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Review Article

The Health System in Nepal — An Introduction

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Abstract

We present here a study on the health system in Nepal. Approximately two-thirds of the health problems in Nepal are infectious diseases. Epidemics occur frequently with a high rate of morbidity and mortality and there are occasional outbreaks of infectious diseases of unknown etiology. In addition, the rapid rate of HIV infection in the Indian sub-continent is likely to add a new dimension of opportunistic infections. Until now, the Health System introduced as the General Health Plan in 1956 has been expanded by focusing on primary health care, and a comprehensive network-like Health System has been developed; the most basic unit is a Sub-Health Post or Health Post in each Village Development Committee area. However, the expansion of the Health System has not been matched by an expansion in the domestive resources, workers and supplies, and the available resources are not efficiently distributed. In addition, insufficient resources available for preventive and promotive medicine and the occurrence of non-infectious diseases such as cancer and cardiovascular diseases has been increasing. The Government recently introduced a Health Policy encouraging the private sector to invest in the production of health workers and in providing quality health services. As a result, several private health institutions have been founded and are expected to contribute to the development of the human resources required by Nepal.

Key words: health system, health problems, preventive medicine, domestic resources, primary health care, Nepal

General introduction

Nepal is a small land locked *Himalayan* kingdom (Total area: 147,181 sq. km) located in South Asia between China in the north and India in the East, South and West. The population is 21.8 million (Male: 10.90 mill. and Female: 10.93 mill.)[1)]. The average life expectancy at birth is 57.52 years, and the crude birth rate, the crude death rate, and the infant mortality rates are 36.9, 11.6 and 97, respectively. The literacy rate is 52.6 percent. The ethnic groups living in the country can broadly be divided into two groups; *Tibeto-Burman* and *Indo-Aryan*[2)]. The country has been divided into three ecological regions (running east to west) — Mountains (3,000–8,848 m), Hills (1,000–3,000 m) and *Terai* (plain area) (less than 1,000 m).

Administratively, Nepal is divided into 75 districts. The districts are regrouped into 14 Zones and the Zones are further regrouped into 5 Developmental Regions; Eastern, Central, Western, Mid-western and Far-western. The districts are divided into small areas; the Municipalities and Village Development Committees (VDCs) of which each VDC consists of approximately 500–700 households. The Municipalities and VDCs are regouped to form Electoral Constituencies. About 90 percent of the people live in villages and depend on subsistence agriculture. The official language is *Nepali* written in *Devanagari* script. Basic statistics for Nepal are shown in Table 1.

Health system

1) Historical background

Until 1950, there were only a handful of doctors to treat the 8 million Nepalese[3)], and the first General Health Plan in Nepal was introduced as an integral part of the First Five Year (developmental) Plan in 1956. The Malaria Eradication Organization was established in 1955, and the Family Planning, the Leprosy and Tuberculosis, and the Smallpox Eradication programs were introduced in 1958, 1966 and 1968, respectively. The Family Planning Program was converted into the Family Planning and Maternal Child Health Board in 1968. Since the introduction of the General Health Plan in 1956, marked progress has been made in the health sector with the aim of providing basic health services to every Nepalese citizen. As a result, the majority of people now live within one or two hours walk of a Hospital, Health Center (HC),

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Table 1 Basic statistics for Nepal*

Location	Latitude: 26°22′N to 30°27′N Longitude: 80°4′E to 88°12′E
Border	China in the North and India in the South, East and West
Area	147,181 Sq. km (Roughly a brick shaped)
Regions (Ecological)	The Mountain (35%), The Hills (42%) and The Terai (Plains) (23%) (all running east to west)
Altitude	Less than 650 m to 8,848 m (Mt. Everest) (Temperature ranges accordingly)
Population	21,126,636 (1996) (Less than 15 years old: 43.06%, 15–64 years old: 53.39% and Over 64 years old: 3.53%) (90% live in rural areas)
Population Growth Rate	2.1%
Mean Family Size	5.5 persons per family
Religion	*Hindu*: 86.5%, *Buddhist*: 7.78%, Others: 6.17%
Government	Constitutional Monarchy, Parliamentary Democracy
Capital City	Kathmandu
Administrative Division	Developmental region: 5, Zone: 14, District: 75, Municipality: 58 and Village Development Committee: 3,913
Transportation	Roads (Total): 11,714 km (*Black-topped: 3,655 km*); Railway: 51 km; Ropeway: 42 km
GNP per Capita	US$ 243.81 (1996/97)
GDP per Capita	US$ 234.23 (1996/97)
Exchange Rate	US$ 1 = Rs. 68.70 (Jan. 2000)
Literacy Rate	52.6% (Males: 67.9%, Females: 37.8%)
No. of Schools	Total: 30,627 (Primary: 22,218; Lower Secondary: 5,506; Secondary: 2,903)
No. of Universities	3
Crude Birth Rate	36.9
Crude Death Rate	11.6
Maternal Mortality Rate	5.39 per 1,000 live births
Life Expectancy at Birth	Male: 57 years; Female: 56 years
Infant Mortality Rate	97 per 1,000
Total Fertility Rate	4.6
Median Marriage Age	Male: 21.4 (Yr.) and Female: 18.1 (Yr.)
Average age of Women at First Birth	19.8 years
Major Food Grains	Paddy, Maize (Corn), Wheat, Barley, Millet
Nutritional Status	Malnourished as a percentage of new growth monitoring cases under 3 Yr. children: 27.6 Under weight as a percentage of under 3 Yr. children: 47.0

* Central Bureau of Statistics, HMG, Nepal, 1991, 1998; Ministry of Health, HMG, Nepal, 1997.

Primary Health Care Center (PHC-C), Health Post (HP), Sub-Health Post (SHP) or a Clinic.

2) Present national health policy

In the new Health Policy announced in 1991 the goal for the 8th Five Year Plan (1992–1996) was to strive for the "attainment of the highest possible level of health for all Nepalese people" and to reduce infant mortality to 50/1,000 from the 1991 estimate of 107/1,000, child mortality to 70/1,000 from the 1991 estimate of 197/1,000, the total fertility rate to 4 from the 1991 estimate of 5.8, and the maternal mortality rate to 4/1,000 from the 1991 estimate of 8.5/1,000[4]. It also aimed to increase the average life expectancy to 65 years by the year 1996 from the 1991 estimate of 53 years.

3) Health system: health care delivery

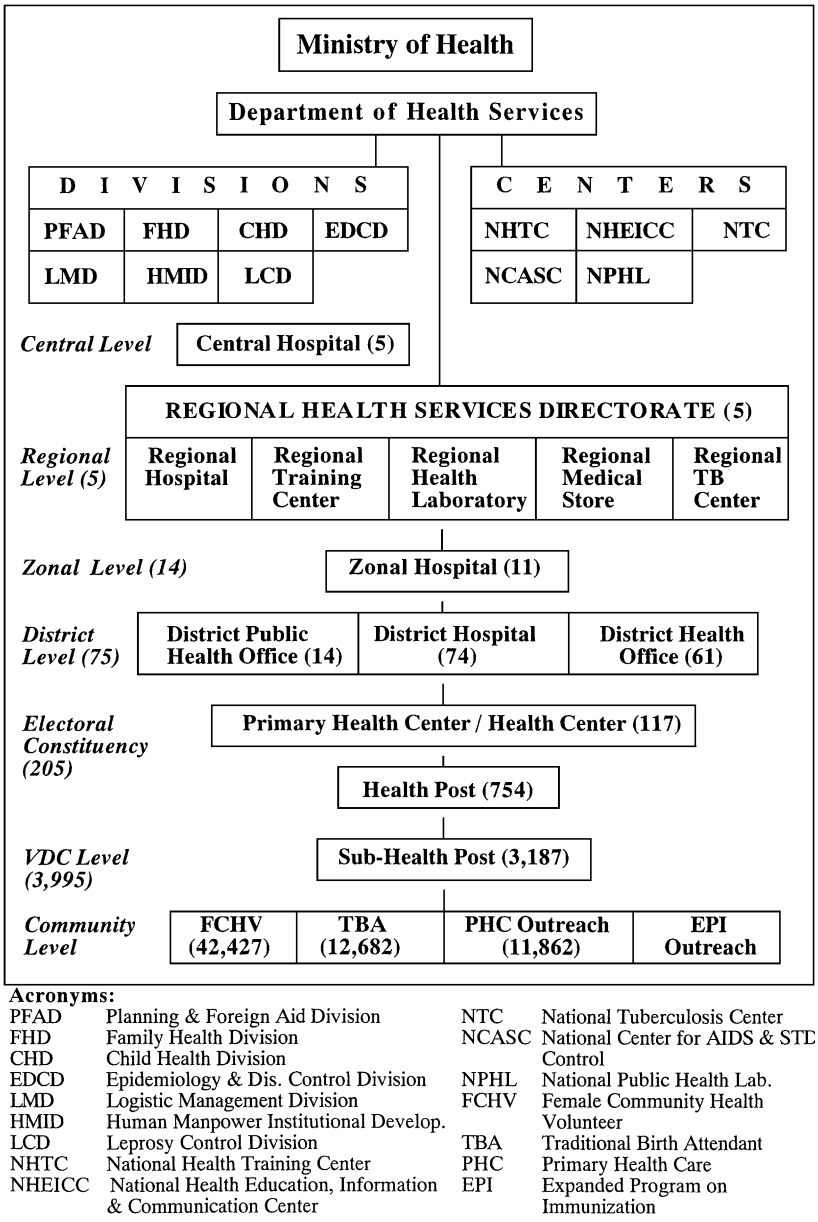
The present health care facilities and the organizational structure of the Ministry of Health Department of Health Services in Nepal are shown in Table 2 and Fig. 1, respectively. Of these, the Central and Regional Hospitals constitute the tertiary level and the Zonal and District Hospitals serve as the secondary level of health care system in Nepal. Primary health care is delivered through PHC-C, HC, HP and SHP at the Electoral Constituency and VDC level. Recently, private heath care institutions including Hospitals, Medical College Teaching Hospitals (Table 2) and Nursing Homes have also been founded. However, these are not sufficient to combat health problems in Nepal primarily due to the shortage of domestic resources, both manpower and supplies, poverty, rapid population growth and urbanization, and the rugged mountainous rural areas.

4) Health system: administration

At the central level, the Divisions, Central Hospitals and Centers as shown in Fig. 1 are administered under the Ministry of Health Department of Health Services. In the rural areas, at the VDC level, there are PHC-C, HC, HP or SHP. The HP and SHP are the basic units of the health system in Nepal. At the District level, there is a District Hospital (DH) with limited number of beds and all of the HC, PHC-C, HP and SHP including the District Hospital come under the jurisdiction of District Health Office (DHO). Above this, there is a Zonal Hospital at the Zonal level with certain specialities. There are Regional Health Directorates in each of the five Developmental Regions under which come all of the health units under the jurisdiction of the DHO, including the Zonal hospitals in the Region. Health research is monitored and coordinated by the Nepal Health Research Council (NHRC), which is administered by the Ministry of Health.

5) Health system: preventive measure

Immunization coverage for children under one year with Polio, DPT, BCG and Measles vaccines is 80.6%, 80.4%, 100.0% and 87.8%, respectively[5]. As part of global program to eradicate



Acronyms:

PFAD	Planning & Foreign Aid Division	NTC	National Tuberculosis Center
FHD	Family Health Division	NCASC	National Center for AIDS & STD Control
CHD	Child Health Division		
EDCD	Epidemiology & Dis. Control Division	NPHL	National Public Health Lab.
LMD	Logistic Management Division	FCHV	Female Community Health Volunteer
HMID	Human Manpower Institutional Develop.		
LCD	Leprosy Control Division	TBA	Traditional Birth Attendant
NHTC	National Health Training Center	PHC	Primary Health Care
NHEICC	National Health Education, Information & Communication Center	EPI	Expanded Program on Immunization

Fig. 1 Organizational structure of the Department of Health Services in Nepal.

polio from the world by the year 2000, a total of 3.38 million children aged under 5 years were immunised in the (fiscal) year 1996/1997 by observing a National Immunization Day. However, the full vaccine potency, particularly in the rural hilly and mountainous areas is in question because of difficulty in maintaining the "cold chain". In order to reduce diarrheal disease related morbidity and mortality, 120,000 school teachers have been trained in oral rehydration therapy (ORT). However, the sanitary/sewerage system in the rural areas is virtually non-existent and the rate of households having latrines in the VDCs in rural areas ranges from 0 to 25%[6,7]. Safe drinking water is still not available in most areas and the drinking water is still highly contaminated even in the capital city and other big cities in Kathmandu Valley[8]. Preventive and promotive health measures are hampered by the shortage of health workers, lack of government resources, a lack of interest by health workers in Preventive and Promotive Medicine, poverty and lack of education, rapid population growth and unplanned urbanization.

International help

International organizations/agencies have been contributing significantly to the health sector, man-power and infra-structure develeopment, and supplies, in Nepal. WHO and UNICEF have been collaborating/contributing in various health programs and USAID, JICA, BNMT, Save the Children Fund (both UK, USA) and others INGOs have also been very active, in addition to foreign aid.

Health problems

1) Infectious diseases

About 70% of all health problems and 70% of all deaths in Nepal are attributed to infectious diseases[9]. The major causes of morbidity and mortality as recorded at an Infectious Disease Hospital are shown in Table 3. Many children die of easily preventable and treatable diseases such as diarrhea and/or dysentery and acute respiratory infections each year. Among the various types

Table 2 Health care facilities in Nepal*

Government Sector	
Central Hospital	1
Specialized Hospitals	5
Military Hospital	1
Police Hospital	1
Regional Hospital	2
Zonal Hospitals	9
District Hospitals	74
Primary Health Care Centers (PHC-C)	100
Health Centers	17
Health Posts (HP)	754
Sub-Health Posts (SHP)	3,187
Teaching Hospitals (Tribhuvan University Teaching Hospital, Kathmandu and BP Koirala Institute of Health Sciences, Dharan)	2
Ayurvedic	
Naradevi Ayurvedic Hospital, Kathmandu	1
Shingha Durbar *Vaidyakhana*, Kathmandu	1
Zonal *Ayurvedalaya*	14
District *Ayurveda Swastha Kendra*	22
Ayurveda Ausadhalaya (Dispensaries)	161
Total hospital beds (under Ministry of Health)	3,465
Non-Government Sector	
Eye Hospitals	14
Others**	10
AMDA Hospitals	2
Private Medical Colleges/Hospitals***	5

* Ministry of Health, HMG, Nepal, 1997; Central Bureau of Statistics, HMG, Nepal, 1998.

** Ampipal Hospital, Gorkha; Anandaban Leprosy Hospital and Patan Hospital, Lalitpur; Dhulikhel Hospital and Sheer Memorial Hospital, Kabhre; Green Pasteur Hospital, Kaski; Lalgarh Leprosy Hospital, Mahottari; Okhaldhunga Hospital, Okhaldhunga; Tansen Mission Hospital, Palpa and TEAM Hospital, Dadeldhura.

*** Bharatpur Medical College, Chitawan; Manipal Medical College, Kaski; Nepal Medical College and Kathmandu Medical College, Kathmandu and Nepalgunj Medical College, Banke.

Table 3 Major causes of morbidity and mortality (as recorded at an Infectious Disease Hospital, Kathmandu in 1989/90)*

Morbidity	Gastro-enteritis	61.7%
	Enteric-fever	9.0%
	Dysentery	4.5%
	Hepatitis	2.3%
	Meningitis	0.9%
	Tetanus	0.5%
	Measles	0.3%
	Others	20.8%
Mortality	Hepatitis	22.8%
	Tetanus	12.5%
	Gastro-enteritis	11.5%
	Meningitis	6.3%
	Enteric-fever	1.1%
	Others	45.8%

* Central Bureau of Statistics, HMG, Nepal, 1991.

of infectious diseases, intestinal parasitosis (mainly soil-transmitted helminthiasis) alone constitutes a major health problem in Nepal[10–14]. Roughly, more than half of the people in Nepal are infected with one or more intestinal parasite species and in some rural areas, over 90 percent of locals are infected[10]. *Ascaris lumbricoides*, the commonest helminth parasite has shown no change in its prevalence in Nepal over one decade period[11,12], where as hookworm infections, have shown a re-emerging trend recently[13]. Among the protozoan parasites, *Giardia lamblia* is most common followed by *Entamoeba histolytica*[12,15]. Diarrhea causing emerging parasites such as *Cyclospora* infections have also been noted[16,17] and 80% of the population has *Toxocara*-specific antibodies[18]. Nearly half of the population are infected with *Toxoplasma gondii*[19-24] and over one-third of infections occur during early life. A high *Toxoplasma*-seroprevalence has also been found in domestic meat animals such as pigs, goats, sheep, buffaloes and chicken[25] and this appears to be a major source of infection though eating raw meat is not a common practice in most parts of Nepal[24].

Vector-borne diseases such as malaria, leishmaniasis[26] and Japanese encephalitis[27–31] also occur in the Terai region and settlements/villages on the river banks between the hills. Of these, *Japanese encephalitis virus* has shown a changing seroepidemiological pattern recently[28]. Hepatitis viruses are also common in Nepal[32–35], and a markedly high prevalence of *Herpes*, *Measles*, *Mumps*, *Rubella* and *Hantavirus* infections have also been reported[36–38]. The rapid spread of HIV infection in Nepal has been attributed to the rapid spread in neighboring India[39] and the open border between Nepal and India.

Tuberculosis and leprosy still pose a difficult challenge in spite of the control program launched in 1966[40,41]; the annual incidence rate of tuberculosis has been estimated as 1.05 smear positive cases per 1,000[40] and the incident of leprosy is also wide spread with the highest prevalence (3.61 per 10,000) in the Humla district in Mid-Western Region[41]. Mycotic infections are also prevalent[42–44], and the emergence of drug resistance in microorganisms[45–47] has further intensified the problem of infectious diseases.

Maternal mortality rate in Nepal is very high (5.39 per 1,000 live births)[5] and has been attributed to the lack of medical facilities, reproductive factors (maternal age, parity, unwanted and/or multiple pregnancy) and socio-economic factors (poverty, lack of information and illiteracy). In some areas, women are considered as unclean prior and several weeks after delivery and are confined to a cow-shed (*gotha basne*), and prior to delivery not even family members and local birth attendants touches them[48].

Many infectious diseases such as *Hantavirus* infection[38], *Chlamydia* infection[49], leptospirosis[50] and toxocariasis[18] go undiagnosed due to the lack of diagnostic facilities. Outbreaks of many infectious diseases such as diarrhea, dysentery, cholera[51], enteric fever and jaundice[35] occur frequently and are attributed to the fecal contamination of drinking water[8]. Outbreaks of diseases of unknown etiology have also occurred in some areas during recent past[6,52]. In future there may be an increase in the spread of various types of opportunistic infections such as toxoplasmosis and *Pneumocystis carinii* infections due to the influence of wide spread HIV infection in neighboring India[39]. Moreover, since the number of cancer cases has been increasing[53–55] the effects of the use of cytotoxic drugs and radiotherapy must also be considered.

2) Non-infectious diseases

Although still relatively rare, the occurrence of non-infectious diseases such as cancer[53–55] and cardiovascular diseases (hy-

pertension, rheumatic heart disease, congenital heart disease and cardiomyopathy) has been increasing and a Heart Disease Hospital was recently established in the country to care for the small number of patients with cardiovascular diseases. Gastric cancer is the most common form of cancer followed by the cancer of the skin, cervix, breast and lymphoma[55]. Cancer cases are common in the age-group of 31–50 years and in children retinoblastoma is the most common. The Nepal Cancer Relief Society, which was established in 1982 introduced a cancer registration system also[56], and a Cancer Hospital has also been established. We suggest that an increase in cancer cases and the use of cytotoxic drugs together with the rapid spread of HIV infection may contribute to the spread of opportunistic infections in the future.

Protein-energy malnutrition is also an important health issue, particularly among children and pregnant women. A tendency to essential fatty acids deficiency, lower cholesterol, with increased triglycerides has been noted in Nepalese people, compared with findings of worldwide studies[57,58]. In general, food consumption and the average energy intake are adequate[59], and the mean total protein intake for children in the parts of the country so far studied was higher than in children in Brazil and Thailand[59]. However, a significant loss of certain nutrients associated with intestinal helminthiasis[14,60–62] and low intake of vitamin A rich foods leading to vitamin A deficiency and its sequelae such as night blindness, xeropthalmia, and anemia have been noted[63]. Recent studies have shown that protein-energy malnutrition among Nepalese may be associated with various types of intestinal infections and diarrheal diseases[60–62] and with a low intake of vitamin A rich foods[63]. A vitamin A program distributing vitamin A capsules through out the country is underway and a program to create awareness among Nepalese about the source of various micronutrients including vitamin A has been started by both governmental and non-governmental organizations. However, there are also some communities where green vegetables are not given to a pregnant women or postpartum mother in the belief that they cause *khupat* (diarrhea or similar diseases)[48].

Health workers

A description of the health personnel working for the Ministry of Health Department of Health Services as of 1996 are shown in Table 4. Of them, health assitant, axulliary health worker, assitant nurse midwife and maternal-child health worker are designated to work in PHC-C, HP or SHP in rural areas but to date there are insufficinet trained health workers available. In addition, most doctors and health workers are concentrated in bigger cities and towns in spite of the provision of certain incentives for working in rural areas. Many health workers feel that working in the rural areas is isolated and also reduces the opportunities for self-development, and those health workers employed in rural areas complain of the lack of supplies, subordinates and opportunities for their own education. In 1986, Tribhuvan University Institute of Medicine launched a radio program called “Distance Education Program” for the continuation of education of health workers working in rural and mountainous areas[64], and the government has been encouraging the private sector to invest in training health workers. As a result, several medical institutions, as shown in Table 2, have been established and are expected to contribute to increasing the number of trained health workers available.

Table 4 Health personnel in Nepal*

Under Ministry of Health	
Doctors (including Dental Surgeons)	922
Nurses	1,160
Pharmacists	17
Health Assistants (HA)	1,084
Laboratory Technologists	41**
Laboratory Technicians (including Microscopist and Lab. Assistant)	Over 500***
Auxiliary Health Workers (AHW)	4,659
Assistant Nurse Midwives (ANM)	1,601
Maternal Child Health Workers (MCHW)	3,176
Female Community Health Volunteers (FCHV)	42,427
Traditional Birth Attendant (TBA) (*Sundeni*)	12,682
Ayurvedic Manpower	
Adhikrit Kaviraj (Officer level)	60
Kaviraj/Sr. *Vaidhya*	230
Vaidya	227
Outside of Ministry of Health	
A large number of health personnel are working in the Non-Government Sector (Table 2). Some are also working independently. The exact number is not available.	

* Ministry of Health, HMG, Nepal, 1997; ** Rai et al, 1998;
*** Present estimate.

Unmatched expansion

There has been a gap between the financing required for health sector operations and the availability of domestic resources[65], and the pace of health sector expansion in Nepal has not been matched by the domestic growth. Many HC, HP and SHP are poorly utilized mainly due to the lack of trained health workers or insufficient medical supplies[66,67]. A significant section of the rural population also still rely on local traditional/trantric healers (*Dhami, Jhankri* and *Bijuwa*)[6,7,66,67], which results in underutilization of the Health Posts in many areas[66,67]. External assistance from foreign countries has partially filled the gap but at the expense of dependency on foreign aid[65].

Private sector

The present National Health Policy encourages the private sector to provide specialized and general curative health services in the country[4]. Both national and international non-governmental organizations, private sector and foreign investors are encouraged to contribute to the development of health services in Nepal and as a result, several Medical Colleges and health care centers have been established, as shown in Table 2.

Conclusion

The government of Nepal has put considerable effort into the expansion of the health system so as to provide basic health services to every citizen. As a result, at present, every VDC in the country has either an SHP, HP or PHC-C. However, in spite of the comprehensive network from central level down to grass roots level, the health situation in Nepal has not improved as expected. As shown in Table 4, easily preventable and readily treatable infectious diseases pose a great challenge due to reasons that are beyond the scope of the health system itself. The most fundamen-

tal factors are poverty, rapid population growth and lack of education coupled with social factors such as gender discrimination (high priority for males), which is reflected in the use of health services[68,69]. Maternal mortality rate is still very high (5.39/1,000 live births), and in the rural communities there is still a demand for traditional practice/treatment[70] from traditional healers[6,7,64,65]. In addition, at the administrative level, the maldistribution of health resources and the allocation of priorities are also major problems; preventive medicine and health research do not receive sufficient attention. Most health workers are concentrated in the bigger cities and towns while many SHP, HP and PHC-C including some District Hospitals have insufficient health personnel or medical supplies. Furthermore, medicine is commonly prescribed under the brand-name[71] rather than the generic name, which can be confusing to the patients.

Local participation not only in the health system but also in the developmental process as a whole has decreased recently, which may be due to dependency on external support, without the participation of locals[66]. Thus, to create a sustainable health system in Nepal the issues of the availability of domestic resources, both workers and supplies and local participation needs to be seriously considered. Very recently, the effect of intestinal helminthiasis in the loss of certain nutrients in rural areas has been noted[14,60] which suggest the need to emphasize preventive medicine. It is expected that the newly established Medical Colleges will contribute significantly to providing the much needed various types of health personnel such as nurses, medical technologists, pharmacists and radiographers in future, although at present, these are producing only doctors. Alhough this report is not a detailed picture of the health system in Nepal, it may give some kind of direction for all those concerned including the donor countries and/or agencies in designing the future health developmental programs for Nepal.

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