

Assessment of the Health System in Nepal with a Special Focus on Immunization

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1 Objectives of the assessment

It is anticipated that His Majesty's Government (HMG) of Nepal will apply to the Global Alliance for Vaccines and Immunization (GAVI). GAVI requests countries to provide background information on the status of their health systems. The Ministry of Health (MoH), WHO, UNICEF and USAID were involved in recruiting an Advance Team of two national and two international consultants to help prepare for an assessment of immunization services, and to carry out a broad assessment of the health system within which immunization is carried out. This assessment has at least three objectives:-

- to provide the requested information on the development of Nepal's health system, in preparation for HMG's anticipated application to GAVI;
- to contribute to the Advance Team's development of a feasible approach to the overall assessment of immunization.

The third objective arose because the Advance Team was the first to use a guideline¹ developed for WHO/VAB/EPI and referred to as "Part II." This objective was:-

- to pretest Part II and provide feedback to WHO/HQ.

Feedback on Part II is included in the consultant's trip report to BASICS.

2 Methodology

The approach was to learn, from briefings, documents, discussion and observation during field visits, how the functions essential to immunization are carried out within the health system, how that system immunizes eligible women and children, and to identify current developments that are shaping the health sector, especially those affecting immunization. The latest assessment methodology from WHO [B23] was pretested, and the chapter headings in those guidelines are followed as far as possible in this report. Documents consulted are shown in Annex 1 [they are referred to by their code in Annex 1], and the schedule of activities and meetings is in Annex 2. The glossary is in Annex 3.

The health system assessment was carried out concurrently with the work of the Advance Team, which took as its guide the Key Indicators for Immunization Assessment Guidelines described in [B24]. Those indicators fall into seven groups: immunization services delivery, immunization safety, logistics, vaccine supply and quality, advocacy and communication, surveillance, and finance. The Advance Team's report identifies the areas in which further efforts are needed to improve vulnerable aspects of immunization services, and should be read in conjunction with this one.

¹ Assessment of Immunization Services, Part II: System Approach to Immunization Assessment and Plan of Action. Draft of 35 pages, dated 21.6.2000. WHO/VAB/EPI. See reference [B23].

3 Summary

Public sector spending on health in Nepal, including external sources, is less than US\$3 per capita per year. Yet during the past decade, there have been problems with underspending of allocated budget, reallocation of funds and off-budget expenditure. In the MoH, connections between allocation of budget and control of expenditure appear to have been weak, and donor partners have funded some of their activities outside the budget framework. In an effort to improve the health gain that might be achieved from allocated resources, a sector wide framework has been developed for planning, choosing priorities, and committing funds in accordance with agreed priorities. In order to support this effort, any proposed support to the health sector should be programmed through the planning and financial framework. This process should include an assessment of the medium to long term financial and programmatic implications of the proposal.

Human resources management has been characterised by very frequent changes in staff, at all levels. The MoH has taken measures to address this. Its own excellent human resources database (HuRDIS) can be used to monitor the expected reduction in the frequency of transfers for key categories of staff. The proposed approach is outlined in Section 5.3.2.

Rearrangement of organisational structures, integration of functions, dismantling of vertical programmes, and the cutbacks in development budgets and staff that accompanied these changes have placed the remaining staff under unenviable pressures. Not only must they co-ordinate with many separate units at central level, which takes more time; the accumulation of technical experience has also been hindered and dissipated by frequent transfers into and out of key posts. There is evidence that the technical and operational requirements of immunization are not always recognised within the more generalised, integrated systems, and that for immunization, the allocated staffing level is insufficient for the task at hand (refer to Sections 5.3.1). There is also evidence from Nepal's success at achieving international standards for polio eradication indicators that adding staff, nurturing their skills, and supporting them with good management and appropriate resources has produced outcomes that exceed the minimum requirements. Lessons learned from positive experiences (such as Vitamin A distribution and surveillance for polio) should be examined for their approaches, to identify key elements and processes for improving service quality and sustaining it in Nepal (refer to Sections 5.3.3, 5.7, 5.8).

The integrated health information system has been running for several years, but reporting is only one aspect of using information. Research shows that health workers in Nepal know how to report satisfactory results; discrepancies between immunization coverage from monthly reports and cross-sectional surveys indicate that information is not put into use at the point of service delivery. Immunization has powerful indicators of service quality; staff and community should be supported in discovering the messages in the data, interpreting them and applying them in practical ways. Section 5.8 includes a recommendation for building on existing developments in community participation in monitoring, to use information for improving services.

The health sector's planning framework provides an opportunity for addressing cross cutting issues, such as the safety of injections and other parenteral procedures, and

infection control. This topic involves many of the essential functions of the health system discussed in Section 5. That section ends with a recommendation to carry out an independent assessment of injection safety. The methodology should serve as (a) a needs assessment of skills, preceding any training activities, (b) an indication of equipment, spare parts and supplies needed, (c) a basis for supportive, technical supervision, and (d) an exploration of alternative strategies (including use of drums instead of racks). The approach should be participatory, problem solving, competency based and practical, and should pretest how to convey information to health staff effectively, and how best to support them in adhering to safe injection practices.

The Advance Team's report concentrates on immunization services, and should be read in conjunction with this one.

4 Context

In 1990 democracy in Nepal was restored through revolution. The popularly elected government put forward a new health policy, and the organisation structure of the MoH was changed, for four reasons: to remove duplication of administrative and financial functions, to integrate functions that were duplicated in separate programmes (e.g., training, logistics, data collection), to create a structure that supported integration, and to follow the Administrative Reform Commission's recommendations on delivering health services effectively with the least manpower necessary [A2].

Despite improvements in access to health posts and primary education, basic networks for roads, electricity and telephone, and expanded irrigation and community forestry, Nepal is still one of the poorest countries in the world. In rural areas population growth has outpaced agricultural growth.

“More rapid progress in the fight against poverty has been hampered by ineffective and increasingly unstable governments. There have been five governments since 1994, and two of the three major parties have split in the last year. Corruption is perceived to be widespread, contributing to misallocation of government resources, delays in project implementation, difficulties in obtaining approval for private investments, and rapid turnover and perverse incentives for civil servants. And while macroeconomic management has generally been acceptable, the economy has suffered from the lack of proper management of public expenditures, stagnant real revenues, large and inefficient parastatals, and a weak financial sector. As a result Nepal has not been able to adequately exploit its assets - fertile land in the Terai, access to generous donor aid, strong tourism appeal, and enormous, if partly seasonal, water resources and hydropower export potential. This discouraging picture may be a factor in the recent emergence of a low-intensity, but violent, Maoist insurgency.” [A9]

4.1 Health policies and strategies

Nepal's health policy is described in the documents arranged on a time line in Figure 2. The MoH has just published the operationalisation of the second 20-year health plan [A13], and is half way through the Ninth Five-Year Plan. The annual cycle for plans and budgets, and the reporting period for the information system (HMIS), starts on 16th July.

Figure 2 Policy Documents and Plans, showing their Time Frames

1991	1997	2002	2007	2012	2017
1991 National Health Policy					
Ninth Five-Year Plan 2054-2059 (1997-2002)					
Second Long Term Health Plan, 1997-2017 (LTHP) (published 1999)					
Strategic Analysis to Operationalise Second LTHP (Aug 2000)					
Policy Document, Immunization Programme (draft, 1999)					
Local Self-Governance Act, 2055 (1999)					
1997/8 to 2001/2 Annual Plans of Action					
N.B. Fiscal year starts on 16th July					

Policy and strategies in the Ninth Five-Year Plan are summarised in the Annual Report, in which the objectives of health policy are synthesised as follows [C1, p.11]:

- to significantly improve the general health conditions of the people by providing preventative, promotive, curative, rehabilitative and family planning services through the development and extension of existing health services with the realisation that health service is a basic human right;
- to reduce the population growth rate by popularising the concept of small families through health and family planning services; and
- to promote the capacity of people's access to the labour market by creating a healthy labour force, as well as income-generation activities to alleviate poverty.

Strategies include extending basic health services to the village level, decentralising planning, management and implementation to district level supervised from Regional Health Directorates, making the district the focal point for strengthening health services, involving local political bodies in financial aspects of government health institutions, co-ordination with drinking water and nutrition, and giving "due importance" to people's participation including follow-up by the community.

After a period of expanding the number of facilities at the periphery and recruiting female volunteers to work in their communities, the emphasis is now on ensuring that resources allocated to the health sector are used to address Nepal's health priorities more effectively. The recent history of resource allocation and expenditure is discussed in Section 5.2. The process of operationalising the Second Long Term Health Plan is still in progress, and includes a concerted effort to prioritise interventions in the health sector within a framework that is agreed between the major stake-holders (refer to Section 4.3).

The Local Self-Governance Act (1999) is part of a movement towards more decentralised decision making and offers an opportunity for increasing local control over local issues.

“The private sector will be encouraged to develop and provide services with the facilitation of HMG” and to collaborate in producing high and medium level manpower [C1, p.13]. Private sector purchase and provision of health services are an essential part of curative care in Nepal; however, there is considerable overlap between public and private, from two perspectives. First, two-thirds of household health expenditures were for accessing or using government health services, and second, government employees may also provide private health services (e.g. medicine shops). About a quarter of all health expenditures in 1994 were for private modern and traditional health care (refer to Section 5.2). A recent survey [B14] has found that almost one-third of households (31%) had used health services in the last month, and among these the use of non-government health services was twice as high as the proportion using government facilities. In general, the choice of one type of service instead of the other relates to issues of convenience, access, cost and quality rather than to the type of health problem. The exception is immunization; 94% of the households that obtained an immunization during the last month did so from a government health facility.

The regulatory environment is reflected in the following vignettes related to immunization:

- **Injection equipment:** Regional Health Directors said that if clients bring their own syringes and needles, then staff would use them. This led to a discussion about whether packaged syringes were indeed sterile, and how the purchaser or the health worker would be able to assess the quality of the purchase. This issue has arisen in other countries in South East Asia Region, but does not appear to have been discussed at this level in Nepal.
- **Vaccines:** a newspaper reported on tetanus toxoid (and insulin) being sold from medical shops that do not run a refrigerator (“to save the cost of electricity”); local people said that fewer than 10 of 100-150 such shops even owned a fridge. There were anonymous reports that some vaccine imported for the private sector arrives without any cold chain.
- **Hepatitis B vaccine** has been provided in some schools. The Team was told that this has happened without the parents being asked to sign a consent form, and without being told in advance what the cost would be; the charge for the vaccine would be added to the quarterly bill.

The current policy document for immunization [A5] describes five targets, namely:

1. Achievement of 90% coverage at district level through strengthened routine immunization services
2. Polio eradication by the year 2000
3. Neonatal tetanus reduced to fewer than 1 case per 1000 live births in each district
4. Measles mortality reduction
5. Introduction of new vaccines

The Advance Team's presentation to the Inter-agency Co-ordination Committee (ICC) included detailed discussion of these targets, as does the Team's report.

4.2 Structure of health services

The organisational structure of the MoH is shown in Figure 3, and the Department of Health Services (DoHS) in Figure 4. This structure has continued to develop since the major reorganisation at central level in 1993; for example, since the first organograms were published [A2] it was deemed essential to have a Child Health Division (CHD) in addition to the Family Health Division, and CHD was created in December 1994.

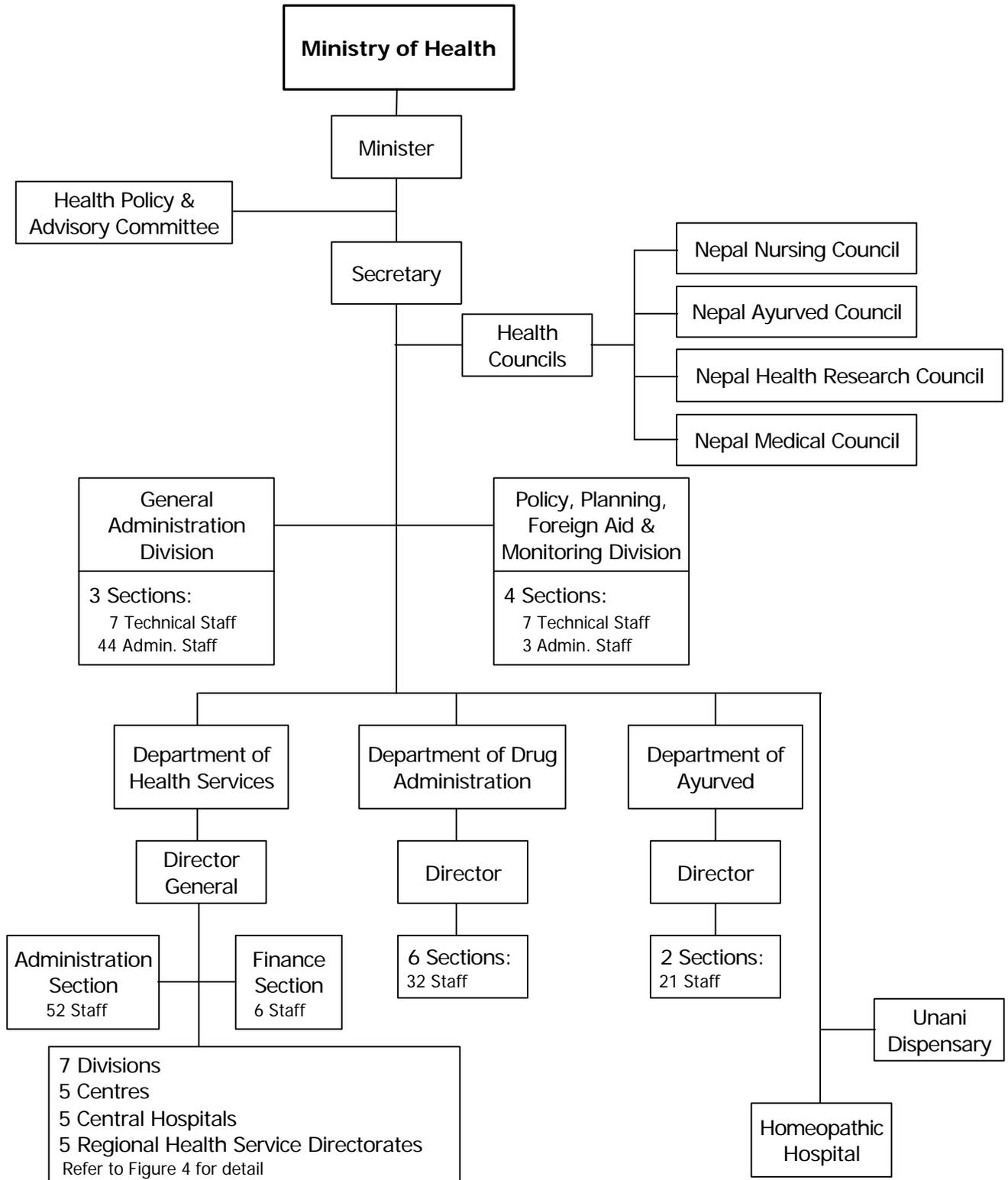
The EPI Section is within CHD, and is responsible for policy, guidelines and general strategies. Responsibility for other immunization functions is distributed between at least five other Divisions and Centres (notably Planning and Foreign Aid Division for HMIS, Epidemiology and Disease Control Division, Logistics Management Division for supplies, National Health Training Centre and National Health Education, Information and Communication Centre). Some financial matters flow through the General Administration Division, others may involve direct contact with donors and partners. The Chief of the EPI Section is in daily contact with international partners involved in immunization, especially WHO and UNICEF.

The five Regional Health Service Directorates are shown on the map in Figure 1. Each region includes districts from all three ecological zones: Terai (Gangetic plain), Hills (610 to 4800 meters) and Mountains (above 4800 meters). Thus every Region faces the challenges posed by wide variations in terrain, accessibility, and climate. For example flooded rivers during monsoon cut off some facilities in the Terai. Extreme winter conditions make it difficult to reach health facilities in the Mountains, and some of the target group eligible for immunization migrate seasonally, making it more difficult to complete scheduled doses on time. More than 20 Districts do not have road access.

Far Western Development Region contains only 9% of Nepal's population, but one-third of this Region's population of 1.68 million lives in four districts which do not yet have an earthen road connection to District headquarters. In Darchula, a Mountain district, the average distance from District headquarters to Health Posts is 14.3 kosh (about 50 km) one way. [D11]

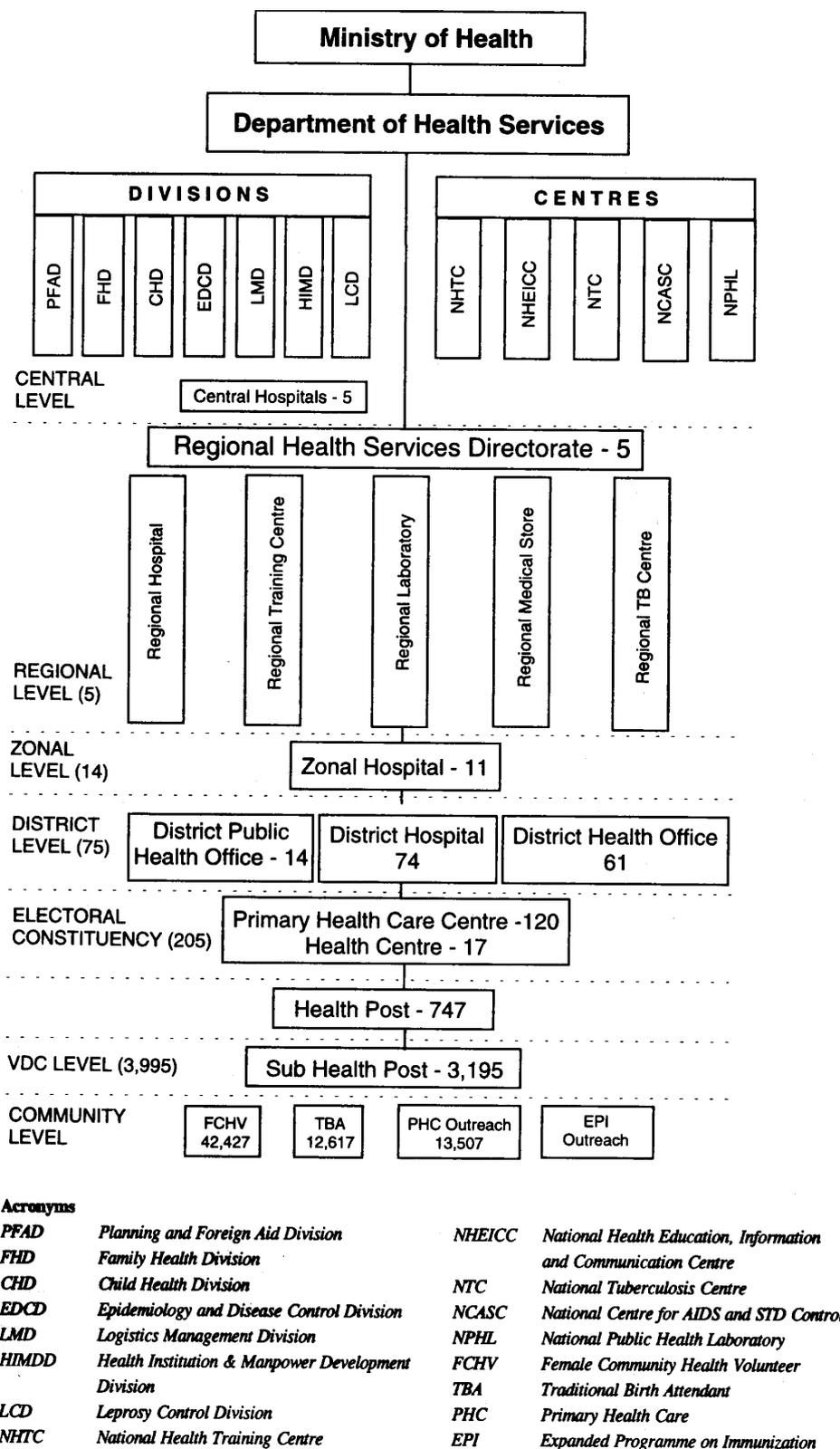
Figure 4 and the data in Table 1 illustrate some key features of Nepal's demography and health services. Birth rate in the Mountains and Hills is higher than in the Terai, and population density is lower. The Terai has larger catchment populations per Village Development Committee (VDC), and the Village Health Worker (VHW), based at the VDC, organises more EPI Clinics per VDC in the Terai compared with the Hill and Mountain Districts. These calculations assume that each VDC has an active VHW; in 1993 there were 4,015 VHWs at VDC level, but the Annual Report does not include current information on VHWs in post and active. Average session size, calculated under the assumptions in Table 1's Footnote (b), is expected to be smallest in the Mountains and largest in the Terai; in practice there will be considerable variations in session size, as indicated by the range in the size of VDC populations (from 450 to 28,000). These

Figure 3 Organisation chart of MoH



Source: [A2], Charts B, C-1, C-2, C-3, E, O, P

Figure 4 Organisation chart of DoHS



Source: [C1]

variations underline the need for “pull” systems of logistics, and for bottom-up micro-planning, which started for EPI during the UCI campaign in 1989.

Each VDC includes nine wards; there are 35,217 wards nationwide. The model is to have one *Sevika* or Female Community Health Volunteer (FCHV) per ward; in 1993 there were approximately 27,000 FCHVs. Since then recruitment has almost doubled, to 46,615.

Table 1 Selected indicators of health system infrastructure, by ecological area

	Mountain	Hill	Terai	Total
Districts	16	39	20	75
Municipalities	2	27	29 ^a	58 ^a
Total population	7%	45%	47%	22,892,441 12% urban
Population under 1	8%	46%	46%	698,824
Hospitals (government)	13	39	24	76
Private+NGO,INGO etc sending reports to HMIS	2 + 9	13 + 95	6 + 39	21 + 143
PHC Centres & HCs: Constituency level (100,000)	6 & 8	60 & 8	54 & 1	120 & 17 Target: 205
Health Posts Ilaka level	156	401	188	745
Sub-Health Posts VDC level: 3,995 VDCs	392	1,628	1,165	3,185
Village Devpt Ctees	542	2,006	1,365	3,913
Population per VDC	3,164.0	5,105.2	8,012.2	5,850.4 Range: 450 to 28,000
PHC Outreach Clinics	1,567	6,661	5,279	13,507
EPI Clinics (1998/99)	1,708	7,155	5,535	14,398
EPI Clinics per VDC	3.15	3.57	4.05	3.67
Average no. of under-1s per EPI Clinic session ^b	10.9	15.1	19.2	16.2
Total pop. per FCHV	279.2	441.8	673.6	502.5

Source: [C1], p.327 (data for 1999/2000). Number of EPI Clinics from p.329.

a Includes one metro city.

b Assumptions: all children under 1 are immunized in EPI Clinics during four visits; each EPI Clinic is run once per month. Adding women aged 15-44 on a schedule of 5 lifetime doses of TT (on average, one-sixth of this cohort receiving one dose of TT each year) would increase session size by 3 to 6 attendees per session.

In reality, session size will vary enormously depending on actual uptake, frequency of sessions, and special strategies (e.g. for eliminating maternal and neonatal tetanus).

Table 1 shows the average number of people served by these *Sevikas*, who have been described as “the main hope for providing services for the poor, and for women and children,” and the *Sevika* programme as “the most significant component of health infrastructure operating at the community level across Nepal” [D6].

The features of Nepal’s health service structure that are most relevant for immunization can be illustrated by describing how a child or woman gets immunized. Supplies are procured by MoH and UNICEF, and stored by the Logistics Management Division (LMD) in the Central Cold Store. Supplies are distributed to the five Regional Cold Stores and two Zonal (sub-regional) Stores, and from there to District Cold Stores. Vaccines are looked after by cold chain assistants; after the first steps towards integration in 1989 it was found necessary to recruit and train 105 of these specialised storekeepers. Other supplies (notably needles, syringes, cotton, spares for sterilizers) are under the responsibility of the general storekeepers.

Immunization services are provided in hospitals, Health Centres and PHC Centres, Health Posts and Sub-Health Posts, and at outreach sessions in communities in the health facility’s catchment area. The term “outreach clinic” is used to describe both the EPI Clinic and the PHC Outreach Clinic, which is principally for family planning services. These two types of clinic depend on different staff (VHW and MCHW respectively) and different logistics (e.g., Depo does not require a cold chain, and is administered using different injection technology). For a particular catchment population the two clinics are not necessarily held on the same day or at the same place.

In a 1999 inventory [B17], 290 refrigerators and freezers were at EPI sub-centres, i.e. away from the District headquarters, indicating that one-third of the 882 PHC Centres, Health Centres and Health Posts are intended to function as sub-centres where vaccine can be stored and issued for use during outreach sessions. However the same inventory noted that 227 (26%) of the refrigerators and freezers were not operating at that time; facility-specific analysis is needed to show how many EPI sub-centres have a functioning cold chain capable of storing vaccine between 0°C and +8°C, and of freezing ice-packs for the safe transport of vaccine.

The usual way of classifying the mode of service delivery into static, outreach and mobile cannot be applied unambiguously in Nepal. In this report, immunization services that are provided in health facilities with a working refrigerator (active sub-centres) are referred to as fridge sessions, and services where there is no working fridge at the EPI Clinic - whether inside a health facility or at a session held away from the facility - as carrier sessions. The relative contribution of these two modes of service delivery is not reported, although one source states that 90% of infant immunization is conducted through “outreach clinics” [B18].

The need to move vaccine quickly to carrier sessions has led to organising 5-7 days of concentrated immunization activities at the beginning of each month. Even when a facility has an operating fridge, immunization services are offered at scheduled times.

For example one District hospital offers children’s immunization on Mondays and antenatal care on Wednesdays; TT for women was not offered during the children’s Monday session observed by the team. Some mothers who had brought their babies

for immunization had spent time and money to reach the under-5s clinic at the hospital, but never attended for antenatal care, and said they had never received TT injections. The organisation of separate clinics for under-5s and pregnant women may seem necessary because of staffing shortages, but this compartmentalisation of services misses many opportunities for ensuring that the mother and her next baby are fully protected against maternal and neonatal tetanus.

The organisation of immunization services in the capital's metro area and in other large urban centres has received less attention than the rural areas. Identifying and following up eligibles in towns tends to be more complex than in the countryside, and finding effective strategies for eligibles moving into towns, and for seasonal migration between high and lower altitudes, pose a challenge to those responsible for service delivery.

4.3 Developments in progress

Making the Second Long Term Health Plan operational includes a concerted effort to establish priorities for resource allocation in the health sector, and to develop a framework through which HMG, partners and other stakeholders can proceed with developing the overall plan in a coherent, co-ordinated, transparent manner. This approach was deemed necessary given (a) the need to focus scarce health resources on interventions that support poverty reduction and economic growth, (b) the MoH's record of underspending and diversion of budget to tertiary level investment, and (c) the donors' propensity to undertake their own favourite projects whose funding may not be part of the formal budget and is therefore not included in the Ministry of Finance's Red Book, which is the official record of public finances.

The most recent phase of developing a strategy for the health sector [A11, A12, A13] has been to develop the recommendations of the strategic analysis into a logical framework/ planning matrix and a plan of operations for each of the following: Essential Health Care Services (EHCS), Public-Private-NGO Partnership, decentralisation, and sectoral management. There is a plan of operations for the preparatory phase and an action plan for July 2000 until July 2002, when it is anticipated that the activities in a detailed Program Implementation Plan (to be ready by March 2002) will begin to be carried out. The EHCS package has been defined (refer to Box 1), and consists of 20 prioritised interventions, each with specific elements or components [A14]. Recognising that it is not feasible to implement the full EHCS package immediately, some components within each of the 20 interventions are being given higher priority. The EHCS package is in the process of being costed.

The budget for fiscal year 2000/2001 includes a rise in personnel salaries, which it is hoped will boost the morale of civil servants and thus reduce the extent of corruption, red tapism and revenue leakage "that have for long become almost a culture in most institutions of the country" [A15]. There has been an effort to reduce the number of projects, to prioritise them, and for NGOs to maintain and increase the transparency of their programmes, the origins and uses of their resources, and their financial transactions. The operationalisation of the Second Long Term Health Plan is thus consistent with these aspects of the government's policy as presented in the current budget.

Box 1 Main interventions and focal points for defining EHCS package

	Main interventions	Focal point	Health problems addressed
1	Appropriate treatment of common diseases and injuries	HIMDD	Common diseases and injuries
2	Reproductive health	FHD	Maternal and perinatal
3	EPI + Hepatitis B vaccine	CHD	Diphtheria, pertussis, TB, measles, polio, neonatal tetanus, hepatitis B
4	Condom promotion and distribution	FHD and STD/AIDS	STD, HIV, hepatitis B, cervical cancer
5	Leprosy control	LCD	Leprosy
6	Tuberculosis control	NTC	Tuberculosis
7	Integrated Management of Childhood Illness (IMCI)	CHD	Diarrhoeal disease, acute respiratory infection, protein-energy malnutrition
8	Nutritional supplementation, enrichment, nutrition education and rehabilitation	CHD and FHD	PEM, iodine deficiency disorders, Vitamin A deficiency, anaemia, cardiovascular disease, diabetes, rickets, perinatal mortality, maternal mortality, diarrhoeal disease, ARI
9	Prevention and control of blindness	Dr. Dahl, Bir Hospital	Cataracts, glaucoma, pterygium, refractive error, preventable infections
10	Environmental sanitation	HIMDD	Diarrhoeal disease, ARI, intestinal helminths, vector borne diseases, malnutrition
11	School health services	NHEICC	Diarrhoeal disease, helminths, oral health, HIV, STDs, malaria, eye and hearing problems, substance abuse, basic trauma care
12	Vector borne disease control	EDCD	Malaria, leishmaniasis, Japanese encephalitis
13	Oral health services	PFAD	Oral health
14	Prevention of deafness	DAHAL	Hearing problems
15	Substance abuse including tobacco and alcohol control	NHEICC	Cancers, chronic respiratory disease, traffic accidents
16	Mental health services	Dr. Shrestha	Mental health problems
17	Accident prevention and rehabilitation	LCD	Post trauma disabilities
18	Community based rehabilitation	LCD	Leprosy, congenital disabilities, post trauma disabilities, blindness
19	Occupational health	NHEICC	Chronic respiratory disease, accidents, cancers, eye & skin diseases, hearing loss
20	Emergency preparedness and management	EDCD	Natural and man-made disasters

Source: [A14], Table 1. See Figure 4 for key to abbreviations of focal points.

Decentralisation is supported by the Local Self-Governance Act [A7], which describes powers and responsibilities for bodies at municipality, district and village level. The budget describes making these local bodies self-reliant by arranging for them to receive resources from various taxes. The DoHS's planning matrix for decentralisation includes targets for health committees to be functional at District and VDC levels and for 20% of health expenditure to be borne by local contribution in public health facilities by FY 2006/7.

Thus both in the government's overall strategies and in the details being developed for the health sector, there are substantial changes under way. Any initiative directed at a specific health problem or service should proceed within the framework that the government and development partners are creating.

How the context is affecting immunization services is described below.

5 Findings and recommendations

5.1 Policy and planning

The development of the planning framework for the health sector is still in progress. Immunization is given third highest priority in the EHCS package (after appropriate treatment of common diseases and injuries, and reproductive health), and includes hepatitis B vaccine as one of its components. These priorities were set with the help of hospital-based data that formed the basis of analysing the burden of disease. At the time of writing, a broader based assessment of the epidemiology of hepatitis B disease in Nepal is under way.

The planning framework provides a mechanism for weighing competing demands to include additional components of the 20 main interventions. For optimising the health gains from health services, the activities most relevant to Nepal's circumstances should be chosen. The realities of resource constraints were made clear by staff in the National Planning Commission Secretariat, who indicated that the health budget, at less than \$3 per capita, would not be able to fund the addition of hepatitis B vaccine to immunization services unless charges were levied. This would require policy changes, and would involve considerable complications at all levels of service delivery, supervision and management.

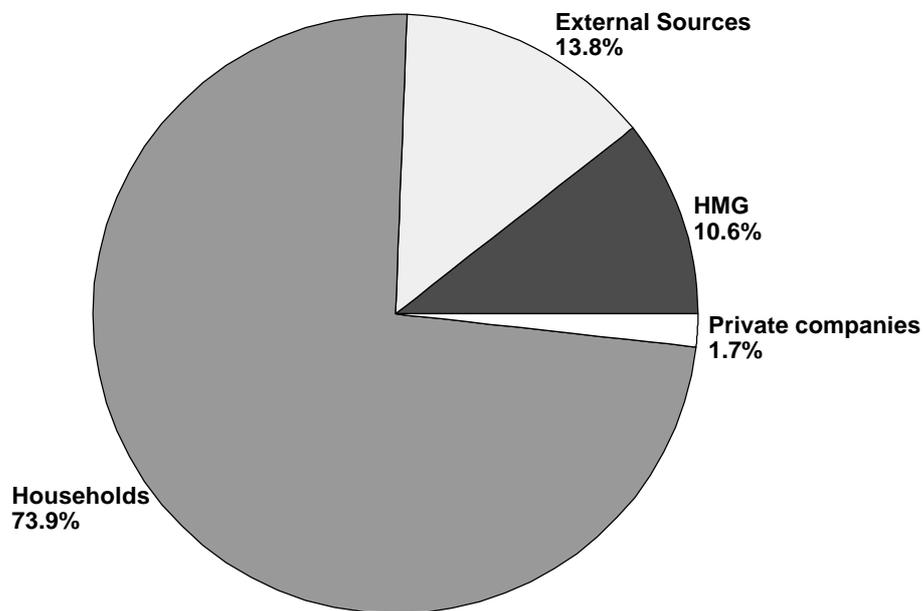
RECOMMENDATION

Proposals to include additional components of the prioritised main interventions should be considered within the framework for health sector planning and financing, giving highest priority to those additional components that are feasible and will lead to the most cost-effective improvement in the population's health status.

5.2 Financing

In 1994 it was estimated that 5.3% of GDP was spent on health [A3]; this represented about US\$11 per capita, with by far the greatest share spent by private households. External sources contributed more than the government (refer to Figure 5). These figures should not be interpreted to mean that health care provision was mainly in the private sector; two-thirds of household expenditures (i.e., about half of total expenditure on health) were spent on accessing or using government health services (for example, buying prescribed medicines). About a quarter of all expenditures (i.e., one-third of household expenditures) were on private modern and traditional health care.

Figure 5 Sources of expenditure on health in Nepal, 1994



Regarding the public funding of health services, various aspects should be appreciated:

- The budget is divided into two elements, regular and development.
- There are two main levels within the regular and the development budgets: hospitals, and health services (PHC Centres, Health Centres, Health Posts, Sub-Health Posts).
- Donor funding that is allocated through the budget is recorded in the development budget.
- Some donor assistance is not allocated through the budget, and is not reflected in the Ministry of Finance's statistics (the Red Book).
- Actual expenditure data are two to three years in arrears of the allocation (budget).
- The MoH spends a lower proportion of its allocated budget than other ministries.
- Other ministries (Defence, Home, Education, Finance) allocate public resources to health.

Over the last five years, other ministries' allocations to health have added between 7% and 20% of the MoH allocation, but the benefits of these public resources are generally restricted to their employees and families.

Between 1995/6 and 1996/7, external assistance increased by a factor of three (grant increased by 2.7 times, and loan by 4.4 times), whereas the government allocation actually fell by 6% (from NRs.2,036 million to NRs.1,921 million; refer to Table 2). External assistance (grant and loan) has comprised 40-45% of the health budget since 1996/7 (refer to Figure 6).

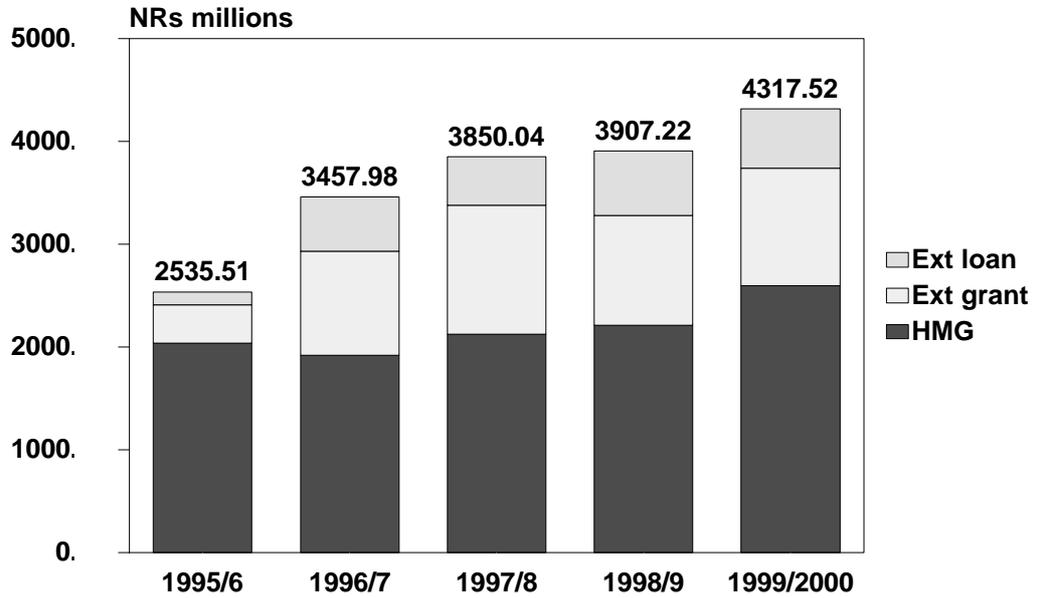
The pattern of allocation for the three parameters (government and donors, regular and development budgets, hospitals and ambulatory health services) show diverse trends. For example, comparing 1997/8 with 1999/2000, the government's allocation to hospitals rose slightly (from NRs.607 million to NRs.633 million) but this was a reduction in terms of the percentage of the government's total (from 29% to 24%), whereas the donors' allocation to hospitals fell from 49% to 26% of the donors' total (refer to Figure 7).

Table 2 Budget allocations for health, 1995/6 to 1999/2000 (NRs. millions)

	Description	1995/6	1996/7	1997/8	1998/9	1999/2000
<i>a</i>	Health budget (<i>b+d</i>)	2,535.51	3,457.98	3,850.04	3,907.22	4,317.52
<i>b</i>	HMG	2,036.18	1,921.31	2,123.81	2,212.09	2,594.45
<i>c</i>	(<i>b</i>) as % of (<i>a</i>)	80.3%	55.6%	55.2%	56.6%	60.1%
<i>d</i>	External (Donor) grant and loan	499.33	1,536.67	1,726.23	1,695.13	1,723.07
<i>e</i>	Regular (HMG)			1,138.00		1,557.00
<i>f</i>	Development (<i>g+h</i>)			2,711.00		2,760.00
<i>g</i>	Devpt HMG			913.61		1,026.72
<i>h</i>	Devpt Donors			1,797.39		1,733.28
<i>i</i>	Hospitals, total (<i>j+k</i>)			1,446.00		1,088.00
<i>j</i>	Hospitals Regular (HMG)			221.00		250.00
<i>k</i>	Hospitals Development (<i>l+m</i>)			1,225.00		838.00
<i>l</i>	Hosps Devpt HMG			385.88		382.97
<i>m</i>	Hosps Devpt Donors			839.13		455.03
<i>n</i>	Health services, total (<i>o+p</i>)			2,310.00		3,051.00
<i>o</i>	Hserv Regular (HMG)			847.00		1,213.00
<i>p</i>	Hserv Development (<i>q+r</i>)			1,463.00		1,838.00
<i>q</i>	HServ Devpt HMG			484.25		571.62
<i>r</i>	HServ Devpt Donors			978.75		1,266.38
<i>s</i>	Hospitals+Health Services (<i>i+n</i>)			3,756.00		4,139.00
<i>t</i>	Adjustment (other) (<i>a-s</i>)			94.04		178.52

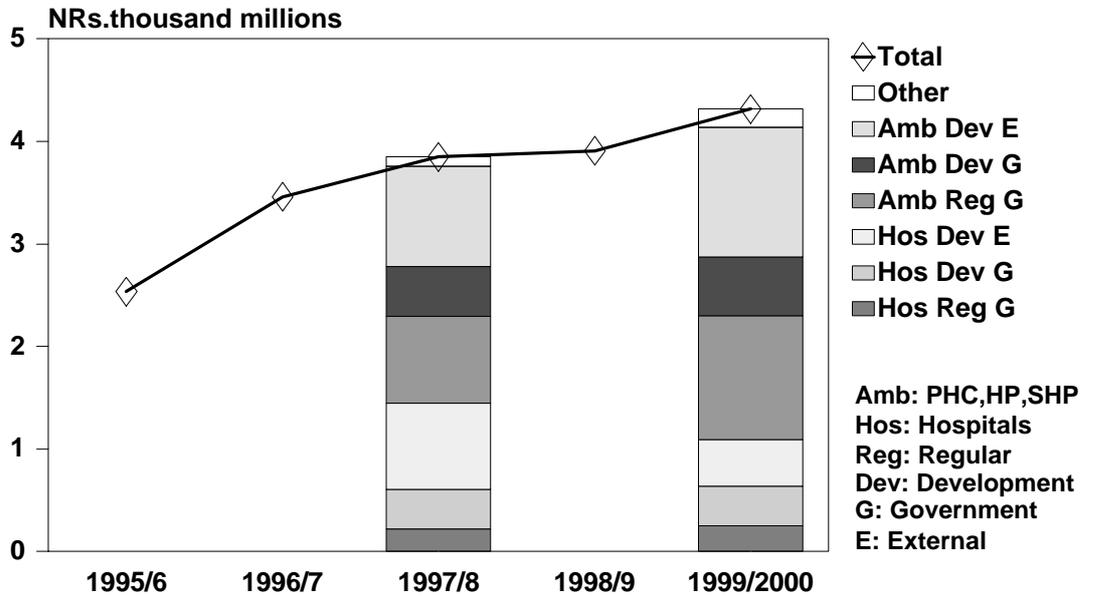
Sources: Red Book, HMG, Ministry of Finance (various issues) and Economic Survey, HMG, Ministry of Finance (1999/2000), compiled by Shreebatsa P. Shrestha, and [A11], Table 3.1. The adjustment in Line (*t*) is small items of expenditure not classified under (*i*) or (*n*).

Figure 6 Health budgets for FY1995/6 to FY1999/2000, showing allocations from HMG and external assistance grants and loans (millions of NRs.)



Source: See Table 2.

Figure 7 Health budgets for FY1995/6 to FY1999/2000, showing allocations from HMG and external assistance (millions of NRs.)



Source: See Table 2.

This pattern of donor and government expenditures “suggests that aid flows to the sector are highly fungible” [A11]. Donors’ priorities and funding favoured primary care in the early and mid-1990s, and in response the Government shifted its resources (relatively) out of primary care and into hospitals. Recently total allocations have shifted in favour of primary care (77% in 1991/2; 63% in 1994/5, 57% in 1997/8, 69% in 1999/2000) [A11, Table 3.3]. The increase in the government’s allocation to the regular budget for health services, illustrated in Figure 7, reflects the increased work force for newly established primary care facilities.

However, over the last five years, per capita allocations have remained amongst the lowest in the world; “public health expenditures barely exceed 1% of GDP” [A9]. In 1998/99 per capita public expenditure was equivalent to \$2.54, and is lower in only five other countries in the world. Actual outlays have typically fallen short of the budgeted amount, due to revenue shortfalls and diversion of resources to unbudgeted expenditures. These circumstances make it essential to track trends not only in allocations (intentions) but also in actual expenditures. Over the past decade, there has been significant underspending of

Table 3 Budget allocations for EPI and NIDs (NRs. thousands), with numbers of eligibles for two components of the immunization programme

Description	1995/6	1996/7	1997/8	1998/9	1999/2000
<i>a</i> EPI budget	111,189	99,528	89,995	86,229	95,285
<i>b</i> HMG	62,029	54,738	55,055	60,339	65,285
<i>c</i> (<i>b</i>) as % of (<i>a</i>)	55.8%	55.0%	61.2%	70.0%	68.5%
<i>d</i> External grant (UNICEF)	49,160	44,790	34,940	25,890	30,000
<i>e</i> Estimated expenditure	100,547	75,194	83,144	71,459	
<i>f</i> Actual expenditure	43,973	98,482	81,866		
<i>g</i> (<i>f</i>) as % of (<i>a</i>)	39.5%	98.9%	91.0%		
<i>h</i> <1 population	628,359	645,325	662,669	680,498	698,871
<i>i</i> <1s with DPT3*	509,141	519,007	548,134	519,920	
<i>j</i> DPT3 coverage* (<i>i/h</i>)	81.0%	80.4%	82.7%	76.4%	0.0%
<i>k</i> EPI budget/<1 (<i>a/h</i>)	NRs. 177	154	136	127	136
<i>l</i> EPI actual expen./<1 (<i>f/h</i>)	NRs. 70	153	124		
<i>m</i> EPI actual exp/DPT3 (<i>f/i</i>)	NRs. 86	190	149		
<i>n</i> NIDs budget		45,000	60,000	67,800	87,887
<i>o</i> HMG		5,000	7,490	7,130	7,887
<i>p</i> (<i>o</i>) as % of (<i>n</i>)		11.1%	12.5%	10.5%	9.0%
<i>q</i> External grant, donors		40,000	52,510	60,670	80,000
<i>r</i> NIDs actual expenditure		54,450	47,995		
<i>s</i> <5 population		3,093,270	3,176,607	3,262,277	3,350,257
<i>t</i> NIDs budget/<5 (<i>n/s</i>)	NRs.	15	19	21	26

Sources: Red Book, White Book and Source Book, HMG, Ministry of Finance (various issues) and [C1], compiled by Shreebatsa P. Shrestha

* DPT3 doses and coverage are used here as a proxy for the level of immunisation activity. Note that neither the EPI budget nor the NIDs budget covers all the costs of immunization, and these figures can not be used for calculating cost per immunized child.

budget allocations, especially in the development budget, with actual expenditure averaging 68% of budget allocation since 1990/91. For particular activities the pattern of underspending shows wide variations; for example in 1995/6 only 40% of the allocation for EPI was spent, but in the following two years 99% and 91% of EPI's allocation was spent (refer to Table 3 and Figure 8). Underspending of immunization allocations by WHO and UNICEF (refer to Advance Team report) are in part a reflection of the constraints posed by limited absorptive capacity within DoHS.

Over the last five years the EPI allocation per infant has varied between NRs.127 and NRs.177, and actual expenditure per infant has varied by a factor of two (between NRs.70 and NRs.153). However, as Figure 9 shows, there was no clear connection between the amount spent and trends in reported coverage. Several reasons may explain this:

- Some donors' funding is not reflected in the Red Book.
- Routine services may have continued to run on skeleton funding (see 1995/6).
- Additional expenditure (1997/8 onwards) did not produce any change in activity.
- Reports of activity continued to show attainment of target even though actual activity was at lower than reported levels [B16, D1, D2].

The apparently loose connection between expenditures and outcomes may also reflect a lack of programmatic control over financial resources once they are received.

The pattern of financial support for immunization shows that the government is funding an increasing share of the allocation, with HMG's share increasing from 56% in 1995/6 to 69-70% for the last two years (refer to Figure 8). This reflects the fact that the government has been purchasing DPT, Measles and TT vaccines for several years. However, since 1996/7 the allocation for routine immunization has fallen in absolute terms, from NRs.99.5 million to NRs.95.3 million in 1999/2000, whereas the NIDs (polio eradication) budget, which is separate, has increased each year, almost doubling over the same period (refer to Figure 10). One of the outcome indicators for polio eradication - the non-polio AFP rate - shows that the grant funding secured as part of the eradication effort has resulted in vastly improved performance in surveillance.

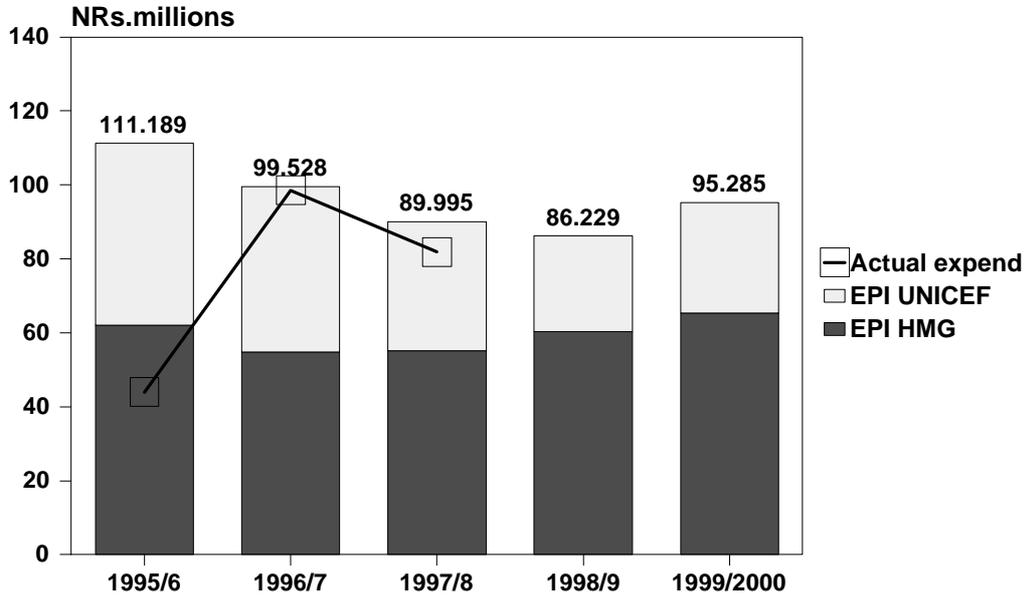
The health services component of the development budget included 47 separate projects when the Public Expenditure Review [A11] was prepared. There were 29 centrally run projects, of which 19 were supported by donors. The figures presented above only include external support that is recorded in the Red Book.

RECOMMENDATION

Any new financial support that may be obtained through GAVI from the GFCV should be programmed through the planning and financing framework that is now being developed for the health sector in Nepal.

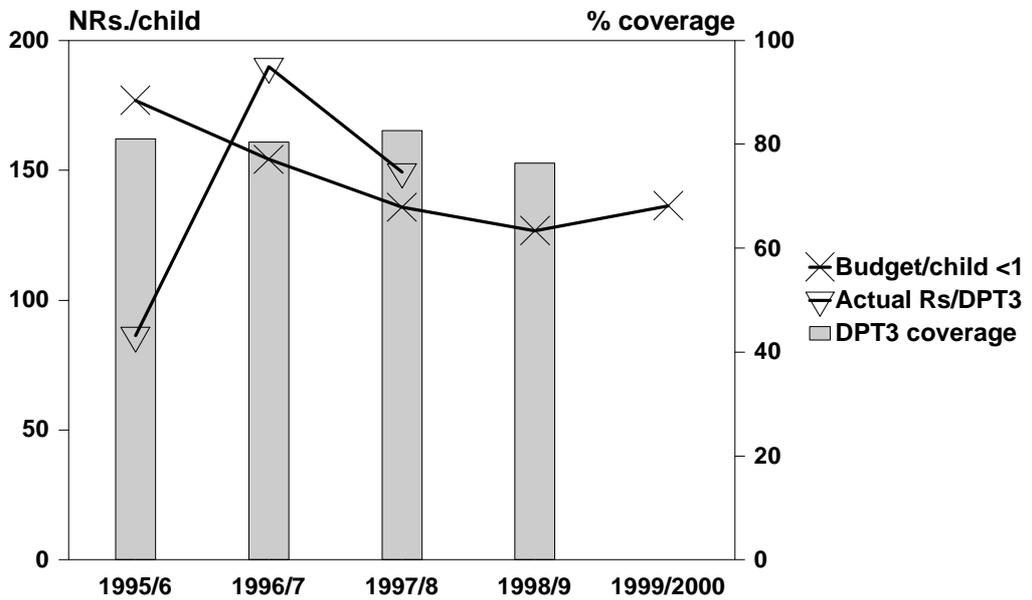
An assessment of the medium to long term financial implications of adding a new vaccine to the immunization schedule is needed before accepting a short-term donation of vaccine.

Figure 8 EPI budgets allocated by HMG and external assistance for FY1995/6 to FY1999/2000, showing actual expenditure (millions of NRs.)

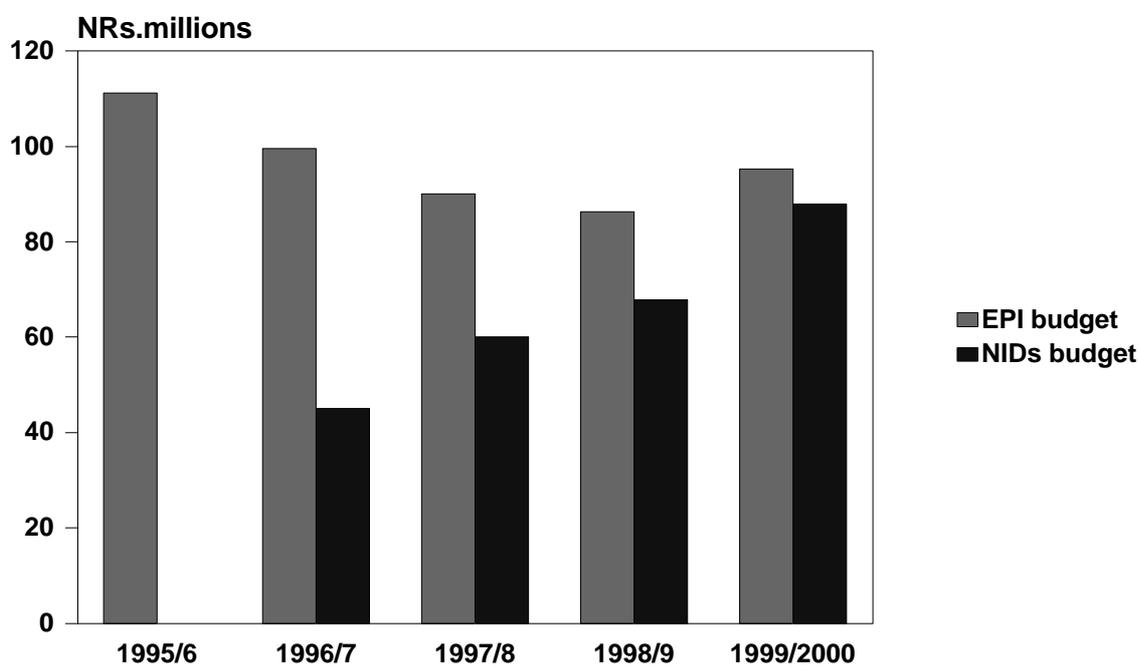


Source: See Table 3.

Figure 9 EPI budgets and actual expenditure per DPT3 (proxy for output) to children under 1, for FY1995/6 to FY1999/2000, and DPT3 coverage



Source: See Table 3.

Figure 10 Budget allocations for EPI and NIDs, FY1995/6 to FY1999/2000

(millions of NRs.)

Sources: See Table 3.

5.3 Human resources

A set of problems and constraints that has attracted repeated recommendations in each of the last five years concerns staff: too few human resources in post with adequate skills to get the job done (refer to Figure 11). There are several dimensions to these problems.

Figure 11 Recommendations about staffing and skills in five successive years

Recommendation to:	1995	1997	1996/97	1997/98	1998/99
Strengthen EPI central staffing					
Improve supervision/give training					
Provide, train more cold chain staff					

Sources: 1995 - [B7]; 1997 - [B12]; 1996/97, 1997/98, 1998/99 - [C1] and earlier years.

5.3.1 Capacity

The reorganisation of the health sector and the subsequent creation of a separate Child Health Division (December 1994) provides for one health officer (MD) to be Chief, EPI Section, supported by a public health officer.

Nepal has achieved excellent results in a demanding aspect of polio eradication, namely AFP surveillance, with non-polio AFP rates exceeding the target for the last two years (refer to Section 5.7). This has only been possible by recruiting and training ten additional surveillance officers, plus the administrative and logistics support (secretaries, drivers, cars) that are required to get the job done. Polio eradication is only one aspect of immunization, and the AFP surveillance component requires 35 additional full time project staff, plus support from WHO and UNICEF staff and teams of short term consultants, and it also absorbs the majority of the Chief of EPI Section's attention and energy.

Integration at the centre has resulted in time-absorbing efforts to co-ordinate one programme's needs across 17 Divisions, Centres, and Regional Directorates. It is not possible for one person to run the immunization programme in the present circumstances. The plan of action can only be implemented, and acceptable performance (verified by monitoring) will only be achieved, if the MoH allocates additional capacity to the EPI Section.

RECOMMENDATION

Additional staff must be allocated to cover specific technical aspects of immunization, namely cold chain, and to cover the proposed elements of the plan of action designed to improve the quality and outcome of the programme. The most appropriate and sustainable way to achieve this should be determined within the planning framework currently under development by the MoH and donor partners.

5.3.2 Employment practices

Frequent changes of senior staff: At central level, staff in key positions have been transferred frequently; for example, since July 1996

- the Director of Child Health Division has changed five times, and
- the Chief of EPI Section has changed six times, including a 4-5 month period with no-one in the post. The shortest time in post was about 6 months, the longest was about 8 months.

At more senior levels there is also lack of continuity; since FY1992/3, the Director General, DoHS has changed seven times, and the Secretary of Health six times (three of these were into retirement). The Minister of Health has changed seven times during the same period.

The results of these frequent changes include all the problems attending lack of continuity in national posts; to paraphrase comments from global and regional (SEAR) colleagues, "How can we provide effective support when the country sends a new national manager to each meeting?" Nepal has been noted as the country with the highest turnover of national EPI managers.

Changes of mid-level managers and key technicians: Preliminary findings from one regional store and two districts show that over the last three years there have been staffing problems in four out of ten posts that are key for immunization services.

Box 2 Vacancies and other staffing problems for EPI in one Regional Store and two Districts, 16 July 1997 to 15 July 2000

From 16 July 1997 until 15 July 2000,

- Regional Refrigerator Technician's post has been filled for a period of seven months, and that staff member was temporary.
- Post of District Cold Chain Assistant (CCA) has been continuously occupied by one person, but during this time two other CCAs have been transferred into the same post, stayed a matter of days or weeks, and were transferred elsewhere. The processes by which these transactions were achieved were not studied.
- District Health Officer has changed three times, while the District Public Health Officer's post was vacant for three years (filled 16th July 2000).

Transfers cause discontinuity in direction of policy, in management and in service provision; they are also very costly. No official cost analysis has yet been circulated, but the unofficial record for the amount of advances claimed for transfers within a year by one individual is NRs.100,000. Put into context, these advances represented more than 120% of a DHOR's annual salary.

Key service providers (VHWs, MCHWs, AHWs): VHWs are experienced but some practices need improvement (refer to Section 5.3.3), and the cadre is aging. MCHWs are expected to join the VHW to conduct EPI Clinics but MCHWs may already be programmed to do outreach to PHC Outreach Clinics (principally for family planning) on a different schedule. The reasons for separate visits to the same community of eligibles need careful assessment (not top-down instructions to integrate them) to see how the two cadres can better complement and support each others' work.

Underlying attitudes and assumptions among staff about the health system and the way it works have been studied by others. Box 3 contains some summary observations from a study [D1] that identified implicit "values in use" (as distinct from the official value system).

Within the "*wide and coherent system of 'values in use'*" EPI was highlighted as an example of vertically organised programmes "*which are not only easy to monitor and provide donors and the official value system with countable outcomes, but also provide access to allowances and additional resources which satisfy the implicit values in use. The programme therefore satisfies the needs of both value systems at once.*"

Box 3 Values in use

- The unstaffed posts are at undesirable places.
- If a post is “filled” by an absent worker on a regular contract, they cannot be replaced.
- If a post is filled by a worker on regular contract who is not working, s/he cannot be fired.
- Employment means the right to a salary even if not working.
- The allocation of jobs is thought to be corrupt.
- There are no clear job descriptions or allocation of responsibilities.
- There is no emphasis on the right skills or personal qualities for any job.
- Work, training and rewards are allocated on the basis of factors other than post held.
- Posts are seen as salaries and not duties or work.

From Jean-Marion Aitken, “Voices from the Inside: Managing District Health Services In Nepal.” See [D1].

Other human resources that are not employees of the government health system (including the FCHVs and TBAs) have been involved in polio eradication campaign activities, for which incentives have typically been offered; but they do not receive incentives for supporting routine immunization. Continuous follow-up among the community is an essential component of immunising all eligibles on time, and can be promoted through community based monitoring (refer to Section 5.8).

The Director General, DoHS told the team that the issue of staff transfers has been addressed. If the measures taken by the MoH are successful, then over the next few years the government health system will benefit from greater continuity and reduced costs.

The team discussed using the MoH’s excellent information system on human resources (HuRDIS) to track the rate of transfers for posts that perform key functions for immunization, and this suggestion has been well received, not only within the MoH but also in the National Planning Commission and among donors.

RECOMMENDATION

Baseline indicators for tracking continuity of key staff in post should be developed, and used by the MoH, ICC and GAVI for monitoring progress in this area. Indicators from three sources are proposed:

- The mapping of key posts (already pretested and started by the Advance Team for a selection of districts) should be extended to cover all 75 districts and the five regions, using the same methodology. (Note that the HuRDIS database is not suitable for this purpose.)

RECOMMENDATION (continued)

- The HuRDIS database could provide summary data showing the frequency of transfers by categories of staff (e.g., VHW, MCHW, Cold Chain Assistant, EPI Supervisor, DPHOr, DHOr). The protocol for this use of HuRDIS should be developed by the MoH and the ICC with additional technical input as needed. At present, the team sees this as an annual query to the HuRDIS database. If the MoH wished to take additional action in response to the baseline then the plan of action should reflect that initiative.
- Community based monitoring with quality indicators such as reducing drop-outs and completing all doses on time (refer to Section 5.8) provides a way to track progress on effectiveness of service delivery at the periphery, something that neither HuRDIS nor HMIS is designed to do.

5.3.3 Maintaining and developing skills

A considerable amount of training has been carried out, and the numbers attending each course are shown in the Annual Report [C1]. However, the results of these efforts are perceived to fall short of the intended outcomes, for numerous reasons. Frequent transfers of the trainers make it difficult to develop a cadre of skilled, experienced, specialised trainers at the National Health Training Centre (NHTC). The emphasis on numbers of trainees attending diverts attention away from the correct objective, which should be to improve trainees' skills. The educational style has been criticised as depending on rote methods and failing to engage the students. With these problems at the NHTC, it is not surprising that reliance on cascade training to transfer skills down through the regions and districts and out to the periphery has produced ineffectual results.

In contrast, some NGO and INGO projects have achieved remarkable results in clusters of communities throughout the country. However, "*such outstanding examples of dedicated public and private service have had little opportunity to share their learning. Demonstrations of community empowerment have been stifled by administrative rigidities.*" [D6] It is usually difficult to take a small, successful project "to scale" and the different perspectives of people running such projects and those running a health service can become polarised into arguments about whether bottom-up development is more appropriate than top-down. Both approaches are needed. The experience of the Vitamin A project (phased, rolling expansion involving FCHVs) may hold lessons for developing an effective, sustainable process for improving the quality of skills, both for trainees and for trainers.

RECOMMENDATION

The proposed approach to an in-depth operational assessment of injection safety (Section 5.9) could provide a tangible experience and example of assessing needs and developing competency based approaches for improving skills that lead to improvements in performance.

RECOMMENDATION (continued)

Experiences from the Vitamin A project should be examined to identify lessons that are relevant to other components of primary health services that are delivered principally at community level.

5.4 Procurement

This essential central function is carried out in two places: the Procurement Section of DoHS's Logistics Management Division (LMD), and in the UNICEF office. Nepal procures and pays for all of the DPT, measles and TT vaccine used in the routine immunization programme, plus some BCG (starting last year). Child Health Division forecasts their requirement according to the Annual Plan (which is based on the Five-Year Plan) and the allocated budget. The forecast is sent to the Planning Commission for approval, after which it is forwarded to LMD's Procurement Section. This year the budget was proposed in May/June, a month earlier than usual, in a move to bring the process into closer synchronisation with the planning cycle.

The terms of the contract for choice of product and shipping conditions are said to be according to "international standards;" however, these standards are not spelled out in the documentation. Temperature monitors (CCMs and FreezeWatch) are not specified in the contract, but some manufacturers put them in anyway. The Procurement Section staff are not aware of VVMs as they do not handle OPV. Experience with international competitive bidding over the last few years has led to some greater specificity; the Advance Team was told that the Minister had recently issued a *tippani* or regulation concerning quality of vaccines. This may have been prompted by recent experience with DPT, for which a nation-wide recall took place after concerns over the appearance of frozen vaccine led to laboratory testing for its toxicity.

UNICEF procures the rest of the BCG and all the OPV following its own procedures. CHD has also requested donors directly for additional TT for campaigns. The timing of the arrival of these supplies is not necessarily co-ordinated closely with LMD, leading to occasional pressures on cold storage space.

The Vaccine Arrival Report, developed in Nepal and recommended by the Technical Network for Logistics in 1996, is not used. Staff in the Procurement Section told the team that readings on the CCMs are not recorded, but that if problems arose, those problems would be reported. This approach of assuming that "no news is good news" has been shown to be operationally unsound. For example, in the absence of routine recording of the condition of the vaccine upon arrival, the health system has not been able to pinpoint where the DPT became frozen: if freezing had occurred during shipment then the damaged goods could have been replaced free of charge.

The Procurement Section has never been involved in procuring needles, syringes, other immunization supplies, or cold chain equipment and spare parts, which have all been obtained through UNICEF until now.

RECOMMENDATION

Any products that are destined for Nepal's government health services should be procured within the existing framework of integrated, prioritised planning, thus making it possible for LMD to prepare for the arrival of temperature-sensitive vaccines. This would apply especially to new vaccines and different injection technology provided through procurement mechanisms stipulated by GAVI/GFCV.

5.5 Logistics

LMD is responsible for stock management, storage and dispatch of supplies and equipment procured by HMG and by others, including donor partners and NGOs. The integrated logistics management project has developed and implemented systems and software for the logistics management information system (LMIS) for health commodities, developed and printed stock books, trained personnel, designed a prototype store room for district level, and analysed the logistics distribution network [D10, D11]. Although the original project brief did not include immunization, the pipeline report generated by LMIS includes vaccines, but the "decision defaults" do not yet correspond to the stock management standards for vaccines. For example in the pipeline report, *desired maximum months of stock* is 24 months [D12], but in practice most vaccines have a total shelf life of 24 months, so the LMIS's default value would lead to expiry of stock. LMD staff do not actually use the LMIS for managing vaccine stocks. The LMIS tracks the syringes used for Depo, but does not yet include the injection equipment used for immunization.

The Advance Team found evidence of both push and pull distribution systems; if the central stores are over full (sometimes caused by unscheduled donations of heat-sensitive vaccines) then stock is moved to the regional stores on the initiative of the centre. The Advance Team found evidence of unexpected patterns in the frequency, timing and quantities dispatched or collected between central and regional levels, and between a regional store and its districts. The team's report contains details of those findings.

The need to take into account the technical requirements of each element of the health system is well illustrated by the ongoing challenge of expanding LMIS to include immunization commodities. The fact that immunization is a universal programme means that the target number of users is easier to predict than for other interventions, but the details of service delivery (such as variable utilisation rates from multidose vials depending on session size) make it essential for districts to adhere to micro-planning based on sessions. Top-down multipliers calculated from global guidelines or aggregated consumption will lead to stock-outs at the point of use [B7].

RECOMMENDATION

If logistics management of immunization commodities is to be integrated with other health commodities, then EPI's technical guidelines and operational realities of immunization service delivery must be respected, and the LMIS adjusted to accommodate the relatively rigorous and complex requirements of storing and transporting these essential supplies.

5.6 Supervision

After the reorganisation of administrative structures in 1993, the organisation charts for DHOs still showed at least one EPI supervisor per District. Since then, there have been moves to integrate supervision, so that each supervisor checks on all programmes whenever a visit is made to a health facility. The result of integration has been reported to be a lack of specificity in the supervisors' guidance and advice, too much time required to carry out a full supervisory check of all key service activities, too little specificity in the shortened, integrated check list, and insufficient time to follow up on problems found. An assessment of the effectiveness of supervision and monitoring functions is in progress [E3]; the effectiveness of training on supervision and monitoring is also part of the assessment. However, the assessment protocol does not involve observing supervision in practice. It is hoped that the findings and recommendations of that assessment will provide insight and guidance into how supervision can be strengthened.

In health systems where trainers of basic health staff also supervise and resupply them, integration is taken to another level: the trainer has a built-in incentive to equip the trainee with adequate skills and to encourage correct practices, as this will make easier the task of supervising the trainee once qualified and in post. Unfortunately, in Nepal's culture of frequent transfers of staff, the effectiveness of this concept would be greatly diminished.

5.7 Surveillance

Surveillance functions at national level are the responsibility of the Epidemiology and Disease Control Division (EDCD) of DoHS, with involvement of other divisions and specialist centres (e.g., Leprosy Control Division, National Tuberculosis Centre, National Centre for AIDS and STD Control). There is also the specialist Vector Borne Disease, Research and Training Centre (VBDRTC) in Hetauda, Makwanpur in Central Region.

The Early Warning Reporting System (EWARS) started at 18 sentinel sites in 1995, expanding to 24 sites in 1999. EWARS produces a weekly report of data from these sites which report to both VBDRTC and EDCD. This is a passive surveillance system, based on cases presenting at the sentinel facilities (hospitals). The weekly EWARS Bulletin shows the timeliness of reports received from each site; completeness was above 95% in both 1998 and 1999, but timeliness had dropped from 59% in 1998 to 55% in 1999 (the epidemiological year starts on 1 January). The weekly bulletin also reports on acute flaccid paralysis (AFP), and on cases and deaths due to measles, neonatal tetanus, malaria, kala-azar and encephalitis. There is a special surveillance system for cholera, with randomly collected stool samples sent to the National Public Health Laboratory. Reports of other communicable diseases (such as influenza, diarrhoea, dysentery, typhoid), and of snake bites and animal bites are sent to EDCD.

The difficulty of reporting through the multiple channels is reflected in the first problem identified in the FY1997/8 Performance Review Meeting, namely,

“Problem/ Constraint: Conflict between direct surveillance system for kala-azar reporting system and integrated HMIS data.” [C1, p.140]

The recommended action was for DHOs/DPHOs, which are responsible for surveillance at District level, to report kala-azar according to the integrated reporting format. However, for some matters, surveillance cannot be effective if it is passive and if reporting is restricted to the ordinary channels. This fact is reflected in the development of active AFP surveillance since the acceleration of polio eradication in the South-East Asia region with the first national immunization days (NIDs) in December 1996.

The existing surveillance system had identified only 15 AFP cases in 1996 and 35 in 1997, whereas the target, representing 1 AFP case per 100,000 children under 15 years old, was a minimum of 96 cases per year. Nepal's surveillance performance indicators (including non-polio AFP cases per 100,000 under-15s and completeness of adequate stool specimen collection) were the lowest of the SEAR countries. In July 1998, in co-ordination with HMG, WHO established the Polio Eradication Nepal (PEN) Surveillance and Support Team, with a central office in Kathmandu, Regional Surveillance Officers (two per Region, except in FWDR), and a support staff of 25. The resident team of 35 was joined by Stop Transmission of Polio (STOP) officers on four short term assignments of 3 months. In May 1999, less than a year after the PEN team began work, Nepal's AFP surveillance indicators met international standards, and performance has become one of the highest in the SEAR.

Adequate surveillance performance is crucial given Nepal's position between north India, with over one thousand cases of wild polio virus in 1999, and China which was free of indigenous wild poliovirus since 1994 (until one case in 1999?). Two points should be emphasised:

- It required additional, highly motivated human resources and specialised operational training and management to achieve the present level of performance.
- The AFP cases are not necessarily found through the allopathic health system; some cases are taken to ayurvedic doctors and traditional healers [B20], and have only been identified by extending the network of surveillance far beyond the HMIS reporting system.

After the PEN team started work, AFP reporting increased to 52 in 1998, and 234 in 1999. Non-polio AFP rates were 2.00 per 100,000 children under 15 years in 1999, and 1.63 in 2000. The experience of developing a surveillance system for AFP that meets epidemiologically specified performance standards suggests that the number of cases of vaccine-preventable diseases, especially neonatal tetanus and measles, greatly exceed the cases reported through the HMIS. If the surveillance function is to provide a more positive contribution to preventing these diseases, then improvements are needed in the quality of reporting, case definition, outbreak investigation and outbreak response. The processes are similar to those required for addressing adverse events following immunization (AEFI) or any parenteral procedure.

RECOMMENDATION

The systemic lessons learned from developing AFP surveillance to the necessary performance standards should be identified, analysed and compared with current procedures for reporting, responding to “hot” reports, and taking action. As the definition of an outbreak and the appropriate response to an outbreak are specific to each disease or condition, operational procedures and training should supply the relevant epidemiological basis for each disease, instilling rigourousness and supporting a problem-solving approach. Measles, maternal and neonatal tetanus and AEFI are prime candidates for developing more effective surveillance (including the community) and outbreak response procedures.

5.8 Monitoring and Evaluation

The Annual Report, produced by the DoHS’s Planning and Foreign Aid Division, contains data by District and Region, with a commentary on each programme and reports from the Divisions and Centres at national level [C1]. The document has been produced annually for the last five years, and is made possible by the monthly reports from the integrated HMIS, which is described as the basis for the planning, monitoring and evaluation cycle. Part of that cycle are the annual performance review workshops attended by all the Districts in each Region, and the National Performance Review Workshop. The Advance Team was privileged to attend the first day of Eastern Development Region’s Performance Review Workshop in Bhiratnagar, when immunization performance was presented by the Districts. Several observations arose.

- The presence of national level staff and key donors provides an opportunity for District staff to raise urgent issues and constraints with the centre.
- Based on the presentations observed, District capacity to analyse and use their own data needs to be strengthened. There were problems with the arithmetic used to calculate certain indicators, especially vaccine utilisation. This suggests that some Districts do not really use the HMIS’s data for planning, monitoring or evaluation.

The Advance Team report gives details of comparisons between reported data and coverage surveys. In some areas the difference between HMIS routine reports and survey data were consistent with the phenomenon of numbers being inflated as they move up the system, reported from research into the health system [D1, D2]. One way to help staff move beyond filling out reports and to encourage responsible monitoring with ownership is to use data at the point where the service is provided: at community level. There is a project for community based monitoring, supported by the World Bank, running in five Districts (Ilam in EDR, Kathmandu in CDR, Nawalparasi in WDR, Banke in MWDR and Bajhang in FWDR) using a “Community Data Board.” This and other projects with experience of community monitoring may provide insights into how information on immunization indicators could be used effectively at local level.

Communities cannot take over responsibility for all monitoring; health facilities and Districts are responsible for regular tracking of routine indicators, which is essential for

keeping immunization on time, minimising late doses, and catching up after seasonal disruptions. Making routine monitoring effective in supporting improved performance service quality requires analytical skills and a problem solving approach; in-service training could be designed to develop supervisors' and health workers' capacity in these areas.

RECOMMENDATION

Ways should be developed for health workers, FCHVs, VDC members and other interested parties in the community to use data at the point where activities take place. The process for building local capacity in monitoring should be bottom up, supported by advice from superior levels to inform the local selection of the key indicators. The items that are selected for scrutiny should be few, and pertinent to improving quality of services in that locality. (Examples might include scheduled sessions held as planned and with all supplies available; the colour of the TST (time, steam and temperature) indicator after the sterilisation cycle; the drop-out rate with most relevance for the locality; and the completeness of infant immunization on time.) Experience from other initiatives to involve communities in monitoring should be taken into consideration when developing the approach. This effort is seen as starting in a small number of places, and iteratively improving the process, based on experience, as the scope of the endeavour expands.

The outcome indicators for in-service training for supervisors and other staff should include improved analytical skills in handling and interpreting information, and competency in applying data analysis within a problem solving approach.

5.9 Injection safety, infection control, and adverse events

This final section addresses a cross cutting issue which is larger than any one intervention in the Essential Health Care Package. It involves policy, planning, technical protocols, training, supervision, choice of equipment, funding, procurement, logistics, surveillance and monitoring by the health system and the community.

Policies and practices regarding injection equipment: Government health programmes use a combination of injection equipment for preventive services:

- Immunization injections are administered with sterilizable needles and syringes from steam sterilizers equipped with racks. TST indicators have been procured and distributed, but health staff have not been trained how to use them.
- Family planning (another preventive service, also provided through outreach clinics) offers Depo administered using disposable syringes. As far as we could discover, no disposal boxes for collecting and burning the used syringes have ever been procured.
- If clients (typically in urban areas) brought their own syringes, the health workers would use these syringes for administering immunizations. The possibility that

disposable syringes in packets may have been recycled² does not yet appear to have been considered by senior health service managers. There are risks of inserting such a syringe into a multi-dose vial of vaccine.³

The policy on injection safety in primary health services should be consistent, affordable and operationally sustainable, and must include the proper disposal of disposable items.

Planning for additional workload: The process for putting disease control initiatives into practice reflects many aspects of how the health system functions, including completeness of plans, quality of communication between central, regional, district and VDC levels, and translation of objectives into effective action. The team observed the second round of a “TT campaign” supported by the VDC in one Sub-Health Post.

Box 4 A TT campaign observed

The first round had used 170 TT doses, but perhaps demand had exceeded expectations, because for this round there were 250 doses (25 vials) in the vaccine carrier. The preparations had included mobilising the targeted clients and getting enough vaccine, but no extra sterilisation equipment had been planned for. There was only one double-rack sterilizer (containing 84 0.5 ml syringes and 23G x 30mm needles) which was adequate for the routine workload of infants’ immunizations and women taking TT. This meant that the temporarily increased number of clients would have to wait until a second, third and possibly fourth sterilizing cycle could be completed in order to receive a safe injection.

The immunization programme’s steam sterilizers make it possible to provide sterile syringes for the extra clients; if the health system had opted for disposable technology - which cannot be reused safely - then ineffective planning for injection supplies or problems with their distribution would have more serious consequences than asking clients to wait.

Infection control: Preventing cross-infection is a cross-cutting issue that affects most aspects of health service delivery. The choice of where particular activities will be carried out can minimise the risk of infection, or exacerbate it. In the static immunization sessions

² The wire services carry newspaper reports about manufacturing of sub-standard syringes and repackaging of used disposable syringes, referring to China, Pakistan, Korea, Bangladesh. For example, “...Another alarming problem faced by the people is the re-use of disposable syringes. The discarded syringes, says a hospital staffer, are recollectd by the hospital staff from the waste bins and then sold to the scratch dealers from where agents of the manufacturers transport them back to the factories for the purpose to be recycled and repacked for the consumers.” Frontier Post Pakistan NWFP June 12 1998.

³ If the authorities allow their employees to insert into a multi-dose vial a “private” syringe whose cleanliness is not assured by the government health service itself, then serious questions arise about the government’s legal and ethical responsibilities.

held in a hospital, a PHC Centre and one Sub-Health Post, the team observed work flows that held risks:

- immunizations and dressings being done from the same table
- healthy infants sent to the crowded outpatients' room (full of coughs) to be weighed
- sterilizer lids used to hold dirty needles and syringes (instead of being flushed immediately in water in a bowl)
- disposable needles (used for Depo) recapped and removed from their syringes, carried home from PHC outreach clinics in the health worker's bag for separate disposal by the health facility's peon; there were no proper sharps containers for these disposable items.

RECOMMENDATION

The issue of infection control needs to be addressed in a holistic manner so that safe working practices and proper disposal of contaminated waste are observed in other components of essential health care services and in curative care, and by the private and not-for-profit providers. It is the government's responsibility to take the lead in developing policies and guidelines for these matters, and for regulation.

Policies and procedures for investigating adverse events following immunization

(AEFI): The team had the opportunity to discuss the process for reporting and investigating AEFI, based on events in April/May 1999 when three infants died after measles immunization in Morung District, EDR. There does not appear to be an identifiable protocol for investigating AEFI; this is important as questions about injection safety should be investigated as thoroughly as the other factors (e.g., quality of manufacturer's vaccine, cold chain failure, health worker's behaviour) that might have contributed to the final diagnosis.

RECOMMENDATION

The MoH/Department of Health Services should develop written policies and procedures for investigating any adverse event following a parenteral procedure, including immunization. **Cross reference to the Advance Team Report.**

An **independent assessment of injection safety** is required in order to complete the MoH's application for funding from GAVI/GFCV. The team has recommended to the DoHS and the ICC that the most constructive approach is to include such an assessment in the plan of action for the current year. The features of the proposed assessment are as follows:

Develop a methodology that serves as

- (a) a needs assessment that precedes any planning of any activity to improve skills (precise gaps in knowledge and practices need to be identified first),
- (b) an indication of the replacement equipment, spare parts and supplies needed.

RECOMMENDATION (continued)

- (c) a basis for developing a supportive approach for technical supervision of injection safety,
- (d) an exploration of alternative strategies (e.g. use of drums instead of racks).

The approach should be participatory, problem solving, competency based and practical.

It should pretest

- how to convey information persuasively and effectively, and
- how best to support health staff in adhering to safe injection practices.

The methodology should include introducing the TST indicators, not only to health workers and their supervisors, but also to the relevant people in the community; that is, inform the VDC, FCHVs and mothers about the special indicator that shows whether the sterilizer has worked correctly.

The assessors who visit the steam sterilizers' operators (health workers and peons) should ensure that the sterilizer is working properly, that all necessary supplies are available, and as far as possible that any other operational or management issues (e.g. how to get resupplied on a pull system) are resolved before concluding their visit. In areas with hard water, the level of mineral salts could be tested.

The information about faulty equipment and the spare parts and supplies needed to restore a fully functioning sterilization system at each site will be used to develop ways of estimating the quantities of supplies and spare parts required to sustain this element of the immunization programme nation-wide.

This operational approach to assessment could also include the possibility of using drums (instead of racks) inside the steam sterilizers. Micro information on daily session size, damage to needles in transit, whether equipment is cleaned and sterilized immediately after work or immediately before work, and so forth, could be included, as a precursor to possible introduction of drums (following the positive experience of the pilot project in Bangladesh).

An indicator based on TST indicators would be a possibility for monitoring progress with injection safety, but would have to be carefully defined, probably after the first phase of the operational assessment.

The basis of the reasoning for putting an interactive, outcome oriented assessment of injection safety into the plan of action is that such an assessment:-

- cannot be done by enumeration,
- will take time to do effectively (possibly phased), and
- will have several benefits beyond the collection of information.

The assessment proposed above goes substantially beyond the survey approach to assessing injection safety available from WHO/VAB and the Safe Injection Global Network (SIGN). The objective for Nepal is that any data collection activity on this topic also makes a tangible contribution to the process of improving injection safety.

