

Islamic Republic of Pakistan

National Institutes of Health

Federal EPI Cell

**Comprehensive Multi-Year
National Immunization Strategic Plan
2005-2010**

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Glossary

AD	auto-disable
AEFI	Adverse events following immunization
AFP	Acute flaccid paralysis
CBAW	Women of child-bearing age
CIDA	Canadian International Development Agency
DQA	Data quality audit
DSO	District Surveillance Officer
DTP	Diphtheria, Tetanus, Pertussis vaccine
EDO	Executive District Officer
EMR	Eastern Mediterranean Region
EPI	Expanded Programme on Immunization
FSP	Financial sustainability plan
GAVI	Global Alliance for Vaccines and Immunization
GIVS	Global Immunization Vision and Strategy
GOP	Government of Pakistan
HepB	Hepatitis B vaccine
Hib	Haemophilus influenzae type B
HIV	Human Immunodeficiency Virus
HMIS	Health management information system
ICC	Interagency coordination committee
IMCI	Integrated management of childhood illnesses
ISS	Injection safety support
LHW	Lady health workers
MCV	Measles containing vaccine
MNTE	Maternal and neonatal tetanus elimination
MO	Medical Officer
MYP	Multi-year plan
NGO	Non-governmental organization
NID	National immunization day
NIH	National Institute of Health
NRA	National regulatory authority
NVS	Support for introduction of new vaccines
NWFP	North-West Frontier Province
OPV	Oral polio vaccine
PC-1	Planning Commission Form 1
PEI	Polio eradication initiative
RED	Reach every district
SIA	Supplementary immunization activity
SNID	Sub-national immunization day
TB	Tuberculosis
TT	Tetanus toxoid
UC	Union council
UNICEF	United Nations Childrens Funds
UNPD	United Nations Population Division
VitA	Vitamin A
VPD	Vaccine-preventable diseases
WHO	World Health Organization

Executive Summary

If Pakistan's Expanded Programme on Immunization (EPI) is to reach the goals of the Global Immunization Vision and Strategy (GIVS) in terms of coverage, access to new vaccines, mortality and disease reduction, the provision of routine immunization services in the country needs to be further strengthened.

The Pakistan Comprehensive Multiyear National Immunization Strategic Plan 2005-2010 is a major update of the previous plan for 2000-2004 and aims at providing essential, safe and effective immunization to all eligible children and women near to where they live, in a manner that is dependable and sustainable. Within the plan, eleven specific objectives have been established. These include targets for progressively increasing routine immunization coverage, the control of individual diseases including the final eradication of polio, the elimination of measles (through SIAs and the nationwide provision of a second dose of measles at 15 months of age), the elimination of neonatal tetanus as a public health problem, and a further increase in Hepatitis B vaccine coverage. The plan foresees that the immunization programme will develop its capacity to provide vitamin A supplementation to young children and to introduce new cost-effective vaccines on the basis of sound scientific evidence. The EPI will work towards strengthening advocacy and communication related to immunization, providing good data for decision-making on coverage and VPD incidence, providing safe injections and safely managing sharps waste and further improving vaccine supplies, quality and logistics management.

Objectives and milestones of the Multi-Year Plan:

- Objective 1 90% routine immunization coverage of all EPI antigens with at least 80% coverage in every district by 2010.
- Objective 2 Polio transmission interrupted by the end of 2006.
- Objective 3 90% reduction in measles morbidity and mortality by 2010 compared to the 2000 level
- Objective 4 Neonatal tetanus eliminated in every district by 2010.
- Objective 5 HepB3 coverage equal to DTP3 coverage by the end of 2006.
- Objective 6 New and appropriate vaccines introduced by the end of 2010.
- Objective 7 100% safe immunization injections by the end of 2008; Appropriate sharps waste management in every district by 2010.
- Objective 8 Vitamin A supplementation fully integrated into routine EPI schedule by 2006.
- Objective 9 EPI communication plans implemented in every district with all caretakers of infants valuing the importance of routine immunization by 2010.
- Objective 10 Good quality surveillance data on EPI coverage and VPD incidence by 2010.
- Objective 11 Appropriate vaccine supply, quality and logistics management at all levels by the end of 2006.

Planning for the further development of EPI in Pakistan falls into four key strategic areas: Service delivery and programme management, advocacy and communications, surveillance and data for decision-making, and vaccine supply, quality and logistics. These areas and their constituent recommended strategies can be summarized as follows, detailed activities with timelines are presented in tables 4A to 4D of the plan:

Strategic Area 1: Service Delivery and Programme Management
(considering objectives 1 through 8)

- Develop and implement EPI micro-plans in every district.
- Increase the number of static EPI centres.
- Reduce DTP1-DTP3 drop-out rate and trace defaulters.
- Improve human resources management.
- Train EPI staff at all levels.
- Strengthen management and supervision at all levels.
- Provide sufficient transport facilities for field and supervisory activities.
- Establish sustainable public-private partnerships.
- Improve financial management.
- Improve operations management and evaluation.
- Improve routine infant polio immunization coverage.
- Conduct polio SIAs.
- Maintain good AFP surveillance.
- Improve routine infant measles immunization coverage.
- Offer second measles vaccine opportunity.
- Run measles SIAs.
- Improve case management of children with acute measles disease.
- Improve measles outbreak response.
- Establish measles surveillance.
- Improve routine TT immunization coverage.
- Run TT SIAs in high-risk districts.
- Extend MNTE programme to cover all districts.
- Involve Lady Health Workers (LHWs) in TT immunization.
- Offer Hepatitis B immunization together with DTP.
- Monitor and supervise Hepatitis B immunization.
- Increase social awareness of Hepatitis B disease.
- Assess feasibility and cost-effectiveness of new vaccines.
- Undertake demonstration study for the benefit of Hib vaccine by introducing Hib vaccine in fixed combination with DTP-HepB vaccine in selected districts.
- Introduce Hib Vaccine in fixed combination with DTP-Hep B in EPI schedule , if need felt on the basis of available evidence.
- Strengthen domestic vaccine research and development.
- Endorse the National Injection Safety Policy.
- Implement injection safety pilot project.
- Provide sufficient safe disposable injection equipment.
- Improve safe injection practices.
- Adequately dispose of sharps waste.
- Establish Vitamin A supplementation in routine EPI.

Strategic Area 2: Advocacy and Communications
(considering objectives 2, 4, 7, 8)

- Continue PEI advocacy with key policy and decision makers.

- Communicate with parents to get every child under 5 years vaccinated against polio every time.
- Build capacity in PEI advocacy and communications.
- Develop innovative approaches to reach the un-reached.
- Improve MNTE advocacy and communication.
- Strengthen communication activities on injection safety in the EPI programme.
- Establish and implement EPI communication plans at all levels.
- Use PEI advocacy and communications experience for EPI strengthening.
- Develop EPI special branding and programming on mass media.
- Establish EPI card initiative through, NGOs , boy scouts and girl guides etc.
- Improve community ownership of the EPI.
- Train relevant staff on EPI advocacy and communications.

Strategic Area 3: Surveillance and Data for Decision-Making
(considering objectives 2, 3, 4, 6, 7, 10)

- Maintain AFP surveillance.
- Strengthen surveillance for measles and other VPDs, building on the AFP surveillance.
- Strengthen MNT surveillance in high-risk districts.
- Estimate burden-of-disease of potential new VPDs.
- Improve injection safety monitoring.
- Strengthen collection, analysis, interpretation, use and exchange of routine EPI data.
- Re-vitalize current routine VPD reporting system.
- Strengthen AEFI surveillance and response.
- Link EPI surveillance with national health information system.
- Involve private sector in VPD surveillance.
- Strengthen human resources for surveillance.
- Strengthen laboratory-based surveillance.
- Perform regular comprehensive EPI coverage surveys in all districts.
- Perform adequate operations research.

Strategic Area 4: Vaccine Supply, Quality and Logistics
(considering objectives 2, 7, 11)

- Supply adequate quantities of potent oral polio vaccines for all NID/SNIDs.
- Supply AD injection equipment and injection safety supplies bundled with all vaccines.
- Improve sharps waste disposal system.
- Improve self-reliance in quality assurance and regulatory oversight related to vaccines and immunizations.
- Improve vaccine management and cold chain system.
- Strengthen the vaccine forecasting and supply system
- Reduce vaccine wastage.
- Improve transportation of vaccines and supplies in every district.

The issues involved in implementing the comprehensive national immunization strategic plan are detailed in the next sections of this document.

EPI Background and Situation Analysis

The new Global Immunization Vision and Strategy (GIVS) strives for a world in 2015 where immunization is highly valued; every child, adolescent and adult will have equal access to immunization as provided for in the national schedule; more people are protected against more diseases; immunization and related interventions are sustained under conditions of diverse social values, changing demographics and economies and evolving diseases; vaccines exert the maximum impact on global health and security; and solidarity among the global community guarantees equitable access to needed vaccines for all people.

The GIVS provides broad strategic directions for national policy and programme development; commits all to unprecedented attention to reaching the “hard-to-reach”; promotes data-driven problem solving to improve programme effectiveness; takes immunization beyond infants into other age groups and beyond the current programmatic use of other settings, while maintaining the priority of early childhood vaccination; anticipates the introduction and wide-spread use of new and underused vaccines and technologies, all of which will require long-term financial planning; encourages a package of interventions to reduce child mortality; and contributes to global preparedness against the threat of emerging pandemics.

By 2015 all contributors to immunization and product development should aim at the following GIVS overarching goals:

Coverage: Every person eligible for immunization included in national programmes will be offered immunization with quality vaccines according to the established national schedule.

Access to new vaccines: Immunization with newly introduced vaccines will be offered to the entire population within five years of the introduction of these new vaccines in national programmes.

Mortality and disease reduction: Global childhood mortality and morbidity due to vaccine preventable diseases will be reduced by at least two-thirds compared to 2000 levels.

Sustainability and systems strengthening: All national immunization plans will be formulated and implemented in ways that link them explicitly with sector-wide human, financial and logistics plans and ensure that activities will not have to be scaled back due to shortage of human resources, funding or supplies.

The Pakistan Comprehensive Multiyear National Immunization Strategic Plan has been established as a result of discussions and deliberations of senior federal and provincial EPI staff during a workshop held in Islamabad in February 2005. Outline and structure follow the GIVS 2006-2015. The plan is based on the Expanded Programme on Immunization (EPI) Multi-Year Plan (MYP) 2000/2001 - 2004/2005. Some of the observations and conclusions of the former MYP, which are still valid today, were carried over into the new plan. The plan goes beyond the established PC-1, however, and includes more strategies and activities such as preparations for the introduction of new vaccines and more detailed advocacy and communications activities.. The MYP is to be regarded as “work in progress” which needs to be revised on an annual basis in light of new developments in the field and/or possible changes in financial contributions from both the Government of Pakistan (GOP) and international donors. A detailed costing and financing analysis using the cMYP tool has been undertaken. The Analysis of costing and financing of this cMYP is placed at Annex-1

The EPI in Pakistan

For over 15 years, the EPI has delivered six vaccines only. Until the development of strategies aimed at polio eradication, maternal and neonatal tetanus (MNT) and measles elimination and incorporating supplementation with Vitamin A, technical innovation of the EPI had been low. More historical data on the EPI in Pakistan is provided in the former Multi-Year Strategic EPI plan 2000-2004. Innovation and progress towards a sustained and healthy EPI has been brought about through the introduction of Hepatitis B vaccine in 2001, the successful introduction and use of auto-disable (AD) syringes and safety boxes, and the recent establishment of a meningitis surveillance network set out to assess the relative contribution of Haemophilus influenzae B (Hib), Streptococcus pneumoniae and Neisseria meningitidis as causal agents of this disease entity.

The following tables provide an overview of the present situation of routine EPI and accelerated disease control initiatives in Pakistan, based on 2002-2004 data.

Table 1: Situational analysis by accelerated disease control initiatives

Component	Annual Performance: Basic indicator (Data sources see reference section)		
	Routine Coverage	Surveillance	
Polio	OPV3 coverage	Non polio AFP rate in children under 15 yrs. of age	No. of rounds of NID/SNID (Coverage range)
2002	69-71%	2.5 / 100,000	4 NIDs + 4 SNIDs (108%)
2003	69-71%	3.1 / 100,000	5 NIDs + 3 SNIDs (105%)
2004	68%	3.4 / 100,000	7 NIDs + 1 SNIDs (96%)
MNT	TT2+ coverage	Cases reported to federal level	SIAs
2002	48-56%	935 cases reported (499 NWFP, 237 Sindh, 186 Punjab) concentrated in 28 districts	Yes (selected UCs in 54 districts in all provinces)
2003	46-57%	812 cases reported (448 NWFP, 171 Punjab, 169 Sindh) concentrated in 18 districts	Yes (selected UCs in 57 districts in all provinces)
2004	43%	529 cases reported	Yes (selected UCs in 8 districts in Baluchistan and Punjab)
Measles	Measles coverage	No. of outbreaks reported	NID/SNID
2002	63-68% range: 43-85%	5 (447 cases)	No
2003	61-68% range: 34-87%	4 (326 cases.)	No
2004	67%	8 (1096 cases)	No

Table 2: Situational analysis of routine EPI by system components

System components	Indicators	National (Data sources see reference section)		
		2002	2003	2004
Routine Coverage	National DTP3 coverage	68%-69%	67%-71%	69%
	Range of DTP3 coverage across provinces	35%-87%	40%-89%	50%-89%
	% of districts with > 80% coverage	19%	16%-21%	20%
	National DPT1-DPT3 drop out rate Range across provinces	16%	11%-16%	13% (4-20%)
	Percentage of districts with drop out rate DTP1-DTP3>10%	70%	66%	52%
New vaccines	National HepB3 coverage	18%	63%	65%
Routine Surveillance	% of surveillance reports received at national level from districts compared to number of reports expected	98%	87%	83%
	Surveillance data quality sufficient	No	No	No
Cold chain/Logistics	Percentage of health facilities which are functioning EPI centres	~ 30%	~ 30%	~ 30%
Immunization safety	Percentage of districts supplied with adequate number of AD syringes for all routine immunizations	80%	100%	100%
	Percentage of districts supplied with safety boxes	80%	100%	100%
	Percentage of districts with proper sharps waste management systems	6%	Very low	Very low
Vaccine supply	Stock-out at national level during last year?	No	No	Yes, DTP for

				1-2 months
Communication	Availability of a plan	Yes (PEI)	Yes (PEI)	Yes (all EPI) 2004/2005
	Percentage of all districts which have developed EPI communication plans (14/35 priority districts)			12% (14/121)
	Percentage of caretakers of children < 1yr understanding the importance of routine immunization.	42-48%	~ 50%	~ 50%
Financial issues	Percentage of total routine vaccine spending financed using Government funds (EPI programme costs excluding HepB vaccine and AD syringes)		59%	~ 60%
	Release and utilisation of GAVI funds at district and provincial levels		slow	Slow
Management planning	Regular collection of district indicators at national level.	Yes	Yes	Yes
	Percentage of all districts with micro-plans			27% (32/121)
NRA	Number of functions conducted	0	0	1
Research	Vaccine related studies conducted: Coverage survey at provincial level Injection safety survey Hib prevalence study Cold chain/vaccine management assessment Study on barriers in immunization services Coverage survey in selected districts in Sindh	2002 2002	2003	2004 2004 2004
National ICC	Number of meetings held last year	4	4	3
Human Resources	Percentage of UCs with at least 1 vaccinator			<< 100%
	Number of vaccinators / 10.000 population			0.53
	% of vaccinators time available for routine EPI			67%
Transport / Mobility	Percentage of districts with a sufficient number of supervisory/EPI field activity vehicles/motorbikes/bicycles in working condition	Low	Low	Low

Basic Immunization Schedules

a. The routine immunization schedule for infants

Age	Vaccines		
At Birth	BCG	OPV0	
6 weeks	DPT1	OPV1	Hep B 1
10 weeks	DPT2	OPV2	Hep B 2
14 weeks	DPT3	OPV3	Hep B 3
9 months	Measles		

b. The Immunization schedule for Pregnant and women of child bearing age (15-45 years)

Dose	When to give	Expected duration of protection
TT 1	at first contact or as early as possible during pregnancy	None
TT 2	at least 4 weeks after TT 1	1-3 years
TT 3	at least 6 months after TT 2	5 years
TT 4	at least 1 year after TT 3	10 years
TT 5	at least 1 year after TT 4	All child bearing years

Immunization Coverage and EPI Performance

The reported DTP3 immunization coverage in 2004 was 69%, slightly lower than the 71% routine coverage reported for 2003 and clearly below the 77% coverage target set for 2004. The quality of reported EPI coverage estimates was approved by a 2003 data quality audit (DQA) with a very high

verification factor (99%). Overall, however, reported DTP3 coverage has remained virtually unchanged over the past years. The last survey-based results from 2001 show 63% DTP3 coverage.

The present number of surviving infants approved by the Global Alliance for Vaccines and Immunization (GAVI) is based on an extrapolation of the 1998 census data. This number does not correspond well with the United Nations Populations Division (UNPD) database, with the latter containing around 500,000 fewer surviving infants. In order to resolve this issue the more recent population growth rate, Birth rate and IMR are used in the cMYP tool. The total population and target population thus derived will be considered for future EPI projections and activities¹.

There is a wide variation in EPI coverage estimates between provinces and between districts. Although some of this variation may reflect diverse geographical and demographic conditions, the most critical factors are most probably the variation between areas in senior staff commitment, motivation and supervision of immunization. Management at the provincial and district levels is not yet sufficiently committed – or does not possess sufficient capacity - to ensure effective planning, management and supervision or to hold officers to be accountable for immunization performance. Supportive supervision is weak at every level, there is a shortage of supervisory staff at district and sub-district level, and an inadequate number and quality of supervisory visits. In addition, although a template in the form of multi-year plans against which to measure expected achievements has been available, this has not been done. The interference of routine EPI with ongoing intensive polio eradication initiative (PEI) activities and inappropriate and untimely distribution of resources may have further aggravated the situation.

Challenges in the provision of immunization services lie mainly at implementation level. There is still limited access to EPI services. Static EPI centres presently reach about 25% of children and vaccinators do not perform outreach services as planned. Since outreach activities are honoured by a per-diem, static services are often neglected and EPI outreach is done in the near vicinity of static centres. Areas further away from fixed centres, on the other hand, may not see a vaccinator for a long time. In addition, the provision of an extensive network of outreach sessions has resulted in an approach where many parents, especially in more remote communities wait for immunization to be brought to them, rather than actively seeking it. Since the outreach network is difficult to sustain it is clearly desirable to focus EPI predominantly onto fixed centres. A target was set in the last MYP to increase the number of static centres by 20% each year. While some new centres have been established in the past 5 years it is evident that this target has not been reached.

Survey results have indicated earlier that completion of the full course of scheduled immunization was unsatisfactory. There may have been some improvement over the past years: Present national DTP1-DTP3 drop-out rates are 13% (after 16% in 2001). The proportion of districts reporting a drop-out rate of more than 10% has decreased from 70% in 2001 to 52% in 2004. Reasons for high drop-out rates include the inconvenience of travelling to fixed immunization centres, failure to trace and motivate defaulters and insufficient client demand, mostly reflecting a lack of knowledge but also, to some degree, a lack of motivation.

EPI Administration and Management

A National EPI Policy with strategic guidelines has been prepared. At the federal level, EPI coordination mechanisms are well established: The Inter-Agency Coordination Committee (ICC) meets 3 to 4 times a year and the National EPI Advisory Group at least twice per year. A National Task Force for Strengthening of Routine Immunization was formed in October 2004. Thirty-five priority districts have been selected for the RED (“reach every district”) approach in 2003. In 32 of 35 districts, micro-planning workshops have been successfully conducted and micro-plans drafted and submitted. At the district level, however, there is still some apparent lack of interaction of the EPI team with health officials and with the elected district representatives.

¹ Agreed in the joint NICC and NHSCC meeting held on 21.10.2006 at Islamabad

At present, about 71% of routine EPI funds are financed by the GOP. The present PC-1 budget, which is for about 191.23 million makes provision for decreasing future GAVI and donor support.

Repeated debates are held over the required number of staff to increase EPI performance. The present policy is to allocate at least one vaccinator per UC. Around 6,000 to 8,000 vaccinators are presently employed in the country, some 950 more will be employed in Sindh and Punjab in 2005. These vaccinators are, however, not distributed across districts in a balanced way, and their expertise and training status varies widely. Assuming up to 5.5 million surviving infants in 2004, one vaccinator would be responsible for the routine immunization of 690 to 920 infants per year, i.e. for around four to six infants per day, based on 160 working days per year for routine EPI services. This leaves room for an additional workload of 10 days each for polio NIDs (i.e. a total of some 80 days per year).

Several thousand Lady Health Workers (LHWs) have been added to the health-related workforce in the course of the MNTE programme. LHWs will receive additional training in all EPI immunizations and can thereafter be utilized as vaccinators within their catchment area (normally 200 households with up to 1000 population) by the Executive District Officer (EDO) Health according to need. Their other roles remain as before, i.e. birth registration, social mobilisation, defaulter tracing and TT vaccination in the context of the Maternal and Neonatal Tetanus Elimination (MNTE) programme.

Many constraints contribute to inadequate staff performance. There is a very rapid turnover of staff in supervisory positions, so that officers with little EPI background become responsible for its performance. Senior supervisors, having planned certain activities are frequently transferred before their completion of the task. Moreover, senior staff based at the district level have multiple responsibilities, with immunization occupying a relatively small part of their time and attention. For many districts, the management ability of responsible staff is limited. At the vaccinator level, multiple problems have contributed to variable performance and it is to their credit that the majority performs so well. There are inappropriate channels of authority, e.g. vaccinators have previously reported directly to districts, not to the medical officer responsible for provision of health services in the union council (UC) where they work. This has meant that local supervisors have not been accountable for immunization performance. Vaccinators are appointed at a relatively low grade and have little opportunity for advancement in their careers. In conducting outreach and mobile sessions, vaccinators possess inadequate personal transport, depending on DHO /DDHO for vehicles, which have to be used for many other duties.

In many districts supervision from senior district staff has been limited and too often has not included major components of support and training. Supervision checklists have not been updated for many years and are mostly not used. Shortages of transport and failure to release budgeted funds to districts have greatly limited supervision activities. There is a lack of continuity and follow up in supervision. In general, vaccinators and their supervisors are not being held accountable for poor performance and, with little analysis of data been carried out at the district level, poor areas of work are often undetected, with the problems remaining uncorrected.

In the past years, training has not received the essential attention it merits. Although UNICEF supported some refresher training and a few were also organized utilizing GAVI support, immunization training of vaccinators, primary care staff and supervisors has been limited in the past 5 years. There is insufficient awareness of the needs and of the impact of existing training. Each province has its own training tools and training plan, with little national coordination. Some materials are out of date in view of programme development and will become more so after new policies, such as the introduction of new vaccines, are implemented. In spite of this, some training sessions have been conducted at provincial level and cold chain technician, data management technician and vaccinator competence is generally high. This is less true of supervisory staff.

Surveillance and Data for Decision-Making

The goal of EPI surveillance activities is a well-functioning and sustained EPI and vaccine-preventable diseases (VPD) reporting system, used for taking managerial decisions to improve EPI services. Monthly reporting of immunization provision within the EPI reporting system works well, as demonstrated by the data quality audit of 2003 (for 2002 DTP3 data) which resulted in a 99% verification factor. The EPI reporting system collects data from basic health units, rural health centres, Tehsil (sub-district) hospitals and some district and teaching hospitals. Aggregate VPD-specific data are also reported by age group and immunisation status for acute flaccid paralysis (AFP), measles, diphtheria, pertussis, neonatal tetanus and childhood tuberculosis. Data or programme performance indicators analysis is, however, limited and there is virtually no feedback to lower levels. There is no monitoring of drop-out rates, vaccine wastage, or scheduled outreach activities. No proper training on VPD surveillance has been carried out in the last 10 years.

The health management information system (HMIS) still appears to provide less representative data on EPI-related diseases and indicators than the routine EPI reporting system. Coordination between the two systems is still limited. An additional VPD surveillance system has been initiated by the polio programme: AFP surveillance staff has started to include apparent cases of measles and MNT derived from patient register review into their reporting system. Cumulative data on these diseases are being reported to the National AFP surveillance cell and will be used for a quality check of the regular EPI VPD reporting system.

Social Mobilisation, Advocacy and Communications

In addition to the programmatic issues, factors that are further contributing to the low immunization coverage are low parental awareness of the importance of immunization, little involvement of community and political leadership, and low motivation and poor interpersonal skills of vaccination staff. Moreover, both beneficiaries and service providers are exhausted and fatigued after years of polio campaigns. Intensive communication on polio has also resulted in misperceptions about routine immunization.

A national EPI communication plan for 2004-05 has been established. Innovative communication planning to address the low awareness, misperceptions and mobilisation of communities was initiated. A sustained communication presence is to be ensured at all levels to achieve the programme objectives.

Vaccine Supply, Quality and Logistics

Vaccine management is not of the required level and is mostly undertaken on an ad-hoc basis. In 2004, the EPI experienced DTP vaccine stock-outs, albeit for short duration at all levels. Vaccine quality is presently guaranteed through procurement via UNICEF. The National Regulatory Agency (NRA) has been strengthened in recent years, but is not yet performing all of its necessary quality assurance functions.

The cold chain network is extensive, mostly works well and, in spite of difficulties, there is little evidence that vaccine has been improperly stored and transported. However, the cold chain units are aging and many have reached the limits of their expected lives. Though cold chain equipment is being provided under GAVI ISS funds since 2002-2003, this does not fully cater to the demand. The system of repair and maintenance of cold chain is ad-hoc. Extension of the fixed centre network will need additional cold chain capacity. Transport logistics will also need renewal, as appropriate transport for EPI field supervision activities is still lacking in parts of the country. Supervision of district and health posts in cold chain management is still unsatisfactory and there are no guidelines or written operational procedures except for the province of Punjab.

Progress has been made regarding safety of injections, albeit starting from disturbing levels. In 2002, only 50% of immunization injections had been administered safely and 94% of sharps waste disposal

had been considered unsafe. Less than half of EPI units had a one-week stock of AD syringes and only 5% of health facilities had a sufficient quantity of safety boxes. By 2005, all districts are provided with AD syringes and safety boxes, and a recent spot-check did not find any evidence for re-use of syringes and needles.

Accelerated Disease Control Initiatives

The three accelerated disease control initiatives presently run in the country are polio eradication, and measles and MNT elimination. While the PEI hopes to be able to interrupt wild polio virus transmission in Pakistan in 2006, the MNTE programme has been ongoing with variable success since 2001, and the measles elimination campaign is planned for late 2006.

PEI: Major progress has been made in polio eradication in a number of activities. These include the continuous conduct of NIDs, based on house-to-house OPV administration, strengthening of AFP surveillance, use and coordination with the laboratory and supplementation of existing staff with additional national and international experts. As a result of this progress, the incidence of polio is at a historic low, although the target of interruption of wild virus transmission by the year 2000 has not been achieved. It appears likely, however, that this will be accomplished in 2006.

Measles: Model calculations based on available sparse data estimate that approximately 2.1 million children are infected with measles each year in Pakistan resulting in 22,000 to 66,000 deaths and an attributable mortality of measles for all deaths among children under 5 years of age of 2% to 11%. Epidemiological data suggest intense transmission among infants, however, the burden of disease is not widely recognised.

MNTE: Neonatal tetanus is a major cause of preventable mortality in Pakistan. It is estimated that more than 50% of districts have a NT rate of >1/1000 live births and that NT remains endemic with an estimated 25,000 to 28,000 cases annually, due to unclean deliveries. Over 90% of deliveries are conducted at home and only 42% of women of child-bearing age in 2004 are reported to have received two or more doses of TT, a proportion lower than 5 years ago. Campaigns to administer TT to women of childbearing age have been completed in selected high-risk areas. Progress towards increasing rates of hygienic childbirth is uncertain. Surveillance for MNT remains insensitive and is still inadequate to reliably identify high-risk areas, with only 5% to 10% of NT cases reported in the routine EPI surveillance system. Strategies of the MNTE programme are strengthening routine TT immunization, SIAs for TT in high risk areas, improved surveillance of NT based on mortality statistics integrated with AFP surveillance, and the promotion of safe/clean delivery practices. MNTE focus districts were selected based on a prior risk assessment, and the highest risk union councils in 57 high-risk districts were included for SIAs in Punjab, Balochistan and AJK. Eight districts were added in the second phase starting in 2004 and around 45% of women of child-bearing age are targeted in these districts. SIAs had variable success, with coverage ranging from 20% to 90%. The MNTE relies heavily on the work of LHWs and approximately 30,000 of them were trained for 6 days in EPI theory and practical TT vaccine injections. Their role in MNTE is birth registration, registration of pregnant women, defaulter tracing, and TT vaccination in their catchment area.

Other EPI Activities

Vitamin A supplementation: Sub-clinical Vitamin A deficiency is prevalent in many parts of Pakistan. Until now Vitamin A supplementation has been provided during Polio NIDs (twice per year). It is foreseen to integrate Vitamin A supplementation into the routine EPI schedule with two doses administered to children aged 6 to 59 months twice per year. In 35 priority districts this activity will start in September 2005.

Hepatitis B vaccine has been introduced in 2001 with good success and swiftly increasing coverage, approaching DTP3 coverage by 4 percentage points in 2004. It is foreseen that GAVI phase II support for pentavalent DTP-HepB-Hib vaccine for the years 2008-2015 will be provided on a cost-

sharing basis, covering a full 5 years which could be “stretched” through increasing GOP funding until 2015.

Hib meningitis incidence studies in 2003 estimated some 16 cases per 100,000 children below 5 years of age, with some probable underestimation. A meningitis surveillance network was established in February 2005. Surveillance for rotavirus-related diarrhoea will start in 2006. Such surveillance will help to generate data to be used for cost-effectiveness analyses prior to the anticipated introduction of new vaccines in the near future. EPI will also explore the possibility of undertaking “Demonstration study for Hib burden.”

Pakistan has rapidly become import-dependent in the area of vaccines while existing national public sector vaccine research and production facilities are insufficient for current and future needs for EPI vaccines. There is, however, an enormous potential for the development and use of vaccine technology and research to promote biotechnology and local vaccine production.

Development of the EPI in Pakistan

Since 1998, significant progress has been made in strengthening the EPI. With sustained GAVI and further donor support a re-vitalization of the programme has taken place. Much of this progress reflects improved management at the federal level and in some provinces. Senior federal and provincial EPI staff has accepted the need for renewed medium-term planning and has been operational in developing the present multi year strategic EPI plan.

Good progress has been made towards polio eradication. The previous stagnation of EPI policies has been changed with the highly successful addition of Hepatitis B vaccine to the routine immunization schedule, the introduction and use of AD syringes and TT campaigns in high-risk areas. Measles SIAs will add further momentum to the programme. Steps have been taken to improve district level management with the successful preparation of micro-plans in priority districts. The well-established active AFP surveillance shows potential to extend to other VPDs and will further improve the quality of the routine EPI reporting and surveillance system.

The EPI has gained momentum in the new millennium. There is continuous high level commitment at the federal and provincial levels, but also among national and international partners. It is clear that there is a major opportunity to make the EPI more effective and to allow the ambitious disease eradication and elimination targets to be achieved. This optimism should not minimize the major problems facing the programme and these must be tackled in a positive manner, if this opportunity is to be grasped and not lost. The present update of the Multiyear Strategic EPI plan is an essential step towards a logical, well managed future for EPI in Pakistan.

Underlying Principles of the Multi-Year Immunization Strategic Plan

Planning for the future of EPI in Pakistan has been assisted by recommendations from meetings of the ICC. National priorities, strategies and objectives were reviewed and revised during a joint planning workshop in February 2005 preceded by a joint situational analysis.

A number of principles have been identified which form the basis for specific planning and target setting:

General principles

- Immunization services will be planned to be sustainable.
- Parallel with commitment to polio eradication and MNT and measles elimination, the focus will be placed on ensuring system development and reliability in providing routine immunization.

Devolution of responsibility and strengthened planning

- Planning and executive authority will be further devolved to the provinces.

- The federal EPI cell will fulfil a role for technical coordination, policy development, and procurement.
- The key management level is the district, with the EDO Health being fully responsible and accountable for planning, monitoring and progress in the district.
- The operational level is the union council, the medical officer of the basic health unit being responsible and accountable for planning and guaranteeing immunization services for all communities within the UC.
- The existing network of fixed units offering immunization services is to be extended to ensure at least one such unit in every UC.
- At all levels, written plans of action need to exist and be regularly updated.
- Special emphasis for development of routine services is to be directed at high-risk populations.

Improving the quality of EPI services

- Major emphasis is to be placed on ensuring the quality of all aspects of immunization, with special note on the safety of injection practices and vaccine storage.
- Supervision and monitoring is to be strengthened, with written documentation on findings to allow follow-up.
- Systems to allow continuous monitoring of performance based on supervision, reporting and data analysis are to be further improved.
- A comprehensive training plan needs to be developed with all immunization staff to receive technical and management training, as appropriate, with refresher courses at least every three years.
- Lady Health Workers will have a key role in motivation and defaulter follow-up, and routine immunization services, where needed.
- Active surveillance through patient register review is to be extended to include MNT and measles.
- It will be explored how the HMIS can develop as an effective operational tool for EPI disease control.
- Surveillance and investigation of adverse events after immunization will be further improved.

Extension of the scope of the present EPI

- Vitamin A will be administered during polio SIAs and routine EPI immunization sessions twice per year.
- New vaccines (e.g. Hib, rotavirus) will be added to the EPI schedule, as appropriate, with decisions taken based on disease burden and cost-effectiveness studies.
- Advocacy and communications activities will create client demand and ensure community awareness of available effective health interventions.
- The potential for involving the private sector in immunization will be further investigated and developed.

Based on these principles and in line with the GIVS and global and regional EPI goals the following eleven national objectives for Pakistan were established in four major strategic areas:

National Objectives and Milestones 2005-2010

I. Service Delivery and Programme Management

- | | |
|-------------|--|
| Objective 1 | 90% routine immunization coverage of all EPI antigens with at least 80% coverage in every district by 2010 |
| Objective 2 | Polio transmission interrupted by the end of 2006 |
| Objective 3 | 90% reduction in measles morbidity and mortality by 2010 compared to the 2000 level |
| Objective 4 | Neonatal tetanus eliminated in every district by 2010 |
| Objective 5 | HepB3 coverage equal to DTP3 coverage by the end of 2006 |
| Objective 6 | New and appropriate vaccines introduced by the end of 2010 |

- Objective 7 100% safe immunization injections by the end of 2008; Appropriate sharps waste management in every district by 2010
- Objective 8 Vitamin A supplementation fully integrated into routine EPI schedule by 2006

II. Advocacy and Communications

- Objective 9 EPI communication plans implemented in every district with all caretakers of infants valuing the importance of routine immunization by 2010

III: Surveillance and Data for Decision-Making

- Objective 10 Good quality surveillance data on EPI coverage and VPD incidence by 2010

IV. Vaccine Supply, Quality and Logistics

- Objective 11 Appropriate vaccine supply, quality and logistics management at all levels by the end of 2006

An overview of the global and regional goals of the WHO/EMR together with the national objectives and appropriate milestones is provided in the following table.

Table 3 : Global goals, regional goals, national objectives and milestones

Global goals	EMR regional goals	National objectives	Milestones
Coverage¹ By 2010 or sooner all countries will have routine immunization coverage at 90% nationally with at least 80% coverage in every district.	Coverage By 2010 all EMR countries will have routine immunization coverage at 90% nationally with at least 80% coverage in every district.	Coverage By 2010, 90% routine immunization coverage of all EPI antigens with at least 80% coverage in every district.	2005: 75% routine coverage 2006: 80% routine coverage 2007: 85% routine coverage 2008: 87% routine coverage 2009: 90% routine coverage 2010 : 90% routine coverage
Polio¹ By 2005 the world will be certified polio-free.	Polio By 2005 the EMR will be certified polio-free.	Polio By the end of 2006, wild polio transmission will be interrupted.	2005: 2006: Polio transmission interrupted 2007: 2008: 2009: Polio-free certification
Measles² By 2010, 90% reduction in infant mortality by 2010 compared to 2000.	Measles By the end of 2010, measles will be eliminated in the EMR.	Measles By 2010, 90% reduction in measles morbidity and mortality compared to the 2000 level	2005: 20% morb./mort. reduction 2006: 40% morb./mort. reduction 2007: 60% morb./mort. reduction 2008: 80% morb./mort. reduction 2009: 85% morb./mort. reduction 2010 : 90% morb./mort. reduction
NT¹ By 2007, elimination in every district.	MNT By the end of 2007, elimination in every district.	MNT By 2010, neonatal tetanus eliminated in every district.	2005: 55% TT+ coverage 2006: 65% TT+ coverage 2007: 70% TT+ coverage 2008: 80% TT+ coverage 2009: 85% TT+ coverage 2010: 90% TT+ coverage
HepB³ By 2002, 80% of all countries with adequate delivery systems will have introduced hepatitis B vaccine. By 2007, all countries.	HepB By 2007 all countries of the EMR will have introduced HepB vaccine	HepB By the end of 2006, HepB3 coverage equal to DTP3 coverage.	2005: 70% routine coverage 2006: 80% routine coverage 2007: 85% routine coverage 2008: 87% routine coverage 2009: 90% routine coverage 2010 : 90% routine coverage
New Vaccines By 2005, 50% of the poorest countries with	New Vaccines	New Vaccines By the end of 2010, new and appropriate vaccines	2005: --- 2006: Surveillance for new VPDs established

Global goals	EMR regional goals	National objectives	Milestones
high disease burdens and adequate delivery systems will have introduced Hib vaccine.		introduced.	2007: Cost-effectiveness studies / conducted 2008: Hib vaccine introduced if found feasible 2009: Preparation for the introduction of other new vaccines (e.g. rotavirus)
Injection Safety By the end of 2003, all countries use only auto-disable syringes for immunization.	Injection Safety By the end of 2008, all immunization injections are administered safely.	Injection Safety By the end of 2008, 100% safe immunization injections; By 2010, appropriate sharps waste management in every district.	2005: 60% safe immunization injections 2006: 75% safe immunization injections 2007: 85% safe immunization injections 2008: 100% safe immunization injections 2009: 100% of districts with safe waste management system
Vitamin A	Vitamin A	Vitamin A By 2006, Vit A supplementation fully integrated into routine EPI schedule.	2005: 60% of districts with VitA supplementation through the EPI 2006: 100% of districts
Advocacy & Communications	Advocacy & Communications	Advocacy & Communications By 2010, EPI communication plans implemented in every district with all caretakers of infants understanding the importance of routine immunization.	2005: 30% of districts with EPI communication plan 2006: 50% of districts with EPI communication plan 2007: 70% of districts with EPI communication plan 2008: 85% of districts with EPI communication plan 2009: 95% of districts with EPI communication plan 2010 : 100% of districts with EPI communication plan
Surveillance	Surveillance	Surveillance By 2010, good quality surveillance data on EPI coverage and VPD incidence.	2005: VPD surveillance established 2006: 50% of all VPDs reported 2007: 60% of all VPDs reported 2008: 80% of all VPDs reported 2009: 90% of all VPDs reported 2010: 100% of all VPDs reported
Vaccine Supply, Quality & logistics	Vaccine supply, Quality & logistics	Vaccine supply, Quality & logistics By the end of 2006, appropriate vaccine, supply and logistics management at all levels.	2005: 60% of districts with uninterrupted vaccine supply 2006: 100% of districts with uninterrupted vaccine supply

1. UNGASS goals

2. Goal set by GIVS 2006-2015

3. GAVI goals

4. WHO/UNICEF goals

National Strategies and Key Activities 2005-2010

In order to achieve these objectives, specific strategies and activities have been developed. Based on the current status of the programme with respect to these objectives, a review of the major issues involved is given for each objective, followed by a list of the proposed strategies and key activities with an indication of the time of their implementation over the next five years. Strategies and activities are listed in the sequence of the eleven national objectives given above – not all objectives, however, are relevant in each of the four major strategic areas.

1. Service Delivery and Programme Management

Objective 1 90% routine immunization coverage of all EPI antigens with at least 80% coverage in every district by 2010

The necessary improvement and expansion of the EPI during the coming years includes setting new targets, researching new techniques and exploring the means to be more effective and efficient. The

low routine EPI immunization coverage in Pakistan and the relatively high dropout rate are related to a number of programmatic factors, such as inequitable distribution and often limited capacity of the human resources, especially vaccinators, the inadequate number of static centres, a poor cold chain system, poor logistic support to provide outreach and mobile services, the limited availability of funds at the district level and the weak implementation of supervision. In order to reach all communities, the EPI is over-reliant on outreach and mobile teams. A key issue is to what extent the public, having received more effective information through social mobilisation will be prepared to make short journeys to fixed immunization sites.

Strengthening of management is essential and should be a primary responsibility of the provincial EPI cells but one that has been largely neglected. Multiple partners now participate in EPI activities, including various departments in districts and provinces, international partners such as GAVI as well as NGOs?. Systematic coordination is required to make the most efficient use of available resources provided by each partner, to reduce duplication and to identify possible sources of funding for unmet needs. Federal and provincial inter-agency committees will continue to meet regularly to provide a forum for consultation and guidance on immunization, to lead advocacy efforts and to work for inter-sectoral cooperation in the provinces and districts. At the local level, the link between immunization and other interventions should be strengthened in order to develop mutually beneficial interventions, e.g. with the LHW, the HIV, TB or malaria programmes.

It is critical to develop written plans of action for each district. These micro-plans detail coverage targets, staff and resources requirements, the extension of static immunization sites, and the revision of outreach strategies with reduction of dependence on mobile teams. The plans determine the needs for revitalizing and extending the cold chain, upgrading transport logistics and improving essential training. Micro-plans must realistically reflect the situation and the targets for the district and its UCs and they must be used as a template against which to measure progress. It is essential that the EPI teams, at all levels, receive assistance and infrastructure support from the PEI teams in this planning process.

Transportation for vaccinators and supervisors is aging and many vehicles are off the road, limiting the scope and reliability of outreach and mobile team sessions and severely limiting the capacity to supervise. Regular maintenance and replacement of vehicles in poor condition is needed.

There is also an urgent requirement for the development of a comprehensive training plan. This plan should include training both for new appointees and refresher training every three years for all existing staff. Mid-level managers are faced with multiple tasks, for which training will be essential to improve planning, management and supervisory skills. Training of cold chain staff needs to be continued and updated, as does training of staff responsible for surveillance and data management. A new training manual in Urdu has been elaborated and revised and distributed widely to districts as a first step in the implementation of an extensive training programme.

Poor supervision is a major factor in areas with low immunization coverage. Emphasis will be placed on increased accountability at all levels through improved supervision, with closer monitoring of performance and analysis of relevant data. Overall motivation of health workers is limited at all levels. The implementation of an incentives or rewards system for health care workers will be instrumental in improving widespread low staff morale.

The programme will investigate how the private sector can assist in ensuring immunization. This will be done while ensuring the reliability of vaccine quality, safe injection practices and appropriate reporting. Pursuing this strategy will involve identifying persons, organizations and other sectors willing to cooperate, which will eventually release the vast contribution both for advocacy and vaccine administration from paediatricians, gynaecologists and general practitioners.

Funds allocated for immunization by federal and provincial governments, including those received through GAVI have not been released in a timely manner, slowing down achievement of the goals of the last multi-year plan. Use of these resources should be based on budget requests derived from the

district micro-plans. The provincial Steering Committees are to ensure that funds are used according to the plans. Greater flexibility in the use of government funds is warranted. Since GAVI support for injection safety supplies will end in 2005, the GOP will need to assume budgetary responsibility for their subsequent procurement.

Objective 2 Polio transmission interrupted by the end of 2006

The implementation of the strategies of NIDs and AFP surveillance has been instrumental in reducing the number of confirmed polio cases. Routine OPV3 coverage, estimated at 68% is insufficient to allow interruption of poliovirus transmission without supplementary immunization strategies. Twenty-four NIDs and 8 SNIDs have been completed since 1999, and generally have reached 90% of target children. Sub-national IDs have been conducted on a house-to-house basis and appear to have increased coverage by 5-10%. Eight further NIDs/SNIDs are planned each year for 2005 and 2006. In spite of the success of NIDs, increasing routine immunization coverage is a vital component of the national strategy to eradicate polio and will be crucial in maintaining a polio-free status. AFP surveillance has improved to reach globally acceptable standards and needs to be maintained at that level. Expert case review committees have been convened to arbitrate on final case classification. A Polio Eradication Certification Committee has been formed charged with collecting data required to prove that Pakistan has eradicated the disease. It will be critical to ensure that the highest level commitment is retained to the end of poliovirus transmission.

There is a widespread belief – probably erroneous – that the NIDs have markedly damaged routine immunization. Vaccinators are presently performing polio NID duties during 60 to 80 days/year, leaving them with 160 to 180 days for routine EPI work. It is important to use the opportunity afforded by polio eradication in terms of management, staffing, supervision, surveillance and, especially, community contact to strengthen and promote routine EPI. Anything less will be a major missed opportunity.

Objective 3 90% reduction in measles morbidity and mortality by 2010 compared to the 2000 level

Measles remains highly endemic in Pakistan, causing high morbidity and mortality. Efforts to reduce the scale of the problem of measles must initially focus on improving routine immunization as only some 67% of target children received measles immunization in 2004 and repeated outbreaks were reported from various provinces. Morbidity from measles can also be reduced through increasing Vitamin A intake in young children.

Enhanced measles elimination efforts will be started in 2005. Besides strengthening routine infant immunization coverage, it is planned to conduct one time catch-up and subsequent follow-up campaigns every 3-4 years to eliminate the build-up of susceptible people. SIAs will first be piloted in 6 districts in 2006 (3 in Punjab and 3 in NWFP) with a first national SIA to follow in 2007.

A second opportunity for measles immunization will be offered to children at 15 months of age as of 2006, despite the relatively low MCV-1 coverage. Further expanded control activities, e.g. intensified measles surveillance including proper laboratory support, management and response to outbreaks, and continued immunization campaigns in high-risk areas such as urban slums, as well as improved case management will be implemented over the next 5 years.

Objective 4 Neonatal tetanus eliminated in every district by 2010

Pakistan began its efforts to eliminate neonatal tetanus in early 2001. SIAs to immunize all women of child-bearing age with TT are recommended by WHO as a means of rapidly reducing the incidence of MNT in high-risk areas. Such campaigns have been successfully conducted in some high-risk districts of Pakistan. A plan to conduct further SIAs in Sindh and NWFP was approved with funding provided by the Government of Japan. A new PC-1 is being established so that campaigns can be taken up again in fiscal year 2005/2006.

Besides the MNT campaigns, strengthening of routine TT immunization, improved surveillance of NT integrated with AFP and measles surveillance, and the promotion of safe/clean delivery practices remain the major components of the MNTE strategy.

Objective 5 HepB3 coverage equal to DTP3 coverage by the end of 2006

Hepatitis B infection risk in Pakistan was considered moderate prior to the introduction of Hepatitis B vaccine. Immunization with Hepatitis B antigen has been offered to all infants in the routine EPI schedule since 2001. It is foreseen that quadrivalent DPT-HepB vaccine will be available as of 2006. Introduction of this fixed combination vaccine into the routine EPI schedule will require appropriate training. GAVI funding for this vaccine will be available until 2007 and GOP-funding has been budgeted in the present PC-1 starting in fiscal year 2007/2008

Objective 6 New and appropriate vaccines introduced by the end of 2010

Efforts are ongoing to obtain reliable surveillance data for meningitis and rotavirus diarrhoea in preparation of the introduction of potential future vaccines against these diseases. New vaccine introduction will need to be justified by an evidence base derived from solid epidemiological data to allow for appropriate burden-of-disease assessments and cost-effectiveness analyses.

Local vaccine research and development as well as production strategies are being developed at the federal level focusing on the provision of essential EPI vaccines such as tetanus toxoid, measles, and possibly DPT-HepB combination vaccines.

**Objective 7 100% safe immunization injections by the end of 2008;
Appropriate sharps waste management in every district by 2010**

The Pakistan EPI has successively introduced auto-disable syringes since 2001 with support provided by the GAVI/ISS scheme. A national policy document on injection safety has been drafted and awaits endorsement. A project proposal for injection safety in Pakistan has been established focussing mainly on two components of injection safety: assessing options to safe injection waste disposal and ensuring availability of safe injection equipment.

The government will ensure that sufficient auto-disable syringes will be available once GAVI support ends in 2005. As of the 2005/2006, the relevant PC-1 includes sufficient budgets to purchase the required amount of auto-disable syringes and accompanying safety boxes. There remains the need to further develop in-service and pre-service training for immunization staff, monitoring and enhanced supervision at all levels to ensure safe injection practices.

Objective 8 Vitamin A supplementation fully integrated into routine EPI schedule by 2006

The recommended annual need for Vitamin A supplementation is offered to children aged 6–59 months during polio NIDs/SNIDs. Routine EPI services will start to provide Vitamin A in specifications for 6-months-old children (100,000 IU) and for 12–59 months-old children (200,000 IU) in April and October of each year, as of October 2005. LHWs will be prominently involved in Vitamin A supplementation. Support for this programme is provided by CIDA.

Other Programmatic Issues

The integration of EPI activities with other health interventions, e.g. IMCI, HIV, malaria etc will be advanced in a phased-manner approach. Integrated packages for interventions at all levels are to be developed and tested during the regular updates of the multi-year plan. The expansion of immunizations to persons outside the infant age group presently includes the second dose measles vaccine provided to children in their second year of life. With other antigens potentially included in

the future, further age groups will need to be included in EPI provision. The National EPI Advisory Group, which consists of a broad representation of experts from different areas like epidemiology, paediatrics, EPI, Accademia, etc besides GOP and EPI partners is entrusted by GOP for advice on technical expansion of the EPI services.

Table 4A: Service Delivery & Programme Management: Strategies and Key Activities 2005-10

Objective 1: 90% routine immunization coverage of all EPI antigens with at least 80% coverage in every district by 2010		2005	2006	2007	2008	2009	2010
Develop and implement EPI micro plans in every district.	Implement the RED approach for all EPI antigens in every district (over and above the selected priority districts).						
	Distribute micro-planning guidelines to all districts and train district staff on micro-planning using the PEI experience.						
	Use committees formed at all levels for the PEI to strengthen routine EPI.						
	Conduct planning workshops in all districts and develop appropriate micro-plans.						
	Monitor progress of district micro-planning, review, adapt and follow-up on their implementation.						
	Develop operational plans for each union council						
Increase the number of static EPI centres.	Advocate at provincial and district level for an increase in the number of static EPI centres to at least one such unit per UC.						
	Establish EPI centres in all health facilities and provide these with cold-chain equipment.						
	Increase service provision at existing static centres.						
	Review outreach and mobile team services in view of the increased number of fixed sites.						
Reduce DTP1-DTP3 drop-out rate and trace defaulters.	Ensure that daily and permanent immunization registers are maintained and updated.						
	Ensure additional outreach activities by vaccinators and/or LHWs, based on drop-out data in the registers.						
Improve human resources management.	Review total health service needs in the EPI human resources plan.						
	Develop district recruitment plans with proper budget.						
	Adjust the number of vaccinators to have at least one (ideally two) vaccinator(s) per UC and/or at least one vaccinator per 10,000 population.						
	Establish an incentives or rewards system for EPI staff based on quantifiable output.						
	Include routine EPI coverage strengthening in job descriptions of PEI staff.						
	Clearly define the role and responsibility of LHWs in EPI in every district.						
Train staff at all levels.	Develop annual training plans with suitable modules which include: immunization basics and new vaccine developments; vaccine management and cold chain maintenance; strengthening surveillance for EPI targeted diseases; EPI data management; and injection safety.						
	Redefine, expand and adapt EPI in-service training schedules.						
	Offer mid-level managers training at national and provincial level.						
	Provide training and retraining for EDOs Health on all aspects of EPI including AEFIs.						
	Train and retrain supervisors at all levels in all aspects of EPI and specifically in supervisory techniques.						
	Train all EPI staff on appointment and establish improved on-the-job refresher training every three years.						
	Include efforts to strengthen routine infant immunization services in PEI training schedules.						
	Train and retrain LHWs in social mobilisation and defaulter tracing and administration of EPI vaccines, as deemed appropriate by the EDO Health.						
Strengthen management and supervision at all levels.	Ensure that the federal and provincial Inter-Agency Coordination Committees meet regularly to review progress, assess needs and coordinate support.						
	Make full use of the National Task Force for Strengthening of Routine Immunization for joint planning to raise infant vaccination coverage.						
	Endorse the National EPI policy and strategic guidelines.						
	Schedule inter-provincial meetings 3-4 times a year to review progress, share experience and, as necessary provide briefing for the ICC.						
	Maintain management capacity in the Federal and Provincial EPI cells by filling all approved posts.						

	Involve MOs i/c of health facilities in the planning, implementation and supervision of EPI activities at UC level.								
	Prepare definition of responsibilities and appropriate checklists for each level.								
	Hold MOs i/c directly accountable for the implementation and performance of immunization services in their areas.								
	Develop a supervision checklist to systematise visits to ensure that supervisors visit all districts at least monthly and all EPI units at least quarterly.								
	Involve MOs at the district level in facility-based supportive supervision throughout their area of responsibility.								
Provide sufficient transport facilities for field and supervisory activities.	Assess the current status of transport and the needs for vehicles, motorcycles and bicycles for vaccinators and supervisors during establishment of district micro-plans.								
	Advocate for policy decision at the federal and provincial levels on procurement of vehicles, motorcycles and bicycles for EPI activities.								
	Include appropriate budget into PC-1s and/or request from EPI partners.								
Establish sustainable public-private partnerships.	Set up proper communication with the private sector.								
	Expand immunization delivery to utilize all primary care facilities and hospitals.								
	Integrate the private health sector into training and resource distribution.								
Improve financial management.	Improve financial planning and management capacity, base EPI financial planning on budget requests from district micro-plans.								
	Commit increased and sustained national budget allocations for vaccines and immunization equipment in line with the EPI MYP, the established PC-1 2005-2009 and the revised EPI Financial Sustainability Plan.								
	Through the ICC, liaise with national and international partners to identify potential funding for elements not covered by government sources.								
	Coordinate funding requests with political, planning and finance authorities in order to guarantee the timely and regular release of GAVI and other donor funds to provinces and districts.								
	Assist provincial EPI planning and financial units to ensure adequate allocations and timely release of funds to districts.								
	Strengthen accounting procedures and report to ICC on quarterly basis.								
Improve operations management and evaluation.	Use surveillance and monitoring data as basis for programme decisions to improve access to and quality of immunizations.								
	Perform regular internal and external evaluations of the EPI programme and adapt programme targets, strategies and activities accordingly.								

Objective 2: Polio transmission interrupted by the end of 2006		2005	2006	2007	2008	2009	2010
Improve routine infant immunization coverage.	See Objective 1						
Run polio SIAs.	Run at least 6 polio NIDs in 2005 and 2006 as determined by AFP surveillance.						
	Run SNIDs in 2005 and 2006.						
	Run mop-up campaigns in 2007 to 2009.						
	Include Vitamin A supplementation in Polio NIDs twice per year in April and October for children aged 6-59 months.						
Maintain good AFP surveillance.	See 3. Surveillance and Data for Decision-Making						

Objective 3: 90% reduction in measles morbidity and mortality by 2010 compared to the 2000 level		2005	2006	2007	2008	2009	2010
Improve routine infant immunization coverage.	See Objective 1						
	Include measles immunization appropriately in micro-plans in all districts.						
Offer second measles vaccine opportunity.	Provide second measles vaccine opportunity for children at 15 months of age.						
Run measles SIAs.	Run one-time catch-up campaigns in pilot districts in Sindh and NWFP in 2006 targeting the susceptible age group and ensuring coverage of at least 90%.						
	Expand catch-up campaigns to cover all districts during 2007.						
	Run follow-up campaigns every 3 to 4 years for cohorts born after the						

	initial catch-up campaign.						
Improve case management of children with acute disease.	Provide guidelines for measles case management and train health care workers accordingly.						
Improve outbreak response	Establish one outbreak response team per province.						
	Train health care workers in the management and response to measles outbreaks.						
Establish measles surveillance.	See 3. Surveillance and Data for Decision-Making						

Objective 4: Neonatal tetanus eliminated in every district by 2010		2005	2006	2007	2008	2009	2010
Improve routine TT immunization coverage.	see Objective 1						
	Include routine TT immunization appropriately in micro-plans in all districts.						
	Expand TT immunization through gynaecological and maternal care clinics.						
Involve LHWs in TT immunization.	Train and retrain LHWs in the administration of TT injections - as part of their training in provision of all EPI vaccines.						
Run TT SIAs in high-risk districts.	Conduct TT SIAs for CBAWs in 65 high risk districts in 2005/2006, vaccinating at least 80% of CBAWs in at least 50% of UCs of these districts.						
	Ensure proper response to reported cases by immunizing all women in a locality where a case has been reported, if not an area with good routine coverage.						
Extend MNTE programme to cover all districts.	Assess TT coverage data and risk status in all districts.						
	Conduct TT SIAs successively in all districts as identified through MNT coverage data.						

Objective 5: HepB3 coverage equal to DTP3 coverage by the end of 2006		2005	2006	2007	2008	2009	2010
Offer hepatitis B immunization together with DTP.	Continue to provide HepB vaccine as routine antigen.						
	Introduce HepB vaccine in fixed combinations with DTP as of 2006.						
	Continuously conduct trainings for all primary care providers on the introduction of the new vaccine combination.						
Monitor and supervise hepatitis B immunization.	See 3. Surveillance and Data for Decision-Making						
Increase social awareness of Hepatitis B.	See 2. Advocacy and Communications						

Objective 6: New and appropriate vaccines introduced by the end of 2010		2005	2006	2007	2008	2009	2010
Assess feasibility and cost-effectiveness of new vaccines.	Perform cost-effectiveness studies prior to the introduction of new vaccines.						
Introduce Hib vaccine in fixed combination with DTP-HepB vaccine.	Take appropriate decisions at federal and provincial levels in accordance with the targets agreed upon under the GAVI/NVS support scheme.						
	Undertake Demonstration study for Hib burden						
Strengthen vaccine research and development.	Influence and prioritize public and private investments in new vaccines and technologies.						
	Engage research communities in defining appropriate research agendas.						
	Strengthen the capacity of the NIH to undertake the research and development of new vaccines.						

Objective 7: 100% safe immunization injections by the end of 2008; Appropriate sharps waste management in every district by 2010		2005	2006	2007	2008	2009	2010
Endorse the national injection safety policy.	Endorse National Injection Safety Policy Document.						
	Distribute injection safety policy document and guidelines to all districts.						
Implement injection	Implement pilot project on injection safety in 4 districts.						

safety pilot project.	Expand injection safety to all districts based on experiences made in pilot project.						
Provide sufficient safe disposable injection equipment.	Provide sufficient supplies of adequate safe disposable injection equipment bundled with vaccines and safety boxes to all districts.						
	Provide AD syringes and safety boxes to the private health sector.						
Improve safe injection practices.	Establish improved on-the-job training on injection safety.						
	Include injection safety in pre-service training curricula of health staff including vaccinators and supervisors.						
	Regularly monitor and supervise safe injection practices in all districts including the use of safe reconstitution.						
	Include private health sector staff in injection safety training.						
Adequately dispose of sharps waste.	Provide high-temperature incinerators at Tehsil level.						
	Provide appropriate transport of safety full boxes to tehsil and exchange for new injection equipment.						
	Provide health service staff with information, guidelines and regular training on waste management.						

Objective 8: Vitamin A supplementation fully integrated into routine EPI schedule by 2006		2005	2006	2007	2008	2009	2010
Establish vitamin A supplementation in routine EPI.	Implement and monitor distribution of Vitamin A twice per year to children aged 9 and 15 months during routine immunization.						
	Implement and monitor Vitamin A supplementation for post-partum women.						
	Involve LHWs and other health facility staff in Vitamin A supplementation.						
	Continue training of health staff on the dosage and administration of the vitamin.						

2. Advocacy and Communications

Social mobilization is needed to increase demand for routine immunization services, but in recent years has largely been limited to support for polio NIDs. Enhanced advocacy and communications efforts will increase awareness of the potential severity of VPDs other than polio and the existence of safe and effective vaccines. This awareness will aim at both health providers and the community.

At the federal level innovative communication planning to address the low awareness, misperceptions and mobilization of communities was initiated. A strategic decision was taken to separate the routine immunization activities from the polio communication plan. To regain the identity of routine immunization services an innovative and consistent approach is to be implemented by branding the communication for EPI. Following the development communication model, industrial marketing techniques such as images, identity and values will be applied to give a new glare and tone to EPI communication. Appropriate efforts will be made to reach and convince remote and illiterate populations.

The EPI Communication Plan 2004-05 develops a programme of active social mobilization, both to educate the public and to create client demand for services appropriate to their needs. The plan aims at convincing at least 80% of parents or caretakers of infants to support the EPI objectives through:

- recognising that routine immunization protects children from seven dangerous diseases;
- knowing where and how to use EPI services and to ask that new disposable syringes are used by health workers for immunization;
- acknowledging that minor side-effects of routine immunization are a sign that immunization is working and normally nothing to worry about;
- accepting that routine immunization is essential in addition to polio drops during NIDs/sNIDs.

In 35 RED approach priority districts the newly developed EPI “Teeku” mascot will be distributed on stickers, calendars, matchbox, and toys during Polio NIDs. A subsequent mass media campaign using the mascot will include television, radio, newspapers and other communications means. There will be for instance an interactive radio programme with subtle EPI messages, television time-check

and theatre shows with EPI messages, “Teeku” post office stamps, SMS messages to customers of major telephone networks, advertisements on electricity bills and newspaper supplements.

The vast experience of PEI staff in communications will be used to strengthen EPI social mobilisation, among others through community advocacy meetings with local decision makers including religious leaders, teachers, female counsellors, private practitioners, GPs and traditional healers to ensure their further involvement and support.

Table 4B: Advocacy and Communications: Strategies and Key Activities 2005-10

Objective 2: Polio transmission interrupted by the end of 2006		2005	2006	2007	2008	2009	2010
Continue PEI advocacy with key policy/decision makers.	Hold polio eradication advocacy meetings, briefings and seminars with key decision makers and potential partners.						
	Print/distribute communication material on polio eradication.						
Communicate with parents of children under 5 years to get every child vaccinated every time.	Establish interpersonal contacts with parents on polio eradication through health workers, boy scouts and girl guides, social mobilization teams, mosque and school announcements and written materials.						
	Improve mass media communication on polio eradication.						
Build capacity in polio advocacy and communication.	Periodically orient and train all polio team members on advocacy and communication.						
Develop innovative approaches to reach the un-reached.	Develop special communication activities for hard-to-reach areas and parents.						
	Form community groups and involve local leaders in polio eradication efforts.						
Objective 4: Neonatal tetanus eliminated in every district by 2010		2005	2006	2007	2008	2009	2010
Improve MNT and communications.	Review existing MNT communication strategies and material, assess their impact and adapt accordingly.						
	Hold briefings, meetings, seminars on MNT elimination with relevant provincial and district decision makers.						
	Hold community events/gatherings, seminars and meetings on MNT elimination at different levels.						
	Develop MNT campaign-specific communication plan for all levels.						
	Develop area-specific mixed media messages for radio, TV, newspapers, mosques, schools, health workers, etc. on MNT elimination.						
	Increase awareness about TT vaccination among teenage girls through health education in high schools and colleges.						
Objective 7: 100% safe immunization injections by the end of 2008; Appropriate sharps waste management in every district by 2010		2005	2006	2007	2008	2009	2010
Strengthen communication activities on injection safety in the EPI programme.	Implement WHO Focus Project communication plan in 4 districts.						
	Expand communication plan to all districts.						
	Improve community awareness about injection safety through appropriate materials targeting the general public.						
	Monitor implementation of communication strategies on injection safety.						
	Use appropriate experience of HIV programme in improving injection safety.						
	Implement focused communication projects on EPI waste management.						
	Expand communication efforts on injection safety to health areas other than EPI.						
Objective 9: EPI communication plans implemented in every district with all caretakers of infants understanding the importance of routine immunization by 2010		2005	2006	2007	2008	2009	2010
Establish and implement	Develop key messages for routine strengthening so that all caretakers of						

EPI communication plans at all levels.	infants understand the importance of routine immunization.								
	Target key decision makers including political, religious and local leaders.								
	Hold community meetings on VPDs in all districts.								
	Include measles and MNT prominently in key messages on routine EPI.								
	Include key messages on new EPI vaccines, when appropriate.								
	Run mass media campaigns on Hepatitis B.								
	Involve school children in advocacy for the EPI programme.								
	Design, produce, field test and print communication material on routine immunization including new vaccines and technologies.								
	Develop innovative channels of communication including hoardings, buses, paintings and signs etc.								
	Increase participation of LHWs in social mobilisation.								
Monitor and periodically adjust EPI communication plans.									
Use PEI advocacy and communication experience for EPI strengthening.	Adapt Polio advocacy and social mobilisation activities to increase awareness and demand for routine EPI services.								
	Incorporate EPI messages in all PEI related printed materials during polio NIDs.								
Develop EPI special branding and programming on mass media.	Plan, launch and periodically review “Teeku” – a new icon of routine immunization through mass, folk and local media at all levels.								
	Produce branded mass media programmes such as television plays (“Teeku” and “Uncle Sargum”) dedicated to the promotion of routine immunization.								
	Design, field test and apply agreed colour scheme to all communication material at all levels.								
	Monitor and periodically adjust EPI mass media plans.								
Establish EPI card initiative through boy scouts and girl guides.	Involve about 100,000 scouts and guides to raise awareness on routine EPI and motivate parents to get their children vaccinated.								
Improve community ownership.	Mobilise female counsellors to take the lead in awareness raising activities at grassroots level.								
	Institutionalize involvement of GPs and traditional healers through national, provincial and district conventions								
Train relevant staff on EPI advocacy and communications.	Arrange training opportunities for provincial and district health staff on how to effectively plan, implement and review EPI communication plans.								

3. Surveillance and Data for Decision-Making

Three independent surveillance and reporting systems are presently in place in Pakistan: The PEI AFP surveillance network, the routine EPI reporting system, and the newly established HMIS.

EPI coverage estimation is based on routine reporting and confirmed by coverage surveys about once every three years. The routine EPI reporting system has been validated by a DQA in 2003, making it a reliable tool in providing data on vaccine provision. The next district-wise coverage survey will be conducted in 2005. Major efforts will be made to compile administrative estimates of coverage at all levels and to improve data analysis in order to assist EPI decision-making. This will involve better estimates of target populations, developing cross-checks between reports and vaccine doses administered and establishing better accountability for reported coverage at the UC level.

AFP surveillance is active through patient register reviews in health facilities and of expected standard. Virological case definition has been implemented and expert review committees are functional at provincial and federal level. Additional surveillance officers in the provinces and divisions and international consultants have been recruited to strengthen field supervision of polio eradication activities.

Surveillance for most other vaccine preventable diseases (diphtheria, pertussis, measles, NT, childhood tuberculosis and Hepatitis B), however, is still insensitive with a vast underreporting of disease episodes. Surveillance for measles is primarily passive through sentinel and health department facilities and is likely to be reporting only a small proportion of the actual incidence. A new meningitis surveillance network, established in 2005, will provide data for burden-of-disease and cost-effectiveness analyses which will assist in the decision to possibly introduce pentavalent DTP-HepB-Hib vaccine by 2007. The surveillance network will be expanded to also include pneumonia

and sepsis as an endpoint, so that appropriate data on all invasive pneumococcal disease can be obtained in view of a possible future introduction of pneumococcal vaccine. Surveillance for NT is probably only detecting and reporting 5-10% of the actual incidence. Surveillance of adverse events following immunization (AEFI) has started in 2004 and is mainly reporting severe adverse events. A project proposal is under way for establishing a rotavirus surveillance system in the near future.

The HMIS is not yet being operationally useful in recording and monitoring the incidence of the EPI target diseases. HMIS reporting, however, may become more sensitive, since it reports both outpatient attendance and in-patient admissions.

It is intended to use AFP surveillance to strengthen the routine EPI VPD reporting system in providing the basis for a broader, more complete surveillance for all EPI target diseases. Measles and MNT have initially been incorporated within the PEI AFP surveillance system. This will allow ongoing quality assurance of the routine EPI reporting system. Once fully established, this surveillance system can be extended to new potential VPDs such as rotavirus diarrhoea and meningitis caused by Haemophilus influenzae b, Streptococcus pneumoniae and Neisseria meningitidis.

Table 4C: Surveillance and Data for Decision-Making: Strategies and Key Activities 2005-10

Objective 2: Polio transmission interrupted by the end of 2006			2005	2006	2007	2008	2009	2010
Maintain AFP surveillance.	AFP	Maintain community-based AFP surveillance involving LHWs in all districts.						
		Hold quarterly meetings of responsible and surveillance staff to provide guidance, training and feedback.						
		Convene the Polio Eradication Certification Committee to provide guidance on improving quality of surveillance and strategies for polio eradication.						
		Involve private health care sector in AFP surveillance.						
		Run awareness/ refresher seminars on AFP reporting for all health care providers.						
Objective 3: 90% reduction in measles morbidity and mortality by 2010 compared to the 2000 level			2005	2006	2007	2008	2009	2010
Strengthen surveillance for measles.		Develop guidelines for measles surveillance.						
		Perform active measles surveillance combined with MNT, making use of the PEI (AFP) surveillance experience.						
		Modify AFP surveillance manual to include measles.						
		Provide appropriate training and support for measles surveillance.						
		Strengthen laboratory-based measles surveillance.						
		Review the HMIS in terms of its capacity to monitor measles incidence, including sensitivity and data quality.						
Objective 4: Neonatal tetanus eliminated in every district by 2010			2005	2006	2007	2008	2009	2010
Strengthen MNT surveillance in high-risk districts.		Establish and maintain active MNT surveillance combined with other VPDs, specifically measles, making use of the PEI (AFP) surveillance experience.						
		Modify AFP surveillance manual to include MNT.						
		Review the HMIS in terms of its capacity to monitor MNT incidence.						
Objective 6: New and appropriate vaccines introduced by the end of 2010			2005	2006	2007	2008	2009	2010
Estimate burden-of-		Establish sentinel surveillance sites for meningitis, rotavirus diarrhoea and						

disease of potential new VPDs.	invasive pneumococcal disease.						
	Establish reliable burden of disease estimates on relevant VPDs for which vaccines will become available soon (e.g. meningitis, rotavirus, HPV).						
	Include new VPDs into routine VPD reporting system.						

Objective 7: 100% safe immunization injections by the end of 2008; Appropriate sharps waste management in every district by 2010		2005	2006	2007	2008	2009	2010
Improve injection safety monitoring.	Monitor availability and appropriate AD use in every district using regular supervision checklist.						
	Regularly assess injection safety activities.						
	Monitor proper sharps waste management as part of regular supervisory activities.						

Objective 10: Good quality data on EPI coverage and VPD incidence by 2010		2005	2006	2007	2008	2009	2010
Strengthen collection, analysis, interpretation, use and exchange of routine EPI data.	Improve denominator estimate for infant immunization.						
	Introduce use of computerised data management tools for monitoring vaccine coverage, disease surveillance at national, provincial and district level.						
	Ensure regular reporting of data from facility to federal level.						
	Record data on supervision visits to districts.						
	Ensure regular and detailed analysis of reported data and proper and timely feedback to all levels.						
	Develop and use up-to-date EPI monitoring charts of immunization coverage, drop-out rates and reporting completeness at all levels.						
Re-vitalize current routine VPD reporting system.	Revise national guidelines on routine VPD surveillance and reporting and distribute to all levels.						
	Re-establish and improve zero reporting system for VPDs.						
	Review EPI reporting format and revise existing case definitions of polio (AFP), diphtheria, pertussis, MNT, measles, childhood tuberculosis.						
	Improve identification and active routine reporting of VPDs from patient registers of health facilities in all districts.						
	Combine polio (AFP) and other VPD reporting to strengthen the routine EPI reporting system.						
	Involve PEI surveillance staff in standardised routine EPI reporting.						
	Include new VPDs (meningitis, rotavirus diarrhoea) into VPD reporting system.						
	Ensure use of VPD data for EPI programme decision making at all levels.						
	Use routine surveillance data for estimation of VPD burden of disease.						
	Develop linkage with disease early warning system to ensure proper outbreak detection, investigation and response.						
Strengthen AEFI surveillance and response.	Improve AEFI reporting as part of the routine VPD reporting system.						
	Train health care workers in AEFI assessment, reporting and investigation.						
	Equip district surveillance system with tools to respond properly to AEFI reports.						
Link EPI surveillance with national health information system.	Better coordinate with the HMIS and evaluate the accuracy of HMIS data on VPDs.						
	Integrate EPI/VPD reporting and surveillance system with HMIS.						
Involve private sector in VPD surveillance.	Provide training on VPD surveillance to private health sector staff.						
	Design abbreviated reporting format for private health sector.						
	Provide proper feedback to reporting clinicians.						
Strengthen human resources for surveillance.	Identify focal points for strengthening surveillance at national and provincial level.						
	Create and fill post of district epidemiologist.						
	Enhance the role of the DSO to facilitate surveillance and reporting of all EPI target diseases.						
	Prepare training manual on VPD surveillance for managers and field staff.						
	Orient and train health care managers and health care workers on routine VPD surveillance and data management at all levels including computer and software training.						
Strengthen laboratory-based surveillance.	Identify laboratory focal points and expand laboratory infrastructure for VPD surveillance.						
	Develop standardized requisition forms for VPD laboratory investigation.						
	Train provincial level laboratory technicians in appropriate culture and						

	antigen detection methods for VPDs.						
	Develop national data-base linking laboratory and epidemiologic surveillance data.						
	Strengthen capacity through the creation of laboratory networks.						
Perform regular comprehensive EPI coverage surveys in all districts.	Perform district-wise coverage surveys.						
Perform operations research.	Conduct internal and external evaluations.						
	Investigate topics important for routine EPI and specific disease control measures through special studies.						

4. Vaccine Supply, Quality and Logistics

Vaccine supply has been interrupted on several occasions. The challenge for the EPI is to accurately forecast its logistic needs through a system that can cross-check, identify inconsistencies and proceed with timely procurement and distribution. This needs improved logistics planning and management.

Problems exist relating to mobility and transportation. Existing vehicles, motorcycles and bicycles are aging and are increasingly uneconomic to repair. Without continuously renewed transport, the problems of ensuring reliable and sustained outreach may prove overwhelming.

Existing cold chain units were mostly supplied in the 1980s. Many are reaching the end of their useful life. Units need to be replaced in order not to compromise the safety of vaccine storage. It will be important to develop a long-term commitment to replace the cold chain on a 10-year renewal basis. It will not be possible within a short period of time to extend the fixed-site immunization delivery network, unless appropriate, additional cold chain units become available to the programme.

AD syringes and safety boxes have been supplied in sufficient numbers to every province and most districts through GAVI/ISS support. The safe management of sharps waste, however, e.g. through high-temperature incineration at district level has not yet been established and adequate solutions found at all levels.

Table 4D: Vaccine Supply, Quality and Logistics: Strategies and Key Activities 2005-10

Objective 2: Polio transmission interrupted by the end of 2006		2005	2006	2007	2008	2009	2010
Supply adequate quantities of potent oral polio vaccines for all NID/SNIDs.	Prepare oral polio vaccine requirements based on micro-plans from provincial offices.						
	Distribute the right quantity of oral polio vaccines to UC level.						
	Monitor polio vaccine storage and distribution.						
Objective 7: 100% safe immunization injections by the end of 2008; Appropriate sharps waste management in every district by 2010		2005	2006	2007	2008	2009	2010
Supply AD injection equipment and injection safety supplies with all vaccines.	Implement and monitor AD bundling policy in every district.						
	Distribute AD syringes to UC level according to vaccine utilization and safety stock based on approved district micro-plans.						
	Train cold chain technicians on injection safety issues.						
Improve sharps waste disposal system.	Distribute guidelines on proper and correct sharps waste disposal to all vaccinators and health workers.						
	Train and re-train health workers on the safe disposal of sharps waste.						
Objective 11: Appropriate vaccine supply, quality and logistics management at all levels by the end of 2006		2005	2006	2007	2008	2009	2010
Improve self-reliance in quality assurance and regulatory oversight related to vaccines and immunizations.	Advocate on the federal policy level for strengthening NRA approval procedures.						
	Ensure further assistance from partners to bring NRA procedures to appropriate WHO-certified accreditation level.						

Improve vaccine management system.	Improve long-term vaccine and supplies demand monitoring and forecasting.								
	Prepare routine vaccine requirements according to vaccine utilization and safety stock based on approved district micro-plans.								
	Establish reliable and timely procurement of vaccine and syringes.								
	Distribute appropriate quantities of routine EPI vaccines to UC level and improve storage of routine EPI vaccines in all provinces and districts.								
	Monitor vaccine inventories at the national, provincial and district level using standardized request and release forms, inventory logbooks and a computerized database.								
	Ensure and replenish a 3-month buffer stock of syringes and vaccines at both the federal and provincial levels and a one-month reserve supply at the district level.								
	Distribute guidelines on vaccine management to all vaccinators and health care workers.								
	Improve vaccine ledger in order to be able to monitor vaccine expiry date.								
	Provide relevant training on vaccine management to all health care workers.								
Reduce vaccine wastage.	Monitor vaccine wastage at health facility level.								
	Respond properly to high wastage rates during supervision visits.								
Improve transportation of vaccines and supplies in every district.	Establish a firm management system of relevant transportation equipment at provincial and district level.								
Improve cold chain system.	Assess the needs to update and maintain the cold chain and logistics.								
	Regularly review annual budgetary needs to maintain and continue renewal/updating of the cold chain and transport.								
	Distribute and allocate cold chain equipment based on EPI district micro-plans.								
	Develop policy aimed at 10% unit renewal each year.								
	Monitor cold chain capacity in every district.								
	Provide technical support for maintenance and replacement of cold chain equipment at all levels.								
	Recruit at least one cold chain technician for every district.								
	Provide guidelines for EPI cold chain technicians in local language.								
	Train and retrain staff members on cold chain issues in all districts, focusing on preventive maintenance.								

References / Documents Consulted

GOP/NIH/Federal EPI/CDD Cell: PC-1 Expanded Programme on Immunization 1999-2004, Aug. 1998

GOP/NIH/Federal EPI/CDD Cell: Multi year strategic plan: FY 2000 – FY 2004, Jan. 2001

WHO/EMRO: Survey on the Safety of Injections in Pakistan, May 2002

GOP/MOH/NIH: EPI Financial Sustainability Plan 2003-2012, Nov. 2003

GOP/NIH/Federal EPI/CDD Cell: PC-1 Expanded Programme on Immunization 2004-2009, Nov. 2003

WHO/VIB: Immunization Profile Pakistan, Sep. 2004

AF Ferguson: Report on the 2003 data quality audit (DQA) of the year 2002, Pakistan, Sept. 2003

GOP/NIH/Federal EPI/CDD Cell: GAVI Annual Progress Report, May 2004

National Communication Committee for EPI – Pakistan: EPI Communication Plan 2004-05, Oct. 2004

AC Nielsen: Draft Report on Identification of Barriers in Immunization Services in Pakistan, Oct. 2004

WHO Pakistan: Injection Safety in the Islamic Republic of Pakistan, Project Proposal, Oct. 2004

GOP/NIH/Federal EPI Cell: National EPI Policy and Strategic Guidelines, Oct. 2004

WHO/EMRO: Measles mortality reduction in Pakistan. Mission report, Oct. 2004

WHO/UNICEF: Global Immunization Vision and Strategies (GIVS), a Strategic Framework for 2006 - 2015, Draft, Nov. 2004

GOP/MOH/NIH: EPI surveillance data, Feb. 2005

ANNEX 1:

Costing and Financing Analysis of the cMYP for EPI Pakistan – 2005-2010

Introduction & Background

The cMYP was drafted utilizing the participatory approach of all EPI stake holders, including provincial health departments in a workshop held at Islamabad in early 2005. It was updated by Federal EPI Cell in mid 2006, to bring it in line with the GOP planning cycle i.e 2005-2010². The cMYP is based on the GIVS, and thus covers all the four strategic areas, which require strengthening of all the components of the programme. Therefore the major emphasis during the plan period 2005-2010 is on scaling up the programme by reaching more and introducing beyond the Tetravalent (DPT-HepB) combo vaccine in a phased manner in 2006 and making a provision of Pentavalent (DPT-HepB-Hib) combo vaccine introduction as per WHO recommendations, in phased manner beginning 2008. A robust EPI programme is also needed to reach the MDGs and honour the commitments of GOP in this respect. The target population for 2005 and the future projection till 2013 (Table 1) is based on the indicators in use by Federal EPI (Table 2)

Table 1 . Population Projections

	2006	2007	2008	2009	2010	2011	2012	2013
Population	164,484,391	168,432,017	172,474,385	176,613,770	180,852,501	185,192,961	189,637,592	194,188,894
Births	5,911,405	6,013,023	6,036,603	6,093,175	6,148,985	6,203,964	6,258,041	6,311,139
Infant Mortality	484,735	481,042	464,818	469,174	473,472	477,705	481,869	485,958
Surviving Infants (SI)	5,426,669	5,531,981	5,571,785	5,624,001	5,675,513	5,726,259	5,776,171	5,825,181
Pregnant women	5,911,405	6,013,023	6,036,603	6,093,175	6,148,985	6,203,964	6,258,041	6,311,139
Child Bearing Age Women	36,186,566	37,055,044	37,944,365	38,855,029	39,787,550	40,742,451	41,720,270	42,721,557
Target Population (Births or SI)	5,911,405	6,013,023	6,036,603	6,093,175	6,148,985	6,203,964	6,258,041	6,311,139
Incremental Increase	144,181	101,618	23,580	56,572	55,810	54,979	54,076	53,099

Table 2 : Demographic Indicators

	2005	2006	2007	2008	2009	2010
Population growth (%)	2.50%	2.50%	2.40%	2.40%	2.40%	2.40%
Births (% total population)	3.59%	3.57%	3.50%	3.45%	3.40%	3.35%
Infant Mortality Rate (per 1,000 live births)	82.0	80.0	77.0	77.0	77.0	77.0
Pregnant women (as a factor of births)	1.0	1.0	1.0	1.0	1.0	1.0
Childbearing age women (CBAW) (% of total population)	22.00%	22.00%	22.00%	22.00%	22.00%	22.00%

² 5 Yrs period based on financial years i.e From July 1, 2005 to June 30, 2010

The future resource requirement of the programme has been estimated under two scenarios:

Scenario 1: Continuation of the use of Tetravalent (DPT-Hep B) combo vaccine

Scenario 2: Introduction of Pentavalent (DPT-Hep B- Hib) combo vaccine in phased manner in 2008 utilizing the GAVI co-financing option under phase 2 and also considering support for ISS & HSS

Salient features of the costing of cMYP

1. The needs are estimated on the basis of the programme requirements to reach the programme objective of at least 90% routine immunization coverage of all EPI antigens with at least 80% coverage in every district by 2010.
2. For expansion and strengthening of VPD surveillance, besides provision for operational cost, provision for District Epidemiologist / Surveillance officer as required under National EPI Policy at each district has also been made.
3. Major inputs are planned to strengthen the cold chain and transport (Table-3)

Table 3: Cold Chain & Transport Requirements (including replacements) for 2006-2010

Cold Chain		Transport	
Description	No	Description	No
Cold Rooms	209	4 WD vehicle Double Cabin	526
Ice Line Refrigerators/Refrigerators	25,728	Diesel Single Cabin Jeeps/Pickup 4 x 2	557
Freezers	799	Refrigerated van	11
Solar Refrigerators	1,615	Delivery van	305
Cold Boxes	4,452	Cars/1000 cc vehicles	475
Vaccine Carriers	23,182	Motorcycle	32,872
Generators	164	Bicycles	8,550

Past Expenditure on EPI³

The total average annual expenditure on routine EPI activities over 1995-1999 period was approximately \$ 21-24 million for about 2 million children being reached. This cost increased to \$ 31.6 million in 2003 largely because of inclusion of Hepatitis B vaccine and use of AD syringes. The SIAs for Polio and MNTE during the year incurred an additional expenditure of \$ 40.5 million, bringing the total EPI expenditure to \$ 72.2 million in 2003. The National and Sub-National Governments, referred herein as Government of Pakistan (GOP) contributed 59% of all funds for routine EPI in 2003 with majority of support being in the form of salaries⁴. Of the salary component, GoP provided 97% of the resources.

³ All \$ costs in this document are US\$

⁴ FSP EPI Pakistan, September 2005

Costing & Financing analysis for 2005

In 2005 , the total expenditure on immunization was estimated to be \$ 154 million⁵. This include an amount of \$ 125.4 million for immunization specific expenditures besides an estimated expenditure of \$ 28.3 as shared cost of the human resource , goods and other activities, utilized for immunization (18% of the costs are shared).

The total expenditure on SIAs (Polio and MNTE) approximated \$ 65 million (i.e 51.5% of all immunization specific spending) , while the expenditure on routine immunization was \$61 million (i.e 48.5% out of the total expenditure of \$ 125.406 million on Immunization). In other words, for every 2 dollars spend on immunization in Pakistan, one is for campaigns.

The cost per DTP3 child works out to be \$ 16.0 , which is a little less than the regional average of US\$ 17.2 , thus confirming the cost effectiveness of the EPI Pakistan . The per capita expenditure on routine immunization is \$ 0.4 , which is 1.8 % of total health expenditure. (Table 4).

Table 4 : Baseline Indicators	2005
Total Immunization Expenditures	\$125,406,551
Campaigns	\$64,602,461
Routine Immunization only	\$60,804,090
per capita	\$0.4
per DTP3 child	\$16.0
% Vaccines and supplies	16.8%
% National funding	16.8%
% Total health expenditures	1.8%
% Gov. health expenditures	6.4%
% GDP	0.04%
Total Shared Costs	\$28,386,411
% Shared health systems cost	18%
TOTAL	\$153,792,962

During 2005 , 41% of the routine immunization cost was spent on personnel , 9% on traditional vaccines , 5% on New Vaccines (Hepatitis B Monovalent) , 11% on transportation and 20% on operational costs⁶ (Chart-1) .

GOP covered 71% of the cost , while remaining 29% was funded by EPI partners, including GAVI . The cost profile for EPI Pakistan shows that the major cost drivers of routine immunization are personnel cost (41%) and operational cost (20%). GOP fully provides the personnel cost, whereas the operational cost is shared by the GOP and other EPI partners. GOP has also been providing all the cost pertaining to traditional vaccines since 1993. (Chart 2)

Scenario 1 : Future cost requirements & Financing

Under this scenario, which is currently being followed, the programme will be strengthened during the plan period primarily in terms of its needs for hardware and human resource . The introduction of the Tetravalent (DPT-Hep B) combo vaccine to EPI schedule with GAVI support in two provinces in 2006 will be expanded nationwide in 2007 . After the

⁵ Derived through utilizing the cMYP tools

⁶ Includes maintenance and overheads, short term trainings, IEC/Social Mobilization, Disease surveillance, Programme Management and other routine recurrent costs.

end of GAVI support under Phase-1 for new and underutilized vaccines , GOP will provide the resources for this tetravalent vaccine beginning 2008.

Under Scenario 1 , the total cost required for routine immunization during period 2006-2010 is \$ 657.589 million (Table 5). Because of different programme requirements, particularly hardware the yearly requirement ranges from \$ 117.218 million to \$ 166.605 million with a yearly average of US\$ 131.517 million during this period. This is a little more than double of the cost of \$ 60.804 million in 2005 for routine immunization. The increase is because of addition of tetravalent vaccine and addressing the programme needs of hardware which have been accumulated over the previous years and could not be fully met despite support under GAVI ISS Funds.

In per capita terms the cost for routine immunization will increase from \$ 0.8 in 2006 to \$ 0.9 in 2010. Similarly the cost per DPT-3 child will increase from \$ 30.9 in 2006 to \$ 40.1 in 2010. As the programme cost varies each year, it would be more appropriate to consider the average cost per DPT-3 child which is \$ 32.9 during the plan period (Table 5).

Table 5 : Resource Requirements, Financing and Gaps*						
	2006	2007	2008	2009	2010	2006 - 2010
Total Resource Requirements	\$231,429,285	\$242,793,650	\$172,755,998	\$178,748,352	\$166,605,413	\$992,332,698
Total Resource Requirements (Routine only)	\$131,880,440	\$119,864,830	\$117,218,707	\$122,020,367	\$166,605,413	\$657,589,756
per capita	\$0.8	\$0.7	\$0.7	\$0.7	\$0.9	\$0.8
per DTP targeted child	\$30.9	\$32.7	\$30.5	\$30.0	\$40.1	\$32.9
% Vaccines and supplies	15%	26%	27%	26%	20%	22%
Total Secured Financing	\$141,611,445	\$124,430,143	\$71,040,472	\$71,038,195	\$48,935,477	\$457,055,733
Government	\$12,860,026	\$17,059,315	\$34,627,249	\$35,676,171	\$12,866,212	\$113,088,974
Sub-national Gov.	\$33,322,425	\$33,988,874	\$34,668,651	\$35,362,024	\$36,069,265	\$173,411,240
GAVI	\$15,776,143	\$32,692,460	\$1,744,571			\$50,213,174
WHO	\$38,164,344	\$15,159,574				\$53,323,918
UNICEF	\$6,203,275	\$3,739,000				\$9,942,275
JICA (Gov. Japan) (Polio)	\$6,541,422	\$3,850,921				\$10,392,343
World Bank (IDA) (Polio)	\$28,743,809	\$17,940,000				\$46,683,809
GAVI (HSS+ISS)						
DFID (Polio)						
Rotary (Polio)						
CDC (Polio)						

USAID (Polio)						
Funding Gap (with secured funds only)	\$89,817,840	\$118,363,507	\$101,715,527	\$107,710,157	\$117,669,935	\$535,276,965
% of Total Needs	39%	49%	59%	60%	71%	54%
Total Probable Financing	\$27,029,309	\$62,214,490	\$49,340,853	\$50,890,950	\$41,761,199	\$231,236,801
Government					\$25,181,762	\$25,181,762
Sub-national Gov.						
GAVI						
WHO		\$35,165,555	\$3,005,755	\$3,044,902	\$2,803,595	\$44,019,807
UNICEF	\$1,500,000	\$3,309,080	\$3,529,000	\$3,529,000	\$3,529,000	\$15,396,080
JICA (Gov. Japan) (Polio)		\$4,342,191				\$4,342,191
World Bank (IDA) (Polio)			\$19,251,812	\$19,410,918		\$38,662,729
GAVI (HSS+ISS)			\$9,044,833	\$9,984,177	\$10,246,842	\$29,275,853
DFID (Polio)	\$17,239,271	\$13,098,733	\$9,797,852	\$10,076,403		\$50,212,258
Rotary (Polio)	\$2,654,570	\$2,016,994	\$1,508,712	\$1,551,604		\$7,731,880
CDC (Polio)	\$2,272,448	\$1,726,650	\$1,291,534	\$1,328,252		\$6,618,883
USAID (Polio)	\$3,363,020	\$2,555,288	\$1,911,355	\$1,965,694		\$9,795,357
Funding Gap (with secured & probable funds)	\$62,788,531	\$56,149,017	\$52,374,674	\$56,819,207	\$75,908,736	\$304,040,164
% of Total Needs	27%	23%	30%	32%	46%	31%

Of the total resource requirements of \$ 992.332 million (including SIA's) for the plan period an amount of \$ 457.005 million (46%) is secured while the an amount of \$ 231.236 million (23%) is probable, leaving a funding gap of \$ 304.040 million (31%). (Table 6 and chart 3& 6) . GOP will have to make an effort to secure the resources for bridging the funding gap.

Table 6 : Composition of the funding gap

	2006	2007	2008	2009	2010	2006 - 2010
Vaccines and injection equipment						
Personnel	\$220,271	\$742,513	\$1,285,210	\$1,328,194	\$1,372,038	\$4,948,227
Transport	\$9,861,260	\$15,302,661	\$20,526,227	\$24,908,560	\$25,749,713	\$96,348,423
Activities and other recurrent costs	\$7,472,133	\$9,319,336	\$7,368,570	\$8,187,338	\$9,446,464	\$41,793,840
Logistics (Vehicles, cold chain and other equipment)	\$45,234,867	\$9,268,572	\$1,418,639		\$39,340,521	\$95,262,598
Campaigns		\$21,515,935	\$21,776,027	\$22,395,114		\$65,687,077
Total Funding Gap*	\$62,788,531	\$56,149,017	\$52,374,674	\$56,819,207	\$75,908,736	\$304,040,164

* Immunization specific resource requirements, financing and gaps.
Shared costs are not included.

As the programme plans to increase the number of fixed EPI centers in coming years, and rely less on the outreach services the outreach cost almost remains the same in the last three years of the plan period. (Chart 6).

cMYP Costing and Financing Graphs for Pakistan

Chart 1

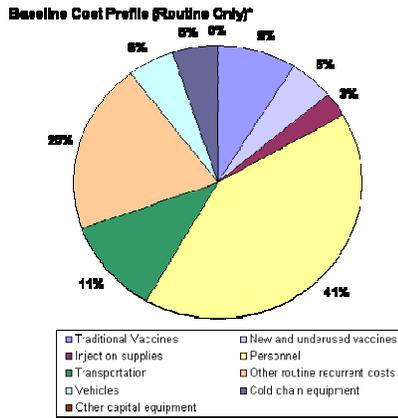


Chart 2

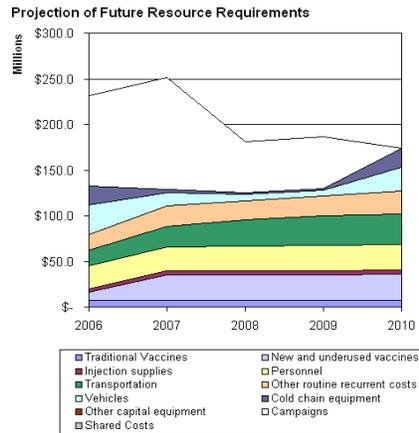


Chart 3

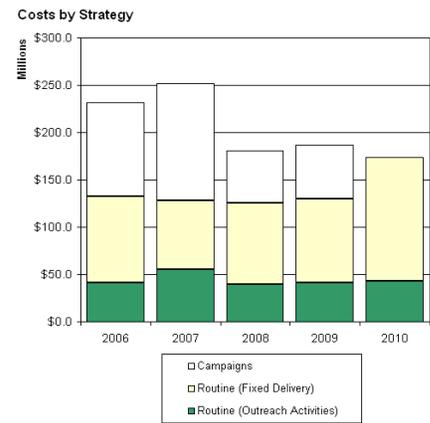


Chart 4

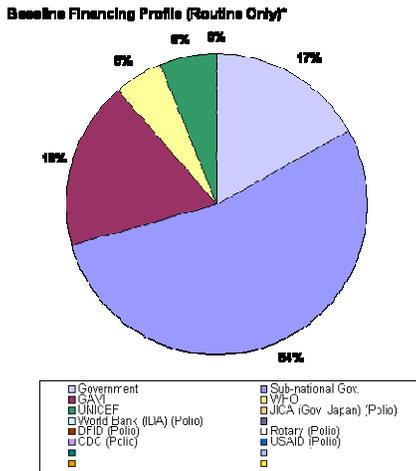


Chart 5

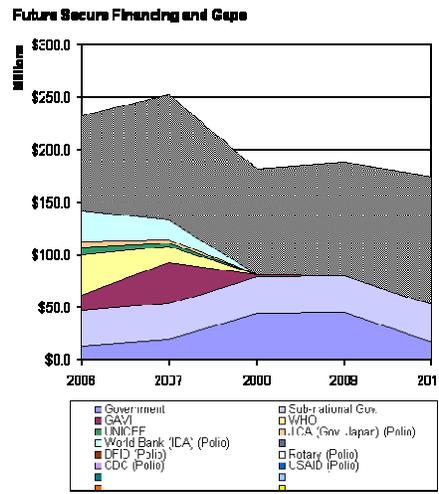
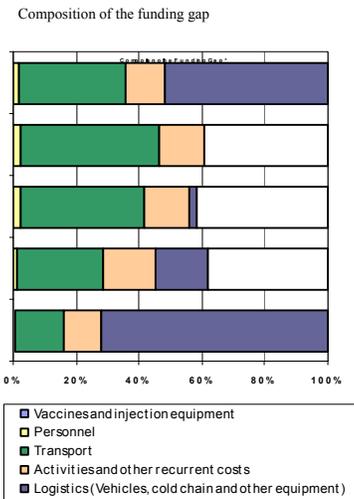


Chart 6



Scenario 2

If it is finally decided by the GoP to introduce pentavalent (DPT- Hep B-Hib) combo vaccine in phased manner in 2008 with nation wide introduction in 2009, the total resource requirement for the plan period will be a \$ 1,136.884 million out of which \$ 802.141 million will be for routine EPI (Table 7). Considering the GAVI co financing , HSS and ISS support for this period , with the GoP contribution towards co-financing of \$ 0.30 per dose of pentavalent vaccine for the year 2008, 2009 and 2010, the total secured funding works out to be \$ 433.798 million (38%). Taking into account probable funding of \$399.046 million (35%) there still remains a funding gap of \$ 304.404 million (27%). (Table-7)

Table 7 : Resource Requirements, Financing and Gaps*						
	2006	2007	2008	2009	2010	2006 - 2010
Total Resource Requirements	\$231,723,114	\$251,419,060	\$222,861,439	\$221,533,440	\$209,347,300	\$1,136,884,353
Total Resource Requirements (Routine only)	\$132,174,269	\$128,490,240	\$167,324,147	\$164,805,455	\$209,347,300	\$802,141,411
per capita	\$0.8	\$0.8	\$1.0	\$0.9	\$1.2	\$0.9
per DTP targeted child	\$30.4	\$27.3	\$34.5	\$32.6	\$41.0	\$33.3
% Vaccines and supplies	15%	31%	49%	46%	36%	36%
Total Secured Financing	\$141,905,275	\$133,055,553	\$54,920,876	\$54,253,692	\$49,662,750	\$433,798,146
Government	\$13,011,024	\$19,198,260	\$18,507,653	\$18,891,668	\$13,593,485	\$83,202,090
Sub-national Gov.	\$33,322,425	\$33,988,874	\$34,668,651	\$35,362,024	\$36,069,265	\$173,411,240
GAVI	\$15,918,975	\$39,178,924	\$1,744,571			\$56,842,470
WHO	\$38,164,344	\$15,159,574				\$53,323,918
UNICEF	\$6,203,275	\$3,739,000				\$9,942,275
(Polio) JICA (Gov. Japan)	\$6,541,422	\$3,850,921				\$10,392,343
(Polio) World Bank (IDA)	\$28,743,809	\$17,940,000				\$46,683,809
GAVI (HSS+ISS)						
DFID (Polio)						
Rotary (Polio)						
CDC (Polio)						
USAID (Polio)						
Funding Gap (with secured funds only)	\$89,817,840	\$118,363,507	\$167,940,563	\$167,279,748	\$159,684,550	\$703,086,207
% of Total Needs	39%	47%	75%	76%	76%	62%
Total Probable Financing	\$27,029,309	\$62,214,490	\$115,565,889	\$110,460,541	\$83,775,814	\$399,046,043
Government					\$7,081,163	\$7,081,163
Sub-national Gov.						
GAVI			\$66,225,036	\$59,569,591	\$60,115,214	\$185,909,841
WHO		\$35,165,555	\$3,005,755	\$3,044,902	\$2,803,595	\$44,019,807
UNICEF	\$1,500,000	\$3,309,080	\$3,529,000	\$3,529,000	\$3,529,000	\$15,396,080
(Polio) JICA (Gov. Japan)		\$4,342,191				\$4,342,191
(Polio) World Bank (IDA)			\$19,251,812	\$19,410,918		\$38,662,729
GAVI (HSS+ISS)			\$9,044,833	\$9,984,177	\$10,246,842	\$29,275,853
DFID (Polio)	\$17,239,271	\$13,098,733	\$9,797,852	\$10,076,403		\$50,212,258
Rotary (Polio)	\$2,654,570	\$2,016,994	\$1,508,712	\$1,551,604		\$7,731,880
CDC (Polio)	\$2,272,448	\$1,726,650	\$1,291,534	\$1,328,252		\$6,618,883
USAID (Polio)	\$3,363,020	\$2,555,288	\$1,911,355	\$1,965,694		\$9,795,357
Funding Gap (with secured & probable funds)	\$62,788,531	\$56,149,017	\$52,374,674	\$56,819,207	\$75,908,736	\$304,040,164
% of Total Needs	27%	22%	24%	26%	36%	27%

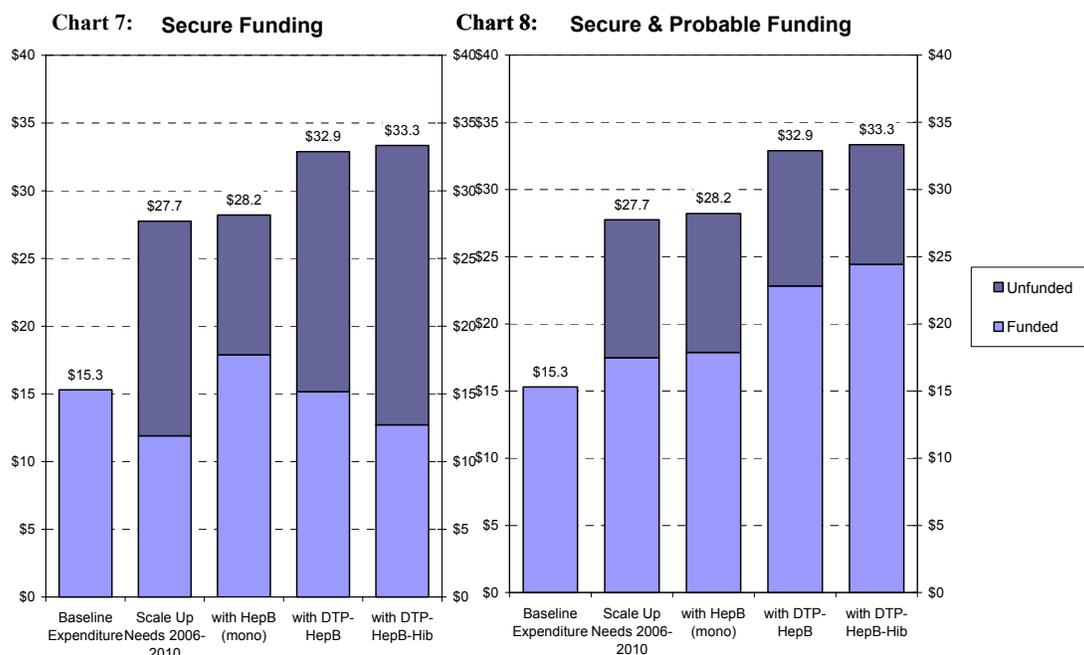
The cost per DTP3 child under this scenario will increase from \$30.4 in 2006 to \$ 41.0 in 2010 with an average of \$ 33.3 during the plan period. Similarly the per capita expenditure for routine EPI will increase from \$0.8 in 2006 to \$1.2 in 2010 with an average of \$0.9

Comparison of these two scenarios is made in Table 8.

Table 8 : Pakistan Cmyp Funding Gaps and Seleted Indicators (Immunization Specific Costs)			
	Baseline	Financing Scenario	Costing & Financing
	DTP-HepB + 100%GovFunding of Tetra by 2008	DTP-HepB + 100%GovFunding of Tetra by 2008 + HSS&ISS	DTP-HepB-Hib + CoFin + HSS&ISS
Resource Requirements, Financing and Gaps*	2006 - 2010	2006 - 2010	2006 - 2010
Total Resource Requirements	\$1,024,460,224	\$992,332,698	\$1,136,884,353
Total Resource Requirements (Routine only)	\$689,717,282	\$657,589,756	\$802,141,411
per capita	\$0.8	\$0.8	\$0.9
per DTP targeted child	\$28.7	\$32.9	\$33.3
% Vaccines and supplies	26%	22%	36%
Total Secured Financing	\$488,074,124	\$457,055,733	\$433,798,146
Government	\$137,478,068	\$113,088,974	\$83,202,090
Sub-national Gov.	\$173,411,240	\$173,411,240	\$173,411,240
GAVI	\$56,842,470	\$50,213,174	\$56,842,470
WHO	\$53,323,918	\$53,323,918	\$53,323,918
UNICEF	\$9,942,275	\$9,942,275	\$9,942,275
JICA (Gov. Japan) (Polio)	\$10,392,343	\$10,392,343	\$10,392,343
World Bank (IDA) (Polio)	\$46,683,809	\$46,683,809	\$46,683,809
GAVI (HSS+ISS)			
DFID (Polio)			
Rotary (Polio)			
CDC (Polio)			
USAID (Polio)			
Funding Gap (with secured funds only)	\$536,386,100	\$535,276,965	\$703,086,207
% of Total Needs	52%	54%	62%
Total Probable Financing	\$207,257,083	\$231,236,801	\$399,046,043
Government	\$30,477,897	\$25,181,762	\$7,081,163
Sub-national Gov.			
GAVI			\$185,909,841
WHO	\$44,019,807	\$44,019,807	\$44,019,807
UNICEF	\$15,396,080	\$15,396,080	\$15,396,080
JICA (Gov. Japan) (Polio)	\$4,342,191	\$4,342,191	\$4,342,191
World Bank (IDA) (Polio)	\$38,662,729	\$38,662,729	\$38,662,729

GAVI (HSS+ISS)		\$29,275,853	\$29,275,853
DFID (Polio)	\$50,212,258	\$50,212,258	\$50,212,258
Rotary (Polio)	\$7,731,880	\$7,731,880	\$7,731,880
CDC (Polio)	\$6,618,883	\$6,618,883	\$6,618,883
USAID (Polio)	\$9,795,357	\$9,795,357	\$9,795,357
Funding Gap (with secured & probable funds)	\$329,129,017	\$304,040,164	\$304,040,164
% of Total Needs	32%	31%	27%

It can be seen from the graphs below (Chart –7 & 8) that adopting the Scenario 2 option i.e introduction of pentavalent vaccine during the plan period , ensures maximum funding for the programme . Though this includes a component of probable funding , but keeping in view the high chance of a successful co-financing agreement with GAVI , this probable funding can be considered quite near to the secure funding.



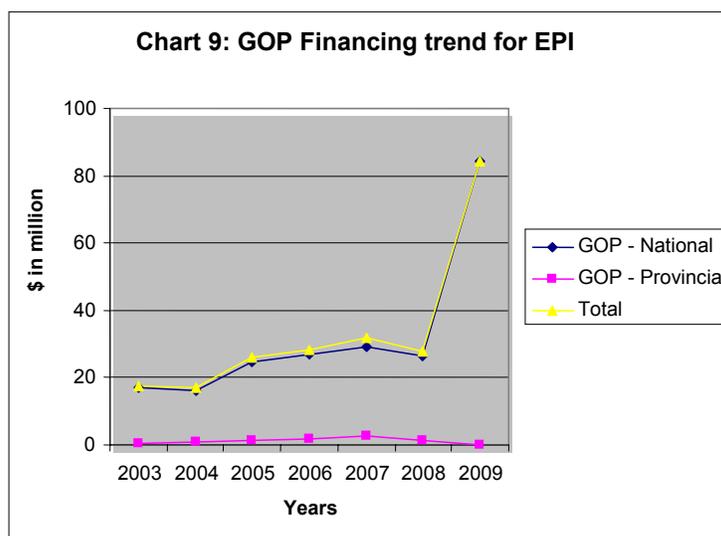
Sustainability Analysis

The GoP , recognizing the important role of EPI in diseases prevention has given it a priority for fund allocations . (Chart 9). In the current perspective plan 2005-2010 a total of \$ 1,380 million has been allocated for health as Federal Government contribution⁷. This does not include the provincial government contribution, which covers almost 100% of the personnel cost. Out of this \$ 190 million i.e 14% of total Federal health budget is for EPI. The federal budget for EPI includes total cost of all routine EPI vaccines including tetravalent vaccine from 2008 onwards , AD syringes and safety boxes.

EPI introduced Hepatitis B (monovalent) vaccine in EPI schedule in 2001 and shifted to Tetravalent (DPT-Hep B) Combo vaccine in phased manner in 2006 with GAVI support. In order to ensure the availability of the tetravalent vaccine for the programme after the end of

⁷ Rupees values converted into US\$ @ Rs. 60=1 US\$

this GAVI support in 2007, GOP has allocated \$ 25 million for the total requirement of Tetravalent vaccine for 2008-09⁸, in line with its policy to provide all the cost of routine EPI vaccines, including Tetravalent vaccine. In the last year of the PC-1 because of large amounts allocated for civil works, cost of tetravalent vaccines and cost of measles vaccines for then planned measles campaign therefore the budget increased to \$ 84 million from an annual average of \$ 26 million in last four years. This huge increase in the EPI budget in a given year as compared to the previous years also indicates the willingness and ability of GoP to provide funding for EPI where and when needed.



The GOP, in line with the cMYP is eager to study the disease burden and cost effectiveness of the inclusion of Hib vaccine in EPI schedule. For this purpose it has allocated Rs 30 million (\$ 0.5 million) from its own resources under current financial year 2006-07.

EPI partners have traditionally supported the EPI activities in the country. Although much of the support is directed towards the polio SIAs, still EPI partners contributed towards 29% of the requirements of routine EPI.

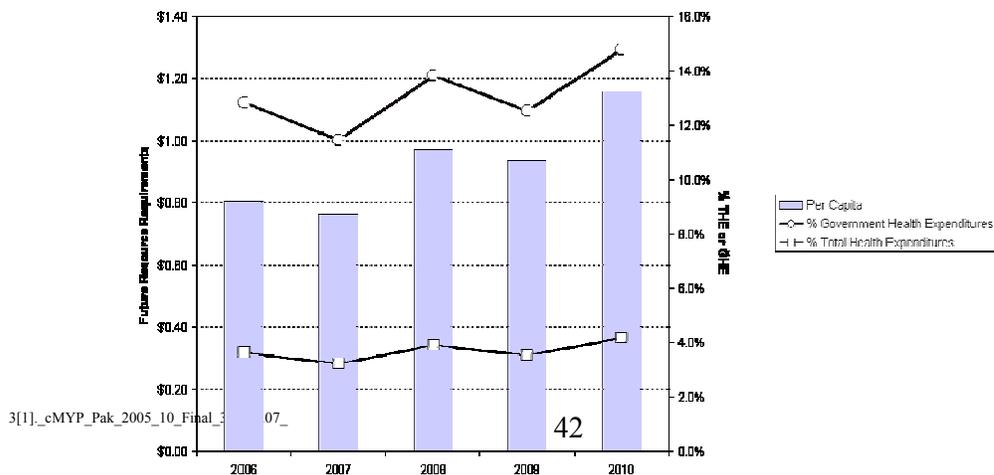
The table 9 and chart 10 depicts the financial sustainability of the programme.

Table 9 : Macroeconomic and Sustainability Indicators						
	2005	2006	2007	2008	2009	2010
Reference						
Per capita GDP (\$)	\$878	\$932	\$989	\$1,043	\$1,105	\$1,167
Total health expenditures per capita (THE per capita \$)	\$21.0	\$22.2	\$23.6	\$24.9	\$26.4	\$27.8
Population	\$160,472,577	\$164,484,391	\$168,432,017	\$172,474,385	\$176,613,770	\$180,852,501
GDP (\$)	\$140,894,922,382	\$153,299,452,565	\$166,579,264,370	\$179,890,783,502	\$195,158,216,058	\$211,054,868,285
Total Health Expenditures (THE \$)	\$3,369,924,112	\$3,651,553,484	\$3,974,995,591	\$4,294,612,185	\$4,662,603,533	\$5,027,699,519
Government Health Expenditures (GHE \$)	\$950,318,599	\$1,029,738,082	\$1,120,948,757	\$1,211,080,636	\$1,314,854,196	\$1,417,811,264

⁸ FY 2008-09 is taken as year 2009, as all other financial years are taken to be corresponding to the calendar year of their later half, for the sake of uniformity in the document.

Resource Requirements for Immunization						
Routine and Campaigns (\$)	\$125,406,551	\$231,723,114	\$251,419,060	\$222,861,439	\$221,533,440	\$209,347,300
Routine Only (\$)	\$60,804,090	\$132,174,269	\$128,490,240	\$167,324,147	\$164,805,455	\$209,347,300
per DTP3 child (\$)	\$16.0	\$30.4	\$27.3	\$34.5	\$32.6	\$41.0
% Total Health Expenditures						
Resource Requirements for Immunization						
Routine and Campaigns	3.7%	6.3%	6.3%	5.2%	4.8%	4.2%
Routine Only	1.8%	3.6%	3.2%	3.9%	3.5%	4.2%
Funding Gap						
With Secure Funds Only		2.5%	3.0%	3.9%	3.6%	3.2%
With Secure and Probable Funds		1.7%	1.4%	1.2%	1.2%	1.5%
% Government Health Expenditures						
Resource Requirements for Immunization						
Routine and Campaigns	13.2%	22.5%	22.4%	18.4%	16.8%	14.8%
Routine Only	6.4%	12.8%	11.5%	13.8%	12.5%	14.8%
Funding Gap						
With Secure Funds Only		8.7%	10.6%	13.9%	12.7%	11.3%
With Secure and Probable Funds		6.1%	5.0%	4.3%	4.3%	5.4%
% GDP						
Resource Requirements for Immunization						
Routine and Campaigns	0.09%	0.15%	0.15%	0.12%	0.11%	0.10%
Routine Only	0.04%	0.09%	0.08%	0.09%	0.08%	0.10%
Per Capita						
Resource Requirements for Immunization						
Routine and Campaigns	\$0.78	\$1.41	\$1.49	\$1.29	\$1.25	\$1.16
Routine Only	\$0.38	\$0.80	\$0.76	\$0.97	\$0.93	\$1.16

Chart 10: Sustainability Analysis



For EPI to achieve financial sustainability, it must achieve the following:

- To reach the coverage Targets, for ensuring projected resources from Government of Pakistan.
- To secure GAVI and other partners funds
- To have continuous and close liaison with Provincial Governments, for reviewing with them EPI Progress, particularly in the following areas :
 - Achievement vs coverage targets
 - Federal, provincial and district resource allocations
- To be used as an advocacy tool for the following:
 - The Government of Pakistan in their dealing with their development partners.
 - The Federal EPI / MoH in their discussions and negotiations with provincial and district governments.

Senior management of the EPI programme for resource mobilisation, programme strengthening and deepening.

- To form the basis for strategic planning for the EPI programme in Pakistan at all levels i.e Federal, provincial and district level.
- To secure resources for EPI at District level from District Governments.

Strategic Plan to Achieve Sustainable Financing

Objective	Actions	Indicator	Responsibility	Means of verification
To reach the coverage Targets, for ensuring projected resources from Government of Pakistan.				
To improve the immunization coverage targets	Continuous monitoring and prompt remedial actions	Monthly coverage reports	Federal & Provincial EPI, NICC,	Coverage reports
To reduce the drop out	Continuous monitoring and prompt remedial actions	Monthly reports	Federal, Provincial and Districts EPI teams	Drop out reports
To secure GAVI and other donor funds				
To secure ongoing GAVI Funding	Complete, approve and deliver cMYP to GAVI.	cMYP accepted	NICC & Federal EPI Cell	Acceptance letter from GAVI
To secure additional GAVI funding	To prepare and submit timely the required reports and proposals	Prepare required reports and the proposal	Federal EPI Cell	Covering letter for submission of the required reports and the proposal
To secure additional donor funding	To bring to the notice of the potential donors	Number of meetings	Federal EPI Cell	Minutes of meeting

	the needs for additional funding, in one to one meetings or through NICC			
To have continuous and close liaison with Provincial Governments , for reviewing with them EPI Progress, particularly in the area of coverage and resource allocation				
To review the EPI progress at the Provincial and District level	Regular meetings with the Provincial EPI to review district level progress	Number of meetings	Federal EPI Cell, Provincial ICC=	Provincial and District coverage reports and minutes of meetings.
Allocation of the Provincial Health Departments for EPI	To submit timely request for the budget for EPI activities	Submission of the budget within time	Provincial EPI Cells	Documents to verify timely submission of the budget
To be used as an advocacy tool				
To brief the EPI partners and potential donors on the achievements of EPI Programme and future plan	Hold briefing and advocacy meetings	Number of advocacy meetings	Federal EPI Cell	Minutes of meetings
To brief district health Governments on the importance of the EPI Programme and the priority it demands from the district health budget	Hold briefing and advocacy meetings	Number of advocacy meetings	Federal EPI Cell, Provincial EPI Cells, Provincial ICC	Minutes of meetings
To form the basis for strategic planning for the EPI programme in Pakistan at all levels				
To develop comprehensive plans at all levels	Develop multi year strategic plan at national level. Develop Provincial multi year strategic plan. Develop district level micro plans.	Planning process undertaken	Federal EPI Cell, Provincial EPI Cell & EDO Health	Availability of actual plans
To secure resources for EPI at District level from District Governments.				
To secure required amount of financing from the District Governments	Convincing the authorities for need of district level resource allocations	Steps taken to convince the district authorities	EDO Health	Actual resources allocated

The following indicators will be used to measure the progress towards financial sustainability:

Dimension of Financial Sustainability	Indicator	Unit
Self sufficiency	Percentage of funds allocated by Ministry of Health as compared to demand by Federal EPI Cell	%
-do-	Programme specific capital expenditures paid for with National resources within the past fiscal year divided by total programme specific capital expenditures	%
Efficient use of resources	Purchase of quality vaccine through UNICEF/or functional NRA	Yes/No
-do-	Purchase of cold chain and transport through competitive bidding	Yes/No
-do-	Annual audit of the expenditure incurred at all levels	Yes/No
Mobilization and use of adequate resources	Plan to set a sight or allocate funds to replace or upgrade capital items essential to immunization programme (e.g. cold chain)	Yes/No
-do-	Well established financial planning process at Federal, Provincial & District level in place	Yes/No
Reliability of resources	Share of actual domestic expenditure on recurrent cost of immunization programme divided by amount budgeted for recurrent cost within the last fiscal year	%
-do-	Share actual district recurrent expenditures to amount budgeted	%
