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Immunization Financing in Nepal

**Human Development
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I. INTRODUCTION

A. Background

1. The Expanded Program on Immunization (EPI) was established in 1979 and is currently one of the priority program of His Majesty's Government (HMG). The EPI was initially piloted in three districts and was extended rapidly during the 1980s to all 75 districts with the standard six antigens. DHS surveys conducted in 1991, 1996, and 2001 indicate that there has been a significant improvement in DPT3 coverage, from 42.4% in 1991 to 72.1% in 2001. This 30 percentage point increase in DPT3 is a much faster improvement than has been observed in Nepal's neighboring countries and progress in the last five years appears to have accelerated. Drop-out rates have declined significantly from 39% in 1991 to 14% in 2001. The results of the DHS surveys, however, also show that there is still an issue of access to routine EPI services. DPT1 (and BCG) coverage in 2001 was 84% suggesting that about 16% of infants in Nepal are still not reached by routine EPI activities. While the EPI in Nepal has made significant progress over the last decade, there is clearly a need to further improve routine immunization coverage as part of a systematic effort to further strengthen the program. In order to help this process, a financial analysis of EPI was carried out by the World Bank with assistance from HMG and UNICEF.

B. Scope:

2. The aim of this study was to: (i) describe the past trends in expenditures on EPI in Nepal; (ii) depict the sources and uses of these funds; (iii) estimate the cost of sustaining and strengthening routine EPI over the next five years (FY03-FY); (iv) examine the availability of financing for EPI over the next five years; and (v) analyze the long-term financial sustainability of EPI.

C. Methodology and Data Limitations:

3. The EPI expenditure data were collected from various sources, including: (i) various issues of HMG's Red Book; (ii) Economic Survey 2000/2001, Ministry of Finance; (iii) various yearly financial reports of the Department of Health Services, HMG; and (iv) records of donors/partners. Collecting this data involved many hours of discussions with the people responsible for the financing of EPI. It is important to realize that the data reflect a number of difficulties including: categories of expenditure are not consistent between partners or the Government, it is not always clear the source of funds in HMG's development (capital) budget, loss of records, and inconsistent accounting of actual expenditures. The data presented here are, therefore, approximate.

II. PAST EXPENDITURES ON ROUTINE EPI

A. Trends in Non-Salary EPI Expenditures:

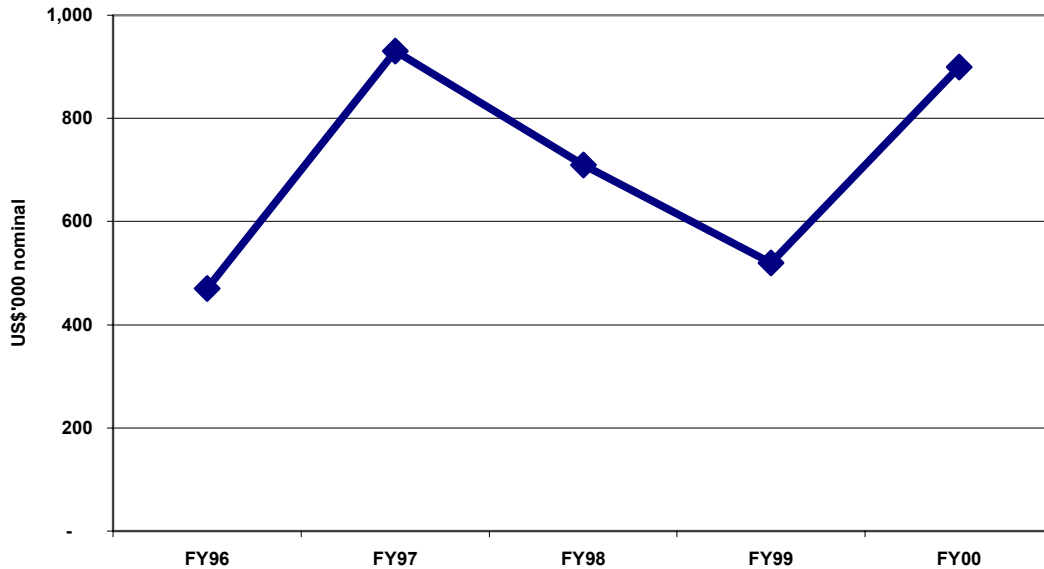
4. Non-salary expenditures on routine EPI come from three sources: HMG's development budget, on-budget support from external partners (a combination of loans and grants), and off-budget external grant support from partners. While separating the first two expenditures is not easy, a rough idea of overall expenditure by source can be gleaned. As can be seen from column (c) in Table 1, total non-salary expenditure on routine EPI has been stagnant during the period from FY97 to FY00. However, the aggregate hides what appears to be an increase in HMG expenditure (column a), which accounts for about 29% of total expenditure, and stagnant donor support (column b).

**Table 1: Government and Partner Expenditures on Routine EPI, Excluding Salaries
FY96 to FY00, nominal US\$ Thousand**

Years	Development Budget HMG (a)	On-Budget External Support	Off-Budget External Support (Grant)	Total External Support (b)	Total (c)
FY1996	470	300	Not available	300	770
FY1997	930	770	1,770	2,540	3,470
FY1998	710	530	1,310	1,840	2,550
FY1999	520	400	1,220	1,620	2,140
FY2000	900	360	2,150	2,510	3,410
Total	3,530	2,360	6,450	8,810	12,340
% of total	29%	19%	52%	71%	100%

5. HMG expenditure on non-salary aspects of routine EPI appears to have been uneven since the mid-1990's (see figure 1). However, there does appear to have been a large increase and the unevenness may reflect accumulation of vaccine stock. Significantly greater HMG expenditure on vaccines began around FY1997 and HMG now buys all the vaccines for routine EPI with the exception of BCG.

Figure 1: HMG Non-salary Expenditure on Routine EPI – FY96 to FY00

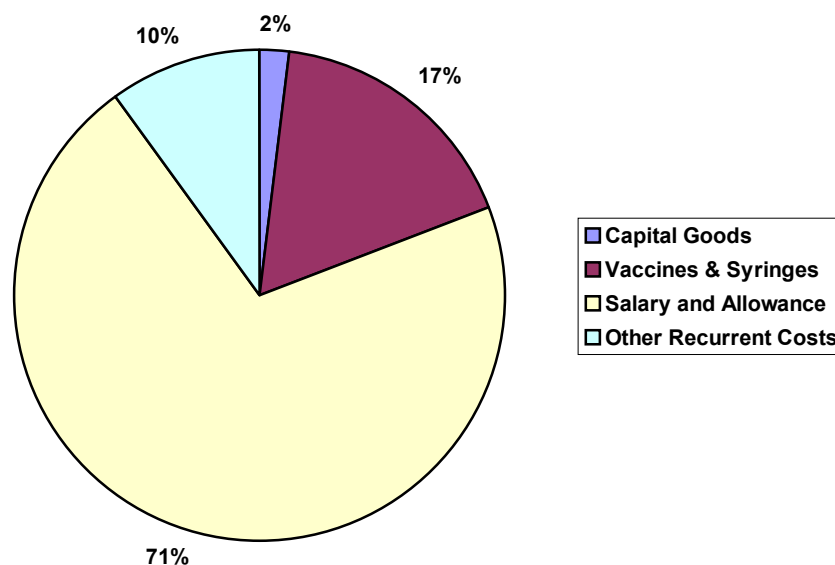


Source: Red Book, HMG, Ministry of Finance (various issues).

B. Sources and Uses of Funds for Routine EPI

6. Figure 2 describes how all the expenditures on routine EPI, including off-budget external support, have been used during the five year period FY1996 to FY2000. More than two-thirds of these all expenditures have gone to pay the salaries and allowances of Ministry of Health personnel involved in EPI and about one fifth of expenditures have been devoted to vaccines and syringes. Non-salary recurrent costs, including travel allowances/daily allowance (TADA), training, social mobilization, vehicle and equipment repair, petrol, oil, and lubricants (POL), accounted for 10% of total expenditures. Capital investments, including cold chain equipment, vehicles, and furniture accounted for only 2% of total expenditure. This figure may represent much lower than required investments in equipment since the most cold chain equipment were fairly old and some of the equipment need maintenance and replacements. Based on recent assessments, it appears that there is an urgent needs for new investment in cold chain equipment.

Figure 2: Uses of All Funds for Routine EPI, 1996 – 2001



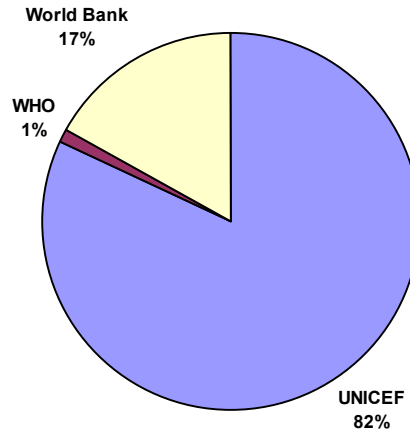
7. HMG has provided 85% of all funds for routine EPI over the last five years, (see table 2), however, most of that support is for salaries and allowances. Almost 84% of HMG's expenditures goes to salaries and allowances. External support has been used for capital equipment, vaccines, and other recurrent costs.

Table 2: Sources and Uses of Actual Expenditures on Routine EPI, FY1996 to FY2000

Expenditure Categories	Government Development Budget		Off-Budgeted External Support		Total	
	US\$ '000	%	US\$ '000	%	US\$ '000	%
Capital Goods	17.17	2	835.03	98	852.20	2
Vaccines & Syringes	3,877.45	54	3,348.14	46	7,225.59	17
Salary and Allowance	30,012.46	100	46.62	0	30,059.08	71
Other Recurrent Costs	1,990.48	47	2,208.63	53	4,199.11	10
Monitoring & Supervision	847.22	32	1,804.53	68	2,651.75	6
Transportation	135.11	89	17.31	11	152.42	0
Maintenance	52.52	89	6.66	11	59.18	0
Supplies	83.60	23	276.57	77	360.17	1
IEC	20.79	45	25.28	55	46.07	0
Operating Costs	815.50	100	-	-	815.50	2
Miscellaneous	35.74	31	78.28	69	114.02	0
Total	35,897.56	85	6,438.42	15	42,335.98	100
Non Salary Total	5,885.10	48	6,391.80	52	12,276.90	29

8. Most of the external support for routine EPI in the last five years has come from UNICEF, WHO and World Bank (see Figure 4). UNICEF and WHO grant contributions have totaled \$7.6 million and \$0.2 million respectively from FY96 to FY00. A World Bank IDA credit has provided \$1.6 million in the form of reimbursements to HMG for its expenditures.

Figure 4: Sources of External Support for Routine EPI, FY1996 to FY2000



Note: Other bilateral funds, i.e. Japan and Norway were channeled through UNICEF.

III. PROJECTED COSTS OF SUSTAINING AND STRENGTHENING ROUTINE EPI

9. Table 3 presents the estimated non-salary costs of sustaining and strengthening routine EPI over the next five years, including new disease control activities such as maternal and neo-natal tetanus (MNT) elimination, and measles control. It also includes the costs of introducing Hepatitis B vaccine. Vaccine and syringe costs constitute almost 50% of the total projected costs although that figure reflects tetravalent vaccine which is currently estimated at US\$0.90 per dose and alone accounts for nearly 38% of total costs. The greatest uncertainty in estimating the future costs of routine EPI concern cold chain equipment and measles control. Unlike MNT where, detailed cost estimates have been developed, little of the detailed work has been carried out on measles control activities. Initial work has been carried out on cold-chain requirements and a request for \$2 million has been made to the Government of Japan. It is possible that additional funds may be required for other aspects of upgrading the cold chain. The amounts given to the districts for envelope budgeting, part of which should be used for TADA, can be adjusted according to resource availability.

Table 3: Estimated Non-Salary Costs of Routine EPI, MNT Elimination, and Measles

Control, FY2003 to FY2007, \$US

ITEM	FY2003	FY2004	FY2005	FY2006	FY2007	TOTAL	%
VACCINE COSTS- ROUTINE						10,302,371	43.8
cost of BCG	64,745	64,039	65,384	66,757	68,159	329,085	1.4
Cost of tetravalent vaccine	341,781	1,201,333	2,326,085	2,464,384	2,494,446	8,828,029	37.5
cost of DPT	204,119	109,645	-	-	-	313,765	1.3
cost of measles	103,188	101,843	110,098	118,656	121,147	554,932	2.4
cost of TT	49,786	56,248	56,472	56,681	57,372	276,560	1.2
SYRINGE COSTS						1,446,341	6.1
Cost of AD syringes	21,478	304,571	310,967	317,497	324,164	1,278,677	5.4
Cost of safety boxes	2,608	36,984	37,760	38,553	39,363	155,268	0.7
Reusable needles	7,690					7,690	
Cost of reusable syringes	4,706					4,706	
MNT CAMPAIGNS						2,558,466	10.9
Vaccines, syringes supplies	611,426	400,337	327,782	55,205		1,394,750	5.9
District level planning, supervision, IEC	187,473	199,038	147,142	44,126		577,779	2.5
Technical assistance	94,167	94,167	94,167	94,167		376,668	1.6
NT surveillance & clean delivery promotion	72,823	67,176	57,226	12,044		209,269	0.9
MEASLES CAMPAIGNS			250,000	250,000	250,000	750,000	3.2
TRAINING-FIELD LEVEL STAFF						248,231	1.1
Training of VHWs	50,000	50,000				100,000	0.4
Training of MCHWs	32,500	32,500				65,000	0.3
Training of facility in-charges		54,286				54,286	0.2
Training of auxiliary health workers		26,786				26,786	0.1
Training of cold chain assistants		1,080	1,080			2,160	
TRAINING - MID-LEVEL MANAGERS						49,000	0.2
Training costs for 150 managers	19,000					19,000	0.1
TA for this training, int'l consultant	30,000					30,000	0.1
PLANNING AND REVIEW MEETINGS						1,000,000	4.3
Cost of district meetings	180,000	180,000	180,000	180,000	180,000	900,000	3.8
Cost of Regional Meetings	15,000	15,000	15,000	15,000	15,000	75,000	0.3
Cost of National meetings	5,000	5,000	5,000	5,000	5,000	25,000	0.1
COLD CHAIN REQUIREMENTS	200,000	500,000	500,000	500,000	300,000	2,000,000	8.5
BEHAVIOR CHANGE COMMUNICATIONS						670,000	2.8
Development of BCC strategy		30,000				30,000	0.1
Formative research/follow-up		25,000			15,000	40,000	0.2
Training for 46,000 FCHVs		10,000	10,000	10,000		30,000	0.1
ITEM	FY2003	FY2004	FY2005	FY2006	FY2007	TOTAL	%
Orientation for VDC leaders		30,000	30,000	30,000	30,000	120,000	0.5

Electronic media development & broadcast		150,000	100,000	100,000	100,000	450,000	1.9
Hiring Immunization officers/FMS for EPI	51,680	51,680	51,680	51,680	51,680	258,400	1.1
District Level Surveys	74,000	74,000		74,000	74,000	296,000	1.3
District Envelope Budgets	375,000	375,000	375,000	375,000	375,000	1,875,000	8.0
Health Facility Survey	20,000	20,000	20,000	20,000	20,000	100,000	0.4
External Audit for GAVI funds	20,000	20,000	20,000	20,000	20,000	100,000	0.4
Research and Development/Studies		15,000	15,000			30,000	0.1
Capital Goods for Central Office						138,000	0.6
pick up vans	108,000					108,000	0.5
Motorcycle	2,000					2,000	
Computers/printers/UPS:	18,000					18,000	0.1
Remodeling of office	10,000					10,000	
Recurrent Costs for Central Office						100,000	0.4
POL/Maintenance	11,000	11,000	11,000	11,000	11,000	55,000	0.2
Additional communications	5,000	5,000	5,000	5,000	5,000	25,000	0.1
TADA for HMG officials on joint supervision	4,000	4,000	4,000	4,000	4,000	20,000	0.1
Development, testing and reproduction of systematic supervision	50,000					50,000	0.2
Other Operating Expenses (excluding TADA)	310,000	310,000	310,000	310,000	310,000	1,550,000	6.6
TOTALS	3,356,171	4,630,713	5,435,844	5,228,750	4,870,332	23,521,809	100.0

IV. FINANCING OF FUTURE ROUTINE EPI AND DISEASE CONTROL ACTIVITIES

10. Table 4 describes the likely funds available from HMG and its partners over the next five years and compares those amounts to the projected expenditures to calculate the financing gap. The estimate of HMG investments in non-salary aspects of routine EPI is based on the assumption that they will remain at the same level as in FY2000. The data for UNICEF comes from their next 5 year country program and is contingent on the availability of funds (in the past this has not been a problem, particularly for EPI). The estimate for GAVI support for Hepatitis B includes the in-kind contribution of tetravalent vaccine, auto-disable syringes and safety boxes for all tetravalent vaccinations, and three years support for auto-disable and safety boxes for all routine EPI vaccinations. The estimate amount of GAVI reward funds (ISS) is based on the low-achievement scenario, i.e., little progress from current coverage levels. WHO support reflects their commitment during the upcoming biennium and USAID support will be primarily in the form of technical assistance.

Table 4: Estimated Funding for Routine EPI Available from HMG and Partners, Estimated Requirements, and Financing Gap, FY2003 to FY2007, US\$

	FY03	FY04	FY05	FY06	FY07	TOTAL
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Likely HMG investment	900,000	900,000	900,000	900,000	900,000	4,500,000
UNICEF	1,130,000	892,000	932,000	879,000	802,000	4,635,000
GAVI Hepatitis B support	365,867	1,542,887	2,674,812	2,820,435	2,650,243	10,054,244
GAVI Reward (low achievement scenario)	700,000	700,000	116,667	116,667	116,667	1,750,000
WHO	70,000	70,000				140,000
USAID	50,000	50,000	50,000	50,000	50,000	250,000
TOTAL AVAILABLE RESOURCES	3,215,867	4,154,887	4,673,479	4,766,101	4,518,910	21,329,244
TOTAL ESTIMATED REQUIREMENTS	3,356,171	4,630,713	5,435,844	5,228,750	4,870,332	23,521,809
FINANCING GAP	140,304	475,825	762,365	462,649	351,422	2,192,565

11. The financing gap over the next five years, excluding polio eradication activities, is estimated to be \$2.2 million. However, the real gap is likely to be far smaller, or may even disappear, for a number of reasons, including:

- (i) There is a good possibility of support from the Government of Japan in the area of cold chain strengthening;
- (ii) WHO will almost certainly continue support for EPI beyond FY2004;
- (iii) Financing may also become available from a proposed World Bank IDA credit; and
- (iv) Given that DPT3 coverage has increased 3 percentage points per year over the last decade, it is likely that Nepal will earn more in reward payments from GAVI (ISS) than has been estimated, conservatively, in the above table.

12. The small financing gap could be further narrowed by the following cost-cutting measures that HMG could adopt:

- (i) Reduction of vaccine wastage rates through improved stock management, introduction of an multi dose vial policy, district and VDC micro-planning, and improved supervision.
- (ii) Greater reliance on inter-personal communications rather than mass media.
- (iii) Scaled up contractual arrangement with local transport companies for use of vehicles which can reduce transport costs.

V. ANALYSIS OF LONG-TERM SUSTAINABILITY OF EPI

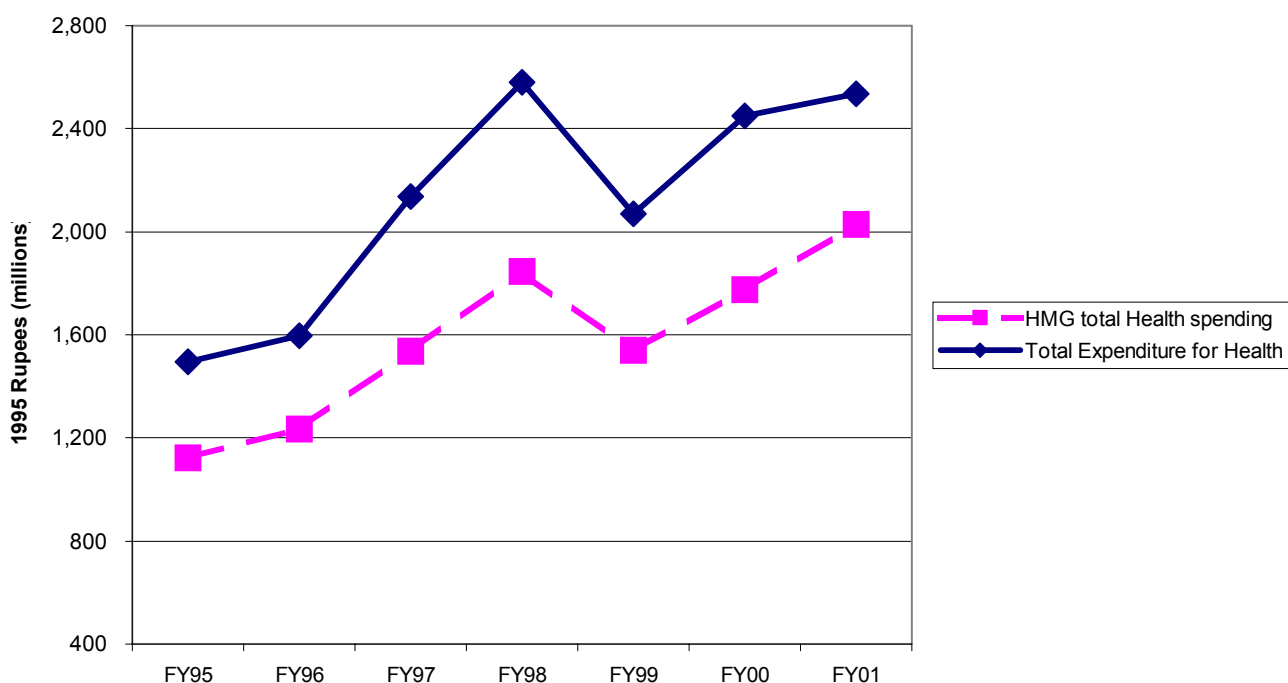
A. Long-Term Trend in Overall Health Expenditure and Implications for EPI

13. In order to determine the long-term financial sustainability of routine EPI, including the introduction of Hepatitis B vaccine and auto-disable syringes, an analysis was carried out which looked at: i) trends in public health expenditures; ii) trends in the proportion of public health

expenditures going for non-salary EPI costs; and iii) long-term costs of Hepatitis B and auto-disable syringes.

14. As can be seen in Figure 5, there has been a fairly consistent increase in public health expenditures (partners and HMG) and HMG health expenditures in real terms from FY1995 to FY2001. There was a decline in FY1999, however this has been reversed in the last two years. Despite increases in real expenditures over the past seven years, public spending on health care remains very low in Nepal. In FY2000, per capita public spending was only Rs.149, or US\$2.03.

Figure 5: Total and HMG Expenditures on Health in Constant (1995) Rupees, millions



Note: FY01 expenditures are estimates.

15. During the period FY1995 to FY2001, HMG's own health expenditures have been growing consistently rapidly. In nominal US dollar terms, the HMG's own health expenditures has been growing at an average rate \$2.0 million per year (see Table 5). If this trend were to continue, total public health expenditure would be \$67 Million in FY2007 or US\$2.60 per capita, a 28% increase on current public health expenditure.

Table 5: Trends in Total Public (HMG & Donors) and HMG Health Expenditures in Real Terms and Predicted Future Expenditures Based on Historical Trends

	1995 Rupees	US\$
Average real change per year from FY95 to FY01 in TOTAL public health expenditure (million)	173.3	2.4
Average real change per year from FY95 to FY01	150.9	2.0

in HMG health expenditure (million)		
Predicted TOTAL public health expenditure in FY2007 assuming continuation of past trends (million)	3,653	67.4
Predicted HMG expenditure in FY2007 assuming continuation of past trends (million)	2,804	51.6

16. The projected increase in HMG expenditures based on past trends also makes sense economically. The economy as a whole has been growing consistently and so have HMG revenues. The proportion of HMG expenditures allocated to health has remained roughly constant over the last few years as has the proportion of HMG expenditures dedicated to routine EPI (table 6). This would indicate that increased total government expenditure will translate directly into increased public expenditure on EPI.

Table 6: Proportion of HMG Expenditures on Health and EPI, FY1995 to FY2001, %

	FY1995	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	Average
HMG Health expenditure as percent of total HMG expenditure	3.8	3.7	4.9	5.6	4.7	5.2	4.4	4.6
HMG Non-salary EPI Expenditure as percent of HMG health expenditure	--	4.8	6.1	3.9	3.7	4.4	--	4.6

B. The Cost of Sustaining Hepatitis B Vaccine and Auto-Disable Syringes

17. The future cost of Hepatitis B vaccine is difficult to predict although it is almost certainly going to decrease. Assuming that GAVI/GFCV covers the cost of Hepatitis B vaccine for the next 5 years, HMG will face the financial liability in 2007 of having to absorb the cost of the new vaccine as well as the entire cost of auto-disable (AD) syringes. Table 7 presents three scenarios about what will happen to Hepatitis B vaccine and AD syringe prices. The first model assumes that prices will remain constant and is almost sure to be wrong. If prices decline, as they are likely to, the cost to the HMG of paying for Hepatitis B vaccine and AD syringes will decline each year after it's introduction (see table 8).

Table 7: Assumptions About Prices of Tetravalent Vaccine and Auto-Disable Syringes

		FY07	FY08	FY09	FY10	FY11
Model 1: Prices remain constant (similar to 2002 Estimated UNICEF price)	Tetravalent	\$0.90	\$0.90	\$0.90	\$0.90	\$0.90
	A-D syringes	\$0.07	\$0.07	\$0.07	\$0.07	\$0.07
Model 2: Modest decline in prices	Tetravalent	\$0.50	\$0.45	\$0.40	\$0.35	\$0.30

	A-D syringes	\$0.05	\$0.05	\$0.04	\$0.04	\$0.03
Model 3: Steep decline in prices	Tetavalent	\$0.40	\$0.33	\$0.26	\$0.21	\$0.17
	A-D syringes	\$0.05	\$0.05	\$0.04	\$0.04	\$0.03

Table 8: Future Costs of Hepatitis B Tetavalent Immunization in Nepal Based on Various Assumptions About Prices, US\$ '000

	FY07	FY08	FY09	FY10	FY11
Model 1: Price remains constant	5,757	5,888	6,022	6,158	6,298
Model 2: Modest price declines	3,270	3,043	2,736	2,483	2,146
Model 3: Steep price decline	2,681	2,320	1,873	1,600	1,308

1. If HMG expenditures on health follow their current trend and continue to grow at about \$2million per year, then HMG would have a large one-off growth in expenditure for Hepatitis B that would occur in 2007. However, assuming a modest decline in the cost of vaccine (model 2) and complete HMG financing, Hepatitis B vaccine and AD syringes would represent a modest and declining proportion of HMG health expenditures (see Table 9).

Table 9: Funds Required for Sustaining Hepatitis B Vaccine After GAVI, Assuming Modest Price Declines, US\$ million

	FY07	FY08	FY09	FY10	FY11
Tetavalent vaccine & AD syringe costs	3,270	3,043	2,736	2,483	2,146
Total HMG expenditure	67,360	70,334	73,307	76,281	79,254
Vaccine & AD syringe as % of Total	4.9%	4.3%	3.7%	3.3%	2.7%

C. Suggested Actions:

2. Based on the above analysis, it appears that financing of EPI should not pose a serious problem for HMG. It is recommended that the HMG take the following actions to ensure the long-term secure financing of EPI:

- (i) Make an explicit commitment to steadily increase its expenditures on the operational costs of routine EPI.
- (ii) Avail of the funds being provided by GAVI/GFCV both for introduction of new vaccines and strengthening of immunization services.
- (iii) Request existing partner agencies for greater support of EPI and working with new partners.

- (iv) Make an explicit commitment to meet the long-term costs of introducing Hepatitis B vaccine after GAVI/GFCV support ends in 2007.