

No. 34

# THE OBSERVATION REPORT ON INFECTIOUS DISEASES IN PAKISTAN

1989

JAPAN INTERNATIONAL COOPERATION AGENCY  
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## PREFACE

In view of the fact that the control of infectious disease is an important subject in the health sector of the developing countries, the Japan International Cooperation Agency (JICA) decided to conduct a basic study on the present state of infectious disease in Pakistan as one of its activities for 1988.

JICA entrusted the contract works to the International Medical Foundation of Japan (IMFJ) and sent to Pakistan a study team with 5 (five) members headed by Dr. Kenji SODA, consultant to the Foundation, from August 5 to 29, 1988.

The study team exchange views with the officials concerned of the Government of Pakistan, and conducted a field survey in Islamabad and other parts of Pakistan.

After the study team returned to Japan, the data obtained from the field study were analyzed and the present report has been prepared.

I hope that this report will be useful for the further promotion of Japan's health and medical cooperation with Pakistan.

I wish to take this opportunity to express my deep appreciation to the officials concerned of the Government of Pakistan for the cooperation and hospitality extended to the study team.

February 1989

Shosuke SUENAGA  
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## **Acknowledgment**

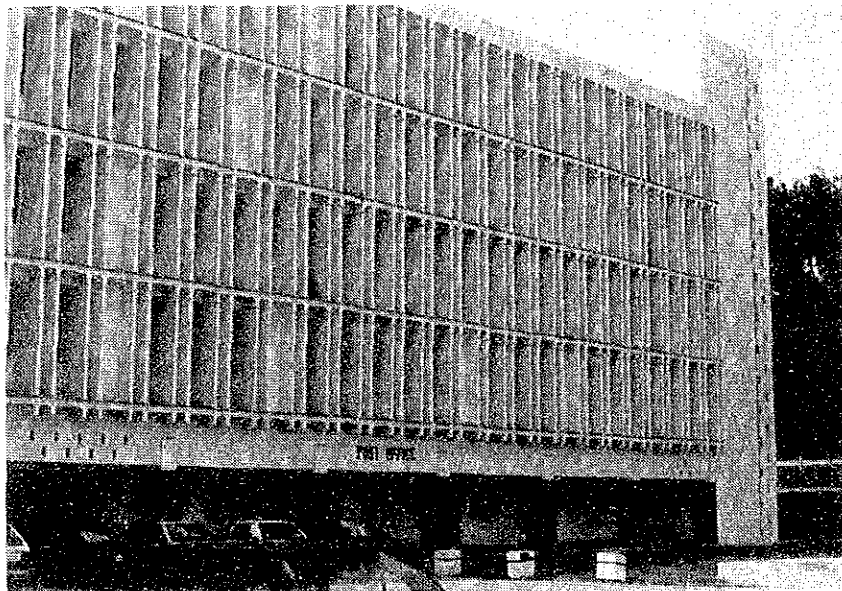
The JICA observation study team greatly acknowledges the kind cooperation given by a large number of Pakistan authorities concerned with health services. Without their devoted helps the team would not be able to complete their observation within such a short period. The team particularly wishes to express its sincere gratitude to their kind cooperation given by Dr. Aminuddin, Deputy Director General of Ministry of Health, Dr. Azhar Usmani, Deputy Director of Jinnah Postgraduate Medical Centre, Dr. N. Rehan, Secretary of National Health Research Complex and other excellent members.





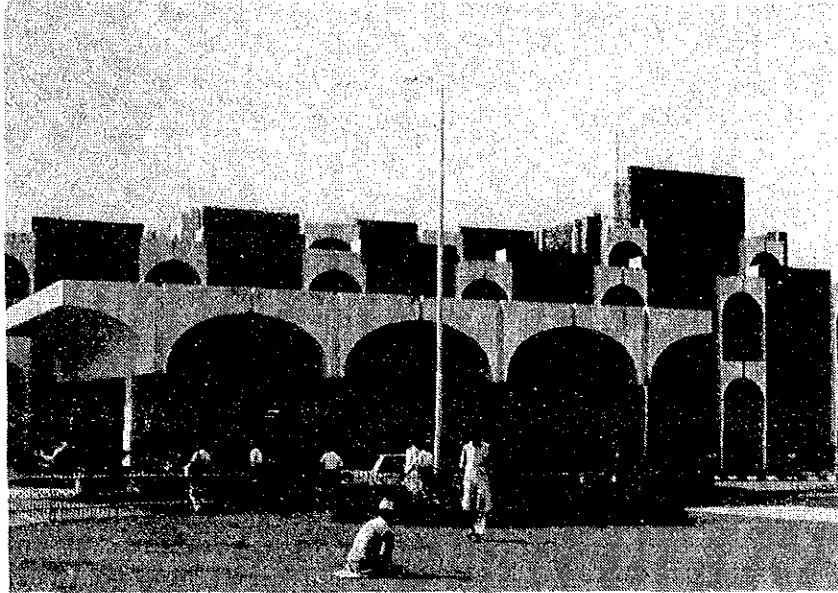


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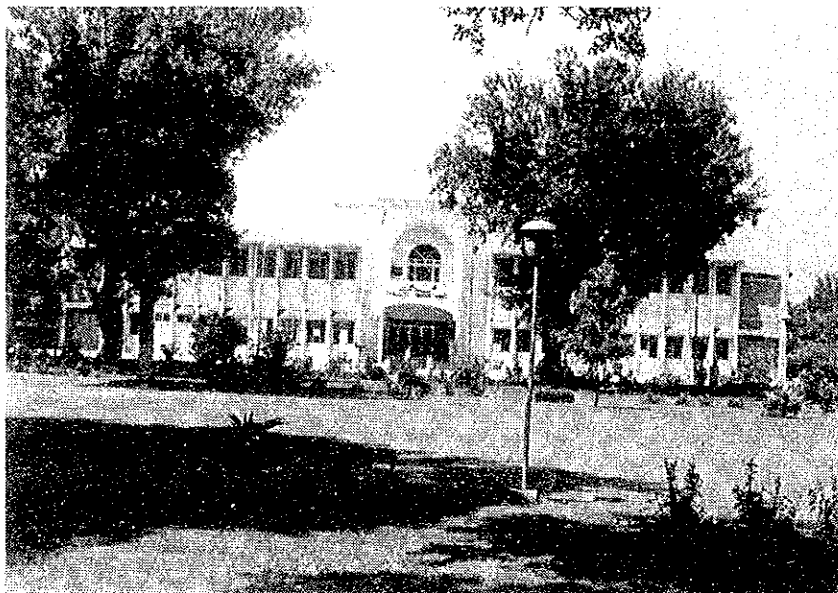


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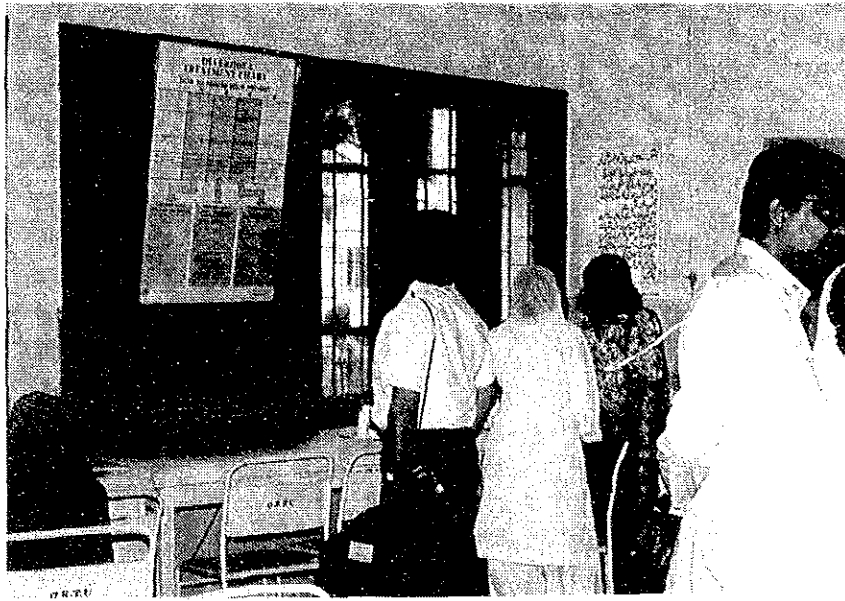


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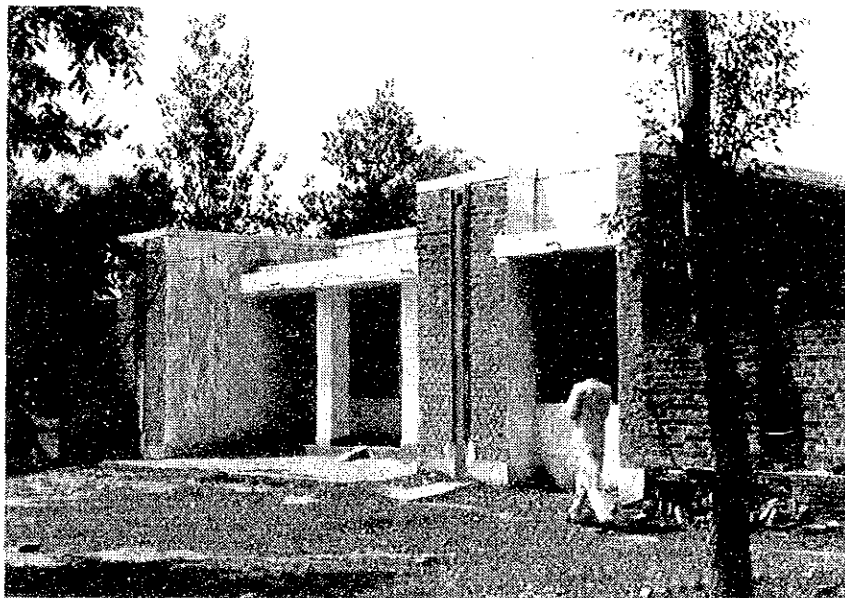


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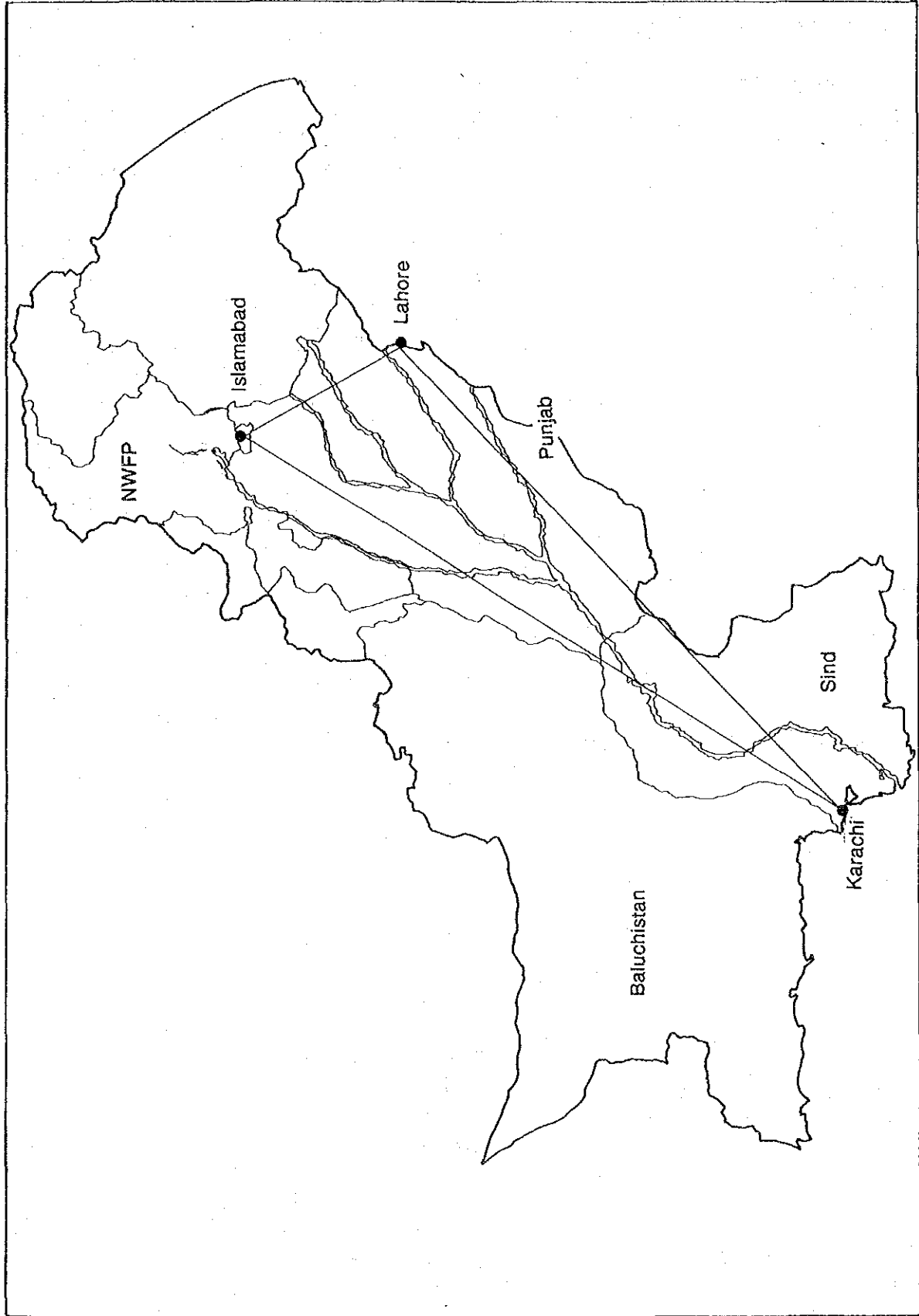


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# **1. Introduction**

Japan International Cooperation Agency(JICA) has already been extending its technical cooperation to Pakistan in various fields including health and medical aspects. In order to explore future cooperation, JICA decided to carry out a observation of the present status of infectious diseases as well as the control strategies in Pakistan by sending the present observation team composed of 5 members who cover public health, epidemiology, microbiology, parasitology, pediatrics, hospital facilities as well as general administrative structures of the Ministry of Health, Special Education and Social Welfare (Ministry of Health).

The team has been in Pakistan for 24 days started from August 5 to 28, 1988 and visited Islamabad, the capital of the country and some provincial areas such as Karachi, Lahore and Rawalpindi. In those places the team studied available informations on the health status and other health related documents, and observed the existing institutions for preventive and curative services, manpower programmes and activities to control various infectious diseases. The team also discussed with the authorities concerned on the health status of the people of Pakistan and strategies to control the diseases prevailing in the country or the areas visited.

This report summarizes their observations and some recommendations for the future cooperation.

## **2. Outlooks of the infectious diseases**

### **2.1 General aspects of morbidity and mortality**

Although there is no reliable data on the disease morbidity and mortality for all over Pakistan, this country seems still to face the time old problems of infections, nutritional and parental disorders. According to the in-patient's morbidity and mortality statistics of three hospitals (JPMC, JPMC children's hospital & Central Govt. Polyclinic, Islamabad) in 1984, accidents & injuries present first ranking mortality, infectious diseases at the second,

neoplasms at the third, parental disorders at the fourth and circulatory disorders at the fifth (Table 2-1). Among these infectious disorders, diarrhea and tuberculosis are predominantly shown by inpatients statistics of public hospitals in four provinces being gathered in the Biostatistic Section of MOH (Table 2-2). Tetanus, meningitis and other infectious diseases are also important. On the other hand, data from some cluster sampling field surveillances show another features and rather exact morbidity. In a cluster survey performed by PMRC in Karachi reveals high prevalence rate of any diseases (male; 55%, female; 67%) and respiratory tract infection presents first ranking (33%) and diarrhea at the second (28%). These infectious and nutritional diseases cause varying degree of morbidity and mortality and have adverse effect on economy. Most of these conditions can be prevented by taking proper control measures, such as improvement of environmental hygiene, adequate nutrization, immunization, early and adequate therapy as well as health education.

## 2.2 Bacterial and viral diseases

### 2.2.1 EPI related diseases

#### 2.2.1.1 Expanded programme on immunization (EPI)

EPI is performed for six diseases since 1979. The target subjects and ages for EPI vaccination in Pakistan is as follows.

Subject	Diseases	Vaccine	Age at immuniz.
Children	Tuberculosis	B.C.G.	at birth
	Measles	live measles vaccine	9 months old
	Polio.	O.P.V.(trivalent)	I: 6 weeks old II: 10 weeks old III: 14 weeks old
	Diphtheria		
	Pertussis	D.P.T.	I,II,III: same as above
	Tetanus		
Pregnant women	Tetanus	T.T.	I: 5 months of gestation II: 6 months of gestation

Epidemiological survey in 1978 with 113 randomly selected clusters from all over the country reveals very high morbidity and mortality rates as below:

Diseases	No. of Cases	Incidence rate Per 100,000	No. of deaths	Mortality rate Per 100,000	Case fatality (%)
Measles	1,252,035	2,888	25,361	58.5	2
Pertussis	328,122	757	7,843	18.1	24
Tetanus	60,520	140	59,827	138.0	99
Neonatal Tetanus	23,033	58	21,421	49.4	93
Poliomyelitis	28,058	65	7,924	18.4	28
Diphtheria	18,104	42	14,935	34.5	82

1987 projected population 43,353 millions

Although immunization for 6 diseases including tuberculosis started in 1979, the coverage rate in 1982 was 5% being far from satisfactory. The Government decided to launch an Accelerate Health Programme (AHP) wherein training of traditional birth attendants (TBA) was also included. AHP started in 1983, the objective being to fully immunize 15 million children under 5 years of age. Since then the full immunization coverage rate has increased rapidly as shown below:

#### National Immunization Coverage Evaluation(Fully Immunized)

Year	12-23 months children	mothers
1984	59%	24%
1987	69%	40%
1988	81%	64%

A nation-wide disease survey (1987) for selected EPI diseases, poliomyelitis, measles and neonatal tetanus, showed marked reduction in morbidity rates when compared with 1978:

	Morbidity rate/100,000 pop.	
	1978	1987
Poliomyelitis	65	23
Measles	2,888	492
Neonatal Tetanus	58	17

Case fatalities in recent years of these communicable diseases also became lower compared to those of 1978. In-patients case fatality rate of measles, pertussis, tetanus, neonatal tetanus and diphtheria in 1984-1986 are 0.44, 0.03, 3.38, 19.23 and 5.21%, respectively. Decreases of case fatality rate might be due to improvement of medical facilities and nutritional conditions. Although the evaluation of effect of EPI is very difficult, efficiency of immunization seems evident according to the annual report (1987) of a Health Centre in Karachi as follow:

Diseases	Fully vaccinated 0-5 years of age		Unvaccinated 0-5 years of age		Case fatality
	Cases	Deaths	Cases	Deaths	
Measles	-	-	74	6	8.1%
Pertussis	-	-	28	-	0%
Diphtheria	-	-	-	-	-
Neo. Tetanus	-	-	142	63	44.4%
Tetanus	-	-	27	9	33.3%
Poliomyelitis	-	-	75	5	6.7%
Tuberculosis	-	-	134	14	10.4%

High case fatality rates of this district compared to above mentioned case fatalities might be due to poor hygienic environments and poor nutritional status. EPI related communicable diseases will decrease further if a more intensive immunization campaign and a more intensive health education are performed.

Although, the immunization coverage rate was increasing in urban areas, it is not yet enough, especially in less populated areas (Table 2-3). In 1988, NWFP/FATA showed the highest coverage rate (fully immunization rate



of 89% for the age group of 12-23 months old children) and Balchistan was the lowest (40%).

The facilities for storage of vaccine such as cold rooms and freezers in Karachi seemed to be provided better than many other developing countries, but it seems to be desirable to use disposable syringes usually to carry out more clean and efficient vaccination.

#### 2.2.1.2 Tetanus

Neonatal tetanus is still one of the most important disease in Pakistan. The annual number of patients reported to the Biostatistics Division is as follow:

Year	1984	1985	1986	1987	Total
Cases	712	450	1,069	1,147	3,378
Deaths	157	42	229	202	630
Case fatality rate(%)	22.1	9.3	21.4	17.6	18.7

As these figures indicate the number of reported patients in some public hospitals, the total number of patients with neonatal tetanus in all over the country is estimated to be at least 10 times large. The reasons for high incidence of neonatal tetanus may be; (1) non-hygienic home delivery (about 90% of total deliveries), (2) low tetanus immunization coverage rate (about 25%) in pregnant women, (3) lack of well-maintained delivery facilities and care. There are also a great number of tetanus patients other than neonates, reported to the Biostatistics Division of MOH, as follows:

Year	1984	1985	1986	1987	Total
Cases	5,930	7,684	5,073	2,043	20,730
Deaths	199	56	370	257	882
Case fatality rate(%)	3.4	0.7	7.3	12.6	4.3

#### 2.2.1.3 Measles

The numbers of inpatients with measles of some public hospitals, reported to in recent years are as follows:

Year	1984	1985	1986	1987	Total
Cases	22,165	26,686	42,304	45,996	137,151
Deaths	29	51	318	271	669
Case fatality rate(%)	0.1	0.2	0.8	0.6	0.5

As these figures come from only the limited sources, the total number of patients including outpatients and untreated ones must be far bigger. Though the annual numbers of inpatients indicated above are increasing every year, the actual number of measles patients is suggested to decrease by the data related to EPI. Case fatality rate of measles is still high in Pakistan, so EPI must be carried out more intensively.

#### 2.2.1.4 Diphtheria

The number of inpatients affected by diphtheria reported to the MOH are 758, 1052, 3179 and 2720 in 1984, 1985, 1986 and 1987, respectively, while the number of patients from the another source of country-wide EPI shows gradual decreases in recent years. Case fatality rate of diphtheria during these 4 years is 6.7%, which might be

far under-estimated, because bacterial examinations are not routinely done.

#### 2.2.1.5 Pertussis

Numbers of patients reported to MOH in recent years are as follows:

Year	1984	1985	1986	1987	Total
Cases	48,095	55,559	53,835	47,676	205,165
Deaths	0	0	45	51	96
Case fatality rate(%)	Case fatality rate throughout these 4 years is 0.05%				

Case fatality rate throughout these 4 years is 0.05%.

The diagnosis of pertussis is usually made only by clinical signs without routinely performed serological examination and bacterial culture. So, it is difficult to get actual incidence of the disease, but it seems no remarkable change in the prevalence of pertussis.

#### 2.2.1.6 Poliomyelitis

The numbers of inpatients reported to MOH and case fatality rate from 1984 to 1987 is as follows:

Year	1984	1985	1986	1987	Total
Cases	894	747	2,660	2,540	6,841
Deaths	3	1	171	119	294
Case fatality rate(%)	0.3	0.1	6.4	4.7	4.3

There seems no decrease of incidence of poliomyelitis recently so far from these figures. An epidemiological survey will be necessary to determine whether the number of patients with poliomyelitis is actually increasing or not.

#### 2.2.1.7 Recommendation for EPI related disorders

(1) Improvement of the medical statistics information system in order to obtain reliable information about the number of patient.

(2) Although an increase of immunization coverage rate is reported, the number of patients with EPI related diseases in some public hospitals are increasing every year. It is not clear whether this is a result of registration failure or is it true increase of patients.

(3) Improvement of methods to evaluate the effectiveness of vaccination, such as the measurement of antibodies and the establishment of more expanded registration method of patients.

(4) More hygienic syringes (disposable syringe) should be adopted.

#### 2.2.2 Infection of digestive system

##### 2.2.2.1 Diarrheal diseases

Diarrhea is the most prevalent disease in children. Out-patient's clinics of children's hospitals in Islamabad and Karachi are always crowded with diarrheal patients of about 600-700 a day on average. As overall estimated ratio of diarrheal morbidity and mortality has not been established, a cluster field survey in the whole country (2,631 children under 5 years in 1,490 families) was performed by NIH supported by the WHO in 1983. The main results are summarized as follows:

	Diarrheal incidence		Home medical care	Rehydration therapy	No treatment
	Summer	Winter			
Pakistan	51%	30%	34%	37%	4%
Rural	51%	31%	35%	32%	5%
Urban	52%	29%	32%	47%	3%

Source: Diarrheal disorders and feeding practices in Pakistan, 1984

This survey revealed that 51% of the children under 5 years of age suffered from diarrhea at any given time during summer season, while 30% of them had diarrhea in winter. The incidence and severity of diarrhea was almost the same extent in all of the four provinces. Four percent of the children suffering from diarrhea had no treatment while 37% were given oral rehydration. 34% had various kinds of home cares as stated below, some of which were considered contraindicated. Only 10 patients (less than 0.4%) received intravenous therapy.

Percent of feeding practices during diarrhea

	Stop all food	Stop all solids	Stop all liquids	Feed normally	Increase liquids	Increase liquids
Pakistan	13.3	17.0	0.7	29.0	36.7	3.3
Rural	15.5	20.0	0.5	29.5	31.0	3.5
Urban	9.0	11.0	1.0	28.0	48.0	3.0

Source: Diarrheal disorders and feeding practices in Pakistan, 1984

The mortality rate (per 1,000 live births) due to diarrhea was 19.7 among children under 5 years of age, and these were lower in rural areas and higher in urban areas ranging from 10.4 to 31.3. The highest child mortality rate of 23.3 per 1000 live births was observed in Sind Province followed by NWFP, Punjab and the lowest of 13.9 in Baluchistan (Table 2-4). Diarrhea is responsible for about 35% of the total number of deaths in children under 5 years, and so rehydrate medication is very important. The oral rehydration therapy has been introduced overall Pakistan and is performed even by home visiting nurses, while the intravenous rehydration therapy still remains very rare. The oral rehydration therapy seems not so effective for patients with severe rehydration and vomiting, and thus more extensive intravenous rehydration should be performed.

The investigations for etiological agents of diarrhea started recently in some laboratories. In most of the reports concerning diarrhea, *E. coli* ranks first (30-48%), rota-virus second (around 30%) followed by other microor-

ganisms including parasites. (Table 2-5). The pattern of age distribution of rotavirus and non-rotavirus infections is almost the same, and the peak of incidence is found in young infants. The mortality rate of hospitalized children is slightly higher in cases of rotavirus infections (3.2%) than in those of non-rotavirus infections. Main clinical features and case fatality rates of rotavirus and non-rotavirus gastroenteritis are as follows:

	Diarrhea	Vomiting	Fever	Case fatality rate
Rotavirus(N=92)	100%	90.2%	55.4%	3.2%
Non-rotavirus(N=172)	100%	46.8%	57.0%	2.9%

Source: Rhutta TI et al. Rotavirus enteritis in hospitalized infants and young children. PJMR, 208, 1987

The distribution of the mode of feeding in infantile diarrhea is shown as below in 280 patients:

	Breast fed.	Animal Milk	Tin Milk	Mixed	Total
No. of Pt.	53(18.9%)	67(23.9%)	12(40.0%)	48(17.2%)	280(100%)

Source: JPMA, May 1986

The percentage of tin milk feeding during infancy in urban areas is estimated to be about 20% in Pakistan. Accordingly the share of diarrheal patients fed with milk is relatively high, and this may be due to unhygienic preparation of tin milk.

The nutritional status of children who visited a diarrheal clinic is generally poor. Around 60% of the patients had chronic malnutrition and 81% of them were under the

5 percentile. Reasons for this frequent chronic malnutrition are considered to be as follows:

(1) High frequency of small-for-date-infants due to malnutrition (around 25% of the new-born are low-birth-weight- infants, and half of them are SFD) closely related with lacks of mother's knowledge on nutrition.

(2) Prolonged period of weaning occasionally accompanied by unhygienic tin-milk feeding.

#### 2.2.2.2 Cholera

Cholera epidemics were sometimes observed in some areas, but epidemiological studies in overall Pakistan have not been carried out yet and there are no reported cholera cases to MOH recently. While we found the three following reports concerning cholera epidemics:

(1) Bokhari S.R et al. The pattern of vibrio El-Tor epidemics in Punjab, Pakistan. Pakistan Journal of Health, 25, 1, 1988.,

(2) Bokuhari S.R et al. A study of cholera in the city of Lahore in 1980. Pakistan Journal of Health, 25, 22, 1988., and

(3) Siddiqui PMA. A study on prevalence of bacterial diarrhea and its agent. JPMA, 29, 239, 1979. According to these reports, the recent situation of cholera epidemics are summarized as follows:

(a) Epidemics of classic cholera occurred in Pakistan in 1947, 1948, 1949, 1958, 1960 and 1968. Since 1968 there has been no outbreak of classic cholera in Pakistan.

(b) On the other hand Vibrio El-Tor serotype Ogawa was introduced to Pakistan, in the Liari of Karachi, in 1964 spread to various towns along the rail road upcountry and epidemics have occurred every year since then.

(c) From 1964 to 1979 cholera epidemics in Punjab occurred in Lahore every year as shown in Fig. 2-1.

(d) Healthy carriers of cholera bacilli are also noticed as follows:

No. of index cases	No. of contacts	Positive for vibrio cholerae		
		Total	Mild cases	Symptomless carriers
8	134	61(45.5%)	49(80.3%)	12(19.7%)

#### 2.2.2.3 Enteric fever and dysentery

As stool cultures are not routinely performed in Pakistan, diagnosis of these diseases basically have to depend on the clinical features. According to the annual reporting of admitted patients in some public hospitals in Pakistan, incidence of these two diseases seems to be too high when compared to the incidence of so called gastroenteritis as stated in chapter IV.1, suggesting doubtful diagnoses of these diseases. Recent investigations of stool cultures in many research institutes and laboratories revealed that the most frequent microorganisms causing diarrhea were *E. coli* and rotavirus. According to the data from 3 reports incidences of *Shigella* and *Salmonella* are not so high comparing to those of *E. coli* and rotavirus (Table 2-5).

In order to determine the causative organisms of these diseases regular stool cultures would be necessary.

#### 2.2.2.4 Rotavirus infection

Since virological and serological examination are not routinely performed, the exact incidence of rotavirus infection is not clear. Recently Bhutta et al. reported that rotavirus was responsible for about 30% of all gastroenteritis in children (Table 2-5). It also became apparent that the mortality rate was higher in rotavirus



gastroenteritis than in non-rotavirus gastroenteritis because of more frequent vomiting.

#### 2.2.2.5 Viral hepatitis

As serological examinations of hepatitis related antigens and antibodies are not routinely performed, morbidity rate of hepatitis is not clear in Pakistan, but the prevalence rate of hepatitis is suggested to be high according to several reports. In some districts, almost 100% of the population have HA-Ab at the age of 20 years and HBs-Ag carriers are found in about 10% of people of both sexes. In general prevalence rate is higher among patients from lower socio-economic classes. Prevalence rate of hepatitis A and B in the Northern part of Pakistan is as follows:

Positive rate of hepatitis related antigen and antibody

Group studies	No. examined	HA-Ab	HBs-Ag	HBc-Ab
Medical student(18-20 years)	60	96.6%	5.3%	
Recruits(16-18 years)	365	100.0%	10.7%	22.5%
Pregnant women(Rawalpindi & Islamabad)	205		7.8%	33.2%

Source: JPMA, 38, 39, 1988

Among patients with acute hepatitis, about 30-50% are of the non-A non-B type. In an investigation of 329 patients with acute hepatitis in a frontier region in Pakistan, the share of non-A non-B type occupied 54.5%, while those of HB and HA were 34.3% and 11.2% respectively (Burney, MGI et al., PMRC, 1988).

As mentioned above, prevalence rate of hepatitis is considerably high in Pakistan, nevertheless there are only a few blood banks and laboratories which have ability to test blood for HBs-Ag. HB examination should routinely be performed to identify HB carriers and to prevent transmission of hepatitis.

#### 2.2.3 Acute respiratory tract infection

Acute respiratory tract infection (ARTI) is one of the most important diseases, particularly in childhood. A surveillance performed in 1985 in Abbottabad district which consisted of 33 villages (a population of 32,078 including 1,425 infants and 3,321 children aged from 1 to under 5 years in 2,923 families) revealed the following results:

(1) The prevalence rate of ARTI per month was around 20% in the age group under 5 years.

(2) Among these patients, 65% were mild cases and 4% were severe cases. Eleven percent of the patients visited a doctor, 1.5% had no medication, 2% visited a traditional healer and 55% were given medications by home visiting nurses.

Another surveillance in Karachi City conducted by Karim in 1988 revealed that the prevalent ratio of ARTI ranked first (24-41%) among all diseases (Table 2-6).

As for inpatients, the number of patients suffering from ARTI including pneumonia ranked second in JPMC children's hospital in 1984, and the mortality rate was 16.4%.

Causative agents of ARTI are still quite unknown in Pakistan. However, staphylococcus aureus in younger children and streptococcus pneumoniae in older children are considered to be the most important ones. As for the viral agents, according to the report by Iqbal in Lahore 1987, 23% of 305 URTI patients had positive findings for viral infection, and 71.4% of them were RS virus positive followed by Influenza A,B and Parainfluenza type 3.

#### 2.2.4 Tuberculosis

Tuberculosis is still an important problem in this country. Two big cluster sampling surveys had been performed in 1961-62 and 1974-78, since then no nation-wide survey on tuberculosis has been conducted.

Results of an overall survey (number of subjects: 19335 in 33 districts) in Pakistan from 1974 to 1978 were summarized in the "Report of National Tuberculosis Survey 1974-1978". Outline of results of this survey are as follows:

(1) Spontaneous positive BCG in two surveys were:

Age in years	Survey 1961-62	Survey 1974-78
0- 4	4.8%	3.4%
5 -9	23.1%	13.0%
10-14	47.4%	45.5%
15-19	70.5%	67.9%

(2) Results of chest X-ray in the two surveys were:

X-Ray Findings	Survey 1961-62	Survey 1974-78
Normal	82.3%	91.5%
Lesion other than TB	6.7%	3.4%
Inactive TB	5.4%	3.1%
Suspected TB	1.0%	-
Active TB	4.6%	2.0%
Total	100.0%	100.0%

Active TB incidence in male was slightly higher than female.

(3) Sputum examination and positive rate was:

	Male	Female	Total
Total examined	770	772	1,492
Positive rate	27(3.5%)	14(1.9%)	41(2.7%)

The sputum positive rate in male was higher than female and the percentage of positive cases among a population with cough was about 4-5 times higher than the one without cough. A difference between urban and rural areas was not observed. However differences between four Provinces were remarkable; Sind ranking first with 4.89% followed by NWFP (3.97%), Baluchistan (2.78%) and Punjab (2.13%). As for age distribution, there was no

positive case in the 10-14 years group and 40-44 years group showed the highest rate (10.48%).

These results proved that tuberculosis is one of the most important diseases in this country. In 1988 it is estimated that there are about 5 million patients in Pakistan. Although the BCG immunization rate has increased rapidly since the introduction of the Plan of Accelerated Health Programme in 1983, at least 100,000 TB patients are admitted to the public hospitals every year. The mortality rate of these inpatients from 1984 to 1986 was 0.8% (2,047 out of 261,043). There are about 4,200-4,500 beds in 17 tuberculosis hospitals and in each district hospitals. However, there is short of laboratory facilities. The medication is started by some combinations among SM, INH, Thiocatazon, EMB, RH and PZM, but in recent years drug resistant TB bacilli are increasing. Probably there are no resistance of bacilli only to Refampicin and Ethambutol.

According to a report, incidence of resistance is variably high in case of the primary drugs (INH, STM, PAS) and relatively low for secondary drugs (Ethio, Ethan, Thia, Rifa). Among the primary drugs more than 28% of the cases are resistant to INH, 32% are resistant to STM and 15% are resistant PAS.

### 2.2.5 Leprosy

Leprosy is also one of the important infectious diseases in Pakistan. Almost all of patients are registrated and the total number of leprosy patients in 1988 is approximately 31,000 (Table 2-7). There are 35 leprosy centers (10 in Sind and Punjab each, and 5 in NWFP, Baluchistan and Aza Kashmir each). In order to get the correct number of patients, who frequently migrate into other areas, all leprosy patients have consecutive registration numbers and charts of their own. Before introduction of this system, WHO estimated the number of patients about 80,000. Drugs used for the treatment of leprosy are Rifampicine, Dopsone (DDS) and Clofazimine (B663). The number of patients for each type of leprosy in some area in 1986 are as follows:

	TT	BT	TB	BB	BL	LB	LL	Others	Total
Punjab	203	184		36	41		302	8	774
Balakot, NWFP	43.0	405		23	122		217	37	847
Leprosy Hos., KMC	557	138	172	169	109	126	1,611	89	2,971
Total	803	727	172	228	272	126	2,130	134	4,592
(%)	17.5	15.8	3.8	5.0	5.9	2.7	46.4	2.9	100.0

	No. of registered Pt.	Deahts(%)	Healed(%)
Balakot, NWFP	847	23(2.7)	2(0.2)
Punjab	774	9(1.2)	1(0.1)
Total	1,621	32(2.0)	3(0.2)

In 1988 there were 1,652 patients registered at the Marie Adelaide Leprosy Centre in Karachi. Among these patients 1,034 were under treatment, 112 were newly admitted and 506 were discharged and under surveillance; 65% were male patients, children accounted for 15%. Deformity rate was 18%, infective rate was 36.6% and 82% of all patients received regular medication.

## 2.2.6 Other infectious diseases

### 2.2.6.1 Rabies

Rabies is an important zoonosis all over the world and particularly in the developing countries. Although the exact morbidity and mortality is not available, 413 cases were reported from 1984 to 1987 and case fatality rate was 32%.

At present rabies vaccine is manufactured at NIH, Islamabad, and NIH supplies about 60,000 doses of rabies vaccine to hospitals every year. So, it is estimated that at least 6,000 persons are bitten by dogs every year.

### 2.2.6.2 Encephalitis

Encephalitis and encephalopathy are one of the most serious diseases. According to a joint Pakistan-Japanese Study in several hospital survey in Karachi from July 1983 to 1986, 126 cases were estimated as viral encephalitis.

In 45 (35.7%) out of 126 the aetiology was identified; Japanese encephalitis was 9 cases, West Nile virus encephalitis was 1 case, rubella virus encephalitis was 1 case, measles virus encephalitis was 2 cases, subacute sclerosing panencephalitis was 23 cases and herpes simplex encephalitis was 9 cases.

The results mentioned above does not seem to show actual aetiological pattern of encephalitis. Encephalitis due to measles and rubella, which are rather popular in pediatric field, are suspected more frequent.

### 2.2.6.3 Cerebrospinal meningitis

Bacterial meningitis is one of the most fatal diseases of children and widespread in Pakistan. The Number of patients in public hospitals from 1984 to 1987 are shown as below:

Year	Cases	Deaths	Case fatality rate
1984	5,590	104	1.9%
1985	592	44	7.4%
1986	6,048	825	13.6%
1987	5,374	433	8.1%
Total	17,604	1,406	8.0%

Source: Biostatistic Section of MOH

The total number of cases in the whole country must be much higher than those figures. Case fatality rate is about 8%. Though bacteriological and virological examinations of cerebrospinal fluid are rarely performed, meningococ-

cus is supposed one of the most common microorganisms for meningitis.

#### 2.2.6.4 Acute hemorrhagic conjunctivitis

Infectious disease of eye is popular in this country, and most of them are viral origin. Pandemic of acute hemorrhagic conjunctivitis (AHC) due to enterovirus 70 was reported in 1981. Main clinical signs of AHC were periauricular lymphadenitis (60%) and subconjunctival hemorrhage, and showed better prognosis if not complicated by bacterial infections.

#### 2.2.6.5 AIDS

According to the WHO Weekly Epidemiological Record 6 AIDS cases were reported to WHO from Pakistan until September 25, 1988. On the other hand, 5 cases of AIDS patients were reported to MOH until April 1988, and 4 cases of them were foreign male seamen and the other one case was a Pakistani woman who had received blood transfusion in Qatar (Table 2-8).

In 1988 R.M.Khanani et al. reported the evidence of the HIV infection in four individuals including a blood donor and three members of a family (husband, wife and a child) in Karachi. In this report two seropositive males were revealed to be a blood donor and a drug abuser. In these cases, the earliest time HIV infection was proved was December 1986 for the male drug abuser. This study also showed that among 230 sera from six high-risk groups HIV seropositive rate by WB test was 0.8% for blood donors, 2.5% for drug abusers and 33% for family members of a positive case (Table 2-9).

More large scale serological survey was conducted by NIH, and 19 cases of HIV seropositives were detected among 827 referred cases from various hospitals. Five of them developed clinical symptoms of AIDS (Table 2-10).

Another seroepidemiological study(S.Z.H. Bankhari, 1988) also gives the evidence of HIV infection in high risk groups. In this study, 1601 serum samples were inves-

tigated by ELISA test; 1050 general population, 60 prostitutes, 30 homosexuals, 60 blood transfusion recipients, 60 blood donors, 20 haemophiliacs, 30 parenteral drug abusers, 60 persistent generalized lymphadenopathy cases and 231 expatriates/visitors (200 from USA, 30 from Europe). Out of them, one case of AIDS was found in transfusion recipients and no HIV carrier was detected (Table 2-11).

At present, serological examination is usually performed in NIH, Islamabad, 3 hospitals in Karachi and Armed Forces Institute of Pathology in Rawalpindi.

Above mentioned situation indicates that AIDS and HIV infection is not yet a serious problem in Pakistan at this stage. However, there are clear evidences of invasion of HIV in Pakistan, and there seems increasing tendency of HIV infection, so the special attention should be placed on the surveillance of AIDS and HIV infection.

## **2.3 Parasitic diseases**

### **2.3.1 Malaria**

The whole country is malarious with the exception of extremely cold areas and deserts in Pakistan. It is estimated that about 62 million people are exposed to the risk of infection.

It has recently been reported that the incidence of malaria seems to be maintained at low level. The recorded slide positive rate for the whole country was 3.13% and annual parasite incidence was 1.43 per thousand in 1986 (Table 2-12 - 2-21).

The seasonal peak of malaria transmission may occur during rainy and post-rainy seasons (June-September) (Table 2-22).

Two species of malaria parasite, *Plasmodium vivax* and *P. falciparum* have been observed in the country and



32.6% of the total positives was recorded as *P. falciparum* in 1986. The first two case of chloroquine resistant falciparum malaria were reported from Sheikhpura in 1981 and it appears that chloroquine resistance is quite widespread in the country now (Table 2-23 - 2-26).

Two species of *Anopheles*, *A. culicifacies* and *A. stephensi*, are confirmed as malaria vectors. Both of them are densely found throughout the country (Table 2-27 - 2-32).

Anti-malaria activities started from 1961 and the Third five years plan(1987-88 to 1992-93) for malaria control has been carried out to maintain the low level of malaria prevalence, USAID is willing to provide financial support during this plan period (Fig.2-2, 2-3).

### 2.3.2 Leishmaniasis

The visceral leishmaniasis was first reported from Baluchistan; the cases were 60 with the 80% of children cases. Following strict control measures it was controlled from that area. Nevertheless the disease reappeared not only the previously endemic areas but also from the neighbouring regions, parts of Northern Punjab and the adjacent NWFP. The cutaneous leishmaniasis on the other hand is reported from all over the country. However, it has been mainly endemic in Baluchistan; the cases were 139 at vital with active cases of 70.

Very few epidemiological studies on leishmaniasis have been carried out in the country. No information regarding their vector(s) and reservoir host(s) is known. Therefore it is an urgent need to carry out further detailed epidemiological investigations before formulating effective control strategies (Table 2-33 - 2-40).

### 2.3.3 Dracunculiasis

In recognition of the existence of dracunculiasis, The Pakistan Guinea Worm Eradication Programme was established in November 1986 at aims of the elimination of dracunculiasis by 1990, the end of the International Drinking Water Supply and Sanitation Decade. During the first

year the programme conducted a national search and validation survey to determine the prevalence of the disease in the country. A nationwide search of all villages (approximately 48,000) was carried out between April and June 1987 and a total of 401 villages were provisionally identified as having endemic guinea worm disease, 252 in Sind Province, 79 in NWFP and 70 in Punjab Province. Following the initial surveys, control measures have been introduced in areas that include a large cluster of affected villages in Sind Province (Table 2- 41, 2-42, Fig.2-4).

#### 2.3.4 Hydatidosis

Very few data are available on the hydatidosis. According to some sources of information the incidence of hydatidosis in livestock is high; the rates were 12.3% for buffaloes, 9.6% for cattle, 8.3% for sheep and 7.5% for goat. Furthermore 26 human cases of hydatidosis were seen over a period of 2 years in Liaquat College Hospital, Hyderabad. Hydatidosis is one of most serious parasitic diseases in Pakistan but little study on the epidemiology of the disease has been undertaken. There is therefore an urgent need to carry out further detailed epidemiological studies including research on the incidence of human being and livestock as the intermediate host and dog as the final host.

#### 2.3.5 Intestinal parasitic diseases

There are several reports which indicate that intestinal parasite infection is common in Pakistan. Among them Giardiasis, Amoebiasis, Ascariasis and Hymenolepis nana infection are common having high prevalence rates. A survey carried out on 3,478 school children in Islamabad indicates that Giardia(41.9%), Entamoeba histolytica(11.9%), Hymenolepis nana (21.6%), Ascaris(11.1%), Enterovius(9.1%) were found at total rate of 53.9% for protozoan and 46.4% for helminthic infections (Table 2-43 - 2-45).

### 3. General health status

### **3.1 Basic aspects**

According to the latest population census in 1981, the population of Pakistan was 84,253,644 (male 44,232,677, female 40,020,967), and annual increasing rate is calculated to be 3% (1981-1985) and 4.2% (1985-1988) in average based on another data in 1986. The population ratio of urban/rural area was 3:7.

According to the data used in the Seventh Plan, the crude death rate is said to be 11 per 1,000 population in 1988, the infant mortality rate (per 1,000 live births) is said to be reduced from 98.5 to 80.0 for the year 1982 and 1987-88 respectively. Life expectancy at birth is said to increase from 58.6 years to 61.0 also for the same years (Table 3-1 - 3-6, Fig.3-1).

Some statistics of governmental hospitals on inpatients in 1984 indicated infectious diseases as the first ranking morbidity (11% of all cases), accidents & injuries at the second (10%), parental & congenital disorder at the third (7%). Limiting to data from Children's Hospital, infectious diseases occupied 31% of all cases. Among infectious diseases, diarrhoeal disease is at the head, following with tuberculosis, pertussis.

According to the above mentioned data, the leading causes of death are diarrhoeal diseases, tuberculosis, parental & congenital disorder, heart disease and road accidents (Table 3-7).

### **3.2 Nutrition and maternal and infantile health**

Although food supply is not poor in this country, malnutrition of children is an important problem. About 60% of preschool children are malnutritional status. Aetiological factors of malnutrition are considered as follows:

1. Frequent diarrhea; about half of the children suffers from diarrhea at least once every season.
2. Percentage of low birth weight infant is high; about 25% of all live births are low birth weight infants, more than 50% are small for dates infant due to maternal malnutrition.

3. Breast feeding failure; bottle feeding is increasing recently up to about 20% and even 50% in poor urban area, a large number of them are not hygienic and over-diluted.

4. Lack of knowledge of supplementary food; a large number of mothers have no knowledge for supplementary foods and sometimes continue only breast feeding for their children even after 1 year old.

Chronic malnutritional anemia and morbidity rate of another disease are also dominant in adult female. These malnutritional status affect the intrauterine fetal growth.

Another problem is that about 90% of overall pregnant women deliver at home under poor hygienic conditions. These problems will be resolved by intensive health education on nutritional and hygiene (Table 3-8 - 3-13).

### **3.3 Environmental hygiene**

In order to reduce the food-borne and water-borne diseases, the facilities related to environmental sanitation and food hygiene should be essentially improved.

Regarding to safe water supply, the coverage of piped water is 51.6% in urban population, while in the rural areas where nearly 70% of the people inhabits, piped water is provided only to 16.1% of population and hand-pumps cover 18.7% additionally.

Not only the coverage of water supply but also quality control must be promoted.

As for sanitation facilities, only 17.5% of the rural population have adequate facilities such as latrine with or without flush and pit latrine.

The provision of sanitary facilities and establishment of treatment plants for the excreta disposal should be extensively promoted (Table 3-14 - 3-20, Fig.3-2, 3-3).

Incidence of food poisoning (food-borne infection) is not clear probably due to absence of surveillance system. Recent study on microbiological contamination of

foods(NIH, 1986) revealed that 49% of various kind of 282 test samples were assessed to be inadequate to eat according to the international criteria of food(ICMSF) (Table 3-21 - 3-24).

## **4. Health services**

### **4.1 Curative and preventive services**

According to the data from "Rural Health Programme of Pakistan(1986)" the numbers of the primary health/medical care sectors are as follows; RHC(Rural Health Centre) 488, BHU(Basic Health Unit) 2,500, MCH(Maternal & Child Health) Centre 867, Dispensaries 3,994, Sub-centre 632. As to the secondary and tertial medical sectors, there are 630 of hospitals including 54 teaching hospitals. However, these hospitals actually play a roll of the primary medical care sectors because of the lack of efficient referral system.

Hospital beds amount to 61,690 in 1986, and 1 hospital bed for 1,580 persons in average (Table 4-1).

### **4.2 Health manpower**

At present, 39,683 of medical doctors and 1,738 of dentists are registered to P.M.D.C. (Pakistan Medical & Dental Council). There are 17 medical colleges producing about 4,000 doctors annually, and 4 dental colleges producing 200 dentists. Doctor/population ratio is approximately 1:2,700, while dentist/population ratio is 1:60,000. Furthermore, more than 80% of doctors are concentrated in urban areas, while the population ratio of urban/rural area is 3:7 (Table 4-2).

There are also 47 nursing schools producing about 850 nurses annually. However, shortage of nurses is serious. In fact, doctor/nurse ratio is approximately 4:1, which is a reciprocal of developed countries' figure.

As to the other professionals, according to the data in 1986, there are some 65 thousands of co-medical workers

including Midwife, Lady Health Visitors, Dispensers, Medical Technologists, and some 45 thousands of TBAs (Traditional Birth Attendants: Dias). There are 10 public health school producing 600 Lady Health Visitors annually, 58 teaching institutions for Midwives and some 30 training institutions for medical technologists.

College of Community Medicine is the only institute which gives postgraduate training for public health professionals (Table 4-3, 4-4).

Besides the modern medical professionals, there are many traditional medical practitioners. In fact, 38,325 Tabibbs, 17,759 Homoeopaths and 539 Vaidas are registered at present. According to "the Expenditure & Financing Study(1987)", 9% of sample population utilized these practitioners as the first source of health care, and authorities estimate more than half of patients visit traditional medical practitioners in rural areas. Since 1965, 4 years training programme has started (there are 14 Tabibbs College and 23 Homeopathic teaching institutions at present). However the majority of the practitioners are unqualified and there are many non-registered practitioners. Therefore, it is desirable to educate and qualify these unqualified practitioners. At least, all practitioners should be registered. The education and qualification of traditional practitioners is very important not only because some unqualified practitioners may risk not a few patients, but also because they established good healer-patient relationships in non-doctor villages. Namely, qualified traditional practitioners are expected to play important roles in Primary Health Care.

#### **4.3 Health statistics and information system**

National population census is carried out once in ten years. The resident registration including notification of birth and death must be collected via data on provincial governmental bodies, however the team could not obtain any kind of annual vital statistics. While some studies regarding health status were conducted on small sample populations and there are some annual reports on morbidity & mortality statistics of governmental hospitals, the team could not come across nation-wide data on morbidity and mortality. According to health authorities and re-

searchers, there is no publication on such nation-wide statistics. The reasons are supposed as follows;

1) There are few communication between federal government and non-federal hospitals concerning statistical informations.

2) Except yellow fever, there is no systematic rule of notifying the number of cases of some fatal infectious diseases(such as tuberculosis).

3) There is no system of publishing reports on statistical data regarding death certificate.

4) There is no systematic procedure of nation-wide research on morbidity of diseases based on ICD-9.

5) There is no central information system of publishing reports on statistical data from provincial governmental bodies and other organizations.

## **5. Research and laboratory services**

Medical research and laboratory services are integral parts of all health care services. There are some specified available facilities of the government laboratories in the country.

### **5.1 Pakistan Medical Research Council(PMRC)**

PMRC was established in 1962 at aims of promoting scientific research in various fields of medical and public health. Its headquater is located in Karachi and 13 research centres in different teaching institutes of the country. PMRC also publishes "Pakistan Journal of Medical Research" regularly. In order to improve research and health care services, the available and organic system should be promoted (Table 5-1, 5-2).

### **5.2 Pakistan Institute of Medical Science(PIMS)**

PIMS, Islamabad is providing outdoor as well as indoor health care to a large number of patients. The Children's Hospital and the College of Nursing and Paramedics are important components of the institute as well as the ordinary hospital (Table 5-3 - 5-5).

### **5.3 National Institute of Health(NIH)**

Since the construction of NIH being completed in 1967, many developments have taken place and diagnostic laboratory facilities. The NIH consists of seven Divisions namely; Public Health, Biological Production, Drugs Control and Research, Nutrition, Clinical Research, EPI, and School of Medical Technology. The NIH is the only research institute affiliated with the Ministry of Health and also has as activity as the reference center in the field of medical examination. As a central institute, which purpose is to support medical and public health activities, the NIH need to adopt new technology and to carry out research to the improvement of the country's health conditions. In order to fulfill its function additional strengthening for facilities, equipments and research manpower is required (Table 5-6 - 5-12).

### **5.4 Regional medical services**

Some hospitals with modern equipment for medical care are concentrated in urban areas. The difference of the facilities between urban and rural laboratory is far larger than our imagination. More effort would be desirable to strengthen the regional medical institutions for the rural population. Furthermore, in order to improve the laboratory services, strengthening of manpower such as medical technologists is required (Table 5-13 - 5-17).

## **6. Recommendations**

Based on their observations and their discussion with many personnels of the Ministry of Health, health organizations and other institutions concerned, the team has



an honour to recommend the following items among which future cooperation between the Government of Pakistan and the Government of Japan might be considered.

6.1 Improvement of some specified infectious disease control

6.1.1 Establishment of the case-finding and registration system for chronic infectious diseases, particularly for tuberculosis

6.1.2 Establishment of new national research and training institute for tuberculosis

6.1.3 Cooperation for EPI including the production of some specified vaccine and manufacture of disposable syringe

6.1.4 Establishment of specialized infectious disease hospital for research and training

6.1.5 Cooperation for control and research of diarrheal diseases

6.2 Improvement of parasitic disease control

6.2.1 Cooperation for malaria control unit with provision of insecticides

6.2.2 Establishment of hydatidosis control

6.3 Improvement of research and laboratory services

6.3.1 Strengthening of the National Institute of Health, particularly of epidemiology and surveillance activity

6.3.2 Establishment of reference systems for district/regional laboratory services

6.4 Strengthening of education and training activities for the personnels of laboratory technology and other health services

6.5 Improvement of the information system of Federal and local levels on the health statistics: to provide efficient facilities and to develop organized notification rules for

information processing system of Federal and Provincial level

6.6 Improvement and strengthening of environmental sanitation: quality of water supply, treatment of nightsoil, sewerage and solid disposals

6.7 Improvement of food hygiene and food control

6.8 Improvement of prevention of malnutrition in children and pregnant women

6.9 Promotion of international cooperation and personnel exchange on research and technology in health science

6.10 Promotion of health education