseases are presented in table 39 and roughly reflect the same pattern as described for mobidity rates.

Some other communicable diseases which seem quite prevalent are tuberculosis with 2.7 per cent prevalence, haemorrhagic fever which was discovered in Murree in 1977; visceral leish-

maniasis present in Baluchistan and in the northern areas is under control at the moment as is cutaneous leishamiasis in some parts of Baluchistan; leprosy though uncommon is prevalent in parts of Karachi and the Mekran coast. Viral hepititis also appears to be on the increase in the country.

Among the non-communicable diseases the more prominent ones are cold, dyspepains aches, mental disorders, accidents, fever of uncertain origins, skin diseases and dental disorders. More recently, road accidents and burns have been on the rise especially in urban areas.

The disease pattern therefore, remains one that is dominated by communicable diseases

particularly in the rural areas with most illnesses caused by poor sanitation, lack of potable water and lack of immunization against the six major diseases. The urban areas, though they primarily bear the same brunt of mortality from the diseases described above; also bear bunt of introduction of more "modern" causes of death such as heart disease, tumours, road accidents which may change the epidemiological situation in the years to come. Accordingly urban Pakistan will acquire a pattern of diseases closer to that of developed countries.

Some specific information has been collected on the incidence of tumours and is presented in table 40. The data are based on a study started in April 1973 and continued through September 1973. The seven participating centres were spread throughout the countries.

The data shows that the most common form of malignant tumours amongst males are oral, metastatic, and skin and lungs and amongst women the breast tumours oral and cervical.

Table 40. Relative distribution of types of most common tumours diagnosed by sex of patient

(Percentage*)

	Males			Females	
1.	Oral	12.6	1.	Breast	24.4
2.	Metastatic tumours	8.5	2.	Oral	11.9
3.	Skin	8.1	3.	Cervix	8.7
4.	Trachea and lungs	7.4	4.	Metastatic tumours	6.1
5.	Pharynx	6.1	5.	Oesophagus	4.4
6.	Intestine and rectum	5.7	6.	Skin	4.3
7.	Larynx	5.2	7.	Ovary	4.3
8.	Bone	5.1	8.	Uterus	3.4
9.	Oesophagus	4.6	9.	Bone	3.4
10.	Hodgkins	3.3	10.	Pharynx	3.2

* Percentages do not add to 100 due to ommission of category of "others"

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V. CONCLUSION

Notwithstanding the exhaustive search of the data, conclusion can hardly be offered without trepidation. In addition to deficiency of information the available data suffer from variety of problems like age mis-reporting and under-enumeration of deaths. Furthermore the data sources are not comparable among themselves, thereby adding further difficulty to draw an inter-temporal comparison. Given these limitations of the data the following few conclusions are hazarded.

1. The crude death rate in Pakistan is estimated to be around 14-15 per thousand for the late 1970s (1976-1979), while infant mortality rate lies in the range of 125-130 for the years 1971-1981. Correspondingly our estimates pertaining to life expectancy at birth for 1976-1979 is 56. It must be noted that our estimated levels of mortality for both the crude death rate and infant mortality rate are substantially higher than yielded by Federal Bureau of Statistics Surveys (PGS) which are often shape the official perception regarding mortality. These surveys provide a crude death rate of 10-11 and infant mortality rate of 90-100. In the light of our estimates these are grossly under-estimated.

2. If the mortality levels reflected by Indian census data correctly depict the mortality situation of Pakistan for the period prior to 1951, then a substantial decline in mortality is visible for 1901-1981 period. The reduction in mortality appears to be mostly confined to 1931-1961 period wherein the CDR declined from 26.3 to 22.8 while IMR went from 178 to 139. The experience of the post 1962 period has not been rewarding enough, registering a drop in CDR from 17.5 for 1962-1965 to 14.6 in 1976-1979 and that of IMR from 143 in 1962-1965 to 130 in 1981. Whilst a significant achievement in mortality reduction during 1931-1961 finds it explanation in the control of mass killer diseases and introduction of chemotherapectic drugs, deceleration in the pace of mortality reduction during the post 1965 period is indicative of a lack of socio-economic policies bearing upon the interactive effects of poverty, malnutrition and mortality. Admittedly Pakistan shares its experience with some other developing countries like Thailand and Sri Lanka where the progress seems to have been slowed down. A major

difference, however, is that such stagnation occurred in the mortality rates; both CDR and IMR are higher for rural areas as compared to urban areas. The rural-urban differentials in CDR are further magnified when the adjustment for under-enumeration of deaths is made. The provincial variation in CDR, adjusted for under-enumeration, is suggestive of the fact that relatively well developed provinces of Punjab and Sind enjoy a higher survival probability than the less developed provinces of NWFP and Baluchistan. Micro-under-pinning of these macro relationships are further investigated by examining the socio-economic and demographic correlates of infant mortality at the level of household.

The rural areas, as expected, recorded higher crude death rates with urban-rural differentials widening over time. When adjusted for under-enumeration the differentials seemed to widen further for the period 1976-1979. Province-wise differentials in CDR indicate higher overall rates for Punjab and NWFP followed by Sind and Baluchistan. When adjusted for under-enumeration the provinces of NWFP and Baluchistan yielded quite expectedly higher rates followed by Sind and Punjab.

In Pakistan, like other countries, infant mortality for males tend to remain higher at all levels and the gap between the sexes of national level continues to widen owing to a greater decline of female mortality, more than 50 in urban as compared with rural areas. Like adjusted crude death rates infant mortality rates in the four provinces of Pakistan do not show any systematic variation. Data available from surveys as well as censuses indicate higher overall infant mortality rate for Punjab followed by NWFP and Baluchistan with Sind scoring the lowest mortality rate. This phenomenon is quite puzzling and does not correspond in any way to the relative socio-economic status of the provinces.

The analysis of infant mortality differentials is extended beyond demographic variables to include such factors as household income and usual occupation of head of household. Consistent with earlier studies on Pakistan and

other developing countries, domographic variables such as mother's age, preceding birth interval, and birth order have been found to be important correlates of infant mortality. Parental education, however, reflects a negative association with mortality; the bivariate finding holds only for the higher level of education (10 classes or more) in multiple regression. This calls for a deeper investigation of the association between education, labour market participation, and mortality experience of the household.

Household income and the survival probability of infants appears to be ~~negatively~~ positively associated. The results hold for both rural and urban areas, and total as well as recent mortality. This result shows the importance of higher food expenditure associated with higher level of income, and presumably difference in the behaviour of households with regard to invest-ment in health capital. It is of interest that when household income, parental education, and demographic variables are held constant, the social status of the head of the household, as indicated by occupation, tends to be related with infant mortality. Kamees and landless labourers, who are generally ranked lowest in order of prestige in rural societies, are associated with lower probability of survival of infants and children. This clearly highlights the relevance of the ways in which health care is provided in a village stratified according to social "classes", where the lower classes may suffer discrimination at the hands of those involved in the delivery of the services. This supply-side discrimation merits distinct treatment in research into the demand side of health capital. In general, the results reflect substantial differentials across the various groups differentiated by socio-economic status.

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Part Two

I. HEALTH SERVICES IN PAKISTAN

There is hardly any approved official health policy though efforts for its formulation date back to pre-independence era. The "Health Survey and Development Committee" generally known as "Bohr Committee" was appointed by the British rulers in 1943 to examine the prevailing health conditions and make recommendations for future development. The committee while recognizing the right of every individual to an adequate medical care emphasized the curative aspect and wider dispersal of it to rural areas.

During the post independence era various commissions and sub-committees were constituted to look into health problems. Medical reforms commission of 1959, for instance, suggested creation of an all Pakistan health services, a multi-tiered system wherein district was placed at the apex to be linked with sub-centres to give first line advice to 10,000 population, and nation-wide eradication campaigns to be executed by semi-autonomous organizations. The health study group of 1969 recommended setting up of self-financing autonomous public utilities with comprehensive charters, a shift of emphasis from curative to preventive and promotion of private sector health facilities. The people's health scheme of 1972 with an explicit objective of providing comprehensive coverage to the population through prevention of diseases and expansion of facilities in rural areas represented further progress on this front.

The people's health scheme was criticized as being too expensive. In addition the Pakistan Medical Association criticized it on account of its failure to provide sufficient incentives and protection for doctors. The priorities and objectives of the scheme with little modification still constitute the basis of health programmes contained in the Fifth (1978-1983) and Sixth (1983-1988) Five Year Plans. A detailed discussion of these programmes and their implementation is provided in a following section. The planning procedures and organizational structures are described below.

PLANNING AND ADMINISTRATION OF THE SYSTEM

Planning, development and co-ordination of health services primarily rests with Federal Government. The Federal Planning Commission in collaboration with Federal Ministry of Health and Provincial Health and Planning Departments formulates five year and annual development programmes. As a by-product of inter-sectoral allocation of funds, the total outlay for the health sector is determined at this level. The guidelines prepared by the planning commission and approved by the policy makers (cabinet) are followed by the Federal Ministry of Health and Social Welfare and Provincial Health Departments which develop the details of the programmes.

The Federal Ministry of Health and Social Welfare (MOHSW) is entrusted the tasks of co-ordination of health functions, provision of health services to government servants, prescription and maintenance of education standards for professionals, drug controls and the eradication of the communicable diseases (such as malaria). The Ministry is headed by a minister who is supported by Secretary and Director General Health. There are various deputy director generals, deputy secretaries and project directors working in the ministry. An organizational chart (appendix table III) depicts the organizational structure of health services.

The provincial health departments provide health services directly through the teaching hospitals and through the district level apparatus. The provincial department is headed by Secretary (sometimes also minister) who has direct control over teaching hospitals and special institutions. The District Health Officers (DHOs) and the Medical Superintendents in charge of district headquarter hospitals are supervised and guided by Director Health in each province.

HEALTH FACILITIES AND STRUCTURE

Compared to health infrastructure inherited at the time of independence, the existing facilities represent a tremendous growth. Improvement in the health facilities and the related manpower during the recent sub-period of 1972-1982 is provided in table 41. The number of institutions and staff, both doctors and nurses, experienced a respectable growth. The effect of this growth appears to have been diluted because of the population growth. The facilities

Table 41. Changes in health facilities and personnel, 1972-1982

Year	Hospitals	Dispensaries	MCH centres	Rural health centres	Sub-health centres	TB centres	Total beds	Regd. physicians	Regd. dentists	Regd. nurses	Regd. lady health visitors	Population per health facility	
												Per hospital beds	Per physician
1972	496	2 137	675	87	249	82	35 337	15 789	503	5 504	1 458	1 845	4 132
1973	521	2 566	677	90	255	84	35 655	16 485	539	5 751	1 618	1 885	4 076
1974	517	2 936	690	102	290	89	35 866	17 194	597	6 010	1 627	1 927	4 025
1975	518	2 906	696	134	373	89	37 776	17 887	638	6 144	1 636	1 887	3 986
1976	525	3 063	715	173	536	96	39 129	18 757	694	6 685	1 688	1 926	3 915
1977	528	3 220	726	186	544	95	40 518	19 863	720	7 186	1 735	1 867	3 806
1978	536	3 306	748	200	544	95	42 469	20 931	767	7 768	1 823	1 834	3 722
1979	509	3 367	772	211	645	98	44 367	21 938	329	8 382	1 921	1 908	3 657
1980	602	3 466	812	217	736	98	47 412	23 594	911	9 098	2 009	1 730	3 475
1981	600	3 478	823	243	774	99	48 441	26 668	999	9 872	2 171	1 755	3 187
1982	613	3 459	817	283	1 587	98	50 335	29 931	1 103	10 554	2 368	1 738	2 922

Source: XVI Souvenier on the occasion of Biennial Medical Conference 1984, A Publication of Pakistan Medical Association PMA, House P.O. Box 726 Garden Road, Karachi, Pakistan.

per 1,000 population did not register significant growth during the period under review (table 41).

The spatial or regional dispersal of the health facilities is uneven — a manifestation of urban-biased planning. Whilst the rural areas account for three fourths of the population the health facilities are over-whelmingly concentrated in urban areas. It must be noted that the facilities such as hospitals located in urban centres are not exclusively used by urban residents. According to some estimates around 25-30 per cent of the beds are generally occupied by rural residents in urban hospitals. The participation, however, becomes an expensive proposition for vast majority of rural poor due to this distance factor.

The rural-urban distribution of the health services is depicted in table 42. Rural areas tend to be neglected resulting in inadequate coverage for the rural populace. Rural urban imbalance is further aggravated by a spectacular growth in private medical facilities, most of which are located in the urban centres or in the semi-urban areas. In rural areas, specially the

sparsely populated areas of Baluchistan and Sind provinces, access to health facilities is quite restricted. The spread of health facilities by average distance is provided in table 43.

As reflected by the table on the average, a patient in rural areas has to travel 22 miles to reach hospital and 8 miles for Basic Health Unit. In contrast these facilities are nearer in urban areas. Importance of proximity for participation and type of treatment opted by patient (modern versus traditional) can hardly be emphasized.

The provincial distribution of health facilities recount the same story of maldistribution (see table 44).

Majority of health services are located in Punjab and Sind. The dispersal of health facilities does not correspond with the relative share in total population of different provinces.

The problems of rural areas are not confined to quantitative shortage of facilities only. The qualitative aspects of the services further complicates the situation. There is a wide spread

Table 42. Health facilities available in urban and rural areas, 1983

	Hospital	RHC	BHC	Sub-centres	Dispen-saries	MCH centres
Urban	48 362	—	—	—	1 664	563
Rural	3 032	374	1 715	632	1 611	304

Source: Planning Commission, The Sixth Plan (1983-88) (Working paper).

Table 43. Medical facility by average distance for rural, urban residents, 1982-1983

	Pakistan		Punjab		Sind		NWFP		Baluchistan	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Hospital	4.3	21.6	4.0	20.2	4.6	25.5	2.0	15.7	9.6	38.3
Dispensary	1.7	9.9	1.7	8.5	2.0	13.4	1.3	9.0	1.6	14.8
Maternity and child health centres	2.5	18.1	1.9	15.7	3.8	24.11	1.1	13.8	2.6	37.2
Rural health centres	—	11.3	—	8.7	—	17.4	—	10.3	—	22.3
Basic health centres	—	8.3	—	6.0	—	13.5	—	8.9	—	14.7

Source: Health Survey, Federal Bureau of Statistics, 1986. (Preliminary tabulations).

Table 44. Health facilities available in the provinces, 1983

	Punjab	Sind	NWFP	Baluchis-tan	FATAa
Hospital beds	24 927	16 448	5 101	2 594	1 068
RHC	190	76	49	28	5
BHC	1 107	41	123	123	32
Sub-centres	460	87	27	27	—
Dispensaries	1 282	710	317	317	169
MCH centres	435	264	49	49	9
Immunization centres	253	199	31	31	—

Source: Planning Commission (Sixth Plan 1983-88, Working Paper).

a Federally-administered tribal areas.

absenteeism in the staff posted in rural service outlets. Non-availability of medicines and equipments further distract the rural population. This apparently has generated the phenomenon of under-utilization. The average bed occupancy rate is estimated to be around 30 per cent while the daily attendance of patients is regarded to be one sixth of the capacity to treat. No wonder that two fifths of the patients in rural areas resort to traditional healers and only one fifth derive benefit from the public services.

' A brief review of the existing public sector services and their growth over-time is suggestive of the fact that the system more or less developed along the lines set by the British rulers. The facilities tended to be concentrated in urban areas. The emphasis has been on curative and individual rather than preventive and community based approach. Some rectification through the introduction of Basic Health System during mid 1970s has been made. As discussed in the next section, the implementation of this scheme has been less than the intended.

The planning process, though apparently lends an impression of having various vertical and horizontal linkages, appears to be attentive more to the suggestions of international organization. Variety of vertical programmes and even the Basic Health System have been an off-shoot of this interaction. The fact that good health is not the exclusive function of the delivery system but depends upon various factors has not been fully recognized in the planning process. The effects and consequences of developments in other sectors such as agriculture industry, popu-

lation growth and its regional spread hardly appeared to have been anticipated in the health planning process.

Administrative structure is centralized. Most of the decisions relating to allocation of funds and staffing are taken at provincial or at federal level. The role of DHO at the level of district, an important level in the system, needs re-definition for effective implementation of the programme. The DHOs need to be equipped with necessary powers to dispense with the wide range of functions assigned to this linchpin. Currently this functionary is constrained in many respects despite the contrary declaration of intent in the official documents.

At present the service out-lets specially in rural areas appear to be disintegrated and over-lapping. Dispensaries, health centres, basic health units and maternity and child health centres have their independent existence. Similarly certain disease specific programmes such as malaria and tuberculosis function in isolation of the health system. Considerable efficiency gains can be achieved through integration.

Coexisting with this duplicity of function the system is plagued by severe under-utilization. It can be improved to some extent by enhanced supply of medicines, and equipments. The absenteeism of the staff, though partly an outcome of inadequate and inhospitable living conditions in rural areas, by and large is a manifestation of a lack of accountability of the society at large.

II. RECENT HEALTH POLICIES AND IMPLEMENTATION

Although rural health centres to provide health facilities in rural areas were introduced in 1961 but they were neither sufficient nor very well linked with the overall health system. The Basic Health System which reflects an attempt to extend an integrated coverage to rural population having a link with urban facilities was initiated in mid 1970s. Under this system, which is integral part of Fifth and Sixth Five Year Plans, a Basic Health Unit (BHU) staffed by one doctor and four to six auxiliary personnel will be provided for a population of 10,000. Not only the health services for the population of the area, but BHU is also supposed to train and act as a referral centre for Community Health Workers (CHW). Basic preventive services, screening and simple curative treatment is to be performed by CHW, who would live in their own villages while BHU is to supply them with medicine and equipment. The Basic Health Unit under the scheme, is responsible for comprehensive health care including among other things, midwifery, child care immunization, diarrhoeal diseases and malaria control etc.

Rural Health Centre (RHC) designed to serve (4-10) BHUs constitute the next tier in the chain. The RHC staffed with 3 doctors and 8 auxiliary personnels is to act as a referre centre for BHUs. Each RHC is to be equipped with the facilities of X-RAY, minor surgery and laboratory. The centre may have up to 25 beds.

A hospital with surgical, medical and laboratory facilities, under the system is to be provided at the level of Tehsil/Taluka (an administrative sub unit). This is supposed to act as a referral centre for RHC. The Tehsil or Taluka hospitals are linked with District Hospital which is equipped to dispense with the main facilities. Every province has Teaching Hospitals with all the modern facilities for treatment.

The expansion in the physical infra-structure during the Fifth Five Year Plan (1978-1983) failed to achieve the targets. In contrast to the targets of 625 RHCs and 4,596 BHUs actual achievements were 206 and 1,617 respectively. This represents the implementation of only one third of the programme. Insufficient funds appear to be the major reasons for the lapses in implementation.

The physical infra-structure targets of the Sixth Five Year Plan (1983-1988) and achievement till now is depicted in table 45.

Table 45. The physical infra-structure targets of the Sixth Five Year Plan, 1983-1988

Infra-structure	Bench-mark 1983	Revised targets 1983-1988	Achieve-ment 1983-1988	Target 1985-1988	End-position 1988
1. Hospitals beds	55 835	28 110	4 398	13 191	73 424
(a) Public	45 835	8 110	2 598	7 991	56 424
(b) Private	10 000	20 000	1 800	5 200	17 000
2. RHC's	337	245	84	110	531
3. BHU's	1 646	1 796	762	923	3 331
4. Physician's residence in rural institutions	1 018	2 260	208	1 785	3 011

Source: Personal Communication with Planning Commission, Islamabad.

Table 46. Public health infra-structure, 1984-1985

(000)

Province	Population/ bed[a]	Population/ BHC	Population/ RHC
All Pakistan	1.8	38.4	208.2
Punjab	2.0	31.4	223.1
Sind	1.3	324.3	264.2
Baluchistan	1.8	31.0	157.1
NWFP	2.7	33.1	225.9

Source: Planning and Development Division.

ᵃ Beds in public sector only.

The above table indicates that plan implementation in terms of physical infra-structure has been below the target. It appears unlikely that the targets pertaining to RHCs, BHUs and beds for 1985-1988 will be met. It must be noted that these targets of 1985-1988 represent a significant departure form that of the original Sixth Five Year Plan. That the existing facilities are quite far from the one envisaged by the scheme is given in the table 46. This is suggestive of the fact that next 15-20 years will be required to build up the physical infra-structure consistent with Basic Health System.

The above table also reflects that the ratio of facility to population varies tremendously across provinces. In case of BHU and RHC rural areas of Sind appear to lag behind the other provinces. While in case of beds NWFP is less equipped than other provinces.

UNDER-UTILIZATION

Whilst the coverage of rural areas by the service outlets has been less than the targets, under-utilization of these outlets further aggravate the situation. According to the original scheme the BHUs and RHCs are designed to treat daily 50 and 150 patients respectively. According to the informed circles the average daily attendance ranges between 20 to 30 per BHU and 60 to 90 per RHC. The bed occupancy rate is reported to be less than one third of the capacity. The claim of the scheme to provide "a systematic link" through referral system is reported to be conspicuous by its absence. Thus the developed super-structure in urban areas is still beyond the reach of the rural population.

Under-utilization of facilities is attributable to the absenteeism of the health workers, a high vacancy rate of female doctors and paramedics and inadequate supply of medicines and equipment. Logistic problems do not permit the referral system to function well. Non-availability of residence facilities and little chances of private practice discourage the doctors to live in rural areas.

The response of Sixth Five Year Plan (1983-1988) has been to increase the numbers of doctors. The posting of a doctor in each BHU, which reflects a change from the original BHS, is expected to improve the quality of care and reduce the need for referrals. The residential accommodation for doctors will be provided at BHU. In a similar vein the Sixth plan aims at increasing the number of doctors at Tehsil/ Taluka and District Hospitals. The strengthening of these institutions will enable them, according to the plan, to train fresh graduates as house surgeons and physicians. Whether the expansion in the number of doctors will by itself solve the problems of inadequate utilization is difficult to determine, it may, however, represent a step towards the employment promotion of doctors — a problem currently faced by the government.

III. PRIMARY HEALTH CARE

Primary health care in Pakistan is provided by various health outlets like hospitals (teaching, district headquarter and Tehsil headquarter hospitals) rural health centres, basic health unit, sub centres, MCH centres and dispensaries. In addition primary health care is also being provided by municipal health services, social security service, population welfare centres and red crescent society. A large number of private clinics and Non-Governmental Organization (NGOs) are delivering primary health care to a large fraction of population too. In Pakistan major emphasis of the primary health care is on the three components:

(a) Immunization;

(b) Diarrhoeal disease control by ORS and;

(c) Training of traditional birth attendants.

A. IMMUNIZATION — PAST EFFORTS

A proper and systematic poly-immunization programme was introduced on a national scale in 1978 as a part of Fifth Five Year Plan (1978-1983). The programme envisaged the immunization against major infectious diseases so as to cover 0-5 year child population by at least 90 per cent by 1990. The main aim was to vaccinate children (0-5 years age) and to eliminate tetanus, by giving tetanus toxoid to pregnant women. This programme was carried out at a cost of Rs. 36 million a year both under current and developmental budget. Although programme was successfully carried out but only one million children could be immunized out of 3.5 million infants added every year. The programme therefore failed to cover the backlog and keep problem from growing. In order to take care of the stock and flow problem, the programme was redesigned to immunize the new borns and the un-immunized under five year children. This programme "Accelerated Health Programme" was introduced in 1982, with the three components outlined above.

Current poly-immunization programme

The existing poly-immunization programme aims at protecting children against six preventable diseases viz. diphtheria, pertussia, tetanus, poliomyelitis, tuberculosis and measles. The accelerated programme was to be carried out in a three year crash programme costing Rs. 600 million. According to the estimates of the Planning Commission the accelerated programme is expected to protect about 5 million children during the first year and the remaining 10 million in 1983-1984, thereafter, it will be merged with the general health system to extend coverage to new borns. Given the fact that there is likelihood of drop-outs when more than one dose is needed for each disease, a follow up system is needed. Though even 80 per cent coverage is often regarded as hard immunity. The immunization drive can be stepped up if supply of vaccines syringes and storage facilities is enhanced particularly at places where electricity exists. With these facilities, the immunization in a period of few years can be considered a possibility.

B. DIARRHOEA CONTROL BY ORAL REHYDRATION SALTS

In Pakistan diarrhoea is very common among small children particularly infants. It is accompanied by vomiting and loss of body fluids, which tends to upset the chemical balance of body fluids. However, patients get well soon without much medication if balance of body fluids is maintained. A modest programme of making oral rehydration salts (ORS) was started few years ago with a negligible allocation. The oral rehydration salts are being packed by the National Institute of Health and distributed to various health outlets.

The use of oral rehydration salts, unfortunately, does not fit well with the customs and popular prescriptions hence requires massive communication support, particularly by the community. The use of birth attendants alongwith the other health functionaries, community leaders and pesh imams (religious leaders) as change agents is under active consideration of the government for this purpose. This will in turn require the training of the health functionaries, so that they can train the field level workers and also educate mothers for administration of ORS.

Availability of ORS at all the health outlets and in areas where health facilities are non-existent poses another problem. They could be made available through grocery shops and certain tea companies could also be involved in their distribution. For instance, in urban area, all chemists shops could stock and publicize ORS. The distribution of ORS appears to have been improved recently. According to official figures 7 million and 12 million packets were distributed during 1983-1984 and 1984-1985 respectively.

C. TRAINING OF BIRTH ATTENDANTS – PAST EFFORTS

Efforts to train birth attendents have been conducted at a slow pace since independence in 1947. The birth attendants remain generally attached for a period of one year with Maternity and Child Health Centres (MCH) and Rural Health Centres (RHC) where lady health vistors are posted. This system provides opportunities for training of 1,000 birth attendants annually. While the number of places for such training is quite inadequate, it is difficult to get birth attendants to avail of even the existing training facilities. Though stipends are offered, the dais (traditional birth attendant) practising the art and providing care to the community hesitate to absent themselves for the one year training period. During the period of apprenticeship, they undergo economic loss. There is also a feeling that the training is sketchy and less productive. Besides, the trainees are seldom supervised by the lady health visitors.

It is estimated that at present there are about 10,000 birth attendents who have been trained through the existing system. Pakistan has 45,000 villages and to cover the entire country, it is envisaged that a birth attendant should be available per village and for each urban slum. These birth attendants should be equipped with the requisite background to conduct the deliveries in a more scientific and hygienic manner than is the practice.

To enlarge the scope of birth attendant for mother and child care, TBAs, according to the programme, will be the change agents for convincing children and expectant mothers to be immunized. In addition TBAs will also be given the necessary background to control diarrhoeal diseases, by trying to educate mothers concerning the advantages of feeding their babies and the importance of fluid and chemical balance during diarrhoea. The TBAs are to be supported by the community and will provide services for a fee. However, the oral rehydration salts will be provided free of cost but the TBAs will charge for other supplies like antiseptics, cotton wool etc. from the community. They are supposed to remain attached to the nearest health outlet for orientation, replenishment of supplies and for reporting live births.

A joint WHO/UNICEF team in 1983 reviewed the progress of the above mentioned three programmes. The progress made was brought to the notice of Executive Committee of the National Economic Council.

The major conclusions of this evaluative exercise were as follows:–

(a) Immunization

(i) High public awareness has been achieved in less than 2 years;

(ii) The national coverage for immunization has increased from 2 per cent to 70 per cent. In Punjab over 80 per cent of children are now fully immunized. The achievement in NWFP is nearly as great and in the other provinces is also commendable;

(iii) Immunization coverage has risen dramatically in a short period and over 8.6 million children have been fully immunized;

(iv) Maintenance of logistic system were of high quality, thereby the shortage of vaccine or other supplies were not allowed to occurr.

(b) Oral rehydration salts (ORS)

(i) Over 15 million ORS packets have been produced or procured, and distributed in the past 2 years;

(ii) 1,311 doctors and about 4,500 paramedical staff have been trained;

(iii) More than half of the mothers interviewed in the current survey said they had used ORS.

(c) TBAs

(i) A full TBA training curriculum has been developed;

(ii) 15,000 TBAs have been trained so far under AHP against 1,000 being trained every year in the past.

Component of programme	Sixth plan target 1983-1988	1983-1984	1984-1985
Immunization of children below 5 years of age	24 million	3.4 million	9 million
Control of diarrhoeal diseases by distribution of oral rehydration salt packets	24 million	7 million	12 million
Training of birth attendants	30 000	6 000	6 750

Targets and progress during the Sixth Plan Period (1983-1988)

Targets and progress made in the first two years of the Plan are as shown above. The data are reflective of the achievement which lends an impression that the plan targets will be achieved if programme implementation does not suffer from any let up in the remaining three years of the plan.

Malaria control programme

In response to the recognition of Malaria as a major health problem in equatorial, tropical and sub-tropical countries of the world, WHO took malaria eradication as one of its goals and launched its activities to that effect in 1955. Pakistan joined this compaign in 1960 under a Presidential Ordinance. A fourteen year plan of operation (1961-1974) was launched with technical and financial assistance from WHO and USAID. The programme was suspended in 1971 despite the successful implementation of the programme during the 1960s. At one time malaria was nearly eliminated from the country, but it reemerged in the late 1960s. This resurgence could be attributed to factors like vector resistence, exclusion of urban malaria programme, poor participation of the health services, and non-incorporation of the effects of expansion in the irrigation in rural areas into the control programme.

In 1974 the programme was restarted under a new extension plan. Notwithstanding bottlenecks during the operation of the programme, malaria control activities have been a success to a considerable degree. The malaria endemicity level of the country is provided in table 47. The execution of a Five Year Extension Plan (1975-1980) has reportedly brought down malaria incidence to a low level but constant vigilance has to be kept in future to achieve the eradication of malaria in the country.

Table 47. Yearly epidemiological position of incidences of malaria

Year	Slides	Positives	S.P.R
1960	Base line survey		15.57
1961	25 733	936	3.64
1962	83 230	754	0.91
1963	272 178	7 479	2.75
1964	407 977	6 660	1.63
1965	1 078 216	15 859	1.47
1966	1 731 691	6 206	0.36
1967	2 574 664	6 465	0.25
1968	3 251 913	11 562	0.36
1969	4 705 567	45 929	0.98
1970	3 847 538	107 999	2.81
1971	3 778 934	202 496	5.36
1972	4 408 610	642 958	14.58
1973	4 252 184	599 177	14.09
1974	3 094 098	503 936	9.82
1975	3 205 689	238 315	7.43
1976	2 857 854	122 219	4.28
1977	2 667 315	47 571	1.78
1978	2 588 257	16 160	0.62
1979	2 682 351	12 304	0.45
1980	3 006 624	17 707	0.59
1981	3 018 468	37 923	1.25

Source: Annual Report of the Director General Health, July 1981-June 1982, Biostatistics Section, Ministry of Health, Special Education and Social Welfare, Health Division, Islamabad.

Tuberculosis programme

A comprehensive tuberculosis control programme prepared by the Federal Government in collaboration with the Tuberculosis Association and the World Health Organization has been under implementation. The objectives of the programme for the Fifth Plan period 1978-1983 were to maintain the sputum position cases at the current level of 4-8 per thousand population. This was to be achieved by proper case detection facilities and provision of ambulatory treatment at all health institutions. Specific beds in hospitals allocated for tuberculosis treatment were to be added for indoor treatment. The expectations that the Fifth Five Year Plan will provide 100 per cent coverage appears to have been materialized only partially because of lapses in implementation.

Family planning programme

Pakistan is one of the forerunners in adopting a family planning programme. Efforts to control fertility were initiated in 1950 by private organizations. Official adoption of the family planning programme took place in early 1960s. During the 1960-1965 period the programme utilized the health infra-structure whereas a separate independent agency was created during the third plan (1965-1970) period. For the first half of the 1970s the programme was changed to the Continuous Motivation Scheme. This scheme, in essence, represented an extension of the pilot work in four districts to entire country. The population planning programme remained suspended during 1977-1979.

The family planning programme during the 1950-1980 period failed to achieve its objective which is amply demonstrated by high growth rate of population (3 per cent) and unchanging level of fertility. Frequent and pre-mature changes, exclusive concerns with supply of contraceptives and less encouraging socio-cultural evironment were some of the reasons of the programme failure.

Based on the deliberations of various sub-committees the government launched a specific Population Welfare Plan for 1981-1984 which also forms the part of Sixth Plan Period 1983-1988. Cognizance of the fact that exclusive focus on birth control may run the risk of being counterproductive with little acceptability, the new plan contains a variety of activities such as mother care, child health, social education and motivational campaigns. Not only the programme is comprehensive but participatory in nature wherein various non-governmental organizations at different levels are involved.

The programme comprises of a series of projects called "Core" "Complementary" and "Support". Establishment of Family Welfare Centres (FWC) to provide general health care (particularly MCH) and female social development activities including family planning advice is a major feature under core projects. The Sixth Plan's target is to add 420 such centres during (1983-1988) to the existing one thousand or so centres. In addition to FWC, the core programme consists of projects such as Reproductive Health Services envisaged to provide family planning services, projects for manpower development and training and information, education and communication (IEC) to create a demand for family planning services through development of programmes.

The complementary projects are designed to provide population education through establishment of population study centres in universities and Provincial Population Welfare Plans. In addition support for population activities of NGOs and other institutions such as PIA also fall under the complementary projects. Monitoring, Research and Evaluation as well as establishment of a Population Development Centre for management information system are the major items under the support projects.

Major objectives of the population welfare programme for the Sixth Plan (1983-1988) period are the reduction of crude birth rate from 42 to 36.2 per 1,000, avertion of 2 million births during the plan period and an increase in the members of family planning acceptors from 0.75 in 1983 to 2.8 million in 1988. Hardly any information is available to assess the degree of success of the programme under the plan. A contraceptive prevalence survey (CPS) was conducted by the Population Division in 1985. The data collected are currently being processed. A crude and rough estimate of the use rate ranges between 12-13 per cent which is substantially higher than 4-6 indicated by the PLM 1979 and PFS 1975.

Although this appears encouraging the programme suffers from various limitations such as absence of detailed operational planning, uncertainty regarding the division of responsibility between Federal and Provincial agencies and general malase-lapses in implementation. Under the programme there are some services

provided at FWC which duplicate those of BHU under primary health care. Formal integration of health and population programmes appears difficult given the institutional rigidities which happens to falls in line with the split of international donor agencies. Efforts are, however, needed to get family planning advices and services administered in the field by health service outlets and workers. Similarly a need to re-organize the MCH care for wider dispersal of benefits is often emphasized. To the extent the strength of MCH care system under the population programme depends upon the community of health workers, a comprehensive training has to be imparted at all levels. In such a scheme a major function of the institutions such as MCH, FWC and BHU will be to supervise the village health workers and follow up of the referred cases.

Sanitation and water supply

Rapid population growth and migration to urban centres has generated problems of overall sanitation and exerted pressure on civic amenities. Adequate sanitation and safe water are often regarded as key component of primary health care. Essentially these are the factors which prevent the spread of water born diseases. Water supply and sanitation is primarily a provincial subject. Each province provides safe water and sanitation through various departments such as housing and physical planning and public health engineering. The Federal Ministry of Housing and Works in this respect also coordinates the activities of various other departments like irrigation, power, communication and works.

The table below depicts the facilities available which can hardly be regarded as satisfactory.

Table 48. Facilities available to households

(Percentage of houses)

Facility	1963	1973	1980
Potable water	16.5	16.1	21.0
Hand pump	42.2	40.4	46.0
Bath	23.4	24.0	53.0

Source: Pakistan Economic Survey, 1983-84.

Health education

The importance of the health education in the context of primary health care can hardly be emphasized. The Sixth Plan, therefore, incorporates health education as an essential element of health services. It aims at the utilization of educated females and representatives of local bodies. Religious leaders are to be used as health educators for the community. For this purpose they will be imparted necessary training in preventive health programmes. Non-governmental organizations will be used to the extent that it is feasible. An allocation of Rs. 50 million has been made for educative programmes, as a component of preventive health programmes. Various aspects of diseases and nutrition do form a part of curricula of the higher level of education. Similarly radio and television often present programmes declining with diseases.

Effectiveness of these measures is united due to overall low level of literacy. In addition unplanned construction in cities and rural areas has further aggravated the overall sanitational problems. Furthermore in the vianity of industrial areas the worsening environmental conductions appeared to have escaped the notice of authorities as well as public at large.

Drugs

The total domestic demand for drugs and medicines was estimated to be around Rs. 3 billion for the year 1981-1982. The drug market currently experiences on the average an annual growth rate of about 25 per cent. At present there are about 6,500 registered medical products out of which 4,500 are manufactured locally while 2,000 are imported. Local production is mostly confined to processing and packaging. The total number of manufacturing units, registered under the 1976 Drug Act in the whole country, is about 206. However, 10 firms, mostly multi-national concerns, control about two thirds of the market. Public sector produces vaccines and serum.

The share of private sector in the use of pharmaceuticals is overwhelming. Around nine-tenths are consumed by private while the public sector accounts for one tenths of the total use. There is a good deal of self medication, because there is no control on sale of drugs. The quality control is hardly adequate and essential drug list is conspicuous by its absence.

The drugs are generally sold at the prices fixed by the Ministry of Health.

Employees social security system

In 1967, Government introduced a scheme for industrial workers to provide medical care to the workers and their dependants. Currently there are three semi-autonomous employees social security institutions (ESSIS) in three larger provinces. The contribution to employees social security fund is made by the employer which is equivalent to 6 per cent of the wage of the employee. The benefits include primary health care, referral care and disability advantages. The facilities managed by ESSIS include dispensaries, MCH centres, injury treatment centres, poly-clinics and hospitals. The system primarily concentrates on primary health care. It is estimated that about 500,000 employees are insured under this system. The total contribution during 1981-1982 was Rs. 155 million out of which 50 per cent was estimated to be spent on primary health care.

IV. NUTRITION

Admittedly it is difficult to quantify the costs of malnutrition to a society. Not only it has a pervasive effects on labour productivity, morbidity and body resistence to diseases but appears to be associated with the behaviour patterns of the family least conducive for its socio-economic advancement. Unfortunately it is difficult to determine the nutritional status of a nation. The problem is compounded by the multiplicity of the indicators which have to be applied for such an estimation exercise.

In a recent study, Irfan and Amjad tried to depict the national nutritional picture rather indirectly. This was accomplished through estimation of poverty wherein the poverty line used in the study was based on the Recommended Daily Adult intake of 2,550 calories — as suggested by a joint FAO/WHO committee report. Poverty line was defined in terms of the food expenditure per adult equivalent consistent with RDA, under the consumption pattern observed for lower income groups in 1971-1972 Household Income and Expenditure Survey of Pakistan. On the basis of the ratio of food expenditure to household income the poverty line was also translated into per capita income and used for intertemporal comparison. The results pertaining to 1963-1964 to 1979 are presented below.

The above table is reflective of the fact that poverty which in essence capture the calorie deficiency is substantial and pervasive. Very poor in the above table refer to those who fail even to satisfy 70 to 75 per cent of the calorie

Table 49. Trends in rural poverty

Year	Percentage of households		Percentage of population	
	Poor	Very poor	Poor	Very poor
1963/64	40.5	30.6	40.96	32.2
1966/67	46.3	34.96	50.21	38.8
1969/70	51.5	38.42	54.52	43.19
1979	36.8	26.50	41.23	29.31

Source: Poverty in Rural Area, Edited by Azizul Rehman Khan and Eddy Lee, ILO, ARTEP, Bangkok, 1983.

required. It is, however, heartening to note that level of poverty has experienced a decline during the decade of 1970s.

In addition to the Household Income and Expenditure Surveys, couple of nutrition surveys were carried out. In particular the Micro Nutrient Survey of 1976-1977 (MNS) provides information on biochemical, clinical and anthropometric assessment of the nutritional status.

Application of the same poverty time to MNS (1976-1977) data yielded the figures of 20 and 27 per cent for very poor and poor households. The corresponding figures for population were 26 and 35 per cent for the year 1976. The survey data do provide some idea about the intra-family allocation of consumption. Interestingly one does not find substantial neglect of females or children as is often alleged (see table below).

Table 50. Shares of average family member intake

	Calories	Protein	Iron	Vitamin A
All adults	0.9896	0.9111	0.9852	1.0932
Adult male	1.0798	0.9823	1.0710	1.1601
Adult female not pregnant not lactating	0.7463	0.6863	0.7773	0.7711
Pregnant or lactating female	0.8810	0.8344	0.8753	1.0521
Children under 5 years	0.3524	0.3396	0.2441	0.6754

Source: Health and Health Related Statistics of Pakistan, Planning Commission Government of Pakistan, September 1978.

Note: Share of average family member is taken as unity.

Poor growth among children besides several other clinical symptoms, due to malnutrition was one of the major findings of the survey. For instance, 56 per cent of the children under the age of 5 years were reported to have low weight in comparison to their age, while 18 per cent had low weight in comparison to their heights. The nation's young continue to grow at a rate hardly comparable with that of their western counterparts. The height of an average Pakistani child aged 2 years is only 75 per cent of the American child of the same age.

It was estimated that 17 per cent of the children need immediate assistance and 43 per cent need some form of special nutritional attention, according to Water-low classification as depicted below.

Table 51. Per cent of children under five years in 'Need of Nutritional Intervention' on the basis of growth failures

		Pakistan	Rural	Urban
1.	Priority	7.18	7.16	7.22
2.	Action	9.52	9.82	8.65
3.	Attention	43.36	43.73	41.29
4.	No intervention needed	39.95	39.28	41.84

Source: Pakistan Country Health Profile, WHO, Islamabad, 1978.

Anaemia and iron deficiency

The prevalence of anaemia is measured indirectly by clinical examination of the conjunctives of the eyes and more directly by the assessment of blood levels for haemoglobin and haematocrit. Haemoglobin results from the MNS indicated that whereas 60.6 per cent of population is adequate, 25.69 per cent is marginal that 13.82 per cent have deficient haemoglobin levels. Similarly, haematocrit result showed 73.08 per cent of the population as adequate, 20.80 per cent marginal and 6.73 per cent as deficient.

Pakistani standards for pre-school child feeding and growth

The high incidence of infective and parasitic diseases, dysentries, malaria and T.B,

which together account for 72.5 per cent of infant deaths, is aggravated by nutritionally detrimental weaning and child care practices, and the cereal based Pakistani diet. The immediate cause of malnutrition of infants is inadequate food intake quantitatively, and qualitatively and subsequent infectious diseases. While severe malnutrition is not common, moderate protein calorie deficiency is estimated to afflict one third of the population. Infants, young children and pregnant and lactating women constitutes the groups of worst sufferor particularly among the low income strata where male bread earner has to be fed more than these groups because of the former's physical exertion entailed by the arduous jobs those people are locked in. In addition 98 per cent pregnant and lactating mothers are anaemic and about 38 per cent mothers are of less than standard weight. Frequent pregnancies, maternal illness, and malnutrition coupled with the late introduction of weaning foods contribute to the child nutrition syndrome in Pakistan.

The results of a pre-school child study by Mushtaq Khan (1978) indicated that the time of the introduction of solid foods is the key to a pre-school child's nutritional status as reflected by his growth performance. Even in the case of children from upper class families, who constituted the sample for his study, the child for whom solid food was withheld till a year after birth, grew at a rate approaching that of the current national average. This however, falls in around the third percentile of the Harvard Standard. This somewhat explains the widespread prevalence of retarded growth among Pakistani children, because the average age of solid food introduction among the general population is twelve months.

In contrast, the same study also demonstrated that Pakistani children, when propertly fed and cared for, can grew like their American counterparts. The growth curves generated by the optimal feeding practices identified in this research may be accepted as standards for Pakistani children. It is, however, unlikely that improvements in economic, environmental and other conditions required for all Pakistani children to achieve these growth standard can be achieved in near future. The results of this particular study suggest that interventions capable of persuading families to start feeding their babies solid food at the appropriate time (around 4 months age) could yield significant improvements in the growth and nutritional well-being of pre-school children.

Maternal nutritional status

Nutritional status of Pakistani mothers is far from satisfactory. The Nutrition Survey of Pakistan (1965-1966) revealed that Pakistani mothers are under-weight in general, 38.8 per cent of mothers in rural areas and 66.7 per cent in urban areas had low plasma protein levels, while 92 per cent and 100 per cent of them had low haemoglobin levels in rural and urban areas, respectively. This naturally is reflected in growth and development of the foetus when women are pregnant. It has been found that the growth of the foetus is comparable to western standards till 34 to 35 weeks of pregnancy, and then tends to slow down. During the 2nd and 3rd trimester, requirements for energy, protein and certain other nutrients increases. These extra needs can be met if the mother eats about one-fifth more of her ordinary mixture of foods, provided she already has an adequate diet.

Unsatisfactory maternal nutrition is generally recognized as a factor in the causation of low birth weight infants, the most widely accepted index of prematurity. At birth, the baby's state of nutrition is greatly influenced by the mothers diet during pregnancy. The average birth weight among babies born in low socio-economic households is distinctly below that of babies from high income households. Average birth weight in developed countries is about 3.5 kg. while in Pakistan it is about 10 per cent above 2,500 grams in well-off families and in low socio-economic sections it is 25 per cent below 2,500 grams.

Basically, feeding practices in Pakistan have not altered significantly since 1965. In a traditional society like ours, breastfeeding is still the norm, and is generally prolonged (1-2 years or more). However, there has been a definite changes in breastfeeding patterns, mainly due to trend towards urbanization and industrialization. The MNS 1977 found that 3.4 per cent of the children were never breastfed. Results from the baseline survey of the Nutrition Education Project (NEP 1980) which was conducted in both rural and urban areas of all four provinces, also showed that urbanization is one of the factors responsible for the early withdrawal of breastfeeding. Data collected from this survey indicated that out of the 5 per cent of total mothers who did not breastfeed at all, the greater portion was that of urban dwellers. This figure was consistent with that of the MNS.

Table 52. Breastfeeding practices since 1965

Age at which breast-feeding stopped	Percentage of mothers			
	NSWP 1965-1966	MNS 1976-1977	NWFP 1979	NEP 1980
No breastfeeding	0.72	5.4	–	5.0
0-6 months	–	7.4	–	12.0
7-9 months	0.20	2.5	25.7	–
10-12 months	1.94	10.9	–	13.0
13-15 months	1.43	2.8	–	–
16-18 months	4.18	12.0	69.0	28.0
19-21 months	3.68	4.4	–	–
22-24 months	27.04	32.3	5.3	36.0
24 months and above	59.8	22.7	–	9.0

Duration of breastfeeding is also decreasing as seen in a comparison of data from the Pakistan Fertility Survey 1975 and the Population Labour Force and Migration Survey of 1979. Whereas the former survey found average length of lactation lasted 19 months, the latter survey found it to have declined to 16 months (Khan 1985). These findings are confirmed by the trend portrayed by the four other studies the Family Health Care Project of Islamabad (PHCP) (1976-1979), a dietary survey of NWFP (1979), the Nutrition Education Project (NEP) the MNS 1978 suggesting that the maximum age upto which the majority of children are breastfed is two years. The finding of these four surveys are summed up in the table which also indicate a change in breastfeeding patterns, with a trend towards earlier cessation of breastfeeding.

Some information on weaning patterns of infant given in table 53 shows that weaning takes place at fairly late ages of over a year. On the basis of MNS results, eight foods emerge as common ones introduced first for weaning children six of the foods, i.e., rice, roti (bread), sweet-biscuits, khichri (a rice and lentil preparation), and dalia (a porridge made from wheat and milk) accounted for 74 per cent of the foods actually introduced first. Shero, or russ, (a hard, plain biscuit softened by soaking in milk) was found to be popular particularly in Sind, and choori (soft bread meshed in butteroil and sugar) is fed first in a few areas.

Table 53. Weaning practices since 1976

Age of introduction of solid food	Percentage of mothers		
	MNS 1978	NWFP 1979	FHCP 1976-1979
0-6 months	4.86	–	59.0
7-12 months	41.20	22.25	26.0
13-18 months	35.91	40.50	–
19-24 months	9.90	37.25	7.0
Over 24 months	8.13	–	8.0

Source: Ibid.

Mothers perception about the best solid food to be introduced to a young child were also recorded in MNS. Although the same eight foods were cited on top, their distribution differs substantially (as shown in table 54) only 1 per cent said they considered sweet biscuits as the best first food whereas 9 per cent stated a preference for roti (bread made of whole wheat flour) even though 17 per cent actually fed it as a first solid.

The macro-nutrition situation

Looking at the nutritional picture at the macro-level in table 55 which presents the Food

Table 54. Weaning preferences of mothers in Pakistan

First food given babies		First food considered best by the mother	
Name of food	Percentage of households	Name of food	Percentage of households
Sweet biscuit	13.1	Sweet biscuit	1.1
Roti	17.1	Roti	8.9
Rice	18.2	Rice	24.1
Egg	9.4	Egg	7.4
Dalia	6.0	Dalia	12.1
Khichri	11.1	Khichri	11.3
Shero	4.0	Shero	3.5
Choori	1.0	Choori	1.4
Others	20.3	Others	30.1
Total	100.0	Total	100.0

Source: Ibid.

Table 55. Food balance sheet for the agriculture year 1982-1983 consumption plan

Country : PAKISTAN
Population : 86.90 million

(Thousand tons)

Commodity	Food gross	Extraction per cent	Food net	Kg/year	Gm/day	Calories/day	Protein/day
Wheat	10 696	95	10 161	116.93	320.36	1 134.06	33.63
Rice	2 209	—	2 209	25.42	69.64	245.84	5.22
Maize	676	90	608	7.00	19.17	69.40	1.82
Other cereals	585	90	526	6.05	16.57	60.00	1.57
Sub total	14 166	—	13 504	115.40	433.88	1 509.30	42.24
Pulses							
— Gram	207	93	193	2.22	6.08	22.47	1.22
— Other pulses	347	93	327	3.76	10.31	34.64	2.31
Sub total	554		520	5.98	16.39	57.11	3.53
Sugar (refined)	1 200	—	1 200	13.81	37.83	146.40	—
Sugar (raw)	1 524	—	1 524	17.54	48.05	168.66	—
Sub total	2 724	—	2 724	41.35	85.88	315.06	—
Potato	437	—	437	5.03	13.78	9.65	0.21
Vegetable	2 426	—	2 446	28.15	77.12	38.56	0.46
Fruits	2 392	—	2 392	27.53	75.41	16.59	1.05
Sub total	5 275	—	5 275	60.71	166.31	64.30	1.72
— Rape and mustard	—	—	—	—	—	—	—
— Sesamum	—	—	—	—	—	—	—
— Cotton seed	—	—	—	—	—	—	—
— Others	9.5	80	7.6	0.09	0.24	1.40	0.06
Sub total	9.5		7.6	0.09	0.24	1.40	0.06
Milk							
— Cow	2 155	—	2 155	24.80	67.40	43.48	2.38
— Buffalo	5 521	—	5 521	63.53	174.06	175.80	7.03
— Others	407	—	407	4.68	12.83	8.98	0.45
Sub total	8 083	—	8 083	93.01	254.83	228.26	9.86
Meat							
— Beef	392	—	393	4.52	12.39	29.74	2.35
— Mutton	509	—	509	5.86	16.05	34.03	2.84
— Poultry	69	—	69	0.79	2.18	3.25	0.41
Sub total	971	—	971	11.17	30.62	67.02	5.60
Fish	299	—	299	3.44	9.43	14.05	1.79
Eggs (3264 mill. No.)	163	—	163	1.87	5.14	8.17	0.66
Fats and oils	700	—	700	8.06	22.07	198.63	—
Animal protein							17.91

Source: Planning Commission.

Balance Sheet for the year 1982-1983 it can be seen that once again wheat is the major crop being produced and consumed followed next by rice, maize and other cereals. Pulses, sugar, vegetables and fruits, milk and meat poultry follow. Wheat, rice and maize contributed the greatest amount of caloric consumption and protein consumption per capita per day in Pakistan. Sugar also provides a substantial number of calories but no protein intake, milk provides calories and some protein intake and to a lesser extent the same applies to meat and poultry, fish, eggs and fats and oil. Pulses and vegetable and fruit provide some slight caloric intake but very little protein intake.

Compared to a similar food balance sheet for 1969-1970 daily caloric intake per capita has risen from 2,103 to 2,463 calories which takes the average above the optimal recommended caloric intake of 2,350 calories. However, of the calories consumed, it seems the proportion consumed in the form of proteins has remained static, infact declined slightly. Such levels of intake of protein are inadequate as the average consumed here is 42 grams as compared to the western recommended intake of 62.5 grams. Although fairly obvious, it needs

to be pointed out, that this national breakdown of food consumption hides the inequalities of intake that exist across socio-economic groups — so therefore the deficiencies in caloric and particularly protein consumption must be more acute, than seen in national averages, amongst the poor in Pakistan.

Goitre

The goitre belt of Northern Area is one of the World's most classical area in an intense form of endemic goitre. In 1906 McCarrison examined the incidence of goitre in many villages of Gilgit and Chitral after finding that about half of the population had visible goitre. Various surveys have confirmed that incidence of goitre was as high as 60 per cent among the adults.

The Government is launching goitre control programme to cover about 5 million population in the goitre zone. This includes lipoidal therapy, both oral and by injection as short term measures. In addition the existing salt iodation programme will be strengthened as a long term measure.

V. MANPOWER AND TRAINING

In line with overall educational growth, the development and training of health personnel has been lopsided and imbalanced. Whilst emphasis was always placed on the production of doctors, the training and education of auxiliary personnel received secondary importance. Sufficient number of doctors were being produced in the 1960s but a sizeable fraction always managed to get jobs in the high wage markets of the West particularly United Kingdom, Canada and United States. The domestic health services generally remained short of doctors, hence institutions to produce doctors were rapidly increased during the last 10 years which currently turn out 4,000 doctors per year. Despite the enhanced intake of doctors under BHS and by private sector Pakistan is faced with the unemployment of doctors currently estimated to be around 13 per cent.

Notwithstanding the unemployment of doctors the institutional training is heavily geared to their production as detailed in table 56.

As reflected by the table above the doctors are roughly three times of nurses. The fact that most of the auxiliary health personnel are highly prone to emigration to Middle East has further compounded the problem of inadequate availability of qualified health support staff.

Both the health manpower needs and problem of doctor's absorption were anticipated in the Sixth Five Year Plan (1983-1988). Employment opportunities for doctors were to be created in the Basic Health System by creating a post of one doctor in each BHU and improving the intake of doctors in other institutions. The proposed public programme under the plan, however would absorb only half of the output, while the remainder to be utilized by the private sector.

The shortage of nurses was recognized in the plan to the tune of 1,470, assuming one nurse for five beds. Additional requirement for nurses during the plan period was estimated to be 3,000. Similarly the plan proposed to train 30,000 Trained Birth Attendants (TBAs) during the plan period. The duration of training for TBA was suggested to be 2-3 months and a trained TBA will be made available to each village.

Excepting the paramedical training and supply of specialist doctors most of the manpower development programmes under the plan are likely to be achieved. It must be noted that the targets of the plan were modest. Their availability, therefore, hardly rules out the deficiency of medical support staff. The imbalance in the health manpower structure, surfiet of doctors as well as shortage of auxiliary staff, is expected to act as a snag for near future.

Table 56. Estimates of number of staff employed, training institutions, and selected categories of annual training outputs, 1983

Categories of personnel	In post 1983	Number of training institutions	Annual training output
Doctors	16 501	16	4 260
Nurses	5 530	44	972
Midwives	4 705	46	359
LHVS	3 473	10	312
Med Technicians	2 000	26	600
Health Inspectors	1 000	—	—
Dispensaries	16 161	50	1 500

Source: Pakistan, Health Sector Report, World Bank, 1983.

VI. HEALTH EXPENDITURE

Currently health expenditure accounts for 3.5 to 4 per cent of GNP, or around $US 14 per capita. This somewhat respectable figures compared to neighbouring countries, however, owes to private expenditure which accounts for more than two thirds of the total. The public sector spending on health represents a very low share of the GNP (0.7 per cent) and of the total government expenditure (2.9 per cent) — hardly a figure comparable with other developing countries.

This low level of public spending, however, has been attained by a significant rise overtime. The financial outlays for various Five Year Plan reflect a continuous rise across successive five year plans. The Second Five Year Plan (1960-1965) allocated Rs. 174 million in contrast to 4,584 million in Fifth Five Year Plan (1978-1983). The capital outlay proposed by Sixth Five Year Plan (1983-1988) is nearly three times of the immediately preceding Fifth plan. In fact financial allocations experienced a real growth rate of 4 per cent per annum since 1978.

There are gross imbalances in the public sector expenditure pattern. The recurring expenditure and particularly operation and maintenance allocation has been low and poor. This is reflected by table 57 which indicates the growth in these two types of expenditure during 1972-1982. As indicated by the table the operation and maintenance expenditure in fact stagnated during the period under review. In terms of per capita expenditure and as a fraction of GNP it has experienced a decline. In contrast the capital outlay has undergone a significant improvement both as a fraction of GNP and on per capita basis. A disproportionately lower share of operation and maintenance expenditure is a factor contributing to inadequate utilization of services. Currently the rural facilities are under financed to the extent of 30 per cent.

Notwithstanding the objectives of successive plans and the regimes, the expenditure pattern

Table 57. Operating and maintenance and capital expenditure, 1972-1982

(constant prices 1969-1970 = 100)

Year	Operating and maintenance			Federal and provincial capital expenditure		
	Rupees (million) total	As percentage of GNP	Per capita rupees	Rupees (million) total	As percentage of GNP	Per capita rupees
1972-1973	335	0.6	5.1	79	0.1	1.21
1973-1974	271	0.5	4.0	112	0.2	1.67
1974-1975	285	0.5	4.1	182	0.3	2.63
1975-1976	522	0.9	7.3	282	0.5	3.95
1976-1977	449	0.7	6.1	221	0.3	3.01
1977-1978	452	0.6	6.0	196	0.3	2.59
1978-1979	473	0.6	6.1	201	0.3	2.58
1979-1980	387	0.5	4.8	230	0.3	2.87
1980-1981	411	0.5	5.0	265	0.3	3.21
1981-1982	407	0.5	4.8	272	0.3	3.20

Source: Pakistan, Health Sector Report, World Bank, 1983.

has favoured urban areas in allocation of funds. At present around two thirds of the recurrent budget is allocated to hospitals primarily located in urban areas. The urban bias is reflected by the Sixth plan expenditure pattern also. During the first two years of the plan (1984-1985) rural health programmes received only one fifth of the health sector, while hospital beds and manpower development received one third and one sixth of the total.

This is not to deny the fact that over time the share of rural health programme has risen (see table 58). What appears to be the consequence of the relative rural neglect is that the nation wide health care will not be achieved, if the allocative pattern, a product of various factors, is not changed. The proportion of the expenditure devoted to rural health and preventive health programmes during 1972-1982 period are detailed in table 58.

Table 58. Federal and provincial government capital expenditures on the rural and preventive health programmes (financial years 1972-1982)

Year	Rural health programme		Preventive health programme	
	Million rupees	As percentage of ADP for health	Million rupees	As percentage of ADP for health
1972-1973	14 100	12.31	34 000	29.69
1973-1974	34 220	19.17	35 390	19.83
1974-1975	46 600	15.08	94 460	30.57
1975-1976	92 159	14.34	286 023	44.51
1976-1977	73 310	9.50	435 168	56.38
1977-1978	190 853	27.89	244 383	35.71
1978-1979	240 707	31.59	118 623	15.57
1979-1980	232 784	32.47	100 193	13.97
1980-1981	285 763	30.32	124 175	13.18
1981-1982	271 130	25.19	89 729	8.34

Source: Souvenier – A Pakistan Medical Association Publication on XVI Biennial Medical Conference, 1984.

VII. PRIVATE SECTOR HEALTH SERVICES

Historically health services in the sub-continent were administered through private traditional medical practitioners. The public sector provision of health services was introduced by the British for their employees and the urban population. The traditional system of medicine along with modern allopathic system grew over time. At present both the systems are functioning and have rendered the health system overwhelmingly a private one accounting for four fifths of the total health expenditure, wherein majority of the patients resorts to private services.

Private modern system

Currently more than 6,000 doctors are engaged in private sector which is also equipped with 150 hospitals and 10,000 beds. The private facilities have developed strongly in the recent past primarily because of inability of the public sector to absorb the medical graduates and at the same time the emergence of effective demand particularly in urban areas because of attrition in the quality of services rendered by the public sector. In addition the government also introduced number of incentives for the growth of private sector. These include customs and tax concession on the import of medical equipment, provision of subsidized land for hospital and cheap credit through small business corporation.

The government till now, has adopted a laisez fair attitude towards private sector which is administring a basic need. This quantitive growth of private medical practitioners, most of them being young, inexperienced and fresh graduates, has generated a quality problem. Inexperienced doctors hardly equipped to deliver unsupervised treatment coupled with the inadequate medical and support staff facility is in fact akin to play with the lives of the people. There is a need to regulate the private sector through legal action. To begin with minimum quality standards should be established, and a mechanism be evolved which should ensure the redressal of the grievances.

Traditional medical practitioner

Traditional medical practitioner such as Tibb-e-Unani, Ayurvedic and Homoepath also provide medical services to the population. These are estimated to be around 3,200 qualified Tibb practitioners, 31,700 registered unqualified Hakims, 3,000 qualified and 13,000 unqualified homoepaths. Due to preponderance of these traditional medicine and the fact that these cater to the needs of a substantial fraction of populace the government recognized and approved these three systems in 1977 and established boards for registeration of these practitioners. It must be noted that in contrast to allopathic doctors who are heavily concentrated in urban areas the traditional medical practitioners are more widely spread.

Part Three

I. SUMMARY

Unfortunately inadequate registration system of vital events in Pakistan does not permit a near enough picturization of mortality in Pakistan. The data utilized for arriving at the mortality level and trends at national and regional levels are obtained from three national demographic surveys namely PGE 1962-1965, PGS 1968-1971 and PGS 1976-1979 and two retrospective national fertility surveys namely PFS 1974-1975 and PLM 1979-1980. For the identification of socio-economic determinants of mortality, data obtained from the latter two fertility surveys have been utilized. Derivation of indirect estimates of mortality from census age structures could not be made possible owing to the poor quality of enumeration. Some indirect estimates of infant mortality from 10 per cent sample surveys of 1981 population census have, however been utilized. Since mortality data prior to the year 1950 are not available for the area comprising Pakistan, a recourse has been made to the relevant Indian data for purposes of analysis here. For depicting the levels and trends of mortality overtime four measures of mortality namely, crude death rate, infant mortality rate, age-sex specific mortality rates and expectation of life at birth by sex have been applied.

In terms of crude death rate (CDR) mortality in Pakistan remained particularly high during the 1980s and the first twenty years of nineteenth century. Crude death rate during all this period remained stable at around 40 per 1,000 population owing to the persistence of famines and epidemics in the sub-continent. During a period of 30 years following 1921, the CDR declined from its high level of 36 to around 23 mainly because of the introduction of chemo-therapeutic drugs and the control of famines and killer diseases like malaria, cholera and small-pox. For the post-partition period (after 1947) the decline in CDR from 22.8 during 1951-1961 to 10.5 during 1976-1979 as suggested by the data hardly seems to be convincing owing to under-enumeration of deaths in the three national demographic surveys. Application of Preston and Coale technique to these data yielded an extent of under-enumeration of 30 to 40 per cent of adult deaths. The adjusted CDRs for the three survey period turned out to be 17.5, 15.5 and 14.6 as against unadjusted CDRs of 15.1, 11.4 and 10.5 showing thereby that the pace of mortality decline in the post 1960 Pakistan was not as fast as was suggested by the surveys data.

In Pakistan, like other developing countries, the death rate among children (0-4) is observed to be very high, accounting for 58 per cent of total deaths in the country. The percentage decline in IMR during 1901-1965 was 34 per cent which appears low as compared to other developing countries where the extent of decline was in the range of 60 to 80 per cent. There are no independent sources of data available to confirm the existing or post 1965 pattern of IMRs available from the demographic surveys which suggest IMR of 94 during 1976-1979. However, IMRs available from pregnancy history data of PFS and PLM do allude to the under-enumeration of infant deaths in the three demographic surveys i.e. PGE and PGS. A decline of 34 per cent in IMR from 143 to 94 during 1962-1965 to 1976-1979 indicated by these sources is not verified by PFS and PLM where the decline in IMR for the same period is insignificant, with IMRs being in the range for 125-130 for 1975-1981 period. What has emerged from the data analysis is that most of the decline in infant mortality in Pakistan as occurred prior to 1965 and only a modest one thereafter. Indirect estimates of IMRs based on children ever-born and surviving by age of mother tend to be on higher side than the direct estimates, reflecting thereby again the extent of under-enumeration in direct estimates.

Age-sex pattern of mortality in Pakistan could be studied only from the data collected through the three demographic surveys PGE 1962-1965, PGS 1968-1971 and PGS 1976-1979. The data for ages 5 years and above in all surveys were adjusted forunder-enumeration by the method of Preston and Coale and any irregularity beyond age 10 due to age mis-reporting was removed by fitting a Gompartz curve to the data in question. Probability of dying within age groups were calculated by Reed-Merril method and abridged life tables for each sex were derived by the usual life table procedures.

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In order to study the age-sex pattern of mortality in Pakistan from 1947 onwards, abridged life tables for the province of Punjab for 1950-1952 were utilized for comparative purposes with the assumption that the incidence of mortality in Punjab would not be different from that of Pakistan as a whole. It was observed that males suffer from higher mortality than females in infancy whereas during early childhood and throughout the reproductive period the female mortality exceeded that of male mortality. Beyond age 50 the situation seems to have reversed with male mortality being higher than that of female. The excess female mortality in childhood and at young ages in Pakistan can be attributed to the deep rooted cultural attitudes leading to female neglect and under-nourishment. Higher female mortality in reproductive ages reflect inadequate medical facilities available in the country.

Examination of changes in age-sex pattern of mortality during the period 1950-1979 reveals a continuous decline of male and female mortality during the period under consideration. Decline in male mortality is observed to be faster than females during the period of early childhood (age 1-4), primary schooling (5-9) and during reproductive age (10-49). These differentials between sexes continue to widen such that during the period 1976-1979 the female mortality during the reproductive period becomes twice that of male mortality. The mortality situation in today's Pakistan is comparable to the one prevailing prior to 1920 in Northern and Western Europe where females had been experiencing excessive mortality both during early childhood and in reproductive period.

Mortality trend in Pakistan with the help of expectation of life at birth are examined which show that for forty years after 1881 there was no addition to human longevity in the sub-continent mainly due to the persistence of famines and epidemic. Life expectancy increased by about 6 years during the period 1921-1931, a period free from famines and epidemics. However, during the period 1931-1941 to 1941-1951 life expectancy increased rather slowly (4 to 5 years) probably as a consequence of human losses in the Second World War and partition of the sub-continent. The post-partition period of 1950-1952 to 1962-1965 may have had experienced an increase in life expectancy but too large an increase of 14 to 19 years during this period as suggested by our estimates probably results from too high a mortality level adopted by M.K.H. Khan in his 1950-1952 life tables.

Females on the average lived longer than males prior to 1921. This phenomenon was probably an outcome of data or a consequence of higher incidence of male mortality caused by wars, famines and epidemics. Subsequent to 1931 males have on the average tended to live somewhat longer than females mainly as a result of higher female mortality during early childhood, at young ages and during reproductive period. Both urban males and females experience higher life expectancy as compared to their counterparts in rural areas. The provinces of Punjab and Sind being socio-economically more developed tend to enjoy somewhat more longevity in life as compared to NWFP and Baluchistan.

Among the demographic factors bearing upon infant and/or child mortality in Pakistan, the most prominent ones are found to be the mother's age at birth of child, order of birth and length of preceding interval. Infant mortality has a U-shaped relationship with mother's age which becomes sharper when infant mortality is replaced by neonatal or post-neonatal mortality rates. Moreover, association between birth order and the survival of a child also tends to be U-shaped with lowest mortality being experienced by the fourth child and the highest by the first. However, infant mortality continues to be associated negatively with the length of the preceding interval even after controlling for age, education and residence of mother, birth order and survival status of the preceding child. Determination of the impact of socio-economic factors on mortality in Pakistan is quite complex mainly because of the differential allocation of development resources and the very uneven distribution of health facilities among various segments of the population. Mothers' education has a profoundly significant effect on the survival of infants and this effect continues to be magnified with further advancement in education. Similarly father's education or that of household head, also experts increasingly inverse effect on infant mortality both at national and urban and rural levels in Pakistan. A higher level of household income continues to be positively associated with the survival of infants. Infant mortality differentials by income groups tend to be sharper in urban areas as compared to rural areas. Rural-urban differentials persist after controlling for income level of the household and tend to become larger for higher income groups. Occupation of father or head of household as an indicator of socio-economic status exerts negative affect on mortality. In

urban areas fathers in white collar occupation enjoy a substantially higher survival probability of their infants than those in blue collar occupations. Differentials in infant mortality by employment status of father seem to disappear after controlling for occupation. In the rural areas of Pakistan, Kamees, who enjoy the lowest social status, have higher infant mortality than those in other occupation groups. Similarly for the rural farm population agriculture landless labour, the lowest in rural heirarchy, have substantially higher infant mortality as compared to cropper/share cropper and owner of land.

II. HEALTH SERVICES – PAST PERFORMANCE AND FUTURE PROSPECTS

Although the disease pattern in Pakistan is still dominated by infectious diseases, Pakistani's appear to have been affected recently by the diseases often associated with little advanced stage of economic development. Whilst the leading causes of death are dairrhoea, and pneumonia among pre-school age children, the road accidents, heart diseases and malignancy are emerging to be as a major killers for the remaining age groups. Of course the tuberculosis is still one of the major killers.

Morbidity is quite high and can be attributed to infectious diseases. The most common causes of illness amongst children are measles, whooping cough, tetanus, and diarrhoeal diseases. About 1.6 million persons have radiologically active tuberculosis, including more than 250,000 open cases. Protein-energy-malnutrition (PEM) is still a problem; with 7 per cent of children (less than 5 years age) exhibiting 3rd degree malnutrition. Other nutritional problems include anaemia and goitre.

Emergence of cardiovascular diseases to the proportion of public concern has been rather abrupt. One of the unfortunate consequence is that its victims are often in the middle age group whose death carries tremendous difficulties for family members. Cancer is rapidly becoming a major cause of morbidity and mortality. The minimal incidence rate for cancer is estimated to be 40-50 per 100,000 of population. Incapacitating mental disorders are likely to affect at least 1 per cent of the population at any one time, and at least 10 per cent at some time in their life. In addition cavitation of teeth affect children more than other age groups. Gum diseases afflict a large number of the population. Diseases affecting the tissues around teeth range between 7-9 per cent of the children and a majority of the adult population.

Heroine addiction has recently emerged as a major health hazard. According to some estimates currently 2 to 2.5 million youngsters suffer from this problem. Similarly malaria which was once under control had reappeared and currently more than 50 per cent of the population is vulnerable to this disease.

HEALTH FACILITIES

There is at persent one doctor for 2,810 persons, one dentist for 64,200 persons, one nurse for 8 hospital beds, one paramedic for 1,800 persons, one primary health care facility for 15,000 persons and one hospital bed for 1,500 persons. Primary health care facilities other than hospitals, are offered by 1,715 basic health units (BHU), 374 rural health centres (RHC), 867 Maternity Child Health (MCH) centres, 3,994 dispensaries and 632 sub-centres.

The existing structure of services reflects the improvement made by introduction of Basic Health System introduced in mid 1970s. Major objective of this scheme were to extend the coverage of facilities in rural areas and integration of rural service outlets with urban hospitals. Although there exists a system in rural areas but its coverage is inadequate, as well as suffers from high degree of under-utilization and works more or less in isolation from urban super-structure.

Co-existing with the public sector service outlets there is a large private health sector which underwent a significant expansion recently. Currently around 250 hospitals 9,000 clinics and 12,000 doctors are engaged in private sector. In addition traditional medical practitioners such as Tibb-e-Unani, Ayrvedic and Homoepath also provide services to the population. These are estimated to be around 3,200 qualified Tibb practitioner, 31,700 registered unqualified Hakims 3,000 qualified and 13,000 unqualified homoepaths. Due to the preponderance of traditional medicine and the fact that these cater to the need of a substantial fraction of populace the government of Pakistan recognized and approved these three systems in 1977 and established boards for registration of these practitioners. It must be noted that in contrast to allopathic doctors who are heavily concentrated in urban areas the traditional medical practitioners are more widely spread.

VERTICAL PROGRAMMES

There are some vertical programmes such as Malaria Control, Tuberculosis Control, World

Food Programme, the recently introduced Expanded Poly-Immunization (EPI), Oral Rehydration Salts (ORS) and training of Traditional Birth Attendants (TBAs). The malaria control programme has been merged with the general health services, although complete administrative integration has not been achieved yet.

DRUGS

It is estimated that the total domestic demand for drugs and medicines is approximately Rs 3.5 billion. Fifteen firms control about 70 per cent of the market. The drug market is growing at an annual rate of about 25 per cent. At present, there are about 6,500 registered medical products; out of which 4,500 are processed and packed locally by 206 units. The remaining 2,000 are imported. Drug prices are controlled by the Ministry of Health.

LOGISTICS

Transport availability at most of the RHCs is very limited. There are very few permanent useful roads. Lack of transport and communication prevents medical officers from visiting basic health units and lady health visitors (LHVs) from visiting villages. Maintenance of facilities for keeping vehicles on roads are inadequate.

HEALTH MANPOWER

Expansion of medical colleges, during the last 10 years has led to a current output of 4,000 new doctors every year. This quantitative explosion has been at the cost of the quality which has gone down substantially since there are not enough class rooms, laboratory facilities and teaching equipment. Also there is a shortage of 8,000 teaching hospital beds. The pace of training of specialist/teachers has lagged behind the production of graduates in the country.

There is a mal-distribution of doctors due to neglect of rural areas which have not been provided roads, communication facilities, electricity, schools, and potable water with unattractive employment system. There are less than 1,000 post of doctors in rural areas as against 6,000 in urban areas even though rural areas contain approximately 70 per cent of the total population. In the rural areas, a very large number of posts for female doctors are lying vacant. Out of the paramedics, very few girls

are being trained. Most of the medical, nursing and paramedical personnel belong to the urban areas and would like to serve in urban areas.

Manpower development is indicative of serious imbalances wherein supply of doctors out-pace that of nurses and paramedics. With the emigration of auxiliary personnel to Middle East the health services are denied of the qualified health support. This shortage of nurses and paramedicals however, co-exists with unemployment of doctors.

HEALTH EXPENDITURE

According to a World Bank study, Pakistan was spending 0.9 per cent of GNP and 1.5 per cent of total government expenditure in 1980. This amounted to $US 2.0 per capita expenditure. In contrast, Indian figures for the year 1978 were reported to be as 1.2 per cent GNP and 1.7 per cent of total government expenditure. Recently there has been a rise in the allocation of funds to the health. During the year 1983-1984 the outlay on health has risen and accounts for 2.9 per cent of the total government expenditure. Still this represents an insignificant share of GNP (0.7 per cent). Although this may lend an impression that health services are seriously under financed but incorporation of private expenditure in total does change the picture somewhat. An estimated per capita inclusive of private expenditure comes to $US 14.0 while the share in GNP rises to 3.5 per cent. These figures roughly parrallel to those found in the developing countries of the region.

Distribution of funds across regions — rural/urban however constitute a major problem. The expenditure pattern disproportionately favours the urban areas. Even during the past few years which coincide with the governmental efforts of extention of coverage to rural areas, the rural areas received less than one-third of the fund. The remainder was diverted to capital intensive hospitals in urban areas.

Notwithstanding the progress made during the past Pakistan's performance is poorer than most of the neighbouring as well as low income countries. Infant mortality rate in Pakistan, for instance, ranges between 120-130 in contrast to 93 in India and 37 in Sri Lanka. The other indicators like child death rate and life expectancy at birth tend to bear the same differentials. It must be noted that India and Pakistan had similar level of achievements in 1965, but the

progress made by India during post 1965 period has not been matched by Pakistan.

In essence the extent, coverage, utilization, financing and staffing pattern of public health facilities are some of the major issues to be squarely faced for improvement in the health of population. In addition the contribution, role and implications of private sector health facilities have to be reckoned. In a similar vein, the ramifications of population growth, urbanization, industrialization and overall economic development need to be assessed for health planning and development.

Pakistan's health infrastructure in 1985 represents a quantum jump over the modest base inherited in 1947, at the time of independence. The geographic dispersal has, however, been disproportionate wherein the facilities tend to be concentrated in urban areas. Partly this is a reflection of the urban bias in the planning and development of the country. Part of reasons lie in the emphasis of the system on curative aspect of health, hence hospitals – a capital intensive projects – in the cities. Although this trend still continues unabated some changes were introduced through Basic Health System in the mid 1970s, which led to establishment of various service outlet such as BHU and RHC in the rural areas. The coverage is still far from the one envisaged by the programme.

Under-utilization of existing facilities particularly in rural areas is more menancing than the quantitative shortage. Both the bed occupancy rate and daily attendance of patients is a minor fraction of what the facilities are designed for. Wide-spread absenteeism of the health workers, high vacancy rate particulary of female doctors and paramedics, and non-availability of medicines are some of the factors underlying the lower level of utilization of the services. In addition the quality of service rendered by doctors and auxiliary staff has deteriorated over time even in urban areas.

From the view point of the patient, there is very little "free" element in the so called free services. Very often the patients have to buy a wide range of items such as cotton, syringes, blood and medicines from the markets. The hospitals provide only a space and services of the doctors whose quality has suffered impairment overtime, because the specialists would prefer to see the patients in their private clinics while the novice is there to take care of the patients in the government hospitals.

The medical treatment has become expensive and beyond the reach of common man. This is an irony that on the one hand the government finds it difficult to finance the health facilities while on the other hand the poor and ordinary folk find themselves ill-equipped and incapacitated to participate in the facilities which already exist. The situation is often alleged to be worse in the rural areas.

FUTURE PROSPECTS

Pakistan is a signatory to "Health for All by Year 2000". The targets to be attained, in-conformity to the HFA, were specified by the Thirty Fourth World Health Assembly in 1981. These indicators include inter-alia, the provision of safe water within five minutes walking distance by 1990, (i) adequate sanitary facilities by 1990, (ii) full immunization of children against six diseases, (iii) local health care including 20 essential drugs to everyone within one hour walk, (iv) trained personnel for the entire population, (v) adequate nutritional status wherein 90 per cent of the newly borne have a weight of 2,500 grams. These targets also include a decline in infant mortality rate to less than 50 per thousands and achieve a life expectancy of over 60 years.

The above targets certainly represent a tall order given the past performance and financial constraints. Even to achieve a position in year 2000 not substantially far from the targets listed above would call for serious efforts and significant changes in the current practices. Both sector specific and overall developmental efforts have to be mutually supportive to improve the current situation and to make some headway in the desirable direction.

In this context priority has to be accorded to implement the Basic Health System. The existing BHUs and RHCs will have to be expended by roughly five times by the year 2000 to achieve the targets of original BHS – one BHU for 10,000 population. Equally important in this respect appears to be the effective utilization of these services. This in turn would require increased allocation of recurrent expenditure, adequate staffing and training of staff posted in rural areas.

It is difficult to make a precise estimate of the expenditure entailed in the implementation of BHS. A crude calculation would indicate that current annual expenditure will increase by

three times, with an implication that it will register around 8 per cent growth in real terms over the next 15 years. Irrespective of the over-all magnitude, which would still be around 1 to 1.5 per cent of GNP, the successfull implementation would entail a significant shift in the sectoral allocation pattern. The share of rural areas has to be around three fifths rather than the existing one third. Similarly three fifths of the total has to be earmarked for recurrent expenditure whose share is currently less than half.

Since recurrent expenditure is the responsibility of Provincial Governments which are equipped with limited tax base, an increasing resort has to be made to user changes. The experience with user charges has not been very encouraging, and the very idea has been criticized by the parliament. A part of the funds collected under the Islamic Levies of Zakat and Usher can possibly be diverted for the medical treatment of the poor, while the private patients in the public hospitals may be passed on more than half of the cost of the service.

Recovery of the cost of service will, however, be justifiable only when the quality standards are maintained. At present the service has been sub-standard for a common man. The discrimination in the administration of the service along the socio-economic groupings is inappropriate. There is a need for improving the system of supervision and also evaluation of mechanism whereby speedy disposal of the grievances of patients is guaranteed.

The health system in Pakistan is overly a private one where both western and traditional medical practitioners operate. Recently there has been significant growth, partly due to over-supply of doctors and partly owing to the incentives provided by the government. There is hardly any regulatory mechanism worth the name. Inexperienced doctors should not be allowed to engage in private practice. More-over group practices may be preferred to solo system, the predominate mode of the day. The government must ensure that the people get proper treatment at reasonable prices. The existing laissez faire attitude of the government is hardly conducive for the welfare of the population.

There is a need for integration of the system to avoid duplication of efforts and smooth functioning. In this context the role of District Health Office needs redefinition with necessary powers vested in him to dispense with all the necessary functions. The current efforts to merge the vertical programmes with overall system be speeded up.

That the preceding birth interval is very closely related with infant mortality rate is reflective of the fact that population growth is a health problem too. The existing split between health and family services may have some justification in the Pakistani context, health objectives will be achieved if family planning services are also provided by health system of the country.

Appendix table I. Distribution of deaths by age and sex for Pakistan: 1962-1965 and 1968-1971

(Percentage)

Age	1962-1965			1968-1971		
	Both Sexes	Male	Female	Both Sexes	Male	Female
All ages	100.00	100.00	100.00	100.00	100.00	100.00
Less than 1 year	37.80	39.88	35.57	36.17	37.91	34.43
1-4 years	20.60	16.81	24.95	21.90	20.00	23.81
5-9 years	3.30	3.80	3.97	4.18	4.73	3.63
10-14 years	1.75	1.53	1.99	2.26	1.93	2.60
15-19 years	2.03	1.79	2.31	1.50	1.26	1.73
20-24 years	1.86	1.76	1.98	1.88	1.36	2.40
25-29 years	2.15	1.95	2.38	2.13	0.96	3.29
30-34 years	2.00	1.72	2.31	1.61	0.84	2.38
35-39 years	2.06	1.72	2.43	1.42	1.23	1.60
40-44 years	1.98	1.89	2.07	1.62	1.73	1.51
45-49 years	1.77	2.06	1.44	1.53	1.23	1.83
50-54 years	2.38	2.81	3.33	3.15	3.20	3.10
55-59 years	1.70	2.19	1.14	1.52	2.55	1.50
60-64 years	3.57	3.38	3.80	4.60	5.52	2.67
65 +	14.40	16.69	15.58	14.58	15.56	13.53

Source: M. Naseem Iqbal Farooqui and Ghazi Mumtaz Farooq, *Final Report of the Population Growth Estimation Experiment; 1962-65* Dacca, Pakistan Institute of Development Economics, July, 1971.

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Appendix table II. Expectancy of life at specified ages by sex for Pakistan for the years 1950-1952, 1962-1965, 1968-1971 and 1976-1979
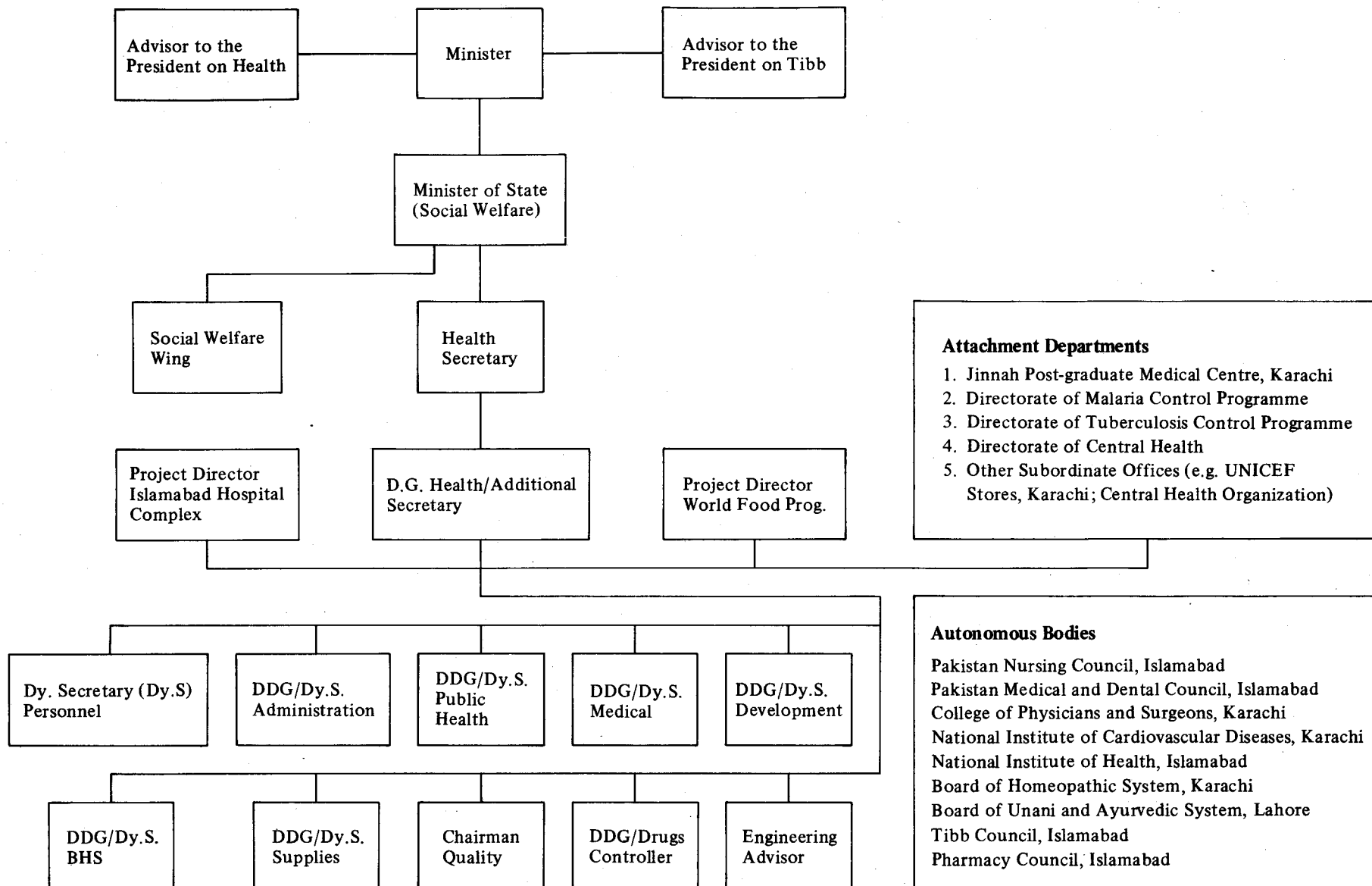
Age	Male				Female			
	1950-1952	1962-1965	1968-1971	1976-1979	1950-1952	1962-1965	1968-1971	1976-1979
0	32.87	52.17	54.85	56.13	34.42	45.97	49.16	56.98
1-4	40.96	59.51	61.33	62.98	41.76	52.44	54.02	63.04
5-9	44.65	60.10	61.34	61.39	44.60	54.60	54.17	61.94
10-14	41.74	55.90	57.23	57.77	41.45	50.93	50.23	57.93
15-19	38.21	51.80	53.07	53.34	37.94	46.93	46.89	53.77
20-24	35.06	47.55	48.84	48.95	34.84	43.05	43.38	49.61
25-29	31.83	43.26	44.55	44.62	31.91	39.29	39.79	45.45
30-34	28.52	39.10	40.20	40.36	28.92	35.42	36.14	41.33
35-39	25.50	35.04	35.96	36.17	26.24	31.60	32.43	37.24
40-44	22.40	31.04	31.62	32.07	33.63	27.53	18.70	33.20
45-49	19.30	27.22	27.39	28.09	20.59	23.82	24.96	29.21
50-54	16.08	23.50	23.28	24.25	17.57	19.92	21.26	25.31
55-59	13.27	19.92	19.36	20.57	14.67	16.10	17.66	21.52
60-64	10.34	16.57	19.96	17.09	11.34	16.11	14.31	17.87
65-69	8.13	13.46	13.00	13.85	9.14	12.78	11.40	14.41
70-74	6.25	10.64	10.42	10.89	6.65	9.70	8.89	11.19
75-79	1.97	8.09	8.24	8.26	4.45	6.96	6.82	8.31
80-84	3.95	5.90	6.26	6.00	3.49	4.77	5.25	5.89
85 +	2.81	4.03	4.07	4.10	2.76	3.70	3.74	4.14

Source: Kingsley Davis, The Population of India and Pakistan, Princeton, Princeton University Press, New Jersey, 1961.

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Appendix table III. Pakistan health sector: organizational structure of the Ministry of Health and Social Welfare

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┌──────────────────┐     ┌──────────┐     ┌──────────────────┐
│ Advisor to the   │─────│ Minister │─────│ Advisor to the   │
│ President on Health│    │          │     │ President on Tibb │
└──────────────────┘     └──────────┘     └──────────────────┘
                              │
                     ┌──────────────────┐
                     │ Minister of State│
                     │ (Social Welfare) │
                     └──────────────────┘
            ┌─────────────┴─────────────┐
  ┌──────────────┐              ┌──────────────┐
  │ Social Welfare│             │ Health       │
  │ Wing          │             │ Secretary    │
  └──────────────┘              └──────────────┘
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Project Director Islamabad Hospital Complex	D.G. Health/Additional Secretary	Project Director World Food Prog.

Dy. Secretary (Dy.S) Personnel	DDG/Dy.S. Administration	DDG/Dy.S. Public Health	DDG/Dy.S. Medical	DDG/Dy.S. Development

DDG/Dy.S. BHS	DDG/Dy.S. Supplies	Chairman Quality	DDG/Drugs Controller	Engineering Advisor

Attachment Departments

1. Jinnah Post-graduate Medical Centre, Karachi
2. Directorate of Malaria Control Programme
3. Directorate of Tuberculosis Control Programme
4. Directorate of Central Health
5. Other Subordinate Offices (e.g. UNICEF Stores, Karachi; Central Health Organization)

Autonomous Bodies

Pakistan Nursing Council, Islamabad
Pakistan Medical and Dental Council, Islamabad
College of Physicians and Surgeons, Karachi
National Institute of Cardiovascular Diseases, Karachi
National Institute of Health, Islamabad
Board of Homeopathic System, Karachi
Board of Unani and Ayurvedic System, Lahore
Tibb Council, Islamabad
Pharmacy Council, Islamabad

Source: Pakistan Health Sector Report (1983).

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