

No. 23

THE OBSERVATION REPORT
ON
INFECTIOUS DISEASES IN NEPAL

1987

JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)

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P R E F A C E

In view of the fact that the control of infectious diseases 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 diseases in Nepal as one of its activities for 1986.

JICA entrusted the contract works to the International Medical Foundation of Japan and sent to Nepal, a study team with four members headed by Dr. Ryosuke Murata, Consultant to the Foundation, from October 19 to November 21, 1986.

The study team exchanged views with the officials concerned of the Government of Nepal, and conducted a field survey in Kathmandu and other parts of Nepal.

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 Nepal, in Nepal.

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

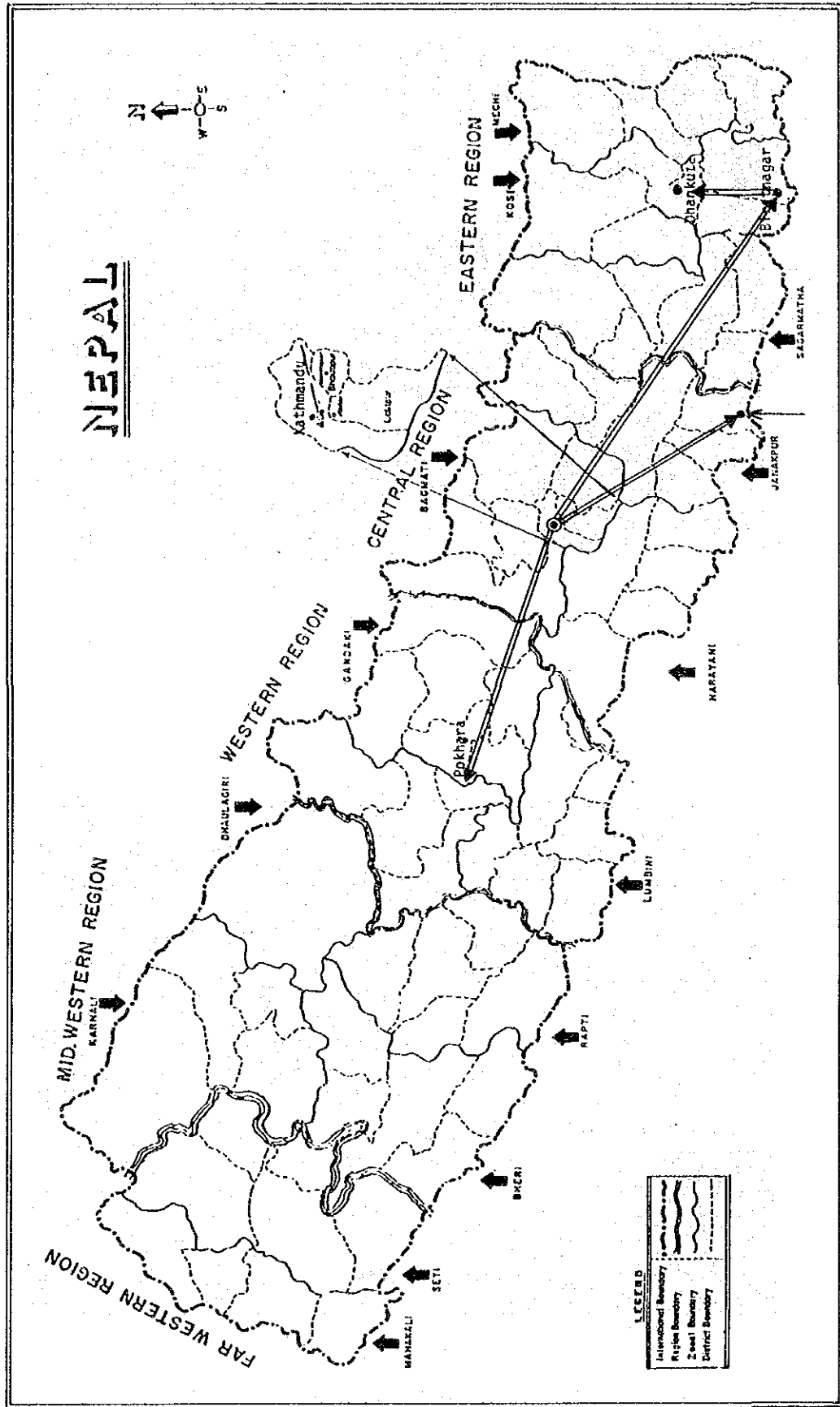
January 1987

Shosuke Suenaga,
Executive Director,
Japan International
Cooperation Agency

ACKNOWLEDGEMENT

The JICA/IMFJ observation team gratefully acknowledges the kind cooperation given by a large number of Nepal authorities concerned with health services. Without their devoted help the team would not be able to complete their observations within such short period. The team particularly wishes to express its sincerely gratitude to their kind cooperation given by honourable Secretary of Health Mrs. Chandra Kala Kiran, Dr. D.N. Regmi, Dr. Suniti Acharya of EPI project, Dr. Badri Raj Pande of Health Planning Division, Dr. D.D. Joshi of Epidemiology and Statistical Section, Dr. K.M. Dixit, International Health and Training Division and other excellent members.

Districts Observed

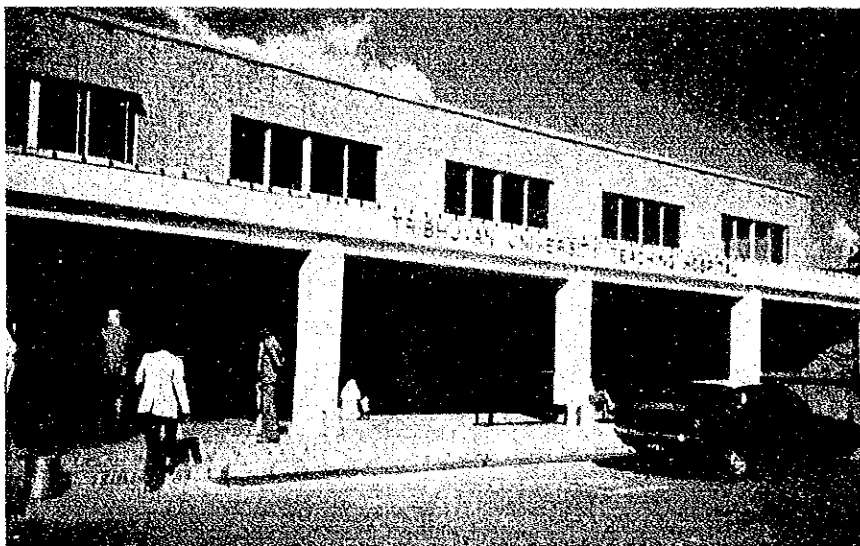




Member of the observation team



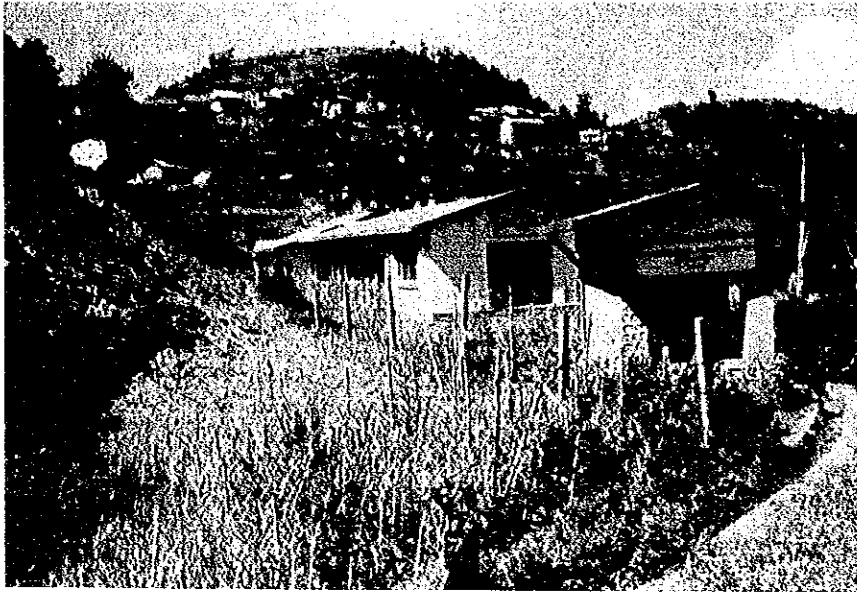
Mrs. Kiran, Ministry of Health (center),
Dr. Acharya, EPI Project (left)



Tribhuvan University Teaching Hospital (Kathmandu)



Central Health Laboratory (Kathmandu)



Eastern Regional Directorate of Health (Dhankuta)



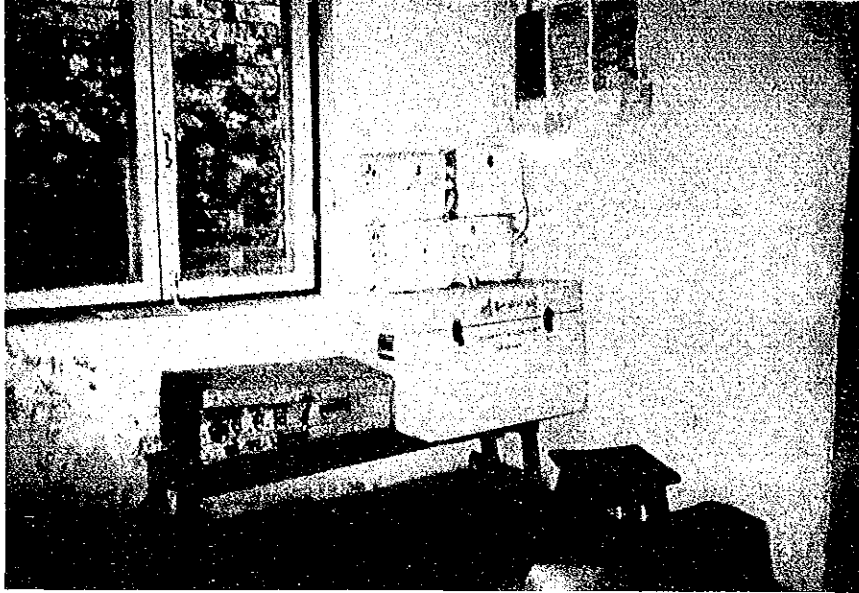
Itahali Health post (Itahali)



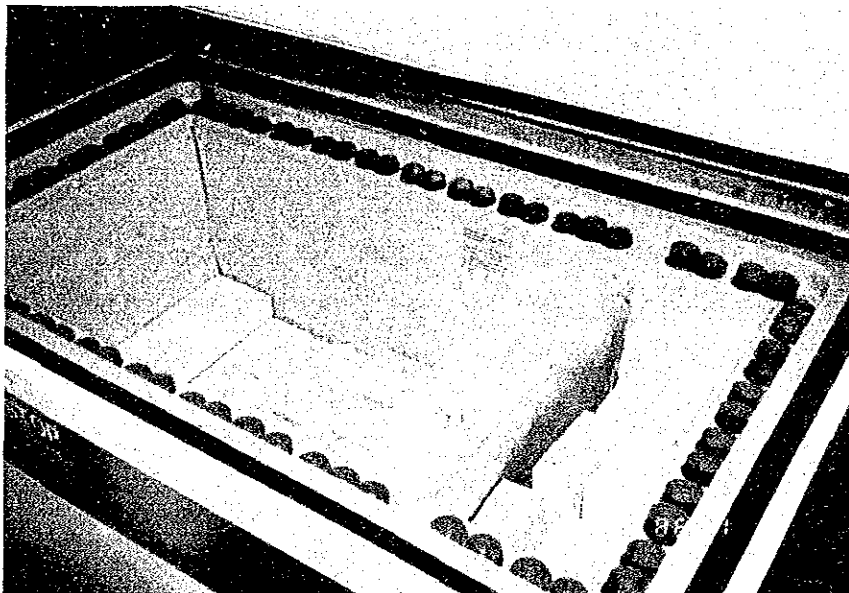
At the corner of a hospital (Kathmandu)



Tharpu Health post (Tanahan)



Ice box for preserving Vaccine (Tharpu Health post, Tanahar)



Vaccine-stack refrigerator (EPI project, Biratnagar)



Street scene in Janakpur (Janakpur)



Street nostrum vendor (Kathmandu)



Poster for Family Planning Campaign



Poster for protecting from rallies



Poster appealing for more medicine

The List of Persons Visited

Kathmandu

Mrs. Chandra Kala Kiran	Secretary, Ministry of Health (MOH)
Dr. D.N. Regmi	Former Director General, Department of Health Services, Ministry of Health
Dr. Badri Raj Pandey	Chief, Health Planning Division, MOH
Mr. Prabodh Sagar Dharal	Research Officer, Health Planning Division, MOH
Dr. D.D. Joshi	Chief, Epidemiology and Statistics Division, MOH
Mr. Janaki Prasad Dhavbhadel	Senior Sanitarian, Epidemiology and Statistics Division, MOH
Mr. Shanti Surab Manandhar	Senior Sanitarian, Epidemiology and Statistics Division, MOH
Dr. V.L. Gurubacharya	Medical Superintendent, Central Health Laboratory
Mr. Nirmal Kumar Acharya	Medical Technologist, Central Health Laboratory
Dr. Chandrica Shrestha	Chief, Virology Section, Central Health Laboratory
Mr. U.C. Shrestha	Lab. Technician, Central Health Laboratory
Miss Sumitra Rajbanshi	M.T. Technologist, Central Health Laboratory
Mr. Panna Devi Ranjit	Lab. Technician, Central Health Laboratory
Dr. Serika Amatya	Pathologist, Central Health Laboratory
Dr. Sarala Malla	Pathologist, Central Health Laboratory
Dr. Suniti Acharya	Project Chief, EPI Project Central Office
Mr. Narendra Shrestha	Administrative Assistant, EPI Project Central Office

Dr. D.S. Bom	Actg. Project Leader, Tuberculosis Control Project (TBCP)
Mrs. Kamal Rana	Chairman, Nepal Anti-TB Association
Dr. Megh Bahadur Parajuli	Chief Officer, Malaria Eradication Project
Mr. Jitendra P.B. Shrestha	D/Y Chief, Malaria Eradication Project
Mr. S.L. Shrestha	Deputy Chief Officer, Malaria Eradication Project
Dr. H.N. Uprety	Chief, ICSDI Project
Dr. Benu Bahadur Karki	Programme Manager, National Diarrheal Disease Control Programme
Mr. Kumar Lamichanne	Actg. Chief, National Diarrheal Disease Control Programme
Dr. Y.M.S. Pradhan	Director, Central Regional Health Office
Dr. Annapurna Shrestha	Actg. Chief, Maternity Hospital
Dr. Surendra Lohani	Pediatrician, Maternity Hospital
Mr. B. Pandey	Chief Accounts Officer, Maternity Hospital
Mr. Sudan Joshi	Hospital Administrator, Maternity Hospital
Mrs. Purna Shrestha	Supervisor Nursing, Maternity Hospital
Mrs. M.B. Tamrarar	Nursing Superintendent, Maternity Hospital
Mrs. D.S. Malla	Deputy Director, Maternity Hospital
Dr. Prembada Khanal	Chief, Infectious Disease Hospital (TEKU)
Dr. Shrestha	Actg. Chief, Infectious Disease Hospital

Dr. M.P. Upadhaya	Dean, Institute of Medicine, Tribhuvan University
Dr. B.R. Prasai	Director, Tribhuvan University
Dr. B.R. Prasai	Director, Tribhuvan University Teaching Hospital
Mr. Yoshinori Terasaki	Coordinator, Tribhuvan University Medical Education Project
Dr. I.B. Khatri	Medical Superintendent, Bir Hospital
Dr. Manindra R. Baral	Medical Superintendent, Kanti Children's Hospital
Dr. Micovic	Representative, WHO, Nepal
Mr. Alireza Mahallati	Project Officer, UNICEF, Nepal
Mr. David H. Calder	Chief, USAID, Nepal
Dr. T.B. Khatri	Project Chief, Family Planning and MCH Project
Dr. Madhav Joshi	Deputy Chief, Family Planning and MCH Project
Dr. Purushottam N. Shrestha	Professor of Community Medicine, Coordinator, Family Health Project, Institute of Medicine
Dr. R.P. Mishra	Director, Department of Ayurved
Mr. Shashi Bahadur Thapa	Project Manager, Solid Waste Management Project
Mr. Arun Kuwar Jha	Head Community, Participation and Training Section, Solid Waste Management Project
Mr. P.N. Nepal	General Manager, Water Supply and Sewerage Corporation
Mr. P.M.S. Pradhan	Actg. Chief Engineer Department of Water Supply and Sewerage, Ministry of Water Resources (MWR)

Mr. D.B. Shrestha	Acting Divisional Engineer, Department of Water Supply and Sewerage, MWR
Mr. T. Tenzing	Acting Divisional Engineer, Department of Water Supply and Sewerage, MWR
Mr. Purushottam Ogla	Section Officer, Department of Water Supply and Sewerage, MWR
Dr. D.P. Upadhaya	Project Director, FPAN/Integrated Family Planning and Parasite Control Project
Dr. Dinesh Raj Sharma	Project Manager, FPNA/Integrated Family Planning and Parasite Control Project
Dr. Paras Shrestha	Statistician, Leprosy Control Project
Dr. Karyon M. Dixit	Sr. Public Health Administrator, International Health and Training Division, MOH
Dr. Katherine Witherington	Chief of Medical Staff, Patan Hospital
Mr. Bir B. Khawas	Chief Executive Officer, Patan Hospital
Krishna Bahodur Prajapati	Health Assistant, Dadhikot Health Post
Krishna Bdr Manandhar	In charge of the Health Post, Indrayani Health Post
Nayan Bahadur Lama	Health Assistant Boudhanath Health Post
Janakpur	
Dr. R.P. Chaudhary	Civil Surgeon, Janakpur Zonal Hospital
Baldcijnath Yadav	Health Aid, Godar Health Post
Dr. H.D. Sah	Paediatrician, Janakpur Zonal Hospital
Dr. V.K. Siryh	Medical Officer, Janakpur Zonal Hospital
Dr. D.B. Shahi	Ophthalmologist, Janakpur Zonal Hospital

Dr. R.K. Chaudhary	Medical Officer Janakpur Zonal Hospital
Mr. T.P. Singh	F.P. Officer, Family Planning Office
Mr. Kaladhor Jha	District Malaria Officer, Malaria Eradication Organization
Mr. Dhavma Leu Shrestha	Senior Health Worker, Ghorghas Health Post
Dhankuta (Biratnagar)	
Dr. Gokul Das Shrestha	Regional Director, Eastern Regional Directorate of Health
Dr. Piyush Raj Pandey	Medical Officer, Dhankuta Regional Hospital
Dr. Gillum	Pediatric Hospital, SCF
Prayaaga Man Shrestha	Regional Chief, Family Planning
Mr. Buddhi Prasad Rai	Family Planning Officer, Koshi Zone
Subodh Narayan Yadav	Sr. A.H.W. (Incharge), Saptari Health Post
Devendra Pokharel	Health Assistant, Saptari Health Post
Mr. R.K. Shrestha	Sr. Malaria Assistant, Regional Malaria Office
Mr. S.P. Upajhyaya	Sr. Malaria Assistant, Regional Malaria Office
Mr. Hira Prasad Tiwari	Senior Supervisor, EPI Project
Dr. Kalyan Raj Pandey	Civil Surgeon, Koshi Zonal Hospital
Pakhra	
Dr. B.P. Shrestha	Regional Director, Western Regional Health Office
Dr. Ram Ratan Upadhaya	Chief, Western Regional Health Laboratory

Mr. Janak Bohadar Karki	Chief, TBCP, Pokhara
Mr. Ramlal Shrestha	JAHW, TBCP
Mr. Chetnath Chaulagai	Chief, Kashi District Health Office
Dr. Rama Mandan Sinha	Civil Surgeon, Gandaki Zonal Hospital
Mr. Mag Ras Ghimere	Medical Record Assistant Gandaki Zonal Hospital
Mr. Pream Bhahader Gurung	A.H.W., Sishuwa Health Post
Mr. M.N. Shrestha	Sr. A.H.W., Batulechaur Health Post
Mr. Mohaw Chandra Baral	Account Officer, Leprosy Project
Mr. Herbert Bedenbender	Technical Director, INF Leprosy Control Programme, West and Mid-West Region
Mr. Bhesh Raj Gautam	Section Officer, Family Planning Regional Office
Mrs. Hindu Maya Grung	Acting Incharge, Pokhara Health Post
Mr. Ramjee Kuwar	A.H.W., Pokhara Health Post
Dr. Mike Levender	Hospital Superintendent, Green Pasture Hospital (Leprosy Mission)
Mr. Jeff Dangey	Compound Manager, Green Pasture Hospital (Leprosy Mission)
Dr. Ramji Chaudhari	Incharge, Medical Officer, Syanja Health Center

1. Introduction

Japan International Cooperation Agency (JICA) has already been extending its technical cooperation to Nepal in various fields including health and medical aspects. In order to explore further cooperation, JICA decided to carry out a preliminary observation of the present status of infectious diseases as well as their control strategies in Nepal by sending the present observation team composed of 6 members who cover public health, epidemiology, microbiology, parasitology, pediatrics, hospital facilities as well as general administrative structures of the Ministry of Health, Nepal.

The team has been in Nepal for 31 days started from October 20 to November 20, 1986 and visited Kathmandu, the capital of the country and some Regional areas such as Janakpur, Dhankuta, Biratnagar and Pokhara. In those places the team studied available information on the health status and other health related documents, and observed the existing institutions for preventive and curative services, man power, programmes and activities to control various infectious diseases. The Team also discussed with the authority concerned on the health status of the people of Nepal and strategies to control the diseases prevailing in the country or the areas visited.

This report contains only the summary of the observations and some recommendations for the future cooperation.

2. An outlook of the infectious diseases in Nepal

2.1. General remarks

Health statistics in Nepal are obtained by the following means:

- (1) Hospital reports are sent to the Epidemiology and Statistical Section.
- (2) Reports from Health Posts (integrated) are sent to the office of ICHSDP (Integrated Community Health Service Development Project) through the District Public Health Office and then

transferred to the Epidemiology and Statistical Section.

- (3) Information on the diseases under the control of the Vertical Projects are collected by the center of each Project in Kathmandu.
- (4) In the case of outbreak of certain communicable diseases, a survey team will be organized, including the members who carry out laboratory examinations. Survey and research have also been carried out on some diseases; e.g. on Japanese encephalitis, rabies, brucellosis, snake bite and leishmaniasis.
- (5) Department of Ayurved started to collect information from Ayurvedic clinics in 1985.

However, the reports have not yet been collected from all the hospitals and districts, and the statistical treatment is rather delayed. Therefore, it is difficult to grasp the actual situation of the diseases. The term tried to catch the general view of the pattern of diseases in Nepal, by scrutinizing various documents and literatures available at present.

The health status of Nepal has been improved considerably by the successive 5-years plans, as will be seen by the decrease of mortality and morbidity. As a result of the 6th 5-years plan, crude death rate has been reduced to 16.57 and infant mortality rate to 111.52 from 150, and average life expectancy at birth was extended to 51.49 years as against the target of 48 years.

However, the information of various infectious and non-infectious diseases in Nepal obtained from the authorities of the Ministry of Health (MOH) indicates that there are still high incidences of several infectious diseases which may be controllable by the adequate measures. Incidences and deaths from various diseases in Nepal are shown in Table 1 and summarized in Table 2. According to the hospital statistics (Table 2), infectious and parasitic diseases present the third ranking of hospitalized cases (12.1%), and the first rank is taken by "Complication of child birth, pregnancy and the puerperium" (39.0%), and the second by diseases classified as "Symptoms, signs and ill-defined conditions" (13.5%). Following the infectious diseases come injury

plus poisoning (9.0%), and the respiratory diseases with 6.8% of the morbidity. Incidences of the diseases of circulatory system and neoplasma are reportedly rather low, showing 2.3% and 0.8% of the total diseases. However, it seems that about 80 percent of the cases in the category of "Complication of pregnancy, child birth and the puerperium" are normal deliveries and should be considered separately for the purpose of the comparison of morbidity, and the group "Symptoms, signs and ill-defined conditions" which contains various kinds of diseases may also be excluded from the ranking. Thus, the corrected ranking is shown in the parenthesis in Table 2. Table 3 shows the morbidity and mortality (per 100,000 population) of various diseases by Region, after correction regarding normal delivery. As will be seen in the column "Total", infectious and parasitic diseases show the highest morbidity of 55.72 and the rate of the incidence is 17.5% of all diseases. It seems that most of the respiratory diseases and a considerable number of perinatal diseases may be of infectious in nature. Thus, the rate of the infectious diseases may be higher than the figure shown in the Table. Mortality statistics in Table 3 indicates that total sum of infectious and parasitic diseases is the first ranking (21.3%) and respiratory diseases take the second rank of mortality (10.8%), and most of the latter are pneumonia. Perinatal deaths may also contain infections which are not shown clearly from the hospital data. The facts stated above show clearly that the infections by microbes and infestations by parasites are the most important problem to be considered in order to improve the health status of the peoples in Nepal.

Regionwise morbidity and mortality in Table 3 are rearranged as shown in Tables 4 and 5, where 10 leading causes of hospitalization and death are shown in order. Infectious and parasitic diseases take the first ranking of morbidity in four Regions except CDR, if "Symptoms, signs etc." is excluded as stated above. Low rate of infectious diseases in CDR is due to the fact that the report from Teku Infectious Disease Hospital is not included in the statistics used for Tables 1 and 3. Cases of infectious diseases treated in Teku Hospital amounted to be

5,500 in 1983; this will be stated later. Mortality data in Table 5 presents that infection is the most important cause of death in all Regions, except FWDR where the number of reported deaths is 20 (Table 1), representing only 1.13 percent of the total (1,777).

Malnutrition, especially deficiency in protein and vitamins seems to influence greatly the incidence and fate of the patients with infectious diseases and the perinatal conditions; the problem will be discussed later in some details. Table 6 shows the morbidity pattern in different periods.

High infant mortality (111.5 per 1,000 live births, 1984/1985), perinatal death of mothers (per 8.5 per 1,000 live births) and deaths due to tuberculosis seem to be responsible for the short life expectancy (51.5 1984/1985) of the peoples of this country. Table 7 compares the vital statistics of several Asian countries visited by the investigation teams of JICA.

Among the infectious diseases showing a serious influence to the health status of the people, attention should be focused on diarrhoeal diseases, dysentery, tetanus, enteric fever, measles, infectious hepatitis, tuberculosis and leprosy as well as malaria. Intestinal infections appear to be the main causes of hazards for children in this country. The majority of such infectious diseases can be controlled by adequate measures, such as improvement of environmental hygiene and early and adequate therapy as well as health education.

Regarding the hygienic conditions, safe drinking water is available to a limited extent only. Majority of the people use water from river, stream, pond, spring, and (shallow) wells etc. which may not be suitable for drinking purpose. Facilities for excreta and waste disposal are very rare in rural area where the majority of the population (> 90%) inhabits.

Some of the infectious diseases such as tetanus, measles, diphtheria, whooping cough and poliomyelitis can be effectively controlled by immunization. Recently, immunization has been carried out enthusiastically in 60 districts of the country (1985/1986); the coverage for BCG is reportedly 81.7% of the target, but those for

DPT, polio, measles and tetanus toxoid seem to be below 50%. The trend of incidence of the target diseases is difficult to estimate, since the survey of the diseases has not yet been completed.

2.2 Present status of some important infectious diseases

2.2.1 Incidence of infectious diseases

Incidence of infectious diseases prevailing in Nepal is shown in table 8 which were prepared based on the hospital statistics presented in Epidemiological Bulletin. The cases treated in Teku Hospital which were apparently left out from the original data were added to the Table. Table 9 shows the morbidity and mortality of the infectious diseases listed in order. It must be added that the actual pattern of the important diseases under the control of Vertical Projects (tuberculosis, leprosy and malaria) can not be obtained from the hospital statistics in the above Tables. As will be seen intestinal infectious diseases rank first, representing about 65 percent of the cases shown in Table 9. Tuberculosis takes the second rank (13.2%), although the figure in the Table may represent only a part of the patients in the whole country. Next to tuberculosis, hepatitis and tetanus are important because of high incidence and mortality. Table 10 gives the ranking of the infectious diseases by zone. Out of ten zones, GE/diarrhoea takes the first rank in seven zones, and tuberculosis ranks the first in Sagarmatha, Gandaki and Bheri zones. However, intestinal infections as a whole rank the first in 9 zones, except Sagarmatha zone. It seems of interest to follow the actual status of tuberculosis in the latter zone. Next to tuberculosis, hepatitis and tetanus are prevalent in most zones. Many cases of meningitis have been reported in Bagmati zone after 1982. Measles seems prevalent all over the country, but the information is scanty. The team was informed in various hospitals that respiratory infection and diarrhoea/dysentery, tetanus and malnutrition are the main causes of deaths among children under five years, and that tuberculosis is the most important disease among youth and adults.

Tables 11 and 12 show the annual incidence of important infectious diseases. No trend of reduction in the cases of any disease is observed.

Leprosy and malaria are heavily prevailing in many districts.

2.2.2 Diarrhoea

The team was informed that the number of diarrhoea patients may reach to about 1,700,000 in a year, and that about 45,000 children under 5 years died of diarrheal diseases in a year. Statistics of Children's Hospital shows that diarrhoea/dysentery is the main cause of deaths among children under 7 years (31.6%). Poor nutritional status may contribute to the mortality greatly.

2.2.3 Respiratory infection (bronchitis and pneumonia)

The diseases are the important diseases as the main cause of deaths of children in various South-East Asian countries. Statistics of Children's Hospital shows that among the inpatients (3,319) 32.8% had some kinds of respiratory infection with the case fatality rate of 9.6%. It seems that low nutritional status may influence the fate of the patients. Air pollution in the living quarters may be one of the causes of high morbidity.

2.2.4 Measles

Measles seem to be prevalent all over the country, especially in mountain and hill areas. Two separate surveys were carried out during 1977-1980. The results indicate the attack rate of about 33-41 per 1,000. Peaks of incidence are observed every two to three years. Vaccination against measles started in 1980 and more than 200 thousands of children were immunized (Table 13). However, the rate of vaccination may not sufficient to control the disease, when the birth rate is taken into account. It will be interesting, if comparison was made between incidence rates in immunized and those in non-immunized population.

2.2.5 Poliomyelitis

Statistics on the disease was not available. The result of census (1981) reported the number of physically handicapped persons to be 77,599, in which 27.8% being children. These figures may include a considerable number of the sequela of poliomyelitis and give some indication that the disease may be widely prevalent among people in this country.

2.2.6 Tetanus

The morbidity of tetanus is 3.44 as shown in Table 9. However, other source of information suggests a high incidence of about 7 per 1,000 population. Incidence is high among children, especially neonatal tetanus has been most frequently observed. A report suggests that approximately 70% of all tetanus cases may be neonatal one, with a high case fatality rate of 68% (refer to Table 14). Incidence of tetanus began to decrease definitely in certain area(s) following extensive immunization campaigns (Fig.1).

2.2.7 Diphtheria and whooping cough

Very few data are available on these diseases. Study at Kanti Hospital showed that diphtheria was observed in 3.5 percent of the inpatients during a period of 21 months, with the case fatality rate of 14.6 percent. Whooping cough seems to be prevalent all over the country. According to some sources of information the incidence of whooping cough is estimated to be about 9-17 per 1,000.

2.2.8 Tuberculosis

It is estimated that one percent of the total population of Nepal suffer from tuberculosis and about half of them are affected by infectious type (Seventh Plan, Chapter 41, Health). A report of a district indicates that deaths due to tuberculosis amount to 23 percent of total deaths among people of ages of 5 years or older.

Control of tuberculosis is carried out by TBC Project. Only a limited number of the cases are treated by the Project. Examination by X-ray is available only in large hospitals. Cultivation of mycobacteria and drug sensitivity test are carried out only in the Central Health Laboratory and Western Region Health Laboratory. Detailed data on the distribution and annual pattern of the patients suffering from tuberculosis could not be obtained. Table 15 presents the incidence of tuberculosis in some Asian countries.

2.2.9 Leprosy

Leprosy is widely prevalent among the people in Nepal. The Leprosy

Project covers 48 Districts and more than 30,000 patients have been treated every year (Table 16). Central Region reveals the highest proportion of the cases. However, it is not clear as to whether the table gives the true distribution of the patients. The cases represent only a portion of the total patients. The total number of patients is estimated to be about 100,000 (0.67 percent of the population), and 3,170 cases were newly registered in 1985/1986 (Table 17). The constraints in the control seem to be "drop-out" cases during treatment and lack of full understanding of the treatment among the patients as well as some health workers. Multi-drug therapy may be preferable to a single-drug-therapy, but it seems to be difficult to apply the former method extensively because of high cost. Facilities for surgical treatments and rehabilitation are not available. Table 18 presents the incidence of Leprosy in some Asian countries.

2.2.10 Malaria

Malaria is widely prevalent among inhabitants in the southern territory of Nepal along the boundary between India. It is estimated that about 60% of the population is exposed to the risk of the infection. The figure suggests that malaria is one of the most important diseases in this country. Malaria Eradication Project started as early as 1958. As a result of the constant efforts, a declining tendency of the case incidence was observed until 1970/1971, but then again, began to increase, and the malaria situation became serious in 1985, showing the number of patients of more than forty thousands. (Table 19). Recurrence of the disease is attributed to the shortage of insecticide as well as appearance of drug resistant plasmodia and mosquitos. Tables 20 and 21 show the incidence by Region and District. It is evident that the prevalence is high in the southern parts of the country. Table 22 presents the age and sex distribution of the disease.

The Control Project covers approximately 90 percent population at risk (Tables 23 and 24), and enthusiastic efforts have been continued in order to implement the control program and evaluation of the program as well as several studies related to the control of the disease. However, the actual control seems to be difficult because of shortage of insecticides (Table 25) as well as man power. Amount of the insecticides

supplied by some foreign countries is consistently decreasing every year. It is thus difficult to perform effective spraying. Appearance of drug-resistant plasmodium and vector has been recognized, and this is a serious obstacle for the control program. Table 26 shows the incidences of malaria in some Asian countries. It is apparent that incidence is increasing in many those countries.

2.2.11 Other diseases

Infectious hepatitis including Non-A and Non-B hepatitis are also important diseases because of increasing tendency and high mortality. As one of the measures to control the diseases, the safe water supply is desirable.

Encephalitis seems to be prevalent in some districts along Terai plain. The high mortality threatens the inhabitants in the areas. Rabies has been reported, and a number of patients were treated after dog bites. Detailed studies on encephalitis and rabies were carried out by the Epidemiology and Statistics Division, MOH, and some data will be given in Appendices.

Meningitis has been observed since 1982, especially in Kathmandu Valley, and the mortality was reportedly high (CFR 11%). Immunization with polysaccharide vaccine was tried.

Regarding sexually transmitted diseases, information is scanty. However, more attention should be paid, because the numbers of the patients show increase among emigrant laborers going to India.

Kala-azar has been reported after 1980; the cases were 604 with the case fatality rate of 8.0 percent.

Filariasis seems to be prevalent not only among rural but also urban population. A survey indicated a high positive rate of microfilaria in blood as 7.1-9.2 percent among people in the Central Region.

2.2.12 Intestinal parasitic infestations

Rate of infestation of the inhabitants by intestinal parasites is very high all-over the country. A survey carried out on 25,260 children (4-14 years old) in Kathmandu valley (in 1985) indicates that

ascaris, whipworm and hook worm were detected at the rate of 68%, 86% and 7%, respectively.

Another survey in a certain village in Kathmandu valley showed the rate of infestation as high as 89%.

2.2.13 Diseases reported from Health Post

While the most of the information discussed above were obtained from hospitals, those of the patients visiting health post were obtained in various districts visited by the present team. Table 27, 28 and 29 show the examples summarized from the Annual Report from the Public Health Office of Kaski District.

2.2.14 Nutrition

Malnutrition is a serious health problem especially among children and pregnant women. The team recognized at a hospital that protein-energy malnutrition may be observed in more than 18% of the inpatients; out of the patients marasmus was recognized in 50% and Kwashiorkor in 25%, and stunting in a considerable number (about 25%). A survey carried out in 1975 indicates that more than 50% of the children of 6-72 months are in the status of stunting and wasting. Other survey in 1975 shows that people in normal nutritional level are only 29.3%, while 29.1% need some treatment.

Deficiency of vitamin A is the most important cause of blindness; it is estimated that 0.84 percent of the total population of Nepal are blind. Iron deficiency causes severe anemia particularly among the pregnant woman and affects growth of babies. Iodine deficiency has been observed in high percentage among mountain and hill people. Special programs are implemented to control these illnesses.

3. Strategies against infectious diseases

3.1 Successive 5 years plans

In order to overcome the menace due to mentioned infectious diseases mentioned above, the Ministry of Health has already implemented various control measures as shown in the successive 5-years plans

started since 1956.

During the first stages of the plan, major emphasis was placed to construct hospitals, dispensaries and training centers. Preventive and curative services were expanded during the third (1965-70) and the fourth (1970-1975) plans.

Some special projects started from the early stages of the plans. Malaria program initiated in 1958, and projects for smallpox, leprosy and tuberculosis launched during the second plan (1962-65), and family planning and maternal and child health were introduced during the fourth plan (1970-75).

Clearcut policy and strategy for the health care were inaugurated after the fifth plan (1975-80). Emphasis was placed to extend health services to all rural areas. Integration of health post activities was stressed at this stage. The multi-sectorial approach for the improvement of health status of the population was emphasized especially in the sixth plan (1980-85). Major targets of the sixth plan were: establishment of a number of hospitals and health posts, establishment of more Ayurvedic centers, provision of modern equipments and specialists at district and zonal hospitals, control of malaria, and vaccination in accordance with EPI strategy of WHO. The results of such health programs have exerted a favourable effect as follows: reduction of crude birth rate to 16.5 as against the target 17, decrease of infant mortality to 111.52 (target 130) and extension of life expectancy at birth to 51.49 (target 48). MBBS course for the production of medical doctors has been started during this period.

However, the plan as a whole was not satisfactorily implemented. Construction of hospitals and health posts were delayed. Production of higher and middle level manpower required for health post and hospital was not fulfilled. Further, because of shortages of medicaments, equipments and appliances, the programs for providing basic health service to rural areas could not be implemented effectively as expected. At present, the seventh plan (1985-1990) is being initiated. The plan may be classified into two categories; i.e. the general measures and specific measures.

3.2 General measures in the seventh plan

The target of the plan is to reduce death rate to 12.8/1,000 and infant mortality to 98.3/1,000 live birth and to raise the average longevity to 55.4 years.

Basic health service will be provided through health posts in an integrated manner under integrated health service projects. Vertical projects will be continued in the districts where the integration of various services would not be completed. Emphasis will be put to increase the basic health services in rural areas, especially to remote areas, Himali and hilly areas.

- (1) Total number of health posts will be increased to such extent so that each Ilaka of district will have a health post (9 HP per Division).
- (2) Full integration of health services in 37 districts will be completed, by the end of 7th plan.
- (3) In order to mobilize people's participation in basic health service, sub-health posts will be established in the integrated district.
- (4) At present 89 hospitals and 3,772 beds (1 bed for 4,768 persons) are available. The number of hospitals and beds will be increased; 1,030 beds will be added.
- (5) The activities of the Central Health Laboratory will be strengthened. Health laboratories will be available in 23 districts.
- (6) Services and facilities for hospitals at zonal and regional level will be increased. Specialist service will be developed in national level.
- (7) The existing system for the distribution and supply of medicaments will be improved.
- (8) Health Directorates system will be established gradually in order to prepare and implement adequate health plan to meet the need of the district.
- (9) In order to maintain healthy atmosphere in villages and to control infections, emphasis will be given to environmental sanitation,

drinking water and personal hygiene.

3.3 Specific measures

As the specific measures there are "Vertical Projects" as follows: Programs for Malaria Control, Tuberculosis Control, Leprosy Control, Family Planning, Maternity and Child Health, and Extended Vaccination. The vertical projects have their headquarters in Kathmandu, which supervise and guide their own district centers regarding surveillance and treatment of the diseases concerned. The offices and clinics of these Project are distributed as shown in Table 29. The activities of the Project include detection and treatment of patients and prevention of the diseases as well as health education for the patients, inhabitants and health technicians.

Special programs are also implemented as follows: Diarrhoeal Diseases Control, Rabies Control, Zoonotic Disease Control, Nutrition Program, Health Education etc.

Extended vaccination program has been undertaken since 1977 in accordance with the recommendation of WHO, "Expanded Program on Immunization (EPI)". By the end of the sixth plan, the program was implemented in 35 districts. Target and the achievement of the immunization are shown in Tables 13 and 31. The coverage for EPI districts in 1984/85 are reported as follows: DPT: 38.9%, Polio: 24.8%, measles 20.4%, BCG 81.7%, TT 12.2%. The target of the 7th plan is to extend the program to all 75 districts. The seventh plan also includes provisions for survey of diseases that can be prevented by vaccination as well as arrangements for cold chain in necessary places, training and supervision etc.

Tuberculosis program started as early as 1962 and has been implemented in 31 districts by the end of the 6th program and will be extended to additional 26 districts in the 7th plan. Japan has cooperated with the project. Non-governmental organization such as NATA is actively cooperating to control the disease. About 548,000 suspected patients will be examined microscopically, and the patients will be given adequate treatment.

Leprosy Control program has been implemented as a leading program since 1962 and is under way in 48 districts. The activities are summarized and evaluated fairly well as described above. The Seventh Plan has aimed to extend the program to additional 12 districts. The standard treatment will be provided to 75 percent of the patients, and multi-drug therapy will be adopted. International Nepal Fellowship (INF) is cooperating with the Project.

Malaria Eradication Project was launched in 1958 with the cooperation of WHO and USAID. The project has already been implemented in 42 districts in 1985 (Table 24). The activities include the vector control by spraying insecticides as well as the detection and treatment of the patients. Survey of the patients and evaluation of the program have been carried out enthusiastically and summarized nicely as the Annual Report. Studies on the ecology of the vectors have also been tried (see Appendices).

4. Some points in the control measures against infectious diseases

In order to improve health status of the people, Ministry of Health has continued to endeavor enthusiastically to upgrade various health services through the successive 5-year plans. By these plans a considerable improvement of health status of the people was achieved during last decade, as mentioned in 3.1. At present the seventh plan (1985-1990) is being implemented. This plan emphasizes provision of better health services to everybody by strengthening primary health care, by decentralization of health care system as well as integration of multi-sectorial health service activities. Since the seventh plan has been designed very carefully by analysing the results of the previous plans, it would be inappropriate to add any comment by a foreign team which stayed only a few weeks in this country. However, the team would like to dare to state a short summary of the discussion exchanged between the authorities of MOH and the JICA team, as a reference for the future mutual cooperation.

4.1 General aspects

The idea to strengthen "primary health care" seems to be quite timely and excellent. The strategy of decentralization of health service

system as well as integration of multi-focussed services at the district level will be effective to improve the health status of the people, especially in rural areas where majority of the people inhabits. However, it seems that consolidation of local system for health service is rather slow. Improvement of the facilities for local health services and strengthening of health manpower in rural areas is prerequisite to the effective implementation of the plan, and foreign cooperation would definitely be required in some ways to achieve the target of the plan.

The team also recognized that various vertical projects have been very effective as the counter measures against some important diseases which are prevailing in the country. However, more efforts would be desirable to grasp the actual status of diseases, in order to implement effective control measures.

4.2 Facilities for medical care deliveries services

4.2.1 Curative and preventive services

(1) Hospitals

Modern facilities for curative care are concentrated in Kathmandu valley and a few urban areas. The qualitative and quantitative difference of the facilities between urban and rural areas is far greater than which the team imagined before its visit. Although it is understandable that modern medical facilities and specialization are necessary at the national level, but more effort would be desirable to strengthen the regional, zonal and district medical institutions for the rural populations. Because of the inadequate traffic system, people in the remote areas cannot receive adequate medical care. The medical care system in Nepal seems to be pyramid-shaped referral system which starts from Health Post up to the zonal (regional) and central hospitals. Some districts have no hospital and doctor. More district hospitals would be necessary in remote areas, and the facilities and manpower of some zonal hospitals may not be sufficient to serve as the reference hospital. It is desirable to upgrade some zonal hospitals to regional one.

(2) Health Post

Some integrated health posts are equipped fairly well to provide the first medical care for the people in the area. However, the number of such health posts seem rather few, and some non-integrated posts are poorly equipped, e.g. even simple surgical treatments may not be possible. It is desirable to provide equipments for simple laboratory examinations, such as microscope and simple centrifuge as well as a few indispensable reagents. Training of the health technicians is also necessary. By such improvement, it may be possible to detect tuberculosis of infective type, malaria, anemia, some diseases of genito-urinary system and parasite infestation etc. at health post level, and this will be useful to improve the health status of the rural inhabitants. Increase of the number of ambulant team for primary medical care is desirable.

Shortage of essential drugs in health posts is also a serious setback. (see below).

4.2.2 Laboratory services

It seems to the team that strengthening of laboratory services is urgently required, especially those for the microbiological and serological examinations. Strengthening of the services in the virology section of the CHL is urgently required, since CHL is the only central laboratory of the country. More laboratory services are necessary at regional and district level. Diagnosis of infectious diseases is dependent mostly on the clinical symptoms without support of laboratory tests. For example, it is well known that diarrhoea which is most common and important disease in Nepal may be caused by various bacteria, protozoa, parasites and viruses, and various different agents may cause encephalitis and meningitis. The counter measures against such diseases should be quite different depending on the causative agents. Therefore, it is desirable to strengthen laboratory activities especially at regional and zonal level. It is also desirable that health posts would be equipped with the apparatus to carry out some laboratory tests, such as microscopy and urine and stool examinations.

4.3 Health personnel

Shortage of doctors and nurses is a serious problem in this country. Furthermore, majority of the doctors (2/3 or more) are working in Kathmandu valley and a few urban areas. Institute of Medicine has a curriculum which emphasizes the importance of community service. The team hopes that many young medical students in this country would be interested in the medical services in remote areas. Because of shortage of doctors, those working in peripheral hospital have to be responsible for both medical as well as administrative activities. This seems to be convenient, but will result in lowering the ability of the doctors in curative services.

4.4 Information system

It seems urgently necessary to assess present information system in order to develop basic but important information to make proper plans of strategy to control infectious diseases. At least small computer and a few trained persons at national level may be urgently required for the statistical treatment of the informations on the infectious diseases. In order to grasp the actual state of diseases, it will be necessary to station a few epidemiologist at regional level. It seems also necessary to strengthen the hospital statistics at least in Central and Regional Hospitals.

4.5 Supply of essential drugs

Shortage of essential drug seems to be a serious problem for the proper medical treatment, especially in the peripheral areas, where the budget for drugs is extremely limited. Adequate measures would be desirable to procure and distribute essential drugs to health post level.

4.6 Consideration on some infectious diseases

The team realized that the vertical projects for tuberculosis control, malaria eradication and EPI have been contributing greatly to control important infectious diseases in Nepal. It is desirable to promote epidemiological study on the actual status of the important diseases prevailing in the country. In this respect the team was interested in the studies carried out on malaria, encephalitis, meningitis

and rabies etc. Epidemiological studies supported by the laboratory examination are very important to plan the counter measures against the diseases.

4.7 Expanded Program on Immunization (EPI)

Vaccination has been carried out enthusiastically since 1977. However, information on the target diseases are rather scanty. Cold chain systems in the central, regional and some district depots are well established. More vehicles with cold system are necessary for transportation. Strengthening of the cold chain system is necessary at peripheral level.

It seems also necessary to increase the manpower for the program. Training of the staffs of middle level may be urgently required. In this regard, it is necessary to establish the facility (building) for training.

4.8 Parasitic Diseases

Malaria Eradication Project is well organized and actively implementing the program. However, it seems necessary to consider the following aspects.

- (1) Strengthening of surveillance measures to grasp the actual status of diseases, including drug resistance of the plasmodia and vectors.
- (2) Training the technicians working at the implementation sites.
- (3) More efforts would be desirable to train specialists to carry out researches to control the disease.
- (4) Shortage of insecticides is a serious problem. Long term plan for procurement of insecticides and for effective spraying may be desirable.

Filariasis seems to be prevalent in some rural areas, but number of cases are reported among urban population. However, little study on the epidemiology of the disease has been undertaken. Although Terai region is known to be affected by Kala-azar, a base line epidemiological surveillances of filariasis and Kala-azar would be desirable

in all endemic area of Nepal.

4.9 Improvement of environmental hygiene and nutritional status of the people.

In order to reduce the food-borne and water-borne diseases, the facilities related to the supply of safe drinking water, environmental sanitation and food hygiene should be improved. The Seventh Plan emphasizes the importance of these problems. However, the actual status may not warrant any optimism. In the urban areas the pipe water is reportedly supplied to about 70 percent of households. However, the quality control of the drinking water seems to be rather insufficient, e.g. in the control of bacterial contamination. In the rural areas, majority of the people obtain surface water from stream, river etc., which is not suitable for drinking.

Households equipped with toilet with flush water which are connected to the sewerage are only 26 percent in large cities in Kathmandu Valley. Households equipped with some kinds of toilet are rare in rural areas.

Improvement of nutritional status is very important for the health of the people. However, there is no need to state here in detail, because several concrete programs are involved in the Seventh Plan.

5. Recommendations

Based on their observations and their discussions with many health personnels of Ministry of Health and other institutions concerned, the team recommends the following cooperations between His Majesty's Government of Nepal and the Government of Japan.

5.1 Improvement of the information systems

- (i) To provide microcomputors.
- (ii) Training of the personnel in charge (Refer to 4.4).

5.2 Strengthening of the laboratory services, and the research activities (refer to 4.2.2).

- (i) Establishment of viral section in Central Health Laboratory

- (ii) Strengthening of laboratory activities in some regions. It would be desirable to consider establishment of a Reference Laboratory somewhere in Tarai Plain where various kinds of infectious diseases are prevailing and the density of population is high.

5.3 Cooperation for EPI (refer to 4.7.)

- (i) To provide vehicles equipped with cold chain and small refrigerators for rural areas. The problem is the shortage or lack of electricity. (Vaccines will be donated by UNICEF for further 10 years.)

5.4 Cooperation for Nepal Malaria Eradication Organization

- (i) To provide insecticides

Amount of the insecticides available for malaria eradication activity become less and less every year and it seems difficult to carry out effective spraying in the districts at risk. (refer to 2.2.10).

- (ii) Surveillance system supported by laboratory examination.

5.5 Establishment of facilities for training of the personnels for health services

The facilities is necessary for the training of staffs of middle level, especially for those engaged in EPI Project and Malaria Eradication Project.

5.6 Others

Cooperation may be necessary for various programs as follows:

5.6.1 Strengthening of the facilities for health services.

- (a) Modernization of zonal hospitals: It would be necessary to cooperate to upgrade a few zonal hospitals.
- (b) Assistance in equipments necessary for the primary medical care at health posts is very helpful for the people in the rural areas (refer to 4.2.1).

5.6.2 Construction of the buildings for health post.

5.6.3 Improvement of facilities for environmental sanitations, such as supply of safe drinking water, nightsoil and sewage treatment and soil disposal treatment.

5.6.4 Establishment of facilities and activities for food control, which involves surveillance system for food hygiene and laboratory examinations necessary for food control.

These programs seem to be very important and helpful to improve health status of the people of this country. However, more observations and studies are necessary to make some concrete proposals, including more studies on the cooperation plans in other countries.

5.7 Some considerations regarding future cooperation

As stated above, factors related to the spread of infectious diseases are manifold and interact each other, resulting in a situation "circulus vitiosus." In order to improve the health status of the people in Nepal, multi-approach is necessary, which involves improvements of medical facilities, laboratory activities, information system health manpower, nutrition, environmental sanitation and health education etc. Foreign cooperation may be necessary to accomplish improvement of various factors.

Although supply of facilities and equipments is urgently necessary at present, it is more important to reinforce personnel training and to find the means to keep in contact with such persons after the cooperation project has finished. In this respect, a long term after care should be intensified and employment of volunteers who can stay in the foreign country for a long period should be considered.

Regarding the supply of equipments, it is necessary to select those which can be used effectively by the staffs of the recipient country themselves after the drawal of the experts of the donor country. Sophisticated equipments, however useful during project period, may be useless after the termination of the project, unless the repairment and supply of the parts are guaranteed.

The team would like to advice to the counterparts of the recipient

country that they must not only depend on the supplies, but must take this opportunity to stand on their own feet.

Table 1 Morbidity and Mortality by Region (1983) (NY 2040)

ICD Basic List Code No.	ICD Basic Tabulation Diseased Lists	Eastern Region*		Central Region		Western Region		Mid-Western Region		Far Western Region***		Total		
		Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	
	I - Infectious & Parasitic Diseases (BTL 010-079)	1,180	93	1,796	83	3,273	173	450	28	86	2	6,785	379	
010	Cholera	-	-	-	-	1	-	-	-	-	-	1	-	
011	Typhoid Fever	69	1	142	1	276	8	57	-	2	-	546	10	
012	Bacillary Dysentery	6	-	4	-	37	4	2	-	-	-	49	4	
013	Food Poisoning	18	-	3	-	6	-	-	-	2	-	29	-	
014	Amoebiasis	9	-	21	-	37	2	9	-	1	-	77	2	
016.0	Dysentery	101	1	105	3	372	18	28	-	4	-	610	22	
016.1	Gastro - enterities	351	9	589	19	984	28	70	1	23	-	2,017	57	
016.2	Diarrhoea	32	3	187	7	195	10	18	-	2	-	434	20	
020	Pulmonary Tuberculosis	151	14	283	16	531	36	125	6	19	-	1,109	72	
021	Respiratory "	46	8	7	-	41	4	6	1	1	-	101	13	
023	TB of intestines, Peritoneum & mesenteric gland	19	1	45	4	60	6	20	2	1	-	145	13	
024	TB of Bones & Joints	1	-	7	2	3	-	-	-	-	-	11	2	
025	TB of Genitourinary Sys.	-	-	4	-	1	-	1	-	-	-	6	-	
026	TB of other organs	18	1	28	-	179	14	24	1	-	-	249	16	
031	Brucellosis	-	-	-	-	2	-	-	-	-	-	2	-	
032	Leprosy	-	-	-	-	89	-	-	-	-	-	89	-	
033	Diphtheria	12	2	2	-	3	2	1	-	-	-	18	4	
034	Whooping cough	-	-	3	1	-	-	1	-	-	-	4	1	
037	Tetanus	116	29	110	18	75	18	55	15	2	2	358	82	
038	Septicaemia	1	1	8	1	10	3	1	1	-	-	20	6	
039	Other Bacterial Diseases	1	-	5	-	5	1	-	-	-	-	11	1	
040	Acute Poliomyelitis	5	-	-	-	2	-	-	-	-	-	7	-	
042	Measles	5	-	15	1	61	1	-	-	1	-	82	2	
046	Viral hepatitis	74	6	100	8	117	12	12	1	9	-	312	27	
049.9	Other Viral Diseases	54	15	29	1	17	1	8	-	-	-	108	17	
052	Malaria	8	-	13	-	21	1	4	-	3	-	49	1	
053	Leishmaniasis	-	-	-	-	5	-	-	-	-	-	5	-	
060	Other Syphilis (Venereal diseases)	-	-	1	-	2	1	-	-	-	-	3	1	
061	Gonococcal infections	1	-	1	-	-	-	-	-	1	-	3	-	
071	Mycosis	-	-	1	-	-	-	-	-	-	-	1	-	
074	Filaria infection & diacontiasis	-	-	-	-	1	-	-	-	-	-	1	-	
075	Ancylostomiasis & necatoriasis (Hook worm)	46	-	39	1	35	1	3	-	12	-	135	2	
076.9	Other Helminthiasis	36	2	44	-	105	2	5	-	3	-	193	4	
	II - NEOPLASMS (B.T.L.080 - 179)											Total	447	32
09-099	Malignant neoplasm of digestive organs & peritoneum	-	-	49	3	23	2	-	-	-	-	72	5	
10-109	Malignant neoplasm of respiratory & intrathoracic organs	-	-	8	1	9	2	3	-	-	-	20	3	

(Table 1 continued-b)

ICD Basic List Code No.	ICD Basic Tabulation Diseases Lists	Eastern Region*		Central Region		Western Region		Mid-Western Region		Far Western Region***		Total	
		Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
11-119	Malignant neoplasm of bone, connective tis- sue, skin & breast	-	-	21	1	1	-	-	-	-	-	22	1
12-129	Malignant neoplasm of genitourinary organ	1	-	50	-	34	3	1	-	-	-	86	3
13-139	Malignant neoplasm of other & unspecified sites	-	-	5	-	4	1	-	-	-	-	9	1
14-149	Malignant neoplasm of lymphatic & haemopoie- tic tissue	3	-	23	3	43	4	1	-	-	-	70	7
15-156	Benign neoplasm	-	-	56	1	21	-	-	-	-	-	77	1
160	Carcinoma in situ	5	2	8	2	68	7	6	-	-	-	87	11
170	Other & unspecified neoplasm	-	-	4	-	-	-	-	-	-	-	4	-
III- ENDOCRINE, NUTRI- TIONAL METABOLIC DISEASE & IMMUNITY (180-199)											Total	445	48
18-180.9	Disorders of thyroid glands	1	-	-	-	19	1	-	-	-	-	20	1
181	Diabetes mellitus	38	5	75	2	23	2	21	1	1	-	158	10
188	Dehydration	19	3	17	4	43	6	6	-	2	-	87	13
189	Rest of diseases within the group	2	-	21	-	12	2	-	-	-	-	35	2
19-193.9	Nutritional deficien- cies	17	1	20	2	96	19	6	-	-	-	139	22
199	Other metabolic & immunity disorders	-	-	4	-	2	-	-	-	-	-	6	-
IV- DISEASES OF BLOOD & BLOOD FORMING ORGANS (B.T.L. 20-209)													
20-209	Diseases of blood & blood forming organ	150	9	251	13	183	17	68	4	6	-	658	43
21-219	V- MENTAL DISORDERS (B.T.L. 21-219)	9	2	14	-	21	-	30	5	-	-	74	7
VI- DISEASES OF THE NER- VOUS SYSTEM & SENSE ORGANS (B.T.L. 22-229)											Total	1,259	113
220	Meningitis	86	14	98	8	157	34	25	3	6	1	372	60
224	Infantile cerebral palsy & other paraly- tic syndromes	18	1	59	5	18	2	11	-	2	-	108	8
225	Epilepsy	17	2	49	1	65	5	7	1	4	-	142	9
226	Encephalitis	45	7	45	7	25	7	13	5	1	-	129	26
229	Other diseases of the nervous system	19	2	18	2	62	3	5	-	-	-	104	7
230-239	Diseases of the eye & adnexa	70	1	123	-	75	-	13	-	-	-	281	1
240-249	Diseases of ear & mastoid process	3	-	90	1	24	-	6	1	-	-	123	2

(Table 1 continued-c)

ICD Basic List Code No.	ICD Basic Tabulation Diseases Lists	Eastern Region*		Central Region		Western Region		Mid-Western Region		Far Western Region***		Total	
		Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
VII- DISEASES OF THE CIRCULATORY SYSTEM (B.T.L. 250-309)											Total	1,306	155
25-259.9	Rheumatic fever & Rheumatic heart disease	9	-	54	2	55	4	7	1	-	-	125	7
260-264	Hypertensive diseases	38	3	101	7	89	8	19	1	-	-	247	19
270-279	Ischaemic heart disease	2	-	25	1	4	-	3	-	-	-	34	1
280-289	Diseases of pulmonary circulation & other forms of heart disease	136	14	207	35	282	42	44	1	2	1	671	93
290-299	Cerebrovascular diseases	35	10	57	11	52	11	4	-	1	-	149	32
300-309	Other diseases of the circulatory system	-	-	47	2	24	1	9	-	-	-	80	3
VIII- DISEASES OF THE RESPIRATORY SYSTEM (B.T.L. 310-329)											Total	3,858	192
31-319	Diseases of the upper respiratory tract	140	4	358	6	520	18	95	5	27	1	1,140	34
32-329	Other diseases of the respiratory system	526	23	1,213	58	979	77	-	-	-	-	2,718	158
IX- DISEASES OF THE DIGESTIVE SYSTEM (B.T.L. 330-349)											Total	2,758	106
33-339	Diseases of the oral cavity, Salivary gland and Jaws	14	1	12	1	32	-	98	2	-	-	156	4
34-349	Diseases of the other parts of the digestive system	600	15	1,082	42	774	41	130	2	16	2	2,602	102
X- DISEASES OF THE GENI- TOURINARY SYSTEM (B.T.L. 350-379)											Total	2,909	65
35-359	Diseases of Urinary System	173	6	288	24	547	17	61	5	11	-	1,080	52
36-369	Diseases of male genital system	57	-	83	1	152	-	41	-	4	-	337	1
37-379	Diseases of female genital system	151	2	868	4	399	6	69	-	5	-	1,492	12
XI- COMPLICATION OF PRE- GNANCY, CHILD-BIRTH & THE PUERPERIUM (B.T.L. 380-410)											Total	22,033	148
38-389	Abortion	340	4	1,330	4	279	1	129	-	6	-	2,084	9
39-399	Direct obstetric causes	209	11	1,638	6	278	17	83	-	2	-	2,210	34
40-401	Indirect obstetric causes	-	-	37	2	53	1	-	-	-	-	90	3
410	Normal delivery	3,211	2	10,482	9	2,861	74	974	16	121	1	17,649	102

(Table 1 continued-d)

ICD Basic List Code No.	ICD Basic Tabulation Diseases Lists	Eastern Region*		Central Region		Western Region		Mid-Western Region		Far Western Region***		Total	
		Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
XII- DISEASES OF THE SKIN & SUBCUTANEOUS TISSUE (B.T.L.42-429)													
42-429	Skin & subcutaneous tissue	138	1	144	3	434	8	39	-	14	-	769	12
XIII- DISEASES OF THE MUSCULOSKELETAL SYSTEM & CONNECTIVE TISSUE (B.T.L.43-439)													
43-439	Diseases of the Mus. Sys. & connective tissue	61	-	68	1	219	4	29	-	6	-	383	5
XIV- CONGENITAL ANOMALIES (B.T.L.44-449)													
44-449	Congenital anomalies	7	-	27	-	33	2	2	-	-	-	69	2
XV- SYMPTOMS, SIGNS & ILLDEFINED COND. (B.T.L.46-469)													
46-469	Symptoms, signs & illdefined conditions	1,553	42	2,544	88	2,819	123	540	19	173	8	7,629	280
XVI- INJURY & POISONING (B.T.L.470-560)													
											Total	5,062	191
47-479	Fractures	203	3	504	3	763	9	73	-	17	-	1,560	15
480	Dislocation, sprains & strains	13	-	10	-	50	-	1	-	-	-	74	-
490	Intracranial & internal injuries including nerves	1	-	-	-	60	2	-	-	-	-	61	2
500	Open wounds & injury to blood vessels	29	-	3	-	60	2	15	-	6	-	113	2
510	Effect of foreign body entering through orifice	2	-	32	-	17	-	-	-	-	-	51	-
52-523	Burns	107	8	212	23	217	20	36	3	14	1	586	55
53-539	Poisoning & toxic effect	114	6	180	12	323	11	14	-	11	-	642	29
54-549	Complications of medical & surgical care	-	-	11	4	3	-	1	-	-	-	15	4
55-556	Other injuries	288	8	766	43	657	24	110	2	18	3	1,839	80
56-569	Late effect of injuries, poisoning, toxic effects & other external causes	27	2	69	-	14	1	10	1	1	-	121	4
GRAND TOTAL		9,867	307	25,366	519	17,351	816	3,279	106	563	20	56,452	1,777

* Mechi Zone : No report

** Rapti Zone, Karnari Zone : No report

*** Seti Zone : No report

Source: Epidemiological Bulletin, Vol. 5, No.1-4, 1984 and Vol. 6, No.1-4, 1985

Table 2 Morbidity by Main Diseases

Cause	Cases ¹⁾	Percent	Rank ²⁾
Complication and childbirth, pregnancy and the puerperium	22,033 (4,437)	39.0	1(3)
Symptoms, signs and ill-defined conditions	7,629	13.5	2
Infectious parasitic diseases	6,785	12.1	3(1)
Injury and poisoning	5,062	9.0	4(2)
Diseases of the respiratory system	3,866	6.8	5(4)
Diseases of the genito-urinary system	2,909	5.2	6(5)
Diseases of the digestive system	2,758	4.9	7(6)
Diseases of the circulatory system	1,306	2.3	8(7)
Diseases of nervous system and sense organs	1,259	2.2	9(8)
Diseases of the skin and subcutaneous tissue	769	1.4	10(9)
Diseases of blood and the blood forming organs	658	1.2	11(10)
Neoplasm	447	0.8	12(11)
Endocrine, nutritional and metabolic diseases and immunity disorder	445	0.8	13(12)
Diseases of the musculo sketetal system and connective tissue	383	0.7	14(13)
Mental disorder	74	0.1	15(14)
Congenital anomalies	69	0.1	16(15)
Total	56,452 (38,856)	100.0	

Source: Summary of Table 1; 1) Figures in the parenthesis show the number of patients after removal of normal delivery (see the text).
2) Figures in parentheses show the corrected ranks (see the text).

Table 3. Morbidity and Mortality (per 100,000 population) by Region in 1983

	E D R			C D R ¹⁾			W D R			MWDR			FWDR			Total				
	Morb	Mort	CFR	Morb	Mort	CFR	Morb	Mort	CFR	Morb	Mort	CFR	Morb	Mort	CFR	Morb	Mort	CFR		
I Infectious and Parasitic Diseases	42.51 (17.6)	3.35 (30.3)	7.88	36.59 (12.1)	1.69 (15.7)	4.62	104.6 (22.6)	5.53 (21.3)	5.29	53.8 (19.3)	3.35 (26.4)	6.22	16.37 (19.5)	0.88 (10.0)	2.32	55.72 (17.5)	3.11 (21.3)	5.59	6,785	379
II Neoplasms	0.32 (0.13)	0.07 (0.65)	22.20	4.56 (1.51)	0.22 (2.08)	4.91	6.49 (1.40)	0.61 (2.33)	9.36	1.32 (0.47)	--	--	--	--	--	3.67 (1.15)	0.26 (1.80)	7.16	447	32
III Endocrine, Nutritional, Metabolic Diseases and Immunity Disorder	2.77 (1.15)	0.32 (2.93)	11.70	2.79 (0.92)	0.57 (1.51)	5.84	6.23 (1.85)	0.95 (3.69)	15.38	3.95 (1.41)	0.12 (0.94)	3.03	0.57 (0.68)	--	--	3.65 (1.15)	0.39 (2.70)	10.79	445	48
IV Diseases of Blood and Blood-forming Organs	5.40 (2.23)	0.32 (2.93)	6.00	5.11 (1.69)	0.26 (2.45)	5.18	5.85 (1.26)	0.54 (2.09)	9.29	8.13 (2.91)	0.48 (3.77)	5.88	1.14 (1.36)	--	--	5.40 (1.69)	0.35 (2.42)	6.53	658	43
V Mental Disorders	0.32 (0.13)	0.07 (0.65)	22.20	0.29 (0.09)	--	--	0.67 (0.14)	--	--	3.59 (1.29)	0.60 (4.72)	16.67	--	--	--	0.61 (0.19)	0.06 (0.39)	9.46	74	7
VI Diseases of Nervous System and Sense Organs	9.29 (3.84)	0.97 (8.79)	10.50	8.82 (3.24)	0.49 (4.53)	4.98	13.61 (2.94)	1.63 (6.27)	11.97	9.56 (3.43)	1.20 (9.43)	12.50	2.48 (2.94)	0.19 (5.0)	7.69	10.34 (3.24)	0.93 (6.36)	8.98	1,259	113
VII Diseases of Circulatory System	7.93 (3.28)	0.97 (8.79)	12.3	10.00 (3.30)	1.18 (10.9)	11.81	16.17 (3.49)	2.11 (8.11)	13.04	10.28 (3.68)	0.36 (2.83)	3.49	0.57 (0.68)	0.19 (5.0)	33.3	10.73 (3.36)	1.27 (8.72)	11.87	1,306	155
VIII Diseases of Respiratory System	24.0 (9.92)	0.97 (8.79)	4.05	32.00 (10.6)	1.30 (12.1)	4.07	48.16 (10.4)	3.04 (11.7)	6.30	11.36 (4.07)	0.60 (4.72)	5.26	5.14 (6.11)	0.19 (5.0)	3.70	31.75 (9.95)	1.58 (10.8)	4.97	3,866	192
IX Diseases of Digestive System	22.12 (9.15)	0.58 (5.21)	2.61	22.29 (7.36)	0.88 (8.11)	3.93	25.75 (5.56)	1.31 (5.04)	5.09	27.26 (9.77)	0.48 (3.77)	1.75	3.05 (3.62)	0.38 (10.0)	12.5	22.65 (7.10)	0.87 (5.97)	3.84	2,758	106
X Diseases of Genito-urinary System	13.72 (5.68)	0.29 (2.61)	2.10	25.24 (8.33)	0.59 (5.47)	2.34	35.09 (7.58)	0.74 (2.83)	2.24	20.44 (7.35)	0.60 (4.72)	2.92	3.81 (4.52)	--	--	23.89 (7.49)	0.53 (3.66)	2.23	2,909	65
XI Complication of Pregnancy, Childbirth and Puerperium	21.83 (9.03)	0.61 (5.53)	2.81	61.21 (20.2)	0.41 (3.77)	0.67	19.37 (4.18)	2.97 (11.4)	15.95	25.35 (9.08)	1.91 (15.1)	7.55	1.52 (1.81)	0.19 (5.0)	12.5	36.44 (11.4)	1.21 (8.27)	3.31	4,437 ²⁾	147
XII Diseases of Skin and Subcutaneous Tissue	4.97 (2.06)	0.04 (0.33)	0.72	2.93 (0.97)	0.06 (0.57)	2.08	13.87 (2.99)	0.26 (0.98)	1.84	4.65 (1.67)	--	--	2.67 (3.17)	--	--	6.32 (1.98)	0.10 (0.68)	1.56	769	12
XIII Diseases of Musculoskeletal System and Connective Tissue	2.2 (0.91)	--	--	1.39 (0.46)	0.02 (0.19)	1.47	7.00 (1.51)	0.13 (0.49)	1.83	3.47 (1.24)	--	--	1.14 (1.36)	--	--	3.15 (0.99)	0.04 (0.28)	1.31	383	5
XIV Congenital Anomalies	0.25 (0.10)	--	--	0.55 (0.18)	--	--	1.05 (0.23)	0.05 (0.2)	6.06	0.24 (0.09)	--	--	--	--	--	0.57 (0.18)	0.02 (0.11)	2.90	69	2
XV Symptoms, Signs and Ill-defined Conditions	55.94 (23.1)	1.51 (13.7)	2.70	51.82 (17.1)	1.79 (16.6)	3.46	90.09 (19.5)	3.93 (15.1)	4.36	64.56 (23.14)	2.27 (17.9)	3.52	32.94 (39.14)	1.52 (40.0)	4.62	62.66 (19.6)	2.30 (15.8)	3.67	7,629	280
XVI Injury and Poisoning	28.24 (11.7)	0.97 (8.79)	3.44	38.40 (12.0)	1.73 (16.0)	4.76	69.16 (14.9)	2.21 (8.48)	3.19	31.09 (11.14)	0.72 (5.66)	2.31	12.76 (15.16)	0.76 (20.0)	5.97	41.57 (13.0)	1.57 (10.7)	3.77	5,062	191
Total	241.82 (100.0)	11.06 (100.0)	4.57	302.99 (100.1)	10.80 (100.0)	3.56	468.18 (100.0)	26.01 (100.0)	5.62	279.05 (100.0)	12.67 (100.0)	4.54	84.16 (100.0)	3.81 (100.0)	4.52	319.12 (100.0)	14.59 (100.0)	4.57	38,856	1,777

Source: Table 1. Figures in parentheses show the rate of the patients of each category to the total number of the patients in each Region.

- 1) Patients treated in the Teiku Infectious Disease Hospital are missing in the report. (refer to Table 8).
- 2) After removal of normal delivery

Table 4 Ranking of Morbidity by Region¹⁾

Rank	EDR		CDR		WDR		MWDR		FWDR		Nepal	
	Dis	%	Dis	%	Dis	%	Dis	%	Dis	%	Dis	%
1	Inf	17.6	PCP	20.2	Inf	22.5	Inf	19.3	Inf	19.5	Inf	17.5
2	Acc	11.7	Inf	12.1 ²⁾	ACC	14.9	Acc	11.1	Acc	15.2	Acc	13.0
3	Resp	9.92	Acc	12.0	Resp	10.4	Dig	9.77	Resp	6.11	PCP	11.4
4	Dig	9.15	Resp	10.6	G-U	7.58	PCP	9.08	G-U	4.52	Resp	9.95
5	PCP	9.03	G-U	8.33	Dig	5.56	G-U	7.33	Dig	3.62	G-U	7.49
6	G-U	5.68	Dig	7.36	PCP	4.18	Resp	4.07	Skin	3.17	Dig	7.10
7	Nerv	3.84	Circ	3.30	Circ	3.49	Circ	3.68	Nerv	2.94	Circ	3.36
8	Circ	3.28	Nerv	3.24	Skin	2.99	Nerv	3.43	PCP	1.81	Nerv	3.24
9	Blood	2.23	Blood	1.69	Nerv	2.94	Blood	2.91	Blood	1.36	Skin	1.98
10	Skin	2.06	Neo	1.51	MSCT	1.51	Skin	1.67	MSCT	1.36	Blood	1.69
SSID		23.1	17.1		19.5		23.1		39.1		19.6	

1) Figures show the rate of the patients in each category to the total number of the patients in each Region.

2) The rate will be 33.5%, if the cases of Teku Hospital will be added (Table 8).

Source : Table 3

Abbreviations

- Dis : Disease(s)
- Inf : Infection and Parasitic Diseases
- Neo : Neoplasms
- ENMI : Endocrine, Nutritional, Metabolic Diseases and Immunity Disorder.
- Blood : Diseases of Blood and Blood-forming Organs.
- Ment : Mental Disorders.
- Nerv : Diseases of Nervous System and Sense Organs.
- Circ : Diseases of Circulatory System.
- Resp : Diseases of Respiratory System.
- Dig : Diseases of Digestive System.
- G-U : Diseases of Genito-urinary System.
- PCP : Complication of Pregnancy, Childbirth and Puerperium.
- Skin : Diseases of Skin and Subcutaneous Tissue.
- MSCT : Diseases of Musculoskeletal System and Connective Tissue.
- SSID : Symptoms, Signs and Ill-defined Conditions.
- Acc : Injury and Poisoning.

Table 5 Ranking of Mortality by Region¹⁾

Rank	EDR		CDR		WDR		MWDR		FWDR		Nepal	
	Dis	%	Dis	%	Dis	%	Dis	%	Dis	%	Dis	%
1	Inf	30.3	Acc	16.0	Inf	21.3	Inf	26.4	Acc	20.0	Inf	21.3
2	Acc	8.79	Inf	15.7 ²⁾	Resp	11.7	PCP	15.1	Inf	10.0	Resp	10.8
3	Resp	8.79	Resp	12.1	PCP	11.4	Nerv	9.43	Dig	10.0	Acc	10.7
4	Circ	8.79	Circ	10.9	Acc	8.48	Acc	5.66	PCP	5.0	Circ	8.72
5	Nerv	8.79	Dig	8.11	Circ	8.11	Resp	4.72	Resp	5.0	PCP	8.27
6	PCP	5.53	G-U	5.47	Nerv	6.27	G-U	4.72	Circ	5.0	Nerv	6.36
7	Dig	5.21	Nerv	4.53	Dig	5.04	Ment	4.72	Nerv	5.0	Dig	5.97
8	ENMI	2.93	PCP	3.77	ENMI	3.69	Dig	3.77	-	-	G-U	3.66
9	Blood	2.93	Blood	2.45	G-U	2.83	Blood	3.77	-	-	ENMI	2.70
10	G-U	2.61	Neo	2.08	Neo	2.33	Circ	2.83	-	-	Blood	4.42
SSID		13.7		16.6		15.1		17.9		40.0		15.8

1. Figures show the rate, as shown in the legend to Table 4.

2. The rate will be 31.6%, if the cases of Teku Hospital will be added (Table 8).

Abbreviations: see Table 4.

Table 6. Hospital Morbidity Pattern in Different Periods

	1974/75 % a/	1975/76 % b/	1978/77 % c/	1983/84 % d/
Infective and parasitic Diseases	32.0	28.9	23.09	17.5
Diseases of the Respiratory System	24.9	28.6	11.03	10.0
Accident, Poisoning & Violence	9.2	8.7	8.78	13.0
Symptoms and Ill defined Conditions	9.3	10.9	6.55	19.6
Diseases of Genito-Urinary System	6.0	6.1	6.34	7.5
Diseases of Digestive System	3.6	4.2	5.98	7.1
Diseases of Circulatory System	3.7	3.7	2.88	3.4
Complication of pregnancy, Child Birth and Puerperium	3.6	3.2	23.30	11.4
Diseases of the Nervous System & Sense Organs	3.5	3.0	3.06	3.2
Neoplasma	—	—	—	1.2
Endocrine, Nutritional & Metabolic Diseases	—	2.7	1.26	1.1
Diseases of Blood and Blood-forming Organs	—	—	—	1.7
Diseases of the Skin and Subcutaneous Tissue	—	—	—	2.0
Other Diseases	4.2	—	7.73	1.3
Total %	100.0	100.0	100.0	100.0
Total No. of Cases	6,776	9,188	27,702	38,856*

Source: a) Based on 10 hospitals)
 b) Based on 9 hospitals) Health Care System in Nepal
 c) Based on 16 hospitals) (G.R. Agrawal and R.P. Shrestha, 198
 d) Epidemiological Bulletin, Epid. & Statist. Division,
 Vol.5 and 6, 1984 and 1985.

Table 7 Vital Statistics

	Bangladesh (1982)	India (1983)	Indonesia (1983)	Nepal (1984)	Paraguay (1982)	Philippines (1977)	Sri Lanka (1981)	Thailand (1978)	Thailand (1983)
Mid-year Population (x1,000)	92,616	732,256	159,434	16,268	3,274 (1985)	44,584	51,970	43,916	49,459
Density of Population/km ²	626	220	82	102*	7.4	140 [†]	173	230	98
Urban Population(%)	10	24.7	24.1	7*	42.3	35.0	37.3	21.5	15.1
Crude Birth Rate ¹⁾	35.8	34	33.7	41.6	36.0	30.0	28.9	26.2	21.3
Crude Death Rate ¹⁾	14.2	13	11.7	16.6	7.2	7.8	6.3	6.1	5.1
Population Growth Rate(%)	2.2	1.8	1.8	2.7*	2.0	2.7	2.8	2.2	2.0
Infant Mortality ²⁾	121.9	93.0	90.3	111.5	51.2	57.0	42.7	34.4 [§]	12.4
Maternal Mortality ²⁾		3.4		8.5	2.9	1.4	1.0	0.9 [§]	0.8
Expectation of Life at Birth	M 55.3*	56	52	52.9	65.1	56.9 [†]	60.7	67.0	60.8
	F 54.4	54	55	50.1	(1980-1985)	59.9	64.3	71.0	64.8
Census Population (x1,000)	90,625 (1981)	680,400 (1980)	146,776 (1980)	15,023 (1981)	3,026 (1982)	48,098 (1980)	14,850 (1981)	44,825 (1980)	

1) Rate per 1,000 Population 2) Rate per 1,000 live birth.

2) *: Data in 1981; †: Data in 1975; §: Data in 1980

Source: Reports of the Observation Team on Infectious Diseases, JICA, 1981-1986,
Sri Lanka Socio-economic Data, 1984, Public Health Statistics, Ministry of
Public Health, Thailand, 1983 and Philippine Statistical Year Book 1986.

Table 8. Incidence of Infectious Diseases by Zone¹⁾ (1983) - (A) Cases

Disease	Zone							Total				
	Koshi	Sagarmatha	Janakpur	Bagmati (1)	Bagmati (2)	Narayani	Lumbini		Dhawalagiri	Gandaki	Bheri	Mahakali
GE/Diarrhoea	352 (12)	31	451 (11)	2	3,497 (30)	323 (15)	753 (28)	98 (1)	328 (9)	88 (1)	25	5,948 (107)
Cholera					115 (3)		1					116 (3)
Enteric fever	64 (1)	5	42	61	343 (2)	39 (1)	105 (2)	27 (1)	144 (5)	57	2	889 (12)
Dysentery	102 (1)	14	92 (1)	7	321 (6)	31 (2)	290 (18)	23 (1)	134 (5)	39	5	1,058 (34)
Tetanus	115 (29)	1	51 (8)		61 (19)	59 (10)	51 (17)	3	21 (1)	55 (15)	2 (2)	419 (101)
Hepatitis	68 (6)	6	39 (4)	37 (3)	342 (53)	24 (1)	49 (5)	11	57 (7)	12 (1)	9	654 (80)
Measles	5		3		322 (8)	12 (1)	20 (1)		41		1	404 (10)
Meningitis					493 (41)							493 (41)
Whooping cough			1 (1)			2				1		4 (1)
Diphtheria	10 (2)	2		6		2	2 (2)		1	1		24 (4)
Poliovellitis	5						2					7
Tuberculosis	160 (22)	75 (2)	125 (3)	154 (16)		95 (3)	319 (27)	41 (1)	455 (32)	176 (10)	21	1,621 (116)
Leprosy							80	1	8			89
Other microbial infections ²⁾	71 (16)	4	28	8 (1)		12 (1)	26 (3)	4 (1)	11 (2)	9 (1)	3	176 (25)
Malaria	6	2	6			7	8	4	9 (1)	4	3	49 (1)
Filariasis							(1)4		(7)1, (1)1			6
Leishmaniasis												
Helminthiasis	75 (2)	7	42			41 (1)	53	10	77 (3)	8	15	328 (6)
Total	1,033 (91)	147 (2)	880 (28)	269 (20)	5,500(162)	647 (35)	1,763(103)	222 (5)	1,288 (65)	450 (28)	86 (2)	12,285 (541)

1) Figures show the number of patients and those in parentheses number of deaths.

2) Viral infections are involved: Total No. of cases 108 and No. of deaths 17.

Source: Epidemiological Bulletin 5 (1-4), 1984 and 6 (1-4), 1985, Ministry of Health Bagmati (2): From the report of Teku Infectious Diseases Hospital, in "Health Information Bulletin, Vol.2, No.2, 1986," M.O.H.

Table 9. Infectious Diseases Prevailing in Nepal (1983)

	Cases	Morbidity ¹⁾ %	Rate ²⁾	Death	Mortality ¹⁾	Rate ²⁾ %	CFR ³⁾ %
1. Gastroenteritis and Diarrhoea	5,948	48.85	48.42	102	0.88	19.78	1.80
2. Tuberculosis	1,621	13.30	13.19	116	0.95	21.44	7.16
3. Dysentery	1,058	8.69	8.61	34	0.28	6.28	3.12
4. Enteric fever	889	7.30	7.24	12	0.10	2.22	1.35
5. Hepatitis	654	5.37	5.32	80	0.66	14.79	12.23
6. Meningitis	493	4.05	4.01	41	0.34	7.58	8.32
7. Tetanus	419	3.44	3.41	101	0.83	18.67	24.11
8. Measles	404	3.32	3.29	10	0.08	1.85	2.48
9. Cholera	116	0.95	0.94	3	0.02	0.55	2.59
10. Leprosy	89	0.73	0.72	0			
11. Diphtheria	24	0.20	0.20	4	0.03	0.74	16.67
12. Poliomyelitis	7	0.06	0.06	0			
13. Whooping Cough	4	0.03	0.03	1	0.00	0.18	25.0
14. Other Infections	176	1.45	1.43	25	0.21	4.62	14.20
15. Malaria and Parasitic Diseases	383	3.15	3.12	7	0.06	1.29	1.83
Total	12,285	100.90	99.99	541	4.44	99.99	

1) Morbidity, Mortality per 100,000 Population.

2) Rate of cases or death to all cases or deaths.

3) Case fatality rate.

Source: Table 8

Table 10. Incidence of Infectious Diseases by Zone (1983) - (B) Ranking

Zone	1	2	3	Ranking of Incidence						9	10
				4	5	6	7	8			
Koshi	(1,033)	GE/Dia 15.5	TBC 15.5	Tet 11.1	Sys 9.9	Hep 6.6	Ent.F 6.2	Diph 1.0			
Sagarmatha	(147)	TBC 51.0	GE/Dia 21.1	Sys 9.5	Hep 4.1	Ent.F 3.4	Diph 1.4				
Janakpur	(880)	GE/Dia 51.3	TBC 14.2	Sys 10.5	Tet 5.8	Ent.F 4.8	Hep 4.4				
Bagmati	(5,769)	GE/Dia 60.7	Men 8.5	Ent.F 7.0	Hep 6.6	Dys 5.7	Meas 5.6	TBC 2.7	Chol 2.0	Tet 1.1	
Narayani	(647)	GE/Dia 49.4	TBC 14.7	Tet 9.1	Ent.F 6.0	Dys 4.8	Hep 3.7	Meas 1.9			
Lumbini	(1,763)	GE/Dia 42.7	TBC 18.1	Dys 16.4	Ent.F 6.0	Tet 2.9	Hep 1.8	Meas 1.1			
Dhawalagiri	(222)	GE/Dia 44.1	TBC 18.5	Ent.F 12.2	Dys 10.4	Hep 5.0	Tet 1.4				
Gandaki	(1,288)	TBC 35.3	GE/Dia 25.5	Ent.F 11.2	Dys 10.4	Hep 4.4	Meas 3.2	Tet 1.6			
Bheri	(450)	TBC 39.1	GE/Dia 19.6	Ent.F 12.7	Tet 12.2	Dys 8.7	Hep 2.7				
Mahakali	(86)	GE/Dia 29.1	TBC 24.4	Hep 10.5	Dys 5.8	Ent.F 2.3	Tet 2.3				

Source: Table 8 Diseases after Leprosy in Table 8 were omitted, because the informations of the "Hospital Report" are incomplete (see the text).

- 1) Figures in parentheses show the total number of patients in each zone.
- 2) Figures under the name of diseases show the rate of the cases in each zone (see legend 1) to Table 4).

Table 11 Incidence of Important Infectious Diseases

Communicable Diseases	1978		1979		1980	
	No. of cases	Percent	No. of cases	Percent	No. of cases	Percent
G/E Diarrhoea	3,606	63.40	3,552	67.27	2,275	53.52
Typhoid Fever	356	6.26	308	5.83	541	12.73
Tetanus	576	10.13	478	9.05	536	12.61
Amoebic Dysentery	492	8.65	529	10.01	476	11.20
Infective Hepatitis	99	1.74	133	2.52	134	3.15
Measles	201	3.53	131	2.48	129	3.03
Bacillary Dysentery	309	5.43	122	2.31	123	2.89
Whooping Cough	13	0.23	6	0.11	18	0.42
Diphtheria	27	0.47	16	0.30	16	0.38
Polioyelitis	9	0.16	5	0.09	3	0.07
Total	5,688	100.00	5,280	99.97	4,251	100.00

Source: Health Care System in Nepal by G.R.Agrawal and R.P. Shrestha (1984)

Table 12. Annual Morbidity and Mortality Statistics of Inpatients Treated
in Infectious Diseases Hospital during the Year 2038-2040

Diseases	2038 (1981)			2039 (1982)			2040 (1983)					
	Cases No.	%	Deaths No.	CFR %	Cases No.	%	Deaths No.	CFR %	Cases No.	%	Deaths No.	CFR %
Gastro-Enteritis	3,011	(69.4)	44	(1.46)	2,646	(57.2)	21	(0.8)	3,497	(50.7)	30	((0.86)
Cholera	116	(2.8)	3	(2.6)	-	-	-	-	115	(1.7)	3	(2.6)
Enteric Fever	98	(2.3)	3	(3.1)	152	(3.3)	3	(1.3)	343	(5.0)	2	(0.6)
Diphtheria	9	(0.2)	1	(11.1)	11	(0.2)	1	(9.1)	6	(0.1)	-	-
Measles	225	(5.2)	7	(3.1)	157	(3.4)	14	(8.9)	322	(4.7)	8	(2.5)
Hepatitis	283	(6.5)	38	(13.4)	645	(13.9)	79	(12.2)	342	(5.0)	53	(15.5)
Dysentery	199	(4.6)	10	(5.0)	275	(5.9)	13	(4.7)	321	(4.7)	6	(1.9)
Tetanus	38	(0.9)	21	(55.3)	39	(0.8)	19	(48.7)	61	(0.9)	19	(31.0)
Meningitis	-	-	-	-	58	(1.5)	14	(20.6)	493	(7.2)	41	(8.3)
Other	358	(8.3)	26	(7.3)	575	(13.5)	32	(5.6)	1,392	(20.2)	83	(6.0)
Total	4,337		153		4,625		198		6,892		245	

Source: Health Information Bulletin, Vol.2, No.2, 1986

Table 13. Number of Immunization by Different Fiscal Year
(1978-July 1985)

F.Y.	BCG	DPT	TT	Polio	Measles	Total
1978/79	115,726	30,740	31,872	-	-	178,338
1979/80	108,412	37,218	35,040	-	-	180,670
1980/81	65,913	68,784	102,060	1,446	530	238,733
1981/82	166,216	65,384	138,284	7,939	5,292	383,115
1982/83	225,520	85,629	238,144	10,938	49,443	609,674
1983/84	219,074	108,861	278,407	18,687	114,769	739,798
1984/85	226,619	192,350	339,120	211,440	210,420	1,179,949

Table 14. Tetanus of Children in Bheri Zonal Hospital

Age group	0 - 1 years	1 - 4 years	5 - 14 years	Total
No. of Cases	162	14	28	204
Percentage	79.4	6.9	13.7	100
No. of Deaths	88	3	12	103
CFR	54.3	21.4	42.9	50.5

(1978-1982)

Fig.1 Effect of TT/DPT on Tetanus Incidence Rate

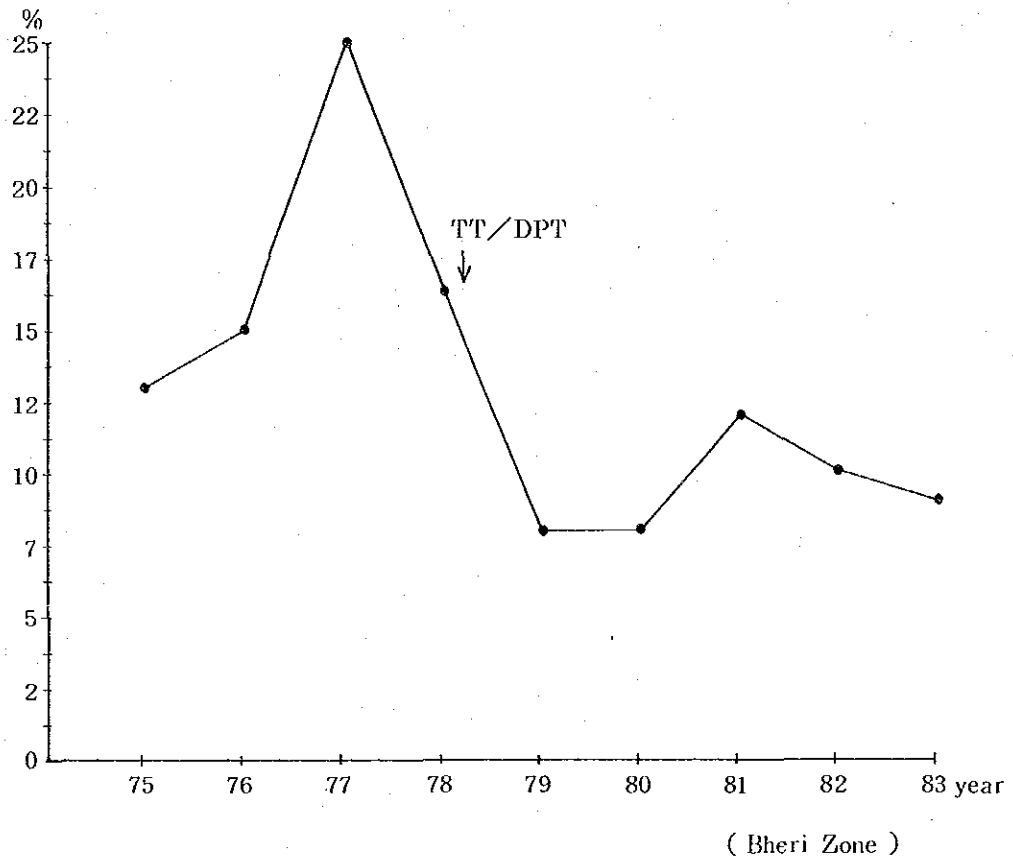


Table 15 Incidence of Tuberculosis

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Japan	Morb 98.4 Mort 9.5	88.8 8.5	80.8 7.8	73.2 7.2	68.0 5.8	62.6 5.5	58.0	56.2	53.4 4.5	52.3 4.1
Philippines	Morb 314.1 Mort 69.2	338.4 71.7	238.0 70.7	260.5 62.4	233.6 60.6	← ←	← ←	Mean 216.8 Mean 57.1	→ →	268.0 52.9
Sri Lanka	Morb 54.2 Mort 13.4	49.7 11.6	42.9 10.8	44.8 9.8	42.5 9.2	42.1	41.9			
Thailand	Morb 90.7 Mort 15.8	82.2 15.4	89.2 16.0	76.4 16.9	68.9 14.9	65.7 14.2	63.4 13.9	59.0 12.0	57.3 11.2	50.5 10.3

Nepal: Estimated Prevalence : 1 Percent (1986) of population
 Infective type: 0.25-0.5 Percent of population

Table 16. Comparison of Leprosy Cases, Registered Treatment in Regions by Different Fiscal Year

Region	Number of Registered Patients under Treatment						
	1977	1978	1979	1980	1981	1982	1983
EDR	2,615	2,728	3,092	6,194	6,399	6,813	7,654
CDR	5,792	13,925	16,682	11,071	13,095	14,293	11,944
WDR	1,782	1,782	2,406	2,483	4,581	3,013	5,777
MWDR	-	-	-	3,896	4,451	5,525	5,436
FWDR	2,094	2,568	2,948	2,929	3,011	3,429	3,802
Total	22,203	23,003	25,164	32,573	31,537	33,073	34,613

Table 17 New Cases of Leprosy Registered in 1985/1986

Development Region	Type of Leprosy		Total
	Multibacillary	Paucibacillary	
Eastern D. Region	307	881	1,188
Central D. Region	318	814	1,132
Western D. Region	146	229	375
Mid-western D. Region	182	247	429
Far-western D. Region	11	35	46
Total	946	2,206	3,170

Table 18 Incidence of Leprosy

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Indonesia (1)	5.5	5.0	6.0	5.0	4.8	5.1	5.1			
Indonesia (2)	1.02	1.04	1.04	← 5.0	1.04 →				0.80	0.78
Nepal (1)										(1985/86) 19.68
Nepal (2)*	1.47	1.53	1.47	1.53	1.68	2.17	2.10	2.20	2.30	2.16
Philippines (1)						1.99	2.07	2.20		3.80
Sri Lanka (1)**	2.1	2.0	1.3	1.8	1.8	2.3	1.5(4.9)		(4.9)	
Sri Lanka (2)							0.68			
Thailand (2)		0.85	0.81	0.80	0.83	0.81	0.88	0.90	0.90	0.88

(1) Morbidity per 100,000 population (New registered case in the year)

(2) Prevalence of the patients per 1,000 population.

* Estimated from the cases of registered treatment.

Total number of the patients is estimated to be 100,000 (=6.7 per 1,000) in 1985/1986.

** Figures provided by Epidemiological Unit;

Figures in parentheses show those provided by anti-Leprosy Campaign Office.

Table 19. Malaria Morbidity in Nepal (1963-1985)

Year	No. population	No. smears	No. positive	API
1963	1,174,324	67,761	159	0.1
1964	2,169,309	37,6502	2,359	1.1
1965	3,325,750	45,4448	4,616	1.4
1966	3,580,856	55,4973	8,583	2.4
1967	4,394,519	67,8401	6,030	1.4
1968	5,660,000	77,4934	2,468	0.4
1969	6,118,500	88,2604	3,897	0.6
1970	6,119,662	1,002,134	2,518	0.4
1971	6,593,889	1,135,847	2,778	0.4
1972	6,200,550	1,200,632	4,067	0.7
1973	6,349,920	1,503,585	8,479	1.3
1974	6,559,029	1,655,878	14,640	2.2
1975	6,668,511	1,482,484	12,370	1.9
1976	6,905,840	1,468,741	10,123	1.5
1977	7,150,631	1,511,925	11,615	1.6
1978	7,390,685	1,560,233	14,212	1.9
1979	7,527,166	1,432,633	12,992	1.7
1980	7,894,317	1,306,679	13,033	1.7
1981	8,073,839	1,290,579	16,084	2.0
1982	8,459,153	1,497,988	16,902	2.0
1983	8,760,698	1,504,544	16,719	1.9
1984	9,005,908	2,500,278	29,388	3.3
1985	9,332,211	1,544,495	42,321	4.5

Table 20. Total Blood Smears and Number of Positive Cases in Each Region

Name of Region	Year	Total Population	No. of Blood Smears Exam.	No. of Positive Cases	API
East	1984	1,704,341	38,0466	2,846	1.7
	1985	1,750,547	36,4381	3,766	2.2
Central	1984	1,728,430	40,9502	6,834	4.0
	1985	1,761,192	41,6957	7,149	4.1
West	1984	1,410,120	29,9797	6,467	4.6
	1985	1,460,303	29,3194	6,374	4.4
Mid west	1984	837,213	14,5745	4,359	5.2
	1985	866,204	14,9956	5,883	6.8
Far west	1984	469,659	7,5094	4,147	8.8
	1985	489,167	10,1931	12,902	26.4
Total	1984	6,149,763	1,310,604	24,653	4.0
	1985	6,327,413	1,326,419	36,074	5.7
Integration	1984	2,856,125	18,9674	3,357	1.2
	1985	3,004,798	21,8076	4,679	1.6

(Source ; Annual Evaluation Report, 1985)

Table 21. Total Blood Smears and Number of Positives in Each District

District name	Population	P.V.	P.F.	Mix	API
<u>East Region</u>	1,750,547	2,999	746	21	0.9
Taplejung	18,377	159	4	0	8.9
Terathum	25,108	30	10	0	1.6
Panchthar	35,776	41	2	1	1.2
Ilam	67,639	81	96	1	2.6
Jhapa	473,703	658	271	1	2.0
Morang	524,356	789	211	3	1.9
Sunsari	328,455	446	44	2	1.5
Chainpur	34,987	69	3	0	2.1
Bhojpur	46,626	207	25	2	5.0
Khotang	47,497	25	0	1	0.6
Okhaldhunga	19,187	16	1	0	0.9
Udayapur	128,206	478	79	1	4.4
<u>Central Region</u>	1,761,192	6,702	445	2	4.1
Kabhre	66,794	138	4	0	2.1
Lalitpur	8,595	3	0	0	0.4
Chitawan	286,745	769	73	0	2.9
Ramechhap	70,159	24	0	0	0.3
Sindhuli	162,528	1,281	40	0	8.1
Dhanusa	444,052	2,095	61	0	4.9
Mahatari	380,768	1,545	180	1	4.5
Sarlahi	341,550	847	87	1	2.7
<u>West Region</u>	1,460,303	5,849	516	9	4.4
Arghakhanchi	22,394	163	13	0	7.9
Kapilvastu	301,967	1,347	61	1	4.7
Rupandehi	408,318	1,930	99	1	5.0
Nawalparasi	354,810	1,452	283	5	4.9
Palpa	144,907	428	32	0	3.2
Lamjung	80,884	98	11	1	1.4
Gorkha	147,023	431	17	1	3.1
<u>Mid West and Far West Region</u>	1,355,371	13,359	5,384	44	13.8
Salyan	16,544	196	7	2	12.3
Dang	279,159	1,441	170	10	5.9
Banke	212,143	735	114	0	4.0
Bardiya	220,097	717	207	1	4.2
Surkhet	138,261	1,796	483	4	16.5
Kailali	275,837	3,468	1,507	1	18.0
Dadeldhura	37,685	1,170	811	8	52.8
Kanchanpur	175,645	3,834	2,085	18	33.8

(Annual Evaluation Report, 1985)

Table 22. Incidence of Malaria among Persons by Age and Sex

Region	Infant (~1 year)			1-14 year			Adult (15 year ~)		
	Male (%)	Female (%)	Total (%)	Male (%)	Female (%)	Total (%)	Male (%)	Female (%)	Total (%)
East	7 (0.3)	9 (0.4)	16 (0.7)	285 (13.0)	251 (11.4)	536 (24.4)	1,249 (56.9)	396 (18.0)	1,645 (74.9)
Central	4 (0.1)	4 (0.1)	8 (0.2)	622 (15.4)	535 (13.2)	1,157 (28.6)	1,917 (47.4)	965 (23.8)	2,882 (71.2)
West	6 (0.2)	3 (0.1)	9 (0.4)	309 (12.5)	248 (10.1)	557 (22.6)	1,378 (55.9)	519 (21.1)	1,897 (77.0)
Mid West	0	1 (0.1)	1 (0.1)	154 (15.6)	112 (11.3)	266 (26.9)	537 (54.2)	186 (18.8)	723 (73.0)
Total	17 (0.2)	17 (0.2)	34 (0.4)	1,370 (14.1)	1,146 (11.8)	2,516 (25.9)	5,081 (52.4)	2,066 (21.3)	7,147 (73.7)

Table 23. Name of Operating Districts in Each Region

East Region	Central Region	West Region	Mid west Far west Region
Panchthar	Ramechhap	Gorkha	Dang
Illam	Sindhuli	Palpa	Surkhet
Jhapa	Mahottari	Kapilvastu	Banke
Sunsari	Dhanusa	Rupandehi	Bardiya
Morang	Sarlahi	Nawalparasi	Kailali
Khotang	Chitwan		Kanchanpur
Bhojpur	Kabhre		
Udayapur			

(Source ; Annual Evaluation Report, 1985)

Table 24. Area and Population Covered by Anti-Malaria Activities

Region	No districts wholly or partially covered	Operating districts	Unit	Locality	Population
East	13	8	44	244	1,750,547
Central	11	7	355	199	1,761,192
West	7	5	33	175	1,460,303
Mid-West	11	6	32	174	1,355,371
Total	42	26	1445	792	6,327,413

(Source ; Annual Evaluation Report, 1985)

Table 25. Annual Amount of Insecticide for Spraying (1977, 1978, 1984, 1985)

Region	1977			1978			1984			1985		
	DDT	Malathion	Ficam	DDT	Malathion	Ficam	DDT	Malathion	Ficam	DDT	Malathion	Ficam
East	252,179	—	—	256,651	—	—	27,662	—	—	11,777	—	6,341
Central	215,241	—	—	178,862	—	—	13,456	161,782	—	15,094	170,078	6,773
West	136,454	203,440	—	149,037	173,271	—	14,972	54,504	—	494	72,752	5,537
Mid West	188,231	—	—	188,065	—	—	23,100	—	—	50,322	—	—
ICHSDP	—	—	—	—	—	—	—	267,944	—	—	—	—
Total	792,105	203,440	—	772,635	173,271	—	79,190	484,230	—	77,687	242,830	18,651

Table 26 Incidence of Malaria in some Asian Countries

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Bangladesh		64	38	44	66	78	51				
Indonesia		241.1	379.2		270.8	276					
Nepal	185.5	146.6	162.4	192.3	172.6	165.1	199.2	199.8	192.0	326.3	453.5
Philippines	63.7	81.3	66.6	77.7	68.2	91.7	84.2	95.0	229.3	207.4	
	2.4	2.3	2.2	2.4	2.5	2.2	2.1	2.3	1.4		
Sri Lanka	2,896	2,150	1,872	4,872	330.2	327.3	317.1				
	0.04	0.01	0.01								
Thailand	740	720	770	790	710	890	1,060	910	520	630	
	14.4	11.5	10.9	10.2	8.2	8.1	8.6	7.8	5.9	4.4	

Table 27 Morbidity in Kaski District (1985/1986).

Disease	Morbidity Prevalance per 1,000		
	Number	Rate	
Cholera	14	.066	
Typhoid & Paratyphoid	191	.901	
Bacillary dysentery & Amoebiasis	4,754	22.438	
Enteritis and other diarrhoeal diseases	4,549	21.471	
TB of respiratory system suspected	434	2.048	
TB of of other system	17	.080	
Leprosy	6	.028	
Diphtheria	3	.014	
Whooping cough	130	.613	
Tetanus	x	-	
Acute polimyelitis	1	.004	
Late poliomyelitis (effect of)	x	-	
Measles	74	.349	
Infectious hepatitis	63	.297	
Malaria suspected	98	.462	
Congenital syphilis	3	.014	
Other syphilis	22	.103	
Gonococcol infection	42	.198	
Filarial infection	6	.028	
Helminthiasis	9,665	45.618	
Other specific infection	637	3.006	
Chicken pox	4	.018	
Total I	Infectious and Parasitic Diseases	20,713	97.78
Total II	Neoplasma	4	.018
Total III	Endocrine, Nutritional, Metabolic Diseases and Immunity Disorder	1,995	9.42
Total IV	Diseases of Blood and Blood forming Organs	1,120	5.29

(Table 27 continued)

	Diseases	Morbidity Prevalance per 1,000	
		Number	Rate
Total V	Mental Disorder	19	0.09
Total VI	Diseases of Nervous System and Sense Organd	4,971	23.47
Total VII	Diseases of Circulatory System	246	1.16
Total VIII	Uper Respiratory Infections	5,601	
	Pneumonia	956	
	Bronchitis, emphysema and asthma	2,746	
	Other diseases of Respiratory System	557	
Total VIII	Diseases of Respiratory System	9,860	46.56
Total IX	Diseases of Digestive System	6,913	32.64
X	Diseases of Genito-urinary System	1,228	5.80
XI	Complication of Pregnancy, Childbirth and Puerperium (Normal Delivery: 94)	247	1.17
XII	Diseases of Skin and Subcutaneous Tissue	20,395	96.26
XIII	Diseases of Musclo-skeletal system and Connective Tissue	2,040	9.63
XIV	Congenital Anomalies	5	0.02
XV	Certain Conditions Originating in the Perinatal Period	4	0.018
XVI	Symptoms, Signs and Ill-defined Conditions	9,254	43.70
XVII	Injury and Poisoning	5,888	27.80
Well Baby Care		2,657	12.55

Table 28 Cause Specific Death Rate of Infants and Children.

Suspected Cause (Disease)	Total no. of deaths	Deaths 0 - 1 year			Deaths 1 - 5 years		
		number	% of cause	% of total deaths	number	% of cause	% of total deaths
Measles	8	1	12.5	0.74	2	25	1.7
Meningitis	4	-	-	-	-	-	-
Hepatitis	16	-	-	-	-	-	-
Malaria	5	1	20	0.74	3	60	2.54
Fever, unqualified	67	4	5.9	3	9	13.4	7.6
Diarrhoea, unqualified	139	14	10.1	10.4	38	27.3	32.2
Food poisoning	20	-	-	-	-	-	-
Acute Abdomen	63	-	-	-	-	-	-
Tuberculosis	53	1	1.8	0.74	3	5.7	2.54
Pneumonia	95	30	31.6	22.2	15	15.8	12.7
U.R.T.I.	136	6	4.4	4.4	5	3.7	4.2
Diphtheria	5	2	40	1.5	3	60	2.54
Heart Attack	26	-	-	-	-	-	-
Renal shut down	14	2	14.3	1.5	-	-	-
Tetanus	16	7	43.7	3.2	1	6.2	0.84
Compl. Birth + Puerp. mothers	18	41	-	30.3	-	-	-
Cause Unknown	248	23	9.2	17	28	11.3	23.7
Injuries	59	3	5	2.2	8	13.5	6.8
Suicide	4	-	-	-	-	-	-
Total	1,037	135	13	100	118	11.4	100

Kaski District (1985/1986)

Table 29 Maternal mortality

Related to gravid		Mother conditions		Mother age	
Gravida	Death	Condition	Death	Age (years)	Death
1st	8	Ante-natal period	3	- 15	-
				16-20	3
2nd	1	Natal	2	21-25	6
				26-30	5
				31-35	2
3rd	6	Within 7 days of delivery	9	36-40	2
4th	2	Within 7 to 45 days of delivery	4	41-45	-
5th & +	1			45+	-
Total	18	Total	18	Total	18

Kaski District (1985/1986)

Table 30

Distribution of Institutions Belonging to Vertical Projects

Zones	FPMCH Clinics	NMEO 2)	EPI 1)	DPH Office	EP/MCH Office 3)	Leprosy 4)
Mechi	15	17	4	2	2	-
Koshi	31	23	4	5	7	1
Segarmatha	9	13	1	5	2	-
Janakpur	27	32	4	4	5	-
Bagmati	30	4	4	5	5	-
Narayani	-	9	-	5	1	1
Gandaki	26	8	3	3	4	1
Lumbini	26	31	4	3	5	-
Dhaulagiri	17	-	4	2	3	1
Rapti	24	9	3	3	4	1
Karnali	17	-	1	1	1	-
Bheri	10	18	2	4	4	1
Seti	21	6	3	3	4	-
Mahakali	5	6	4	3	3	-
Total	258	176	41	48	50	6

Note: 1) Include District and Branch Offices.

2) Include Regional, District offices, Research Training Centre and Unit Offices.

3) Include Regional Training Centre & District Offices and Regional Offices.

4) Include Regional & Sub Regional Offices

Source: Health Information Bulletin, Vol.2, No.2, 1986, Ministry of Health

Table 31. Immunization Project (1983/1984)

	DPT			BCG			TT			Polio			Measles		
	Achievement			Achievement			Achievement			Achievement			Achievement		
	Target	I	II	III	Target	Achievement	Target	I	II	Target	I	II	III	Target	ment
Panchtar	3000	3949	2585	2892	3000	8274	15000	11264	8410	3000	3577	1931	699	1500	4476
Ilam	5000	4679	4252	4330	5000	7374	18000	9277	9279	5000	3305	2214	1268	2500	3445
Jhapa	12000	9676	7589	4276	12000	12757	46000	32989	27137	12000	912	578	533	6000	14771
Sankhuwasabha	3000	4385	4133	3376	3000	5180	12000	8831	11358	3000	4031	1093	371	1500	4625
Terathum	2000	2498	2540	3251	2000	6912	9000	5576	6874	2000	2897	925	339	1000	3620
Bhojpur	5000	4423	4513	4783	5000	9189	19000	6852	7675	5000	4028	2031	183	2500	4446
Morang	14000	11333	9157	6352	14000	14345	51000	31988	23126	14000	5523	2040	2156	7000	9229
Ramechhap	4000	4546	2827	1580	4000	4013	16000	7089	4583	4000	1373	183	82	2000	1621
Sindhuli	5000	3537	3347	3299	5000	3738	18000	4908	4595	5000	1766	176	129	2500	1199
Mahottari	10000	16780	9821	7935	10000	17647	37000	32722	15961	10000	4648	1157	537	5000	4800
Dhanusa	12000	12041	10127	8422	12000	11249	44000	15540	14082	12000	5019	2059	1253	6000	2103
Sindhupal	6000	3511	2959	2385	6000	4605	23000	5662	4907	6000	3504	1582	874	3000	3493
Bhaktapur	4000	1514	977	1109	4000	1684	16000	1334	998	4000	1190	547	427	2000	1037
Kathmandu	11000	5775	2569	910	11000	9695	41000	15506	5179	11000	5799	2637	849	5500	4582
Lamjung	4000	4340	2653	2244	4000	46050	15000	9341	5630	4000	3619	1868	859	2000	3161
Gorkha	7000	3254	4159	6111	7000	6154	24000	9303	16560	7000	3392	2443	2779	3500	3841
Syangja	8000	6399	5711	5096	8000	12584	28000	13784	10531	8000	5130	1979	883	4000	4798
Palpa	6000	3332	1924	75	6000	3613	23000	12575	6316	6000	2595	64	33	3000	2242
Kapilvastu	8000	6001	6539	7306	8000	7553	28000	11248	12305	8000	3423	371	170	4000	2451
Rupandihi	11000	11212	11470	11607	11000	14672	36000	14122	15242	11000	6364	1452	1049	5500	3778
Parbat	4000	2128	741	39	4000	2211	13000	10874	4287	4000	1615	538	32	2000	2034
Beglung	6000	6415	6013	6340	6000	8208	23000	11321	15721	6000	5685	2069	455	3000	6599
Surkhet	4000	6064	2980	1218	4000	10858	16000	11948	6628	4000	5747	1784	236	2000	8508
Dang	7000	6050	5408	5082	7000	8872	26000	10606	11365	7000	3874	1156	795	3500	4919
Doti	4000	3005	1582	282	4000	1808	15000	6786	3333	4000	674	15	8	2000	1568
Kailali	7000	5229	3407	2010	7000	5685	25000	8969	6518	7000	3299	1209	604	3500	2438
Darchula	2000	1891	633	333	2000	3352	9000	5715	1971	2000	1690	333	35	1000	913
Baitadi	5000	2522	2238	1535	5000	6215	17000	5301	6941	5000	298	867	-	2500	984
Dandeldhura	2000	1556	1726	1070	2000	267	9000	4005	4886	2000	1127	509	150	1000	1140
Kanchanpur	4000	3737	2808	2335	4000	3870	16000	4167	3644	4000	2867	1289	594	2000	1459
Total	185000	161692	128298	107583	185000	217234	688000	339543	276042	185000	98971	35984	18382	92500	114281

Source: EPI Status Reports (2040/41) and Policy Proposals 2041/42, Expanded Immunization Project, Department of Health Services.

Follow-up Study of Tuberculosis Chemotherapy

during 1980 and 1985

Follow-up study of Tuberculosis Chemotherapy during 1980 and 1985 in Pokhara

Since 1973 the Government of Japan had been cooperating with the His Majesty's Government of Nepal until 1985, through JICA, in western development region of Nepal on the Tuberculosis Control Programme in connection with the Mutual Technical Cooperation Scheme.

The aim of tuberculosis control is to cut the chain of transmission rendering tuberculosis cases non-infectious through chemotherapy as early as possible. And the efficacy of chemotherapy would be evaluated based on the time of conversion during chemotherapy, the conversion rate of sputum at the end of chemotherapy and the relapse rate after accomplishment of chemotherapy.

In general, standard regimen, consists of SM, INH and TB₁ for one year duration, using widely in developing countries are getting rather poor result, because of poor patients' compliance. So it is urged to find out countermeasure to overcome this difficulty in field conditions prevailing.

Table 1 Cases found (area and periodwise)

Area	Case-Finding	Period	Previous Chemotherapy		Total
			No	Yes	
Siswa,	Active	1980.7-	17		17
		1980.12			
Batulechoule	Passive	'81.6-'82.4	4		4
Pokhara, Siswa, Batulechoule	Passive	'82.12-'84.12	166	101	267
Tanahu District	Passive	'83.12-'84.12	61	49 (21)*	110
Mustang District	Passive	'84.4-'84.12	8	4	12
Total			256	154	410

*Follow-up study for cases found in 1979 by active case-finding TBCT & JMCT

Since the 1980 field study on the Short Course Chemotherapy including Rifampicin (RFP) administration for 6 months has been carried out with excellent completion rate and negative-conversion of mycobacteria in sputum (Table 1). For this treatment, the regimen did not include SM-injection and all four drugs were administered orally in one dose daily before breakfast to avoid defaulting in SM-injection.

Unfortunately, term of technical cooperation had terminated in 1985, and it was too early to conduct the follow-up study determining the relapse rate among the successfully completed patients.

I. Patients assessed.

Patients who had successfully received the Short Course Chemotherapy for 6 months and confirmed negative bacteriologically at that point, and were found from 1980 in western Nepal (Table 2), were assessed.

Table 2 Cases assessed

	Previous Chemotherapy		Total
	No	Yes	
Cases found	256	154	410
Excluded	3	2	5
Transfer out	1	2	3
Non-tuberculous	1	0	1
Incorrect chemotherapy	1	0	1
Cases started therapy	253	152	405
Died	10	1	11
Defaulted	5	3	8
Migrated	1	0	1
Cases completed	237	148	385
Unfavorable result	0	5	5
Cases to be followed up	237	143	380

II. Methods

All the patients are contracted and interviewed by one of the staff members of TBCP in Pokhara with the assistance of the member of respective Health Centres area the patients are living. And sputum were collected and examined by direct smear in Western Regional Health Laboratory. Some of

patients are requested to come to the Gandaki Zonal Hospital to be checked by X-ray.

III. Results

Although it was quite difficult to contact all of the patients who are scattered in remote rural and mountaineous area within short period, nevertheless the following results, though limited, were obtained for time being.

i) Patients who live in Pokhara were called as many as possible and 19 patients were examined X-ray and bacteriologically up to this time. And there was no relapse case detected. For other patients the same procedures are still going on.

ii) Up to the present time there were 15 cases relapsed (Table 3), out of which 8 cases had no history of previous chemotherapy, and remaining 7 were previously treated cases. It seems that relapse occurred in early period of the first year after accomplishment of chemotherapy for the previously treated cases and rather in late for the previously untreated cases.

Table 3 Relapse

After Completion		<3M	<6M	<12M	12M-	Total
Previous treatment	No	1	2	4	1	8
	Yes	3	1	1	1	7

However, to determine the relapse rate for the Short Course Chemotherapy for 6 months of duration with 4 drug orally self-administration requires further study continuously using Cohort Analysis Method.

This study was carried out by Dr. N. Umemura, Research Institute of Tuberculosis of Japan with the cooperation of Dr. D.S. Bom, Tuberculosis Control Project of MOH, and further assistance of this trial is now going way. The detailed outcome will be reported in due course.

Appendix I

Comparison of Incidence of Infectious Diseases
in Asian Countries and Paraguay

Incidence of Important Diseases

	Bangladesh (1984)	Indonesia (1981) (1984:31.9)	Nepal (1983)	Paraguay (1984)	Philippines (1983)	Sri Lanka (1982)	Thailand (1983)
Cholera		15.2 (1984:31.9)	0.95		2.05	1.8	3.34
GE/Diarrhea	4,170	1,220	>48.9	936.7	1,064.6	1,186	940.8
Dysentery			8.69		(1981) 70.4	68	144.7
Food-poisoning					(1981) 1.48	15.3	78.1
Enteric-fever		6.79* (1984:12.9)	7.30		27.3	41.3	33.2
Hepatitis		4.48	5.37	17.2	31.4	46.2	25.3
Poliomyelitis	40	0.06*		0.06	1.54	0.74	0.32
Diphtheria	0.2% 1.2	0.60*	0.20	0.31	6.23	0.15	2.32
Pertussis	21	0.13	0.03	19.9	41.3	2.0	10.8
Tetanus	60	2.26*	3.44	5.07	6.43	4.0	3.71
Measles	320	0.39*	3.32	26.3	139.9	87.4	97.5
Tuberculosis	160	19.4 (1983)	13.3 ⁴⁾	40.7	296.4	74.7	39.7 (130) ⁵⁾
Influenza		↑		913.8	866.2	417.2	132.9
Bronchitis and Pneumonia	3,110	Many cases ↓	Many cases	Br 656.9 Pn 62.4	Br 1,149.7 Pn 373.4	859	Pn 145.4
Meningitis			4.05	11.8			
Leprosy	19 ²⁾	102	2.15 ⁴⁾	4.79	3.80 (70) ⁵⁾	1.9 (69) ⁵⁾	1.3 (90) ⁵⁾
Rabies		0.04 (1983)	+	0.19	0.6 (1981)	0.9	0.53
Dengue-fever		3.48			5.29	0.17	67.0
Encephalitis		0.41*	4.61 (1985)	3.3		0.28	4.65
Malaria	440	564 (1983)	(0.26%) ⁶⁾	17.2	229.3	290	235.2
V.D.		Syph. 1.13 Gono. 43.7		Syph. 29.8 Gono. 12.0	Syph. 0.15 Gono. 28.2	Syph. 8.1 Gono. 26.5	74.4

- 1) Morbidity per 100,000 population.
- 2) Another source estimates ten times as many patients.
- 3) * Taken from hospital statistics.
Other figures were obtained from the report of MOH.
- 4) Estimation from hospital statistics. Estimations of prevalence by MOH are 1 per cent and 0.67 percent of population, for tuberculosis and leprosy, respectively.
- 5) Estimated from the data of special survey.
- 6) Smear positive rate in percent.

Marbidity of Main Infectious Diseases (per 100,000 population)

Rank	Bangladesh	Indonesia	Nepal	Paraguay	Philippines	Sri Lanka	Thailand
1	GE/Diarrhoea 4,170	Int. Infection 1,227	Int. Infection >>66	Diarrhoea 937	Int. Infections 1,313	Int. Infection 1,312	Int. Infection 1,200
2	Malaria 440	Tuberculosis 604	Tuberculosis (0.5-1%)*	Tuberculosis 41	Tuberculosis 296	Malaria 290	Malaria 235
3	Measles 320	Malaria 564	Leprosy (0.67%)*	Measles 26	Malaria 229	Measles 87	Tuberculosis 130
4	Tuberculosis 160	Leprosy 102	Malaria (0.26%)*	Whooping cough 20	Measles 140	Tuberculosis 75	Measles 98
5	Leprosy >100	Hepatitis 4.5	Hepatitis 5.4	Hepatitis 17	Leprosy 70	Leprosy 69	Leprosy 90
6	Tetanus 60	Dengue-fever 3.5	Encephalitis 4.6	Malaria 17	Whooping cough 41	Hepatitis 46	Dengue fever 67
7	Poliomyelitis 40	Tetanus 2.3	Meningitis 4.1	Meningitis 12	Hepatitis 31	Tetanus 4.0	Hepatitis 25
8	Whooping cough 21	Diphtheria 0.6	Tetanus 3.4	Tetanus 5.1	Tetanus 6.4	Whooping cough 2.0	Whooping cough 11
9		Encephalitis 0.4	Measles 3.3	Leprosy 4.8	Diphtheria 6.2	Diphtheria 2.0	Encephalitis 4.7
10		Measles 0.4	Encephalitis 3.3	Encephalitis 3.3	Dengue fever 5.3	Tetanus 3.7	Tetanus 3.7

* Figures in parentheses show the estimated point prevalence in percent of population for tuberculosis and leprosy, and slide positive rate (%).

Ten Leading Cause of Death in Asian Countries and Paraguay

Rank	Indonesia (1980)	Nepal (1983)	Paraguay (1984)	Philippines (1984)	Sri Lanka (1983)	Thailand (1983)
1.	Pneumonia 17.7	Inf Par Dis 21.3	Dis Circ Sys 22.4	Pneumonia 19.0	Dis Circ Sys 21.7	Pulm Circ Heart Dis 6.11
2.	Diarrhoea 17.4	Dis Resp Sys 10.8	Dis Resp Sys 18.6	Heart Dis 12.9	Injury Poisoning 14.4	Dis Digestive Sys 4.38
3.	Dis Circ Sys 9.38	Injury-Poisoning 10.7	Diarrhoea 15.8	Tuberculosis 11.2	Inf Par Dis 14.2	Other Accidents 3.98
4.	Tuberculosis 8.39	Dis Circ Sys 8.72	Neoplasms 13.6	Dis Circ Sys 8.4	Dis Resp Sys 11.6	Dis Resp Sys 3.53
5.	Tetanus 6.52	Preg CB Puerp 8.27	Accident-Poisoning 11.9	Malignant Neoplasms 6.4	Perinatal 8.9	Homicide etc. 3.25
6.	Dis Nervous Sys Sense Org 4.97	Dis Nervous Sys Sense Org 6.36	Perinatal 9.2	Diarrhoea 5.9	Dis Digestive Sys 5.2	Malignant Neoplasms 2.61
7.	Liver Dis 4.09	Dis Digestive Sys 5.97	Tuberculosis 2.8	Accident 3.6	Neoplasms 4.4	Transport Accidents 2.60
8.	Accident-Poisoning 3.53	Dis Gen Uri Sys 3.66	Preg CB Puerp 2.4	Malnutrition 2.9	Dis Nerv Sys Sense Org 4.1	Cerebrovascular Dis 2.32
9.	Neoplasms 3.42	End-Nut etc. 2.70	EPI Dis 1.9	Measles 2.1	End-Nut etc 2.4	Tuberculosis 2.18
10.	Enteric fever 3.30	Dis Blood, Blood forming Org 2.40	Malnutrition 1.4	Nephritis Nephrose 1.8	Dis Gen Uri Sys 2.1	Dis Nerv Sys Sense Org 2.10

Abbreviations. Cir : Circulatory, Dis: Diseases, Gen Uri: Genito-urinary, Inf Par : Infectious Parasitic,

Org: Organs, Resp: Respiratory, Sys: System,

End-Nut etc: Endorine, nutritional and metabolic disorders and immunity disorders,

Homicide etc: Homicide and injury purposely inflicted by other persons,

Perinatal: Certain conditions originating in the perinatal period,

Preg CB Puerp: Complications of pregnancy, childbirth and puerperium,

Pulm Circ Heart Dis: Diseases of pulmonary circulation and other forms of heart disease.

Case Fatality Rate of Infectious Diseases in Asian Countries

	Bangladesh (1981~83)	Indonesia (1981)	Nepal (1983)	Philippines ¹⁾ (1983)	Sri Lanka (1982)	Thailand ²⁾ (a)1983(b)	
Cholera		2.5	2.6	4.3	5.6	2.6	2.7
Acute Diarrhoea	0.38~0.96	2.6	1.8	4.0	1.1	0.07	1.3
Dysentery			3.2	3.8*	1.4	0.03	0.03
Food poisoning			** ⁴⁾	23.0*	1.1	0.04	0.03
Enteric Fever		3.4	1.4	2.9	0.5		0.14
Hepatitis		3.4	12.2	4.4	1.1		0.57
Influenza			**	2.1	0.01		
Pneumonia			**	26.5	5.2		0.56
Diphtheria	5~16.4	12.1	16.7	8.7	13.6	7.1	7.1
Whooping Cough	0.09	4.7	**	1.4	0.3	0.1	0.1
Tetanus ³⁾	9.7~18.8 (90.8)	19.1 (51.2)	24.1 (70~80)	33.8	22.8 (57~79)	14.6 (21.9)	14.5
Measles	0.10	2.7	2.5	7.8	0.17	0.68	0.08
Poliomyelitis		3.6	**	10.9	5.3	0	1.4
Dengue Fever		3.4		3.5			0.77
Encephalitis		41.5	35.3	1.6	11.6		17.8
Tuberculosis		10.4	7.2	19.8*	5.5	19.5	1.3
Malaria		1.5	**	0.59	0.07	1.2	0.22
Other Infections	32.5	3.9	14.2				

1) * 1981.

2) (a) Health Profile, 1985, Ministry of Public Health.

(b) Public Health Statistics 1983. Ministry of Public Health.

3) Figures in parentheses show the CFR of neonatal tetanus.

4) ** : Omitted because reported cases are very few.

Rate of Immunization

	BCG	DPT	POV	Measles	TT
Indonesia (1984)	67	?	14	15	25
Nepal (1985)	117	58.2	9.9	123.5	40.1
Paraguay (1984)	80	66.5	67.8	61.9	70.9
Philippines (1981)	71	62	53	?	35
Sri Lanka (1986)	70.5	69.5	70.7	20	41
Thailand (1985)	79.6	62.0	62.7	29.1	47.9

POV : Polio oral vaccine

TT : Tetanus toxoid for pregnant women.

DPT, POV : After 3rd Immunization.

Annual Incidence of Cholera

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Indonesia											
Morb	38.6	31.9	21.3	16.7	21.7	19.8	14.9				
Mort	2.9	2.1	1.5	0.9	1.0	0.7	0.4				
Philippines											
Morb	2.8	3.3	3.5	3.0	2.7	1.7	2.2	1.0	2.1		
Mort	0.7	1.1	0.9	0.8	0.9	0.6	0.5	0.3	0.09		
Sri Lanka											
Morb	10.8	4.4	0.1	0.2	0.1	1.2	5.6	1.8			
Mort	0.4	0.1	0.01	0	0.01	0	0.4	0.1			
Thailand											
Morb	3.2	0.01	0.88	8.8	0.33	9.2	0.08	1.33	3.03	1.28	1.75
Mort	0.2	0.0	0.03	0.3	0.01	0.2	0.0	0.04	0.08	0.04	0.03

Annual Incidence of Diarrhoea

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Indonesia						943.7	1,206.9	1,215.0			
Morb											
Mort											
Philippines											
Morb	476.2	524.7	464.5	462.6	466.2	466.2	448.1	→	982.6		
Mort	27.8	35.5	40.1	34.5	35.9	35.9	39.0	→	27.8		
Sri Lanka											
Morb	1,221	1,596	1,358	1,365	1,184	964.9	1,186				
Mort	19.8	27.5	23.4	16.8	8.9	10.5	13.1				
Thailand											
Morb	148.9	173.1	227.1	307.6	383.6	483.2	513.2	675.9	852.7	822.2	439.4
Mort		0.93	1.20	1.48	1.17	0.89	0.65	0.59	0.56	0.84	0.37

Annual Incidence of Dystentery

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Philippines											
Morb	47.5	50.5	45.9	60.7	60.7	56.0	70.4				
Mort	1.4	2.1	2.6	2.7	3.0	3.1	2.7				
Sri Lanka											
Morb	15.9	106.0	125.7	132.2	73.5	52.4	42.6	68.4			
Mort	0.2	2.9	3.8	2.1	0.4	0.9	0.7	1.0			
Thailand											
Morb	13.3	18.7	28.5	40.1	71.7	64.5	91.8	110.5	131.1	113.3	121.3
Mort	0.09	0.1	0.1	0.1	0.09	0.06	0.04	0.05	0.04	0.08	0.09

Annual Incidence Enteric Fever

	1975	1976	1977	1978	1979	1980	1981	1982	1983
Indonesia									
Morb		4.2	5.9	14.2	18.7	10.9	6.7		
Mort					0.8	0.4	0.2		
Philippines									
Morb	7.3	7.9	9.6	7.8	7.6	8.9	11.0	11.3	27.3
Mort	1.4	1.6	1.7	1.7	1.4	1.4	1.2	1.4	1.1
Sri Lanka									
Morb	85.9	79.2	60.8	66.7	51.1	50.5	47.3	41.3	
Mort	1.1	1.0	0.8	0.6	0.6		0.3	0.2	
Thailand									
Morb	9.4	14.7	27.1	19.4	22.0	22.0	23.9		
Mort	0.08	0.1	0.2	0.1	0.1	0.06	0.06		

Annual Incidence of Tetanus

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Indonesia ¹⁾	Morb				5.5	3.5	2.2			2.7
	Mort				1.5	0.88	0.61			0.63
					Neonatal Tetanus (51.5) (53.3) (51.2)					
Philippines	Morb	10.8	10.8	12.3	9.3	4.7	4.9	5.6	6.4	
	Mort	10.0	9.4	8.4	7.6	1.9	2.0	2.0	2.2	
Sri Lanka ²⁾	(a) Morb	222	169	217	217	83	44.4			
	(b) Mort									
Thailand	Morb	3.7	4.2	4.6	4.9	3.9	3.9	3.9	3.4	2.8
	Mort			0.97	1.01	0.73	0.63	0.56	0.49	0.29
	Tet. neonat.					1.66	1.33	1.40	1.14	0.93
	Mort					0.43	0.33	0.31	0.25	0.15

1) Hospital statistics

2) (a) Neonatal tetanus/1,000 live birth.

(b) Tetanus except neonatal tetanus, Morb/100,000.

Annual Incidence of Hepatitis

	1975	1976	1977	1978	1979	1980	1981	1982	1983
Indonesia	Morb		0.9	3.1	5.7	4.5	4.4		
	Mort		0.02	0.2	0.3	0.2	0.1		
Philippines	Morb	10.4	15.6	16.4	15.8	19.0	17.9	19.1	31.4
	Mort	1.5	1.8	1.7	1.8	1.6	1.4	1.5	1.4
Sri Lanka	Morb	109.8	132.1	107.8	71.5	43.3	31.3	35.3	
	Mort	1.4	1.9	0.4	0.2	0.3	0.4	0.4	
Thailand	Morb	14.1	15.9	22.5	21.0	27.4	26.9	19.9	
	Mort	0.2	0.3	0.3	0.3	0.2	0.2	0.2	

Annual Incidence of Diphtheria

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Indonesia										
Morb	0.7	0.7	0.9	1.3	1.7	1.3	0.6			0.73
Mort					0.2	0.1	0.07			0.10
Philippines										
Morb	4.2	7.7	6.4	3.1	2.2	1.7	4.4	3.8	6.2	
Mort	1.4	1.5	1.2	1.0	1.2	1.05	1.1	1.0	0.54	
Sri Lanka										
Morb	2.3	1.1	1.0	1.5	0.7	0.3	0.2	0.15	0.16	
Mort	0.5	0.3	0.2	0.2	0.2			0.02		
Thailand										
Morb	4.7	5.5	5.3	4.0	4.4	4.1	1.7	2.3	2.1	2.0
Mort	0.3	0.4	0.3	0.2	0.4	0.3	0.1	0.2	0.2	0.07

Annual Incidence of Whooping Cough

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Philippines										
Morb	66.4	62.7	47.6	33.5	45.6	39.9	33.0	29.6	41.3	
Mort	0.2	0.3	0.2	0.2	0.3	0.1	0.2	0.1	0.6	
Sri Lanka										
Morb	9.7	8.0	7.6	4.9	5.5	3.7	3.4	1.8	1.6	
Mort	0.1	0.2	0.05	0.03	0.06			0.01		
Thailand										
Morb	7.9	4.7	7.3	5.8	11.2	10.4	6.2	7.1	9.8	7.7
Mort	0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.00	0.01	0.01

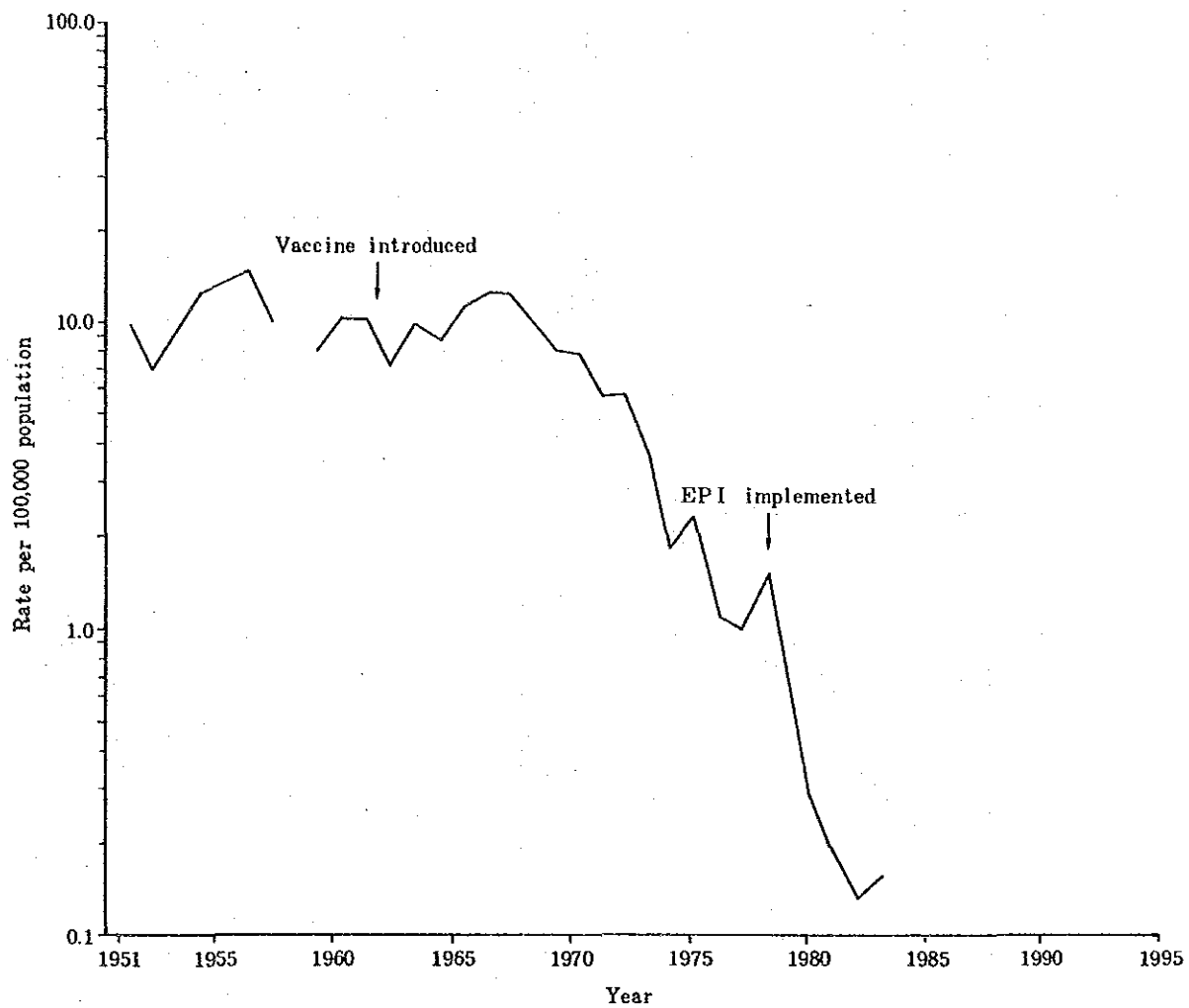
Annual Incidence of Poliomyelitis

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Philippines										
Morb	1.9	1.8	3.2	1.8	2.3	0.61	0.91	0.74	1.54	
Mort	0.4	0.4	0.8	0.4	0.8	0.25	0.21	0.20	0.17	
Sri Lanka										
Morb	1.4	1.8	0.9	1.0	1.0	1.8	1.7	0.6		
Mort										
Thailand										
Morb	1.1	1.9	2.1	1.4	2.4	0.7	0.5	0.6	0.3	0.2
Mort			0.04	0.03	0.10	0.02	0.01	0.00	0.00	0.00

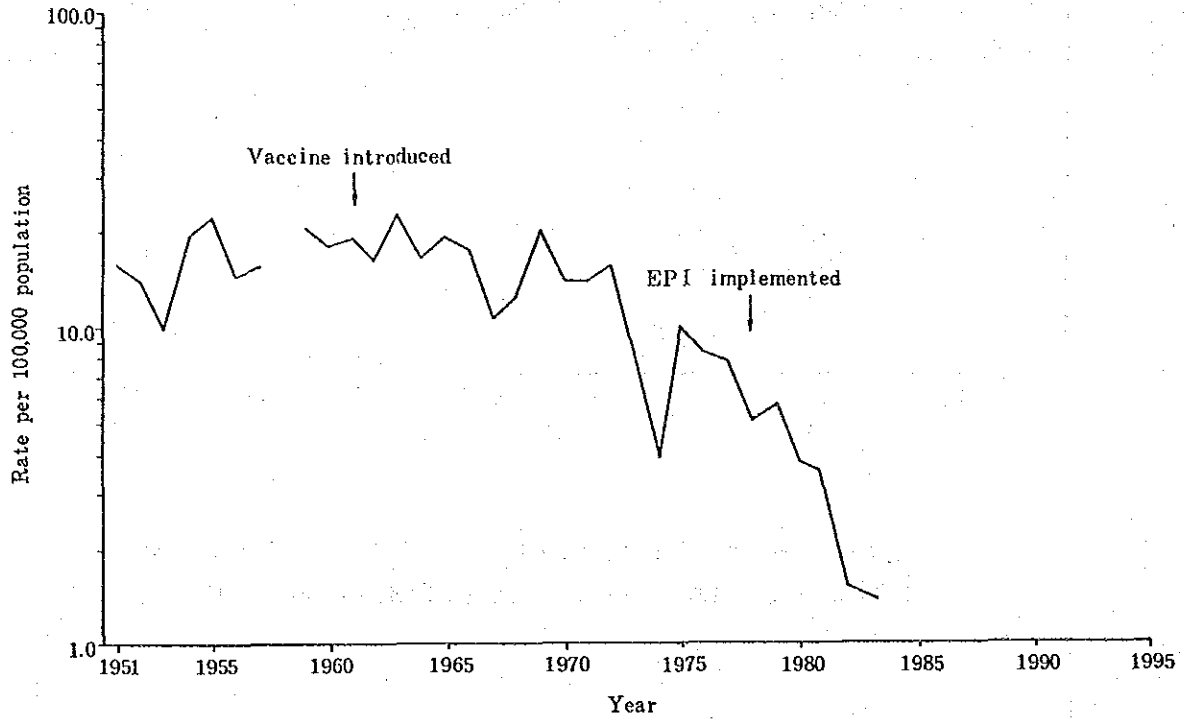
Annual Incidence of Rabies

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Indonesia Morb		0.05	0.04	0.06	0.03	0.05				
Philippines Morb	0.3	0.6	0.6	0.6	0.6	0.63	0.60			
Sri Lanka Morb			2.24	1.71	1.83	1.04	0.90	0.88		
Thailand Morb					0.65	0.78	0.70	0.61	0.58	0.45

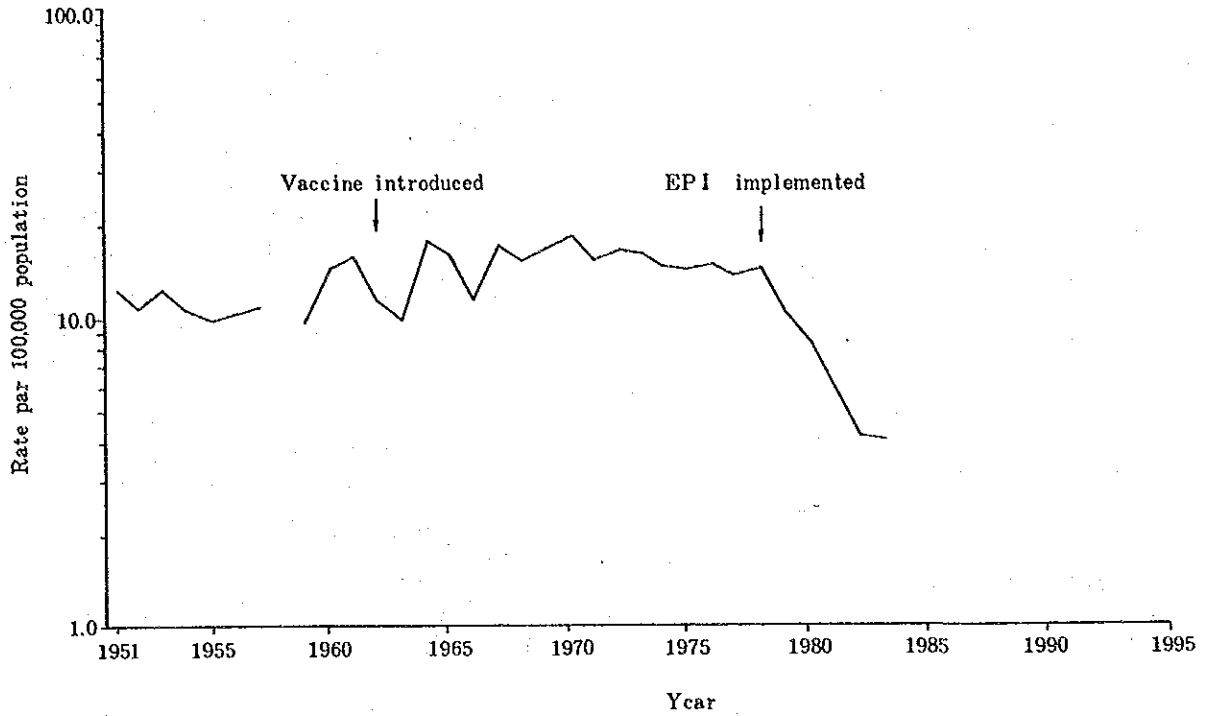
ANNUAL REPORTED INCIDENCE OF DIPHTHERIA FROM
HOSPITAL DISCHARGE RECORDS SRI LANKA, 1951 ~ 1983



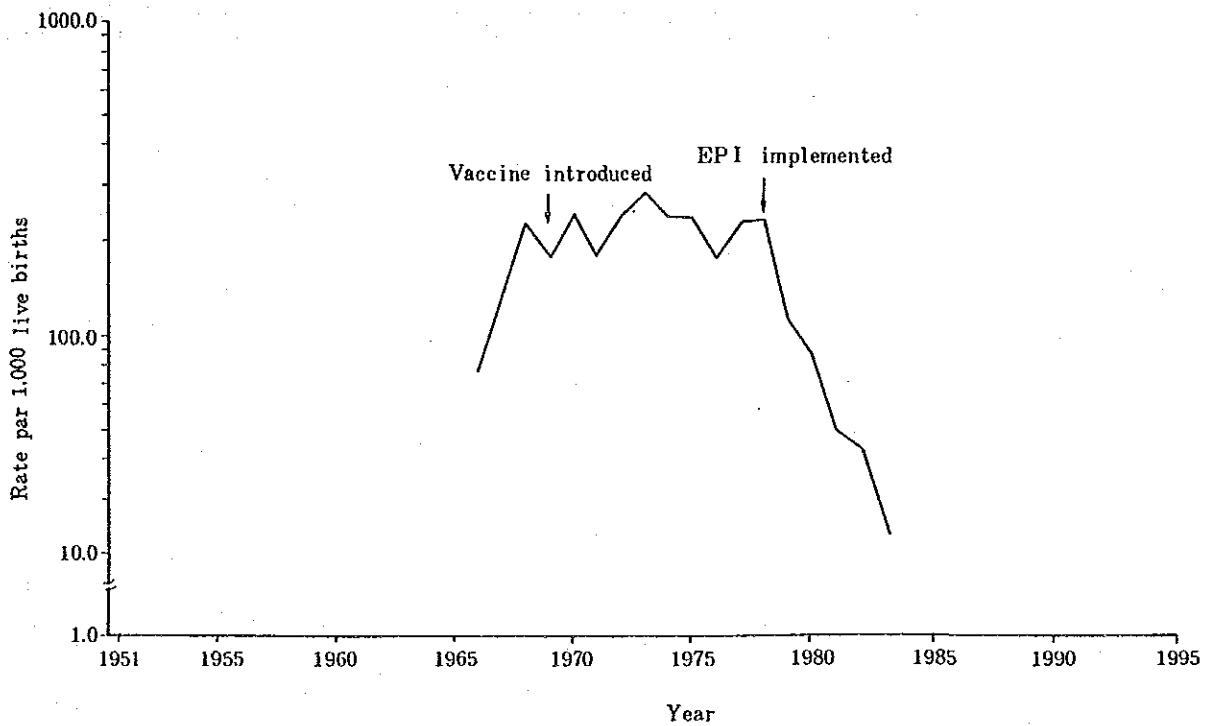
ANNUAL REPORTED MORBIDITY DUE TO PERTUSSIS FROM
HOSPITAL DISCHARGE RECORDS SRI LANKA, 1951 ~ 1983



**ANNUAL REPORTED MORBIDITY DUE TO TETANUS FROM
HOSPITAL DISCHARGE RECORDS SRI LANKA, 1951~1983**



**ANNUAL REPORTED MORBIDITY DUE TO NEONATAL TETANUS
FROM HOSPITAL DISCHARGE RECORDS SRI LANKA**

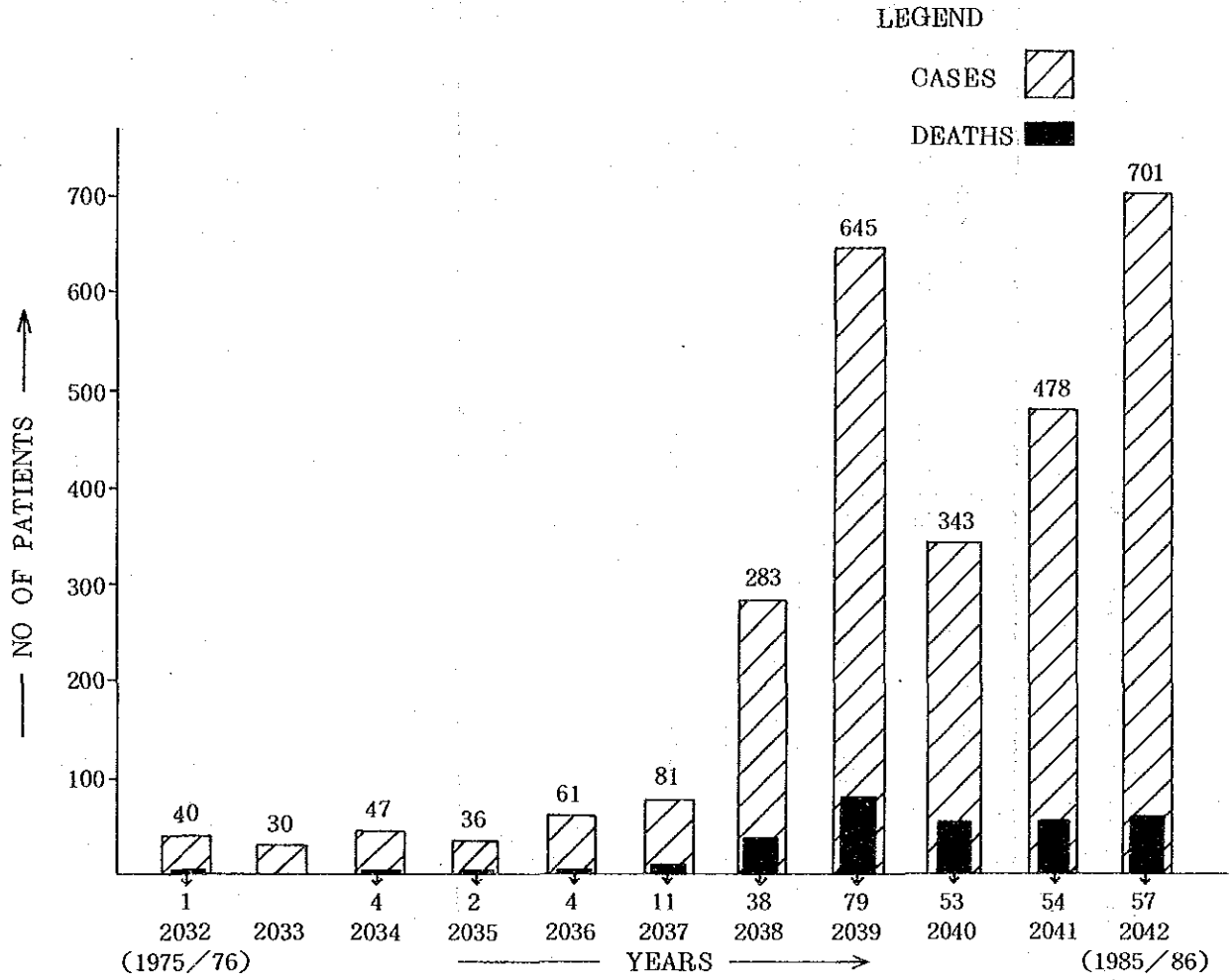


Appendix II

Additional Informations

on Some Infectious Diseases and Nutrition

TEKU HOSPITAL INFECTIVE HEPATITIS CASES



Age Specific Death Rate (January 1983 - December 1983)

Age groups	Total population	Total deaths		Death by ARI		Deaths by ARI+diarrhoea		Death by diarrhoea		Death by other diarrhoea	
		n	rate/1000	n	rate/1000	n	rate/1000	n	rate/1000	n	rate/1000
0-1	304	63	207.23	28	92.10	6	19.73	7	23.02	22	72.36
1-2	239	23	96.23	10	41.84	5	20.92	5	20.92	3	12.55
2-5	639	17	26.60	7	10.95	-	0	7	10.95	3	4.69
Total	1182	103	87.14	45	38.07	11	9.30	19	16.07	28	24.68

Important Diseases of Respiratory System

1. PNEUMONIAS :	789 - 58.84%
a) Bronchopneumonia	683 - 50.94%
b) Lobar Pneum.	86 - 6.4 %
2. Upper Respiratory Infection	177 - 13.2 %
3. Asthmatic/Wheezy Bronchitis	116
4. Bronchitis	114
5. Bronchiolitis	60
6. Pulm. TB.	51
7. Laryngotracheobronchitis	20
8. Empyema	12
9. Pleural effusion	10
10. Pul. Eosinophilia	6
11. Bronchial Asthma	5
12. Others	2
<hr/>	
Total	1,341

Cases and Deaths of Encephalitis Record in Hospital in Nepal

Year 1978 - 1985

Administrative Zones	Recorded cases and deaths										All Total	Case Fatality rate in%
	1978	1979	1980	1981	1982	1983	1984	1985				
1. Mechi	-	-	-	-	13 (2)	-	7 (3)	11 (0)	31 (5)	16.1		
2. Koshi	112(40)	69(15)	117(51)	-	102 (11)	63(17)	75(26)	478(130)	1016(290)	28.5		
3. Sagarmatha	7 (2)	-	54(18)	26 (9)	5 (1)	-	9 (0)	31 (5)	132 (35)	26.5		
4. Janakpur	39(10)	13 (8)	14 (6)	-	65 (49)	16 (7)	20 (4)	53 (23)	220(103)	46.8		
5. Narayani	39(10)	65(15)	158(50)	-	37 (12)	-	18 (9)	13 (4)	330(100)	30.3		
6. Bagmati	2 (1)*	-	-	-	10 (10)*	-	-	-	12 (11)*	91.7		
7. Lumbini	153(41)	26 (5)	217(82)	24 (6)	34 (9)	39 (8)	3 (0)	98 (19)	594(170)	28.6		
8. Rapti	-	-	1 (0)	-	1 (0)	-	-	-	2 (0)	0.0		
9. Bheri	38(13)	8 (3)	53(22)	-	45 (18)	-	6 (3)	6 (1)	156 (60)	38.4		
10. Seti	28 (1)	-	3 (1)	2 (1)	532(282)	125 (4)	4 (0)	2 (1)	696(290)	41.7		
11. Mahakali	4 (2)	4 (2)	5 (1)	2 (0)	-	-	-	-	15 (5)	33.3		
TOTAL	422(119)	182(49)	622(231)	54(16)	843(390)	243(36)	142(45)	492(183)	3200(1069)	33.4		

Note : () Inside the bracket the numbers are death cases.

* Imported Cases.

Source : Epidemiological surveillance report on Japanese encephalitis (1978-1984), 1985

Epidemiological Bulletin Vol. 6, 1985

Cases and Death of Encephalitis Recorded in Hospital in Nepal

By:- Age Groups (Years)

Years 1978 - 1984

Years	Age Groups (Years)				Age and Sex N.S.*	Total Cases (Death)
	0-4 Years	5-14 Years	15 and Above			
1978	20 (7)	60 (11)	93 (39)	249 (65)	422(119)	
1979	26 (7)	33 (10)	33 (9)	90 (23)	182 (49)	
1980	78 (25)	231 (73)	293(125)	20 (8)	622(231)	
1981	17 (4)	20 (6)	17 (6)	-	54 (16)	
1982	73 (15)	292(117)	343(198)	135 (60)	843(390)	
1983	25 (4)	116 (16)	102 (16)	-	243 (36)	
1984	44 (18)	59 (14)	39 (13)	-	142 (45)	
TOTAL	283 (80)	811(247)	920(403)	494(156)	2508(886)	
% of TOTAL	11.1(9.0)	32.3(27.9)	36.7(45.5)	19.7(17.6)	100%	
% of TOTAL except N.S.*	14.0(11.0)	40.3(33.8)	45.7(55.2)			
CFR (%)	28.3	30.4	43.8	31.6	35.3	

* N.S. - not specified

Case Fatality Rate of Japanese Encephalitis by Age and Sex (1987-1980)

Case & Death by Year	0-4 Years			5-14 Years			15 Years & Over			Age & Sex N.S.			TOTAL		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
1978	C 15	5	20	36	24	60	52	41	93	249	103	70	422		
	D 4	3	7	4	7	11	23	13	36	65	31	23	119		
	CFR%	26.7	60	35	11.1	29.2	18.3	44.2	31.7	38.7	26.1	30.1	32.8	28.2	
1979	C 19	7	26	15	18	33	13	20	33	90	47	45	182		
	D 5	2	7	5	5	10	3	6	9	23	13	13	49		
	CFR%	26.3	28.6	26.9	33.3	27.8	30.3	23.1	30	27.3	25.6	27.7	28.9	26.9	
1980	C 52	26	78	139	92	231	177	116	293	20	368	234	622		
	D 17	8	25	41	32	73	77	48	125	8	135	88	231		
	CFR%	32.7	30.8	32.1	29.6	34.8	31.7	43.5	41.4	42.7	40	36.7	37.6	37.1	
TOTAL	C 86	38	124	190	134	324	242	177	419	359	518	349	1,226		
	D 26	13	39	50	44	94	103	67	170	96	179	124	399		
	CFR%	30.0	34.0	31.0	26.0	33.0	29.0	43.0	37.8	40.6	26.7	34.6	35.5	32.5	
M:F ratio (%)	C 69	31	100	59	41	100	58	42	100	-	59.7	40.3	100		
	D 67	33	100	53	47	100	61	39	100	-	59.1	40.9	100		

Human Serum Titer against
Japanese Encephalitis in Different Outbreak Area

Year	No. of Places Surveyed	No. of Serum Samples	No. of serum samples showing HI titer for JE						No. of Positives (%)			
			<10	10	20	40	80	160		320	640	
1978-1980	11	431	264	28	44	62	33*			167	(38.7)	
1981	41	697	546	45	60	25	19	2		151	(21.7)	
1982	9	160	89	4	7	8	18	18	14	2	71	(44.4)
1983	1	159	28		4	39	78	10			131	(82.4)
1984	3	58	48	2	3	2	3				10	(17.2)
Total	46	1,505	975	79	118	136	151	30	14	2	530	(35.2)

*.HI Titer 80 \leq
Serum samples are taken from non-patient residents,
except 64 samples from patients under 14 years in 1978-1980.