Draft Comprehensive Multi Year Plan

(2014-2018)

Expanded Program on Immunization
Capital Development Authority
Islamabad
Government of Pakistan

Comprehensive multi-year Plan

Immunization Program of Capital Development Authority, Islamabad

List of figures

Acronyms

AD	Auto-destruct
AEFI	Adverse Events Following Immunization
AFP	Acute Flaccid Paralysis
BCG	Bacillus Calmette-Guerin
BHU	Basic Health Unit
BPS	Basic Pay Scale
CD	Civil Dispensary
CDA	Capital Development Authority
cMYP	Comprehensive Multi-year Plan
DGHS	Director General Health Services
DHO	District Health Officer
DHQH	District Headquarters Hospital
DPT	Diphtheria Tetanus Pertussis
DQS	Data Quality Self-Assessment
DSV	District Superintendent Vaccination
EPI	Expanded Program on Immunization
EVM	Effective Vaccine Management
FAP	First-Aid Post
FMT	Female Medical Technician
FTE	Full Time Equivalent
GAVI	Global Alliance for Vaccines and Immunization
GAVI HSS	Global Alliance for Vaccines and Immunization Health System Strengthening
GAVI ISS	GAVI Immunization Services Support
GAVI NVS	GAVI New Vaccine Support
ICT	Islamabad Capital Territory
GDP	Gross Domestic Product
GGE	General Government Expenditure
GGHE	General Government Health Expenditure
GHE	Government Health Expenditure
HMIS	Health Management Information System
HR	Human Resources
ICC	Inter-agency Coordinating Committee

ICS	Immunization-system-component-specific
IEC	Information, Education and Communication
ILR	Ice-Lined Refrigerator
IP	Immunization Practices
IPV	Inactivated Polio Vaccine
JICA	Japan International Cooperation Agency
KAP	Knowledge, Attitude and Practice
KM	Kilometer
LHS	Lady Health Supervisor
LHV	Lady Health Visitor
LHW	Lady Health Worker
M&E	Monitoring and Evaluation
MCHC	Maternal and Child Health Center
MDG	Millennium Development Goal
MIS	Management Information System
MLM	Mid-Line Manager
MMR	Measles, Mumps, and Rubella
MNCH	Maternal Neonatal and Child Health
MNT	Maternal and Neonatal Tetanus
MT	Medical Technician
NIPS	National Institute of Population Studies
NITAG	National Immunization Technical Advisory Group
OPV	Oral Polio Vaccine
P&D	Planning and Development
PC-1	Planning Commission Performa No.1
PCV-10	Pneumococcal Conjugate Vaccine – 10
PDHS	Pakistan Demographic and Health Survey
PEI	Polio Eradication Initiative
PKR	Pakistani Rupee
POL	Patrol Oil Lubricants
PSDP	Public Service Development Program
RED	Reaching Every District
RHC	Rural Health Center
SIA	Supplementary Immunization Activity

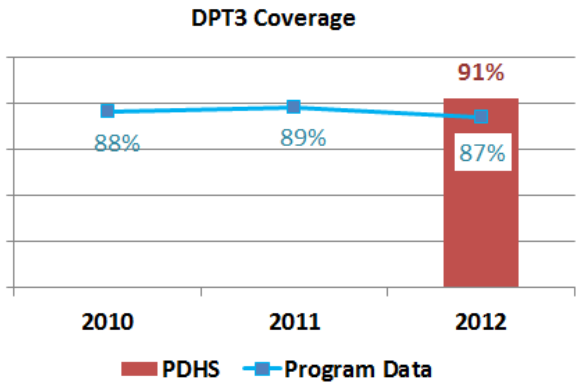
SIS	Skilled Immunization Staff
SOPs	Standard Operating Procedures
SWOT	Strengths, Weaknesses, Opportunities and Threats
THE	Total Health Expenditure
THQH	Tehsil Headquarters Hospital
TPM	Third Party Monitoring
TT	Tetanus Toxoid
UC	Union Council
UK	United Kingdom
UNICEF	United Nations Children's Fund
USD	United States Dollar
VPD	Vaccine Preventable Disease
WHO	World Health Organization

Immunization Situation Analysis Summary 2010-2012

Immunization Achievements

- Polio free since 2008
- High DPT3 coverage since 2010
- EPI Centers established under public-private partnership
- Above 90% coverage in Polio Eradication campaigns

Immunization Coverage

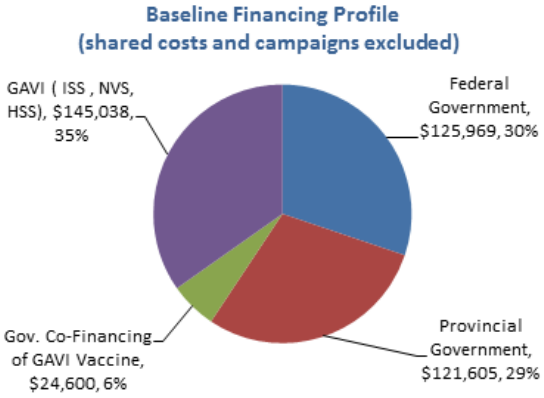


Immunization System Analysis

- Immunization in rural areas entirely dependent upon availability of vaccinators
- Target setting primarily limited to passing on immunization targets set by Federal EPI Cell
- Difficulties in regulating EPI activities in private health sector
- Small number of health centers and workforce under direct administrative control of CDA

Health System Constraints

- No practice of developing annual health plans
- Difficulty in developing linkages with communities due to lack of community base health workers



Baseline Costing Profile

Total Immunization Expenditures ($)	576,339
Campaigns ($)	158,248
Routine Immunization only	418,092
per capita ($)	0.46
per DTP3 child ($)	16.4
% Vaccines and supplies	50%
% Government funding	67%
% Total health expenditures	2%
% Gov. health expenditures	15%
% GDP	0.04%
Total Shared Costs ($)	31,867
% Shared health systems cost	5%
TOTAL ($)	608,206

cMYP Summary: 2014 - 2018

Immunization Priorities

- Polio eradication
- Increasing immunization coverage and reducing vaccine preventable disease
- Extending the reach of immunization services to remote area populations
- Improving the quality of immunization through improved cold chain and logistics
- Introducing new vaccines (IPV/Rotavirus)

Immunization Goals &Objectives 2014-18

- Measles incidence reduced to less than 5 case per million population by 2018 with optimally functioning surveillance system
- Sustaining zero polio case status
- Neonatal death caused by neonatal tetanus reduced to less than 1 case per 1000 live birth by 2018
- Sustaining DPT3 coverage more than 90% by 2018
- Increase the % of children fully immunized to 80% by 2018

Programme Monitoring Framework

DTP3 coverage

87%

92%

Measles 1 coverage

87%

90%

PCV-10 coverage

92%

% of children fully immunized

75%

80%

% of zones that have at or above 80% DTP3 coverage

36%

100%

Dropout rate - % point difference between DTP1 and DTP3 coverage

12%

4%

Priority Immunization Programme Strategies

- Develop CDA-specific EPI policy especially for private health sector
- Develop and institutionalize performance management system
- Introduce mechanisms of accountability through third party monitoring
- Increase the number of skilled immunization staff
- Develop and implement evidence based communication strategies

Health and Development Impacts

- Reduce funding gap for immunization
- Improve child survival through contribution to achievement of MDG Goal 5
- Reduced disability in the community associated with vaccine preventable disease (Polio)

Partnerships & Sustainability Strategy

- Enhance efficient utilization of human resources by developing synergies with other private health sector
- Minimize wastage of resources under immunization program
- Advocacy for ensuring financial sustainability of immunization program

Cost and Financing projections

1. Situational Analysis

1. Background information

1. Administrative and political structure

In 1960, the Government of Pakistan decided to relocate the capital of country out of Karachi and establish a new city, Islamabad, as the Capital of Pakistan. The Capital Development Authority (CDA) was created to undertake the municipal functions. In 1981, the Federal Government reorganized the administrative hierarchy and created a new administrative setup, the Islamabad Administration.[1]

Administratively, Islamabad was divided into two segments: Islamabad Urban area proper, including institutional and industrial area, and Islamabad rural area. The administrative control of the Islamabad rural areas was assigned to the Islamabad Administration, headed by a Chief Commissioner Office under the direct administrative control of the Federal Ministry of Interior.

The CDA was declared the executive authority for Islamabad Urban areas. It addition, CDA was also given the executive powers for planning and coordination in Islamabad.

Under the federal government's organizational setup, CDA is controlled by the Cabinet Division of the Government of Pakistan through its CDA Wing.[2] A CDA Board has been constituted for the management and administration of CDA comprising a Chairman, Member Finance & Accounts, Member Administration, Member Planning & Design, Member Engineering, Member Environment and Member Estate. Commissioner Rawalpindi and Chief Commissioner Islamabad are also the ex-officio members of the CDA Board.[3]

The organizational structure of CDA is divided into a Chairman's Secretariat and six Technical Wings.[4] Each technical wing, headed by the respective Member of the CDA Board, consists of departmental directorates. Under the administration wing, two directorates have been established for the health services: Capital Hospital Directorate and Directorate of Health Services.

2. Landscape and climate

Islamabad is located at the foothills of Margala mountains range and features an atypical version of a humid subtropical climate, with hot, humid summers accompanied by a

1 Islamabad Capital Territory Administration, Government of Pakistan. (Accessed on 28 Feb. 2014 http://www.ictadministration.gov.pk/index.htm)

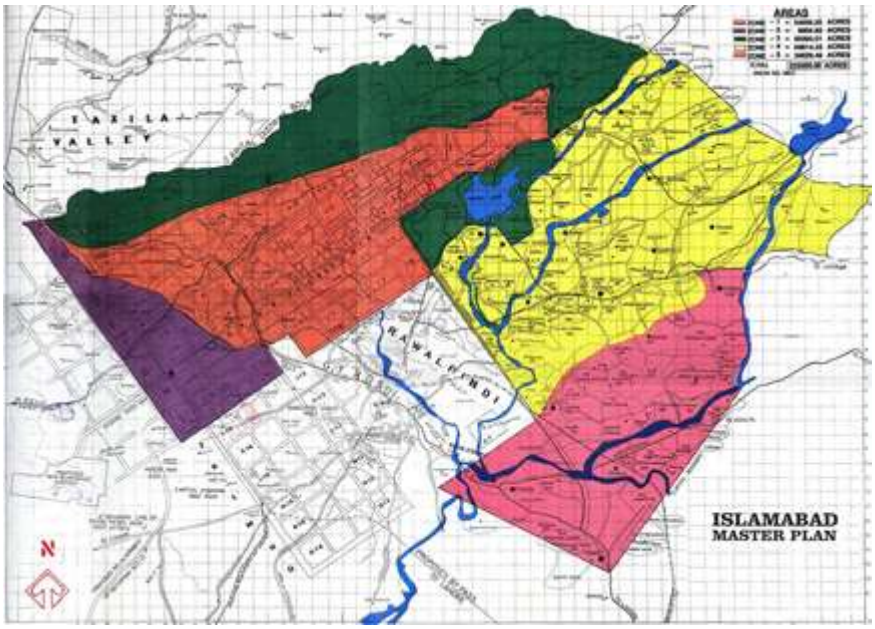
2 Overview of Cabinet Division by The Cabinet Division, The Government of Pakistan (Accessed on 28 February 2014 http://www.cabinet.gov.pk)

3 Board Members by Capital Development Authority, Government of Pakistan (Accessed on 28 February 2014 http://www.cda.gov.pk/about_us/board/)

4 Administration Wing, Finance Wing, Estate Wing, Environment Wing, Planning and Design Wing And Engineering Wing.

monsoon season followed by cool winters.[5] It is spread over an area of 906.5 square kilometers which is further divided into three sections: Islamabad Urban Area (220.15 sq. kilometer), Islamabad Park (220.15 sq. kilometer) and Islamabad Rural Area[6] (466.20 sq. kilometer). A further 3626 sq. kilometers area is known as the Specified Area, with the Margala Hills in the north and northeast.

Figure : Map of Islamabad



Source: http://www.picstopin.com

For provision of immunization services, the Directorate of Health Services (DHS) has divided Islamabad into 16 zones (Figure 2). Seven out these zones cover rural component of the Islamabad population excluding areas covered by the District Health Department (ICT Administration).

5 Facts and Statistics by Capital Development, Government of Pakistan. (Accessed on 28 Feb. 2014 http://www.cda.gov.pk/about_islamabad/vitalstats.asp)

6 Islamabad Rural Areas are under the administrative control of Islamabad Administration.

Figure : Demarcation of Immunization Zones in Islamabad

The geographical and climatic characteristics does not pose major challenges to the health care delivery including immunization services except the hot summers when frequent power breakdowns create difficulties in maintain cold chain in summers.

3. Demographic

According to the 1998 census, the total population of Islamabad was 805,235.[7] In 2012, as per the projections estimated by the DHS, this population has grown up to 908,754. It is pertinent to mention that the population projections by DHS do not include the rural population (472,454) covered by District Health Department, Islamabad. The average population density in the urban population has been estimated as 2,476 persons per square kilometer which is 11 times higher than the national average of 225. Further details are presented in Figure 3.

Figure : Demographic profile of Islamabad Proper (CDA) for the year 2012 (baseline)

Demographic Profile	Urban	Rural	Total
Islamabad Proper (CDA)	545,252	363,502	908,754
Surviving Infants[8]	17,614	11,743	29,357
Pregnant Women	19,466	12,977	32,443
Women of Child Bearing Age	119,956	79,970	199,926

Birth registration is essential for maintaining accurate vital statistics. Births and deaths reported from urban areas are registered by the CDA authorities. However, CDA does not entertain registration of births and deaths reported from the rural areas that are not covered under its development schemes. Some of the permanent residents of the rural areas get their births registered in the union council offices of the adjacent union councils that are working

7 Bureau of Statistics, Government of Pakistan.

8 Surviving Infants are estimated by using the cMYP Costing Tool

under the ICT administration. However, there remains a large segment of population which is registered because they have mostly migrated from the militancy affected areas of Federally Administered Tribal Areas (FATA). Similarly, during hard winters people migrate from the adjacent hilly areas of Murree and Azad Jammu & Kashmir (AJK). This seasonal migration is witnessed from October to February. Because there is no functional registration system in place; therefore, it is difficult to estimate a total increase in population. However, this situation creates problems for CDA immunization system in planning of the outreach activities especially for immunization.

4. Social and political context

1. Poverty

The socio-economic conditions and poverty levels in Islamabad highlight a gross urban-rural divide. The baseline equity assessment 2013, reveal that all the low income quintiles (monthly income less than PKR 10,000) were from the rural areas whereas all the high come quintiles (monthly income PKR 70,000-500,000) belonged to the urban developed sectors.[9]

2. Education

Urban Islamabad has the highest literacy levels in Pakistan. According to 1998 census, the adult literacy in Islamabad was 72.4% as compared to the national average of 43.9%. In comparison, the female literacy in Islamabad was 62.4% as compared to the national average of 32%. Findings from the Pakistan Social and Living Standards Measurement Survey 2010-11 indicate that the net enrolment rate for girls aged 5-9 years is 76% in Islamabad as compared to 53% at the national level.[10]

Maternal education is considered a cornerstone in health and development. Therefore, better literacy rates in Islamabad provide an opportunity to utilize demand generation and social mobilization campaigns to promote health related awareness and practice in an effective manner.

3. Culture and traditions

Islamabad has relatively a recent history and is a planned city; therefore, its urban areas depict a modern culture. There are no specific traditions as the residents in the urban areas belong to all provinces of Pakistan and life style is of a modern developed city. In comparison, the rural areas are dominated by strong social and cultural values and clan system (bradarism). Urdu is official language and other major regional languages include pothohari and Punjabi. Traditionally, Islamabad is known as a peaceful area.

For the health program designers, it is important to account for the differences in social and cultural values and practices between urban and rural population which could provide potential areas to design effective communication campaigns and influence for acceptance of health care interventions.

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9 Baseline Equity Assessment 2013 by Directorate of Health Services, CDA, Islamabad and World Health Organization

10 Federal Bureau of Statistics. Pakistan Social and Living Standards Measurement Survey, 2010-11. Islamabad: Statistics Division, Government of Pakistan.

5. Public expenditure management

The preparation of annual budgets for the public health sector is primarily a responsibility of the Directorate of Health Services (DHS). The duration of a fiscal year is spanned over 12 months, from 1st July to 30th June. Generally, the process of preparation of annual budget starts 4-5 months before the start of a fiscal year. The DHS budget comprises two components: recurrent (non-development) budget and non-recurrent (development) budget. The former is utilized for meeting expenditures of the on-going government operations whereas the latter is allocated to finance new development schemes.

As a general practice, the recurrent budget is allocated for meeting the recurring expenses such as wages, allowances, operational costs and utilities. All the government departments prepare and submit their sector-specific budgets to the finance department. Generally, the estimates for wages and allowances are accepted as such. However, budgetary allocations requested for operational costs and utilities often face cuts depending upon the fiscal space the government has under its revenue collection.

Both recurrent and development budgets are submitted to the Administration and Finance Wings which consolidate annual budget requirements from all the concerned directorates for onward submission to the CDA Board for approval.

Once approved, the budgets are released to the concerned directorates for expenditure. In comparison to other government institutions, CDA generates its revenues from its own resources. However, nearly 11% of the budget is supported by the Federal government by allocation through Public Sector Development Program (PSDP) and a maintenance grant.

This scenario clearly indicates that DHS has to utilize its planning and communication skills in order to increase its share in CDA's annual budgets.

2. Health Sector Analysis

1. Governance

The governance structure of the CDA health sector is divided into two directorates: Capital Hospital Directorate and Directorate of Health Services. Both of these directorates operate under the Administration Wing of CDA. Capital Hospital Directorate looks after the administration and management of CDA Capital Hospital, a tertiary care hospital, where CDA employs and their dependents are treated free of charge whereas the general public has to pay for indoor and specialized services.

The Directorate for Health Services looks after ten CDA Health Centers which out-door and primary health care. These health centers do not offer maternity care services and mostly operate 6 hours a day. Besides managing these health centers, DHS is also responsible for immunization service delivery both for routine EPI and Polio eradication activities.

The DHS is headed by a Director Health Services who is supported by two additional directors. Under the guidance of one additional director, a district vaccination superintendent (DSV) is responsible for management and supervision of immunization system.

At the CDA health center, the health facility in-charges are responsible for provision of clinic-based health services. It is pertinent to mention that no primary or secondary health

facilities have been established in the rural areas. Immunization services in the rural areas are delivered by vaccinators through outreach visits.

Private sector pays a major role in provision of health service in urban areas of Islamabad. Twenty five vaccination centers have been established in 25 private hospitals. However, there is no formal policy mechanism in place to provide a strategic guidance for establishing vaccination centers in the private health sector.

Within the CDA-administered health sector, the power and authority is centralized at the level of the CDA Administration Wing. There is no practice of developing annual health plans. On account of not setting sector-specific targets, it is difficult for the CDA authorities to review the overall performance objectively.

2. Health workforce

There is no information available on the number of doctors and female health care providers available in the private sector in Islamabad. The DHS is operating through a small number of health managers and healthcare providers.

The selection criteria for the recruitment against different cadres of staff (doctors, lady health visitors, vaccinators) require certification from a recognized training institute. The health workforce is recruited on the on the basis of provincial/regional quota stipulated by the federal government for employment in federal areas. The CDA Secretariat is authorized for recruitment against vacant positions as well as creation of new positions.

Promotion of employees is linked to length of service. For example, Basic Pay Scale 6 (PBS-6) is promoted to BPS-9 after ten years of service. It requires another 5 years of service (15 years from induction in service) for promotion to BPS-14. The employees who serve 5 years in PBS-14 are eligible to be promoted to BPS-16. Therefore, a long serving vaccinator can have the same level of seniority as compared to a newly inducted DSV (BPS-16).

It is pertinent to mention that in the CDA-administered areas, as compared to the ICT-administered rural areas, Lady Health Workers Program has not been implemented. For this reason, the vaccinators have limited access inside the households especially for immunizing mothers and pregnant women.

3. Finance

The General Government Health Expenditure (GGHE) allocated by the CDA for 2013-14 is PKR 897 million, 2.6% of the total General Government Expenditure (GGE) (Figure 4).

Figure : Comparison of Government Expenditures for the year 2013-14

		2013-14 PKR in Millions
General Government Expenditure (GGE)	*Recurrent*	13,079
	Development	20,906
	Total	33,984
General Government Health Expenditure (GGHE)	*Total*	897

GGHE as % of GGE	2.6

The GGHE comprised budget allocated for Capital Hospital Directorate and Directorate of Health Services. For the year 2013-14, 92% of the GGHE has been allocated for Capital Hospital Directorate whereas the share of Directorate of Health Services is 8% only.

4. Medical products and Technology

CDA has established a centralized system for purchasing medical products and other supplies. Tenders are advertised and the potential suppliers are notified by the Capital Hospital management. Rate contracts for different medicines are negotiated on annual basis. The DHS is authorized to purchase medicines and other supplies from the suppliers by CDA Hospital management as per its requirement for CDA health centers.

5. Service delivery

The health services delivery system, in relation to EPI only, is a mix of government and private health sector facilities (Figure 5).

Figure : Service delivery capacity in public healthcare system – static

Type of service	Number of facilities		
	Required	Functional	Delivering EPI
Public			
1. **CDA Health Centers**	10	10	10
2. **Health Centers attached with Federal Government Poly Clinic Hospital**	No information	8	8
Private			
1. **Private Hospitals and Clinics**	No information	No information	25

Figure : Service delivery capacity per type of healthcare professional – community level

Type of service	Number of facilities		
	Required	Functional	Delivering EPI
Public			
1. **LHWs**[11]			
2. **LHSs**			
3. **LHVs**	No information	2	2
4. **Vaccinators (CDA)**	37	12	12
5. **Dispensers (Federal Government)**	No information	8	8
Private			
6. **Dispensers (Private Hospitals)**	No information	25	25

11 LHW Program does not operate in CDA administered areas

6. Health Information management

A reliable information system is considered the backbone of any health system because it provides the required information to analyze any gaps between health needs and health service provision. It helps the leadership and governance at different levels to analyze the effectiveness and efficiency of the existing service delivery apparatus. In a way, the information flow provides a tool to integrate all the system building blocks for achieving the health system objectives and goals.

There is no formal health information system[12] under implementation as in rest of the country. The Directorate of Health Services has devised its own proformas to compile information on health service outputs from CDA health centers.

12 Health Information Management System (HMIS) and District Health Information System (DHIS)

3. Immunization system

1. Routine Immunization

Figure : Situational Analysis – routine immunization

Indicators	2010	2011	2012
Official Coverage Estimates			
DTP1	92%	97%	99%
DTP3	88%	89%	87%
Measles 1	83%	87%	87%
Measles 2	76%	71%	75%
OPV0	93%	86%	97%
Most Recent Survey Coverage % DTP3			91%[13]
% Fully Immunized Child	83%	87%	87%
Access and demand			
% Drop Out DTP1 - DTP3	4%	8%	12%
% Drop Out DTP1 - Measles (1st dose)	9%	10%	12%
% Drop out Measles 1st and 2nd dose	7%	16%	12%
Immunization Equity			
% gap in DTP3 between highest and lowest socio economic quintiles	0%	0%	0%
Number and proportion of districts with DTP3 coverage > 80%	1 (100%)	1 (100%)	1 (100%)
New vaccines introduced into the routine schedule in the last plan period			
PCV10	0%	0%	0%

Level of Program Coverage

The official reports reflect high coverage rates for the last three years (2010-12). These coverage rates are not uniformly achieved across CDA covered areas as 6 rural zones are reporting less than 80% coverage for DPT3. The official data reports 102% coverage for DPT1 in 2012 which shows discrepancies in data reporting. Apparently, these high coverage rates are also confirmed by the results of the Pakistan Demographic and Health Survey (PDHS) 2012-13; however, there is a need to take some caution because of the problems in data reporting and calculation of target population. The coverage rates for fully immunized children are on the higher side. In practice, coverage for Measles-I is reported as fully immunized children. This aspect is further substantiated by the reality that the reported data is not validated at zone level. This difference was more prominent in cases of vaccination against Tetanus Toxoid (TT). The PDHS 2012-13 results show TT coverage of 75% whereas the official estimates reflect coverage of 25% in 2012.

The government officials and other stakeholders who participated in cMYP planning workshop were cognizant of this discrepancy in reporting and with a consensus decided that the program data will be used as baseline for cMYP planning process. However, these benchmark coverage and targets will be revisited after EPI coverage survey 2014.

Program effectiveness

13 Pakistan Demographic and Health Survey 2012-13

The findings presented in Figure 7 reflect that a substantial proportion of children is lost before they become due for next dose of an antigen. On average, 8% children are lost between DPT1 and DPT3. This gap further increases up to 12% between Measles-1 and Measles 2. Persistent dropout has implications in terms of more chances of morbidity and mortality but also for wastage of resources. These gaps are the key areas to be addressed in order to achieve effective and efficient vaccine coverage and outcomes.

2. Accelerated Disease Control Initiatives

Figure : Situational Analysis - by accelerated disease control initiatives

Indicators	2010	2011	2012
Polio			
OPV3 coverage	88%	89%	87%
Number of rounds and sub-national rounds per year	9	10	8
Coverage Range	98%	98%	98%
MNT			
TT2+ coverage	22%	23%	25%
Number and proportion of districts reporting >1 case of neonatal tetanus per 1000 live birth	1 (0%)	1 (0%)	1 (0%)
Was there an SIA? (Y/N)	No	No	No
Neonatal deaths reported and investigated			
Delivery at Facility Rate[14]			
Measles & Rubella			
Measles / MR vaccination coverage (1st dose)	83%	87%	87%
Measles / MR vaccination coverage (2nd dose)	76%	71%	75%
Number of lab confirmed measles/rubella outbreaks		27	32
Geographic extent National Immunization Day			
Age Group (in months)	0-60	0-60	0-60
Coverage			
Total Measles Cases (Lab/Clinical/epidemiological)		34	43
Total Rubella Cases (Lab/Clinical/epidemiological)			

The overall situation for accelerated disease control initiatives indicates moderate vaccine coverage and negligible morbidity levels for vaccine preventable diseases except Measles. Poorly functioning surveillance system is an accepted reality in Pakistan. Therefore, the participants of cMYP workshop decided that it would be unwise to use the presently reported figures as baseline for morbidity and mortality. The targets for reducing vaccine preventable morbidity and mortality will be revised once a fully functional surveillance system is in place

14 CDA Health Centers do not provide maternity care services

3. Analysis of Immunization system performance

Program Management

Program management	2010	2011	2012
7. Law & Regulation			
2.1 Is there legislation or other administrative order establishing a line item for vaccines?	No	No	No
2.2 Is the line item for vaccines in regular / recurrent Budget	No	No	No
2.3 Are regulations revised in the province to implement national or provincial policies?	Yes	Yes	Yes
3. Planning			
3.1 Does the country/Province have an annual work plan for immunization funded through Health Authorities budgeting processes?	No	No	No
3.2 What is the number of Zones with an annual micro-plan for immunization?	None out of 16	None out of 16	None out of 16
3.3 Number of planned supervision visits conducted vs. the number of planed visits	No data	No data	No data
4. Coordination and advocacy			
4.1 What were the Number of ICC (or equivalent) meetings held last year at which routine immunization was discussed?	Not established	Not established	Not established
4.2 What were the Number of NITAG (or equivalent) meetings held last year?	Not established	Not established	Not established
4.3 How many presentations on immunization performance, expenditures, were made to Parliament?	None	None	None

The DHS follows National Immunization Policy and no CDA-specific policy has been developed so far. The EPI program managers believe that because DHS has been providing immunization services through a diverse range of care providers (CDA Health Centers, Federal Government Health Centers and Private Hospitals and Clinics), there is a dire need to develop a CDA-specific EPI policy especially in the context of immunization service provision through private health sector. Under the present arrangement, DHS signs a Memorandum of Understanding (MoU) with the private health facilities before granting permission to operate a fixed EPI center. In addition, DHS provides vaccines and injections supplies on a regular basis. However, there is formal no mechanism in place to monitor and supervise opening of new Fixed-EPI centers as well as the on-going functional EPI centers in the private sector. In addition, there is a need to streamline the business processes and develop monitoring and supervisory instruments to enhance effectiveness of EPI activities.

Immunization delivery is an established component of the health care delivery system. Budgetary allocation for immunization services primarily covers salaries and overhead expenses. There is no budget line item for vaccine procurement because vaccines and other related materials are directly supplied by the Federal EPI cell.

Planning is one of the weak areas in immunization system in CDA. Largely, these plans are limited to implementation of policy and program directives disseminated from the Federal EPI cell. There is no culture of developing and implementing annual plans, both for implementation and monitoring and supervision. One of the major reasons is that the CDA EPI team is not formally trained in developing annual health plans.

The present EPI management structure is an established entity but inadequately staffed. The overall management activities are managed by a DSV under supervision of an additional director health. They are well versed with the program modalities on account of their extensive work experience in health department; however, they are not formally trained in managing an immunization system. In addition, no standard operating procedures (SOPs) are being followed under program management. Surveillance and logistics management require specialized expertise. These aspects are not supported by the existing management structure.

The program managers are well aware of the importance of linking cMYP with other government documents. Therefore, the activities and targets of this cMYP are being aligned with two key documents: PC1 (under process) and Plan of Action (agreed upon in February 2013).

Target setting is primarily limited to passing on the immunization targets set by the Federal EPI cell down to the level of zones. These targets are not matched with resource requirement estimates. One of the major problems that the EPI managers face in CDA-covered areas is lack of information about the total number population in a given locality, especially rural areas. In order to overcome this limitation, polio coverage data is used to estimate the total number of population through 'reverse engineering' process. However, it is an accepted reality that there exist major mistakes in calculation of estimated targets as the total number of child vaccinated during PEI campaign keep on changing with every round.

Human Resource Management

Human Resource Management	2010	2011	2012
1. Availability of qualified workforce:			
4.4 Number of healthcare skilled immunization staff per 10,000 population			0.4
4.5 % of vaccinator posts currently vacant			29% (notified by CDA)
4.6 Turnover rate of SIS (or vaccinators specifically)	Negligible	Negligible	Negligible
5. Capacity building			
5.1 Number (and proportion) of immunization program staff trained in immunization services through MLM, IP or other training modalities per year:			
a) Mid-wives and LHS			None
b) Nurses			None
c) Other Skilled immunization staff (vaccinators)			Yes
d) Managers			None
e) Technicians			None
f) Other			
5.2 % of immunization health workers Refreshing trained in immunization in the last two years			95% (vaccinators only)
5.3 Curriculum review for pre-service medical and nursing immunization education conducted			None

The available health force formally trained on immunization comprises vaccinators and paramedical staff at CDA health centers, Federal Government's health centers and private hospitals/clinics. There are 12 vaccinators available and 95% of them have gone through refresher trainings in the past one year. Similarly, DHS has trained 33 health care providers to provide immunization services at Federal Government's health centers (8) and private hospitals (25). This entire staff is paid by their respective institutions and DHS only conducted their trainings on immunization practices.

Figure : Availability and workload of skilled immunization staff (2012)

Accredited EPI Service Providers	Posts occupied (in FTE)	Share of Total Operation Time allocated to Immunization	Share of immunization time spent on PEI	FTE spent on PEI	Available (FTE) for EPI	Total FTE spent on immunization
Vaccinators	12	100%	20%	2	**10**	**12**
Nurses						
Dispensers	14	50%	5%	0	**7**	**7**
Lady Health Visitors (LHVs)	2	50%	5%	0	**1**	**1**
Medical Technicians (MT)						
Female Medical Technicians (FMT)						
Mid-wives	2	0%	0%	0	**0**	**0**
Lady Health Workers (LHWs)						
Dispensers (Federal Government's health centers)	25	100%	5%	1	**24**	**25**
Dispensers (Private hospitals)	8	100%	5%	0	**8**	**8**
				3 (6%)	**50 (94%)**	**53 (100%)**
Total FTE available for EPI (except PEI)						**50**
Total FTE Needed for EPI (except PEI)						**80**
Deficit						**30 (38%)**

The existing staff strength shows that 71% of vacancies of vaccinators are filled at Directorate of Health Services. However, this number is well short of the total requirement (37 vaccinators) if the criterion of vaccination staff required for rural population under National EPI Policy is followed (one vaccinator per 5000 rural population). The EPI managers believed that the number of skilled immunization staff working at 43 fixed EPI centers is sufficient to cater the needs of these static vaccination centers. However, 25 more vaccinators are required to meet the vaccination needs of the rural population where no health centers are available to establish fixed EPI centers. In order to meet this target, CDA requires Fulltime Equivalent (FTE) of 80 for CDA (Figure 9).

The problems of human resource management in CDA are not limited to availability of Skilled Immunization Staff (SIS) only. There is also severe shortage of human resources in the management structure in the DHS. There is no full time EPI focal person or coordinator, surveillance officer, or communication officer for implementation of EPI activities in an effective manner. Majority of these positions even do not exist in the present hierarchy of the DHS. It becomes very difficult for the DHS to perform all these roles with the help of a single district superintendent vaccination (DSV). Moreover, training for Midline Managers (MLM) is not a regular feature of human resource management.

It is pertinent to mention that the DHS has almost no authority in hiring staff on permanent basis. All these positions are recruited by the CDA secretariat. In addition, the concerned departments consider that the existing human resource (HR) policy of the Federal government does not allow recruiting vaccinators from the respective union councils, as recommended under the National EPI Policy, because these positions are distributed and filled according to the federal quota allocated to different provinces and regions. The Federal recruitment policy is based on the provision in the Constitution of Pakistan 1973 which created a quota system for employment in the federal areas in order to ensure participation of all four provinces and the federating units.[15] Initially, this quota system was devised for a period of 20 years.[16] However, this policy was not abolished afterwards. In 2013, the present government also decided to continue with the same quota system.[17] However, in reality the Federal human resources policy should have been applied to those cases only which serve the whole Pakistan. Vacancies in posts in BPS 3-15 in offices that serve only a particular province or region (as in the case of CDA and ICT) should have been filled by appointment of persons domiciled in region concerned.[15]

Majority of the existing EPI staff was initially employed for three years on contractual basis under the GAVI support and then afterwards, regularized by the CDA authorities.

Costing and Financing

Costing and financing	2010	2011	2012
6. Financial sustainability			
6.1 What percentage of total routine vaccine spending was financed using government funds? (including loans and excluding external public financing)	0%	0%	0%
6.2 What proportion of the line item in the CDA budget for immunization was actually funded (actually allocated / planned)?	100%	100%	100%
6.3 What % of immunization resources are being met by the domestic health budget (as identified in the annual budget plan)	100% (for notified HR only)	100% (for notified HR only)	100% (for notified HR only)
6.4 Government expenditures on routine immunization per surviving infant (USD)			16.4
6.5 Are provincial immunization budgets and expenditures monitored and reported at national level?	No	No	No

Historically, vaccine procurement has remained a responsibility of the Federal EPI cell. Therefore, no budget has been earmarked by the CDA to date. The expenditure for vaccine procurement is met from resource allocation from GAVI, Federal government's share in co-

15 Civil Establishment Code (Estacode), Establishment Division, Government of Pakistan (Available at: http://www.fab.gov.pk/category/establishment-publication)

16 Distribution of provincial/regional quota: Merit quota (7.5%), Punjab including Federal Area of Islamabad (50%), Sindh (19%), Khyber-Pakhtunkhwa (11.5%), Balochistan (6%), GB/FATA (4%) and AJK (2%)

17 Cabinet session: Federal job quota gets new lease of life, The Express Tribune (published on 26 July 2013 and accessed on 18 March 2014 at: http://tribune.com.pk/story/582145/cabinet-session-federal-job-quota-gets-new-lease-of-life/)

financing of GAVI vaccines and Federal government's allocation for traditional vaccines and injection supplies.

The CDA government provides funds for immunization services through its non-recurrent annual budget. The main components include salaries and allowances[18] (against notified vacancies only) and operations cost.

Resource allocation processes are generally linked with the available staff positions. In the absence of a formal activity-based implementation and monitoring plan, it is difficult for the EPI managers to negotiate additional funds to meet their operational costs. In addition, the budget allocation for district levels covers all other health programs including EPI; therefore, it is difficult to rationalize the required costs for EPI related operations within a district.

Vaccine, Cold Chain and Logistics

Vaccine supply, quality and logistics	2010	2011	2012
1. Transport / Mobility			
6.6 Percentage of districts with a sufficient number of supervisory/EPI field activity vehicles /motorbikes/bicycles (based on their need) in working condition			100% for DHS, 100% for DSV
6.7 Number of zones with vaccinators using transportation means for outreach			12[19]
7. Vaccine supply			
7.1 Was there a stock-out of any antigen at provincial or district level during 2012?			Yes
7.2 If yes, specify duration in months			September and October (Stock outs in Federal EPI Store)
7.3 If yes, specify which antigen(s)			All vaccines
8. Cold chain / logistics			
8.1 Number of Fixed EPI centers with adequate numbers of appropriate and functional cold chain equipment			43
a) With ILR			18
b) With any kind of refrigerators			25
8.2 Availability of a cold chain replacement plan			No plan
9. Waste disposal			
9.1 Availability of a waste management policy (guidelines/SOP)			Yes
9.2 Number of districts implementing waste management policy			Yes[20]

Uninterrupted supply of vaccine, proper maintenance of cold chain and availability of other logistics are the key components of a functional immunization program.

18 Allowances include multiple items: house rent, professional allowance, medical allowance, conveyance allowance etc.

19 14 motorbikes were provided prior to 2009

20 Used syringes are packed in safety boxes and disposed of by pit digging and burial

There is no central storage system for vaccines in DHS. The DHS receives vaccines from the Federal EPI Cell almost every two months. In addition, there is no warehouse for storage. All the vaccinators have a functional means of transport. In contrast to other district of Pakistan, CDA has established a criterion for allocation of POL. As per the existing CDA policy, every vaccinator is allocated 32 liters of Petrol for outreach services every month.

Immunization Services Delivery

Immunization services	2010	2011	2012
10. Geographical access:			
10.1 Number of population per each EPI fixed sites			21,134
10.2 Proportion of area covered by immunization service to the total populated area			No data
10.3 Proportion of zones not having EPI centers			36%
10.4 Proportion of zones not having Skilled Immunization Staff (SIS)			None
11. Efficiency of service delivery			
11.1 Share of immunization services delivered by EPI centers			No data
11.2 Average time EPI Centers provide immunization service per day			6 hours in Public Sector Extended hours in private sector

There are 43 EPI centers established in the urban areas. For immunization service delivery, Islamabad urban and rural areas are divided into 16 zones. The main purpose of establishing these zones was to distribute workload among vaccinators. Seven of 16 zones cover rural population and there is no fixed EPI center established in these seven zones. The CDA health centers are used as central points for providing logistic support for outreach immunization services.

It is important to highlight that EPI centers in the private health sector are established in response to the demand from the respective hospitals and clinics. The DHS takes necessary measures to fulfil these demand otherwise there is no policy on how many EPI centers are required to be established in the urban areas.

Surveillance and Reporting

Surveillance and Reporting	2010	2011	2012
12. Routine Surveillance			
12.1 Percentage of integrated VPD surveillance reports received at DHS from Fixed EPI centers compared to number of reports expected:			
a) Timeliness			50%
b) Completeness			100%
12.2 AFP detection rate/100,000 population under 15 year of age		1.8	2.4
12.3 % suspected measles cases for which a laboratory test was conducted		79%	74%
12.4 Number of neonatal deaths for which a follow up investigation was conducted			0
12.5 Sentinel Surveillance for Rotavirus established			No

12.6 Sentinel Surveillance for meningitis (Hib/PCV) established			No
12.7 % of suspected meningitis cases tested for Hib/pneumococcal disease according to standard protocol			0%
13. Coverage monitoring			
13.1 % gap in match between DTP3 survey coverage and officially reported figures			Survey coverage is higher than the program reported data
14. Immunization safety			
14.1 % of EPI centers that have been supplied with adequate (equal or more) number of AD syringes for all routine immunizations	100%	100 %	100%
15. Adverse Events			
15.1 National AEFI System is Active with a designated national/provincial committee			No
15.2 Number of serious AEFI cases reported and investigated			No

Surveillance is very important for monitoring the status of vaccine preventable diseases. It requires that all reports are received complete and timely, from health centers to the central level. In practice, surveillance reports are received from all the health centers but their timeliness is well below par. Although these reports are considered complete, no validation is carried out at district level. There are 26 active surveillance sites established but there effectiveness remains under par on account of non-availability of trained staff for surveillance. Under the present situation, it is not possible to conduct outbreak investigations or any epidemiological analysis for improving immunization service delivery.

Demand Generation, Communication and Advocacy

Demand Generation and Communication	2010	2011	2012
16. Communization strategy			
16.1 Availability of a routine immunization communication plan	No	No	No
16.2 KAP Study conducted in relation to immunization	No	No	No
17. Evidence based communication			
17.1 % of government funds on demand generation / communication: EPI and PEI	0	4.6%[21]	6.9%
a) EPI (without PEI)	0	0	0
b) PEI	0	4.6%	6.9%

Demand generation, communication and advocacy are importance for multiple reasons. These provide an opportunity to use EPI data as evidence to create awareness on importance of immunization for reducing morbidity and mortality due to vaccine preventable diseases. These activities not only enhance acceptability of immunization services but also create opportunities to tap support from communities and other stakeholders like political leadership. There is no communication strategy in place in CDA-covered areas. There are

21 %age of total DHS budget

examples of organizing special walks for raising awareness against Polio; however, these are not a part of a well chalked out communication plan. Despite these limitations, the CDA administration has shown its willingness to support Polio eradication activities. CDA allocated 4.6% and 6.9% of the total budget for DHS for polio eradication activities.

Summary - SWOT

Program Management	
Strength	**Weaknesses**
• Immunization a recognized government responsibility • National immunization policy and schedule in place • Improvisation for developing a network of immunization system in place	• Absence of EPI guidelines for private sector • Weak planning and monitoring processes • Absence of annual development plans • Weak management structure for immunization program • Program managers not formally trained in MLM trainings
Opportunities	**Threats**
• Involvement of top bureaucratic leadership in immunization activities especially for PEI	Seasonal migration from Murree and AJK for 4-5 months
Human Resource Management	
Strength	**Weaknesses**
• Regularization of GAVI support EPI staff • Training of health care providers from other than CDA employees on immunization practices • Human resources available in private health sector	• Use of Federal government's HR policy in conflict with National EPI Policy for vaccinators recruitment • Poor capacity of provincial EPI office due absence of qualified technical staff for surveillance, monitoring and evaluation, cold chain management • Absence of fulltime dedicated EPI coordinator at DHS level • 25 vacant positions of vaccinators (out of 80 required)
Opportunities	**Threats**
• Involvement of healthcare providers from private health sector	Non-availability of LHWs in rural areas
Costing and Financing	
Strength	**Weaknesses**
• EPI staff is paid through recurrent annual budget • CDA provides additional support for PEI activities	• EPI managers not trained in costing and financing • No rationalization of operation expenditures by determining unit costs • No budget line item for vaccine procurement
Opportunities	**Threats**
• Donor support	Limited fiscal space for PHC activities

Vaccine supply, quality and logistics	
Strength	**Weaknesses**
• Availability of functional cold chain equipment in 100% EPI centers • Availability of transport facility for vaccinators • POL allocation formula insulated from price hike	• Low storage capacity for vaccine and other logistics at district level • Inadequate planning for effective vaccine management • Lack of technical expertise for repair and maintenance
Opportunities	**Threats**
• Availability of space for constructing warehouse in government health facilities	Frequent power breakdowns
Immunization Services	
Strength	**Weaknesses**
• Availability of established fixed EPI centers both in public and private sector • 100% notified EPI centers are functional	• Absence of health centers in rural areas • EPI service provision in urban areas limited to fixed centers • Difficulty in target setting due to lack of information on actual population size • Lack of focus on dropout from vaccination
Opportunities	**Threats**
• Large private health sector	Limited availability of services in CDA health centers
Surveillance and Reporting	
Strength	**Weaknesses**
• Availability of up-to-date guidelines and standardized case definitions and reporting forms • Formal reporting system in place	• No use of surveillance data for program management • Absence of feedback mechanism from DHS to surveillance sites • Lack of staff qualified in surveillance • Irregular reporting from health facility level • Lack of validation of reported data
Opportunities	**Threats**
• Involvement of district bureaucracy in monitoring of polio eradication activities • Donors are willing to support strengthening of surveillance system	Surveillance not considered a priority in health sector
Demand Generation and Communication	
Strength	**Weaknesses**
• Consistency in making efforts to improve acceptability of vaccination among communities	• No context specific communication strategy is available • Immunization staff not trained in social mobilization and communication
Opportunities	**Threats**
• Availability of multiple mechanism for	• Media hype created by incorrect

communication (radio, TV, print media) • High literacy rates	reporting of morbidity and mortality by vaccine preventable diseases • Social barriers against immunization among population migrating from KPK

2. Immunization objectives and strategies

1. Program objectives and milestones

Goal of the CDA Immunization Plan is to decrease VPD associated morbidity and mortality:

1. Measles incidence reduced to less than 5 case per million population by 2018 with optimally functioning surveillance system
2. Zero polio status is sustained by 2018
3. Neonatal death caused by neonatal tetanus reduced to less than 1 case per 1000 live birth by 2018

The objective of the CDA Immunization Plan is to improve performance of the immunization system that is measured in terms of coverage and equity as listed below:

Indicators	2012	2014	2015	2016	2017	2018
1. **Increase DTP3 coverage**	87%	88%	89%	89%	90%	92%
18. **Increase Measles 1 coverage**	87%	88%	89%	89%	90%	90%
19. **Increase the proportion of population protected at birth from neonatal tetanus**	25%	30%	35%	40%	50%	55%
20. **Increase OPV3 coverage**	87%	88%	89%	89%	90%	92%
21. **Increase PCV10**	0%	88%	89%	89%	90%	92%
22. **Increase IPV coverage**			40%	80%	90%	92%
23. **Increase Rota vaccine coverage**				40%	80%	92%
24. **Increase the proportion of children fully immunized –(% of children aged 12-23 months who receive all basic vaccinations in a country's routine immunization program)**	75%	76%	77%	78%	79%	80%
25. **Improve geographical equity - % of Zones that have at or above 80% DTP3 coverage**	36%	42%	72%	84%	100%	100%
26. **Improve socio-economic equity - DTP3 coverage in the lowest wealth quintile is less than % points of the coverage in the highest wealth quintile**	No Data	Decreased by 5% from the baseline	Decreased by 10% from the baseline	Decreased by 15% from the baseline	Decreased by 20% from the baseline	Decreased by 25% from the baseline
27. **Decrease dropout rate - percentage point difference between DTP1 and**	12%	9%	8%	7%	6%	4%

DTP3 coverage						
28. Increased demand - % of children whose mothers intend to vaccinate children		Increased by 5% from the baseline	Increased by 10% from the baseline	Increased by 15% from the baseline	Increased by 20% from the baseline	Increased by 25% from the baseline

2. Strategies and main activities

1. Program Management

The objective of the immunization system component is to increase program management performance. It means that by 2018:

1. Immunization program planning is integrated into CDA's budgeting, namely:
    1. EPI annual plans are developed and consistent with the CDA cMYP
    2. PC1 are adjusted as needed and aligned with the EPI annual plans
2. One implementation annual progress report is produced and discussed with key stakeholders every year
3. The provincial cMYP is updated regularly reflecting either changes in the context (epidemiological, vaccine availability, etc.), resource availability or immunization system outcomes (achievements)
4. At least 2 meetings demonstrating contribution of EPI partners to the decision-making are held every year

Strategies and activities to achieve the component objective are as follows:

1. **Increase program management performance**
    1. Develop CDA-specific Policy/guidelines on EPI
        1. Review existing EPI policy and guidelines
        2. Develop CDA-specific EPI policy and guidelines including private sector
        3. Align cMYP, PC1 and EPI annual plans with EPI policy and guidelines
    2. Develop and institutionalize performance management system
        1. Set performance standards for immunization system
        2. Select indicators for measuring performance standards
        3. Implement performance standards
        4. Mobilize Technical support as needed (e.g. for Policy development, cMYP revision and development of performance management system)
    3. Review and develop effective and efficient management structure and procedures
        1. Review and analyze existing EPI management structure at DHS and zonal levels
        2. Identify gaps in availability of human resources and skill mix required for implementation of performance management system

3. Revise job descriptions
4. Revise or introduce new standard operating procedures
5. Revise or introduce new reporting mechanisms
6. Conductive regular review meetings at DHS level

4. Introduce mechanisms of accountability through third party monitoring
    1. Revise government rules and regulations for introducing a monitoring of immunization system through an external institution
    2. Engage external institution through formal advertisement
    3. Identify and finalize indicators for assessment
    4. Conduct bi-annual performance reviews through selected institution
5. Streamline business processes
    1. Assess competencies of key EPI management staff on a regular basis
        1. Develop assessment criteria/methodology
        2. Adjust regulations (introducing competency assessment as a mandatory procedure)
        3. Carry out assessments
    2. Develop capacity building plan for EPI program managers at DHS level
6. Advocacy and partnership building
    1. Produce regularly policy briefs/advocacy materials to share with high level officials
    2. Attend high level meetings and present immunization program achievements, challenges and solutions
    3. Organize consultations meetings with EPI partners and follow up implementation of decisions and actions agreed in the past

2. Human Resource Management

The objective of the immunization system component is to increase the availability of qualified human resources for the immunization program. It means that by 2018:

1. Proportion of population served to skilled immunization staff (SIS) increases from 62% to 94%
2. 95% of managerial and technical positions are staffed with qualified human resource

Strategies and activities to achieve the component objective are as follows:

2. **Increase the availability of qualified human resources for the immunization program**

The availability of qualified human resources for the immunization program will be improved by: hiring and training technical and managerial staff at district and union council levels, hiring new vaccinators, integrating available qualified health professionals in delivery of immunization services at health facility level, training and capacity building and enhancing staff motivation through provision financial and non-financial incentives.

Figure : Availability and workload of SIS (Baseline and Different Scenarios)

	Total FTE spent on immunization	FTE spent on PEI	Total FTE available for EPI (except PEI)	Total FTE Needed for EPI (except PEI)	GAP (in FTE and %)	
Baseline	53	3	**50**	80	**30**	38%
Scenario 1	78	3	**75**	80	**5**	6%

Due to a small number of human resources available directly working under DHS, limited options were available for developing different scenarios for improving Fulltime Equivalent for EPI by using HR Modelling Tool (Figure 10). It was realized that proceeding ahead with the National EPI policy of one vaccinator for 5000 population will be appropriate for the rural area covered under CDA's immunization system. In order to meet this target (Scenario 1), 25 additional vaccinators will be recruited (Strategy 2.3:). This strategy will reduce the gap in %FTE from 38% to 6%.

1. Increase the number of technical staff for program management, communication and data management at DHS level
    1. Advertise positions for a EPI coordinators, communication officer and data management officer
    2. Conduct interviews and select appropriate technical staff
2. Increase the number of SIS by recruiting 25 more vaccinators
    1. Advertise vaccinator positions in national/local media
    2. Select and contract new vaccinators preferably from the areas where they will appointed to
    3. Explore and provide professional/carrier growth opportunities to vaccinators
3. Increase the number of SIS by integrating available qualified health professionals in the delivery of immunization services especially from private health sector
    1. Assess opportunities (availability, readiness/willingness) for engagement of different categories of SIS into immunization program
    2. Carry out consultations with relevant health authorities and agree on feasible and sustainable arrangements
    3. Revise the regulatory framework (standards/guidelines, scope of work) in order to ensure the engagement of SIS in the immunization as planned
    4. Carry out trainings in immunization for dispensers and lady health visitors
4. Increase effectiveness of trainings of EPI medical and managerial staff:

1. Carry out refreshing training for each SIS at least once in 2 years
2. Carry out MLM training of managerial staff in planning (e.g. vaccine forecasting, budgeting), reporting, decision making and advocacy at least once in two years
3. Assess periodically competency of selected category of healthcare professionals involved in immunization
4. Introduce a system of pre and post trainings assessment of the knowledge of trainees
5. Train immunization staff in medical, surveillance and logistics required for the introduction of new vaccines

5. Increase motivation of key staff of the immunization program
    1. Assess regularly motivations of selected category of HR of the immunization system
    2. Develop and implement non-financial incentives (carrier growth opportunities, promotion, recognition/awards, etc.)

3. Costing and Financing

The objective of the immunization system component is to increase financial efficiency and sustainability of the immunization program. It means that by 2018:

1. Cost per DPT3 child will be increased from USD 17.6 to USD71
2. Immunization system outcome targets are balanced with the financial resources available:
    1. 90% of financial resources (secure + probable) mobilized vs. planned
    2. Coverage targets revised/adjusted to the availability of funding
3. Increase financial efficiency and sustainability of the immunization program.

The objective of increasing financial efficiency and sustainability will be achieved by: developing synergies between EPI and other health programs, minimizing wastage of resources and advocacy for ensuring availability of funds.

1. Enhance efficient utilization of human resources by developing synergies with other health initiatives
    1. Incorporate financial efficiency as a core component of MLM training
    2. Train EPI program managers on developing mechanisms for financial efficiency
    3. Increase number of SIS through integration of EPI with other private health hospitals
2. Minimize wastage of resources under immunization program

1. Rationalize use of POL for monitoring and supervision by management staff at DHS level
2. Rationalize use of POL for travelling by vaccinators at zonal level
3. Develop and introduce need-based supply of vaccines, syringes and other materials

3. Advocacy for ensuring financial sustainability of immunization program
    1. Assess the 'gap' between existing resources and future requirements
    2. Inform political and technical leadership about the importance of funding gap
    3. Mobilize political and technical leadership for increasing share for program-specific costs under non-recurrent budget
    4. Develop financial projections for mobilizing external donors
    5. Mobilize political and technical leadership for increasing share for program-specific costs under non-recurrent budget
    6. Utilize cMYP, PC1 and Annual Plans as key instruments for ensuring resource allocation

4. Vaccine, Cold Chain and Logistics

The objective of the immunization system component is to improve/sustain uninterrupted supply of vaccines to immunization service delivery. It means that by 2018:

1. Stock out at facility level is decreased to zero
2. EPI in CDA attains an EVM score above 80%

Strategies and activities to achieve the component objective are as follows:

4. **Improve/sustain uninterrupted supply of vaccines to immunization service delivery**
    1. Upgrade/maintain adequate cold chain equipment
        1. Assess of needs for cold chain update
        2. Prepare cold chain replacement plan
        3. Develop specifications and procurement plan (aligned with the availability of funding)
        4. Purchase and install necessary activity
        5. Provide maintenance services on a regular basis
    2. Improve vaccine management by implementing EVM Improvement plan
        1. Carry out EVM assessment
        2. Revise the annual work plan in accordance with the EVM improvement plan

3. Report on the progress of implementation of the EVM improvement Plan

3. Prepare cold chain and vaccine management for the introduction of new vaccine

1. Expand cold chain storage capacity at DHS level
2. Train vaccine management personnel in vLMIS
3. Train and equipment cold technician for repair and maintenance

5. Immunization Services Delivery

The objective of the immunization system component is to strengthen capacity of immunization service delivery. It means that by 2018:

1. Proportion of Fixed EPI centers not having Skilled Immunization Staff (SIS) is sustained at zero

Strategies and activities to achieve the component objective are as follows:

5. **Strengthen and optimize capacity of immunization service delivery**

1. Increase performance/efficiency (effective coverage) of existing EPI Centers
    1. Revise regulations
    2. Mobilize additional qualified staff SIS (see corresponding strategy 2.4 under component 2.2.2 “Human Resource Management”)
    3. Improve micro-planning through regular supportive supervision of designated staff at EPI centers
2. Increase vaccination coverage through effective outreach services
    1. Identify geographical areas to be covered through outreach services through zonal mapping
    2. Prepare zone-specific outreach immunization plans
    3. Monitor and supervise outreach immunization services

6. Monitoring, Surveillance and Reporting

The objective of the immunization system component is to increase performance of surveillance and routine monitoring/reporting. It means that by 2018:

1. Reliability and accuracy of administrative data increased:
    1. Discrepancy ratio (between administrative and survey data) decreases to 4%
    2. 80% of reporting units receiving satisfactory DQS score
2. Ability of surveillance to detect and report on certain cases increased:
    1. Number of non-polio AFP cases per 100,000 population detected and reported is increased from 11 in 2012 to 19 in 2018

2. Number of discarded measles cases per 100,000 population increased from 11 in to 19 in 2018

Strategies and activities to achieve the component objective are as follows:

6. **Performance of surveillance and routine monitoring/reporting improved**

    1. Streamline data collection and reporting practices (integrate EPI routine monitoring into data management mainstream)

        1. Assess main causes of data quality flaws
        2. Introduce regular system of formal feedback mechanism on the administrative reports of subordinated entities
        3. Conduct monthly program reviews
        4. Provide continuous supportive supervision
        5. Conduct immunization coverage survey
        6. Conduct DQS at regular interval

    2. Strengthen accuracy of reporting through validation in field

        1. Recruit qualified staff (see corresponding strategy 2.1 and 2.2 under component 2.2.2 “Human Resource Management”)
        2. Conduct data validation through field monitoring visits

7. Demand Generation, Communication and Advocacy

The objective of the immunization system component is improved knowledge and attitude toward immunization among target population. It means that by 2018:

1. % of children whose mothers intend to vaccinate children is increased by 25% from than the baseline
2. % of parents with children under 1 year of age aware of at least two benefits of immunization is increased by 25% from the baseline
3. % of parents with children under 1 year of age who can identify the nearest immunization center is increased by 25% from the baseline

Strategies and activities to achieve the component objective are as follows:

7. **Knowledge and attitude toward immunization improved among target population**

    1. Continue community mobilization and communication interventions that proved being effective:

        1. Conduct advocacy meetings with community leaders and district administration to sensitize and motivate them regarding the routine immunization
        2. Develop social mobilization plans at all levels

3. Capacity building of immunization staff involved in social mobilization
4. Conduct social mobilization activities as planned
5. Monitor social mobilization activities
6. Provide regular supportive supervision to social mobilization teams

2. Develop and implement evidence based communication strategies
    1. Conduct formative research of the target population regarding immunization
    2. Develop communication plan in the light of formative research findings
    3. Conduct communication activities as per plan
    4. Assess the effectiveness of the communication strategies

3. Implementation and M&E

Timelines for the cMYP

Objective/strategies/activities	2014	2015	2016	2017	2018
ISC Objective 1: **Increase program management performance**					
Strategy 1.1: Develop CDA-specific Policy/guidelines on EPI					
Activity 1.1.1: Review existing EPI policy and guidelines	■				
Activity 1.1.2: Develop CDA-specific EPI policy and guidelines including private sector	■				
Activity 1.1.3: Align cMYP, PC1 and EPI annual plans with EPI policy and guidelines	■	■	■	■	■
Strategy 1.2: Develop and institutionalize performance management system					
Activity 1.2.1: Set performance standards for immunization system	■				
Activity 1.2.2: Select indicators for measuring performance standards	■				
Activity 1.2.3: Implement performance standards	■	■	■	■	■
Activity 1.2.4: Mobilize Technical support as needed (e.g. for Policy development, cMYP revision and development of performance management system)	■	■	■	■	■
Strategy 1.3: Review and develop effective and efficient management structure and procedures					
Activity 1.3.1: Review and analyze existing EPI management structure at district and union council levels	■				
Activity 1.3.2: Identify gaps in availability of human resources and skill mix required for implementation of performance management system	■				
Activity 1.3.3: Revise job descriptions	■				
Activity 1.3.4: Revise or introduce new standard operating procedures	■				
Activity 1.3.5: Revise or introduce new reporting mechanisms	■				
Activity 1.3.6: Conductive regular review meetings at DHS level	■	■	■	■	■
Strategy 1.4: Revise and introduce mechanisms of accountability through third party monitoring					
Activity 1.4.1: Revise government rules and regulations for introducing a monitoring of immunization	■				

Objective/strategies/activities	2014	2015	2016	2017	2018
system through an external institution	■				
Activity 1.4.2: Engage external institution through formal advertisement	■				
Activity 1.4.3: Identify and finalize indicators for assessment	■				
Activity 1.4.4: Conduct bi-annual performance reviews through selected institution	■	■	■	■	■
Strategy 1.5: Streamline business processes					
Activity 1.5.1: Assess competencies of key EPI management staff on a regular basis		■			
(1) Develop assessment criteria/methodology		■			
(2) Adjust regulations (introducing competency assessment as a mandatory procedure)		■			
(3) Carry out assessments		■		■	
Activity 1.5.2: Develop capacity building plan for EPI program managers at DHS level		■		■	
Strategy 1.6: Advocacy and partnership building					
Activity 1.6.1: Produce regularly policy briefs/advocacy materials to share with high level officials	■	■	■	■	■
Activity 1.6.2: Attend high level meetings and present immunization program achievements, challenges and solutions	■	■	■	■	■
Activity 1.6.3: Organize consultations meetings with EPI partners and follow up implementation of decisions and actions agreed in the past	■	■	■	■	■
ISC Objective 1: **Increase the availability of qualified human resources for the immunization program**					
Strategy 2.1: Increase the number of technical staff for management, communication and data management at DHS level					
Activity 2.1.1: Advertise positions for a EPI Coordinator, communication officer and data management officer	■				
Activity 2.1.2: Conduct interviews and select appropriate technical staff	■				
Strategy 2.2: Increase the number of SIS by recruiting 25 more vaccinators					
Activity 2.2.1: Advertise vaccinator positions in national/local media	■				

Objective/strategies/activities	2014	2015	2016	2017	2018
Activity 2.2.2: Select and contract new vaccinators preferably from the areas where they will appointed to					
Activity 2.2.3: Explore and provide professional/carrier growth opportunities to vaccinators					
Strategy 2.3: Increase the number of SIS by integrating available qualified health professionals in the delivery of immunization services especially from private health sector:					
Activity 2.3.1: Assess opportunities (availability, readiness/willingness) for engagement of different categories of SIS into immunization program					
Activity 2.3.2: Carry out consultations with relevant health authorities (vertical program management) and agree on feasible and sustainable arrangements					
Activity 2.3.3: Revise the regulatory framework (standards/guidelines, scope of work) in order to ensure the engagement of SIS in the immunization as planned					
Activity 2.3.4: Carry out trainings in immunization for dispensers and lady health visitors					
Strategy 2.4: Increase effectiveness of trainings of EPI medical and managerial staff:					
Activity 2.4.1: Carry out refreshing training for each SIS at least once in 2 years					
Activity 2.4.2: Carry out MLM training of managerial staff in planning (e.g. vaccine forecasting, budgeting), reporting, decision making and advocacy at least once in two years					
Activity 2.4.3: Assess periodically competency of selected category of healthcare professionals involved in immunization					
Activity 2.4.4: Introduce a system of pre and post trainings assessment of the knowledge of trainees					

Objective/strategies/activities	2014	2015	2016	2017	2018
Activity 2.4.5: Train immunization staff in medical, surveillance and logistics required for the introduction of new vaccines					
Strategy 2.5: Increase motivation of key staff of the immunization program					
Activity 2.5.1: Assess regularly motivations of selected category of HR of the immunization system					
Activity 2.5.2: Develop and implement non-financial incentives (carrier growth opportunities, promotion, recognition/awards, etc.)					
ISC Objective 3: **Increase financial efficiency and sustainability of the immunization program.**					
Strategy 3.1: Enhance efficient utilization of human resources by developing synergies with other health initiatives					
Activity 3.1.1: Incorporate financial efficiency as a core component of MLM training					
Activity 3.1.2: Train EPI program managers on developing mechanisms for financial efficiency					
Activity 3.1.3: Increase number of SIS through integration of EPI with other private hospitals					
Strategy 3.2: Minimize wastage of resources under immunization program					
Activity 3.2.1: Rationalize use of POL for monitoring and supervision by management staff at DHS level					
Activity 3.2.2: Rationalize use of POL for travelling by vaccinators at zonal level					
Activity 3.2.3: Develop and introduce need-based supply of vaccines, syringes and other materials					
Strategy 3.3: Advocacy for ensuring financial sustainability of immunization program					
Activity 3.3.1: Assess the 'gap' between existing resources and future requirements					
Activity 3.3.2: Inform political and technical leadership about the importance of funding gap					
Activity 3.3.3: Mobilize political and technical leadership for					

Objective/strategies/activities	2014	2015	2016	2017	2018
increasing share for program-specific costs under non-recurrent budget					
Activity 3.3.4: Develop financial projections for mobilizing external donors					
Activity 3.3.5: Mobilize political and technical leadership for increasing share for program-specific costs under non-recurrent budget					
Activity 3.3.6: Utilize cMYP, PC1 and Annual Plans as key instruments for ensuring resource allocation					
ISC Objective 4: **Improve/sustain uninterrupted supply of vaccines to immunization service delivery**					
Strategy 4.1: Upgrade/maintain adequate cold chain equipment					
Activity 4.1.1: Assess of needs for cold chain update					
Activity 4.1.2: Prepare cold chain replacement plan					
Activity 4.1.3: Develop specifications and procurement plan (aligned with the availability of funding)					
Activity 4.1.4: Purchase and install necessary activity					
Activity 4.1.5: Provide maintenance services on a regular basis					
Strategy 4.2: Improve vaccine management by implementing EVM Improvement plan					
Activity 4.2.1: Carry out EVM assessment					
Activity 4.2.2: Revise the annual work plan in accordance with the EVM improvement plan					
Activity 4.2.3: Report on the progress of implementation of the EVM improvement Plan					
Strategy 4.3: Prepare cold chain and vaccine management for the introduction of new vaccines					
Activity 4.3.1: Establish one central warehouse in an existing healthcare facility					
Activity 4.3.2: Expand cold chain storage capacity at district level					
Activity 4.3.3: Train vaccine management personnel in					

Objective/strategies/activities	2014	2015	2016	2017	2018
vLMIS	■			■	
Activity 4.3.4: Train and equipment cold technician for repair and maintenance	■				
ISC Objective 5: **Strengthen and optimize capacity of immunization service delivery**					
Strategy 5.1: Increase performance/efficiency (effective coverage) of existing EPI Centers					
Activity 5.1.1: Revise regulations	■	■			
Activity 5.1.2: Mobilize additional qualified staff SIS (see corresponding strategy 2.4 under component 2.2.2 "Human Resource Management")	■	■			
Activity 5.1.3: Improve micro-planning through regular supportive supervision of designated staff at EPI centers	■	■	■	■	■
Strategy 5.2: Increase vaccination coverage through effective outreach services					
Activity 5.2.1: Identify geographical areas to be covered through outreach services through zonal mapping	■	■	■	■	■
Activity 5.2.2: Prepare zone-specific outreach immunization plans	■	■	■	■	■
Activity 5.2.3: Monitor and supervise outreach immunization services	■	■	■	■	■
ISC Objective 6: **Performance of surveillance and routine monitoring/reporting improved**					
Strategy 6.1: Streamline data collection and reporting practices (integrate EPI routine monitoring into data management mainstream)					
Activity 6.1.1: Assess main causes of data quality flaws		■			
Activity 6.1.2: Introduce regular system of formal feedback mechanism on the administrative reports of subordinated entities		■			
Activity 6.1.3: Conduct monthly program reviews at district level	■	■	■	■	■
Activity 6.1.4: Provide continuous supportive supervision	■	■	■	■	■
Activity 6.1.5: Conduct immunization coverage survey	■				■
Activity 6.1.6: Conduct DQS at regular interval		■	■	■	■

Objective/strategies/activities	2014	2015	2016	2017	2018
Strategy 6.2: Strengthen accuracy of reporting through validation in field					
Activity 6.2.1: Recruit qualified staff (see corresponding strategy 2.1 and 2.2 under component 2.2.2 "Human Resource Management")					
Activity 6.2.2: Conduct data validation through field monitoring visits					
ISC Objective 7: **Knowledge and attitude toward immunization improved among target population**					
Strategy 7.1: Continue community mobilization and communication interventions that proved being effective:					
Activity 7.1.1: Conduct advocacy meetings with community leaders and district administration to sensitize and motivate them regarding the routine immunization					
Activity 7.1.2: Develop social mobilization plans at all levels					
Activity 7.1.3: Capacity building of immunization staff involved in social mobilization					
Activity 7.1.4: Conduct social mobilization activities as planned					
Activity 7.1.5: Monitor social mobilization activities					
Activity 7.1.6: Provide regular supportive supervision to social mobilization teams					
Strategy 7.2: Develop and implement evidence based communication strategies					
Activity 7.2.1: Conduct formative research of the target population regarding immunization					
Activity 7.2.2: Develop communication plan in the light of formative research findings					
Activity 7.2.3: Conduct communication activities as per plan					
Activity 7.2.4: Assess the effectiveness of the communication strategies					

2. Monitoring and Evaluation

M&E Framework

1. M&E Framework for immunization

File attached (click the icon).

2. Monitoring and Evaluation Strategy and Plan

The M&E Framework is the essential instrument that the immunization program will use for tracking the performance of CDA's cMYP. The quantifiable indicators are grouped under three broad areas: impact, outcomes and immunization-system-component-specific (ICS) indicators.

The impact and outcomes indicators will facilitate in linking CDA's cMYP with the broader national plans. These will reflect whether the planners and funders are getting value for money.

The ICS indicators will be used to link the inputs, processes and outputs. The source of information for ICS indicators is primarily based on EPI and administrative data. Authenticity and accuracy of program and administrative data is often questioned in Pakistan. Therefore, validation of cMYP results through third party monitoring (TPM) will ensure transparency and accountability within the reporting system.

The main sources of information include EPI MIS and other administrative data. In addition to these health sector-specific data sources, PDHS, EPI coverage survey and other periodic surveys will provide the information that is not covered under public health sector.

The M&E Framework will be used in planning and decision making while developing PC-1, revisiting cMYP, and conducting periodic reviews at district level. It will also be used to negotiate the resource requirement from CDA and Federal governments and donors.

The Data Management Officer will be responsible for maintaining and updating the information required for M&E Framework.

4. Immunization Program Costing and Financing

1. Current program costs and financing

Figure : Baseline Cost Profile (shared costs and campaigns excluded)

The baseline cost profile for EPI under CDA is grouped under 5 categories: Personnel, Transportation, Other routine recurrent costs, Cold chain equipment, and Vaccines and Injection and supplies (Figure 11).

1. Personnel

The information pertaining to personnel consisted of three components: salaries and allowance for full-time EPI staff, per-diems for vaccinators and mobile teams and per-diems for supervisory and monitoring staff.

The baseline information was compiled on basis of standard government payment rates that are used for payment of salaries, allowances and per-diems. The DHS EPI Office used this in consultation with the DHS.

The analysis of the baseline cost profiles (2012) shows that USD77640 was incurred on personnel cost which constituted to 19% of the total expenditure on immunization program. Further analysis shows that primarily this was spent on payment of salaries and allowances.

2. Transportation

The expenditure on transportation was based on the type and number of vehicles available at DHS and zonal levels. In addition, information was collected regarding average mileage per year of a given vehicle. The DHS EPI office provided the information on the quantity of fuel used per 100KM.

The analysis shows that the expenditure on transportation contributed to 4% (USD17663) of the total expenditure in 2012. On the main reasons for less expenditure on transportation was availability of small number of vehicles for the immunization staff. For example, only 12

motorbikes were operating at zonal level. The CDA was the sole contributor for the expenditure on transportation.

3. Other routine recurrent costs

The other routine costs comprised expenditures for cold chain maintenance and overheads. The information pertaining to cold chain maintenance and overheads was populated by cMYP costing tool based on the standard inputs provided by the DHS EPI Office. No such information, specific to EPI, is maintained and consolidated by the DHS.

The total expenditure against routine recurrent costs was estimated as USD27182 which was found 6% of the total baseline expenditure out of which 93% was spent on expenditures for cold chain maintenance.

4. Cold Chain Equipment

In 2012, the Federal EPI Cell provided 18 Ice-lined Refrigerators (ILRs) for 10 EPI centers in CDA Health centers and 8 Federal Government's health centers. The procurement rates provided by the Federal EPI Cell were used to estimate the costs incurred on the cold rooms. An amount of USD84667, 20% of the total baseline expenses, was spent on supplying ILRs.

5. Vaccines, Injections and Supplies

This category consists of: Traditional Vaccines, Underused and New Vaccines, and Injections and supplies. The Traditional Vaccines include BCG, OPV, Measles and Tetanus Toxoid whereas Underused Vaccines include Pentavalent (DPT-HepB-Hib). New vaccines include IPV and Rota vaccine; however, the new vaccines were not introduced in 2012 and the government plans to introduce these vaccines from 2015 onwards. All the vaccines are procured at the Federal level and then supplied to the provincial governments.

WHO's forecasting tools was not used for estimating the expenditures made for procuring vaccines and injections. It was based on the information provided by the Federal EPI Cell on the number of doses per antigen supplied during 2012. The total expenditure was calculated by using the cost per dose per antigen provided in the costing tool.

In 2012, 51% of the total expenditure was incurred on vaccines, injections and supplies, a major driver of the costs required for EPI. In the coming years, this cost will further increase because the government plans to introduce new vaccines, IPV and Rotavirus.

Figure : Baseline Financing Profile (shared costs and campaigns excluded)

In 2012, the total spending on EPI program in CDA was shared among the DHS (Provincial government), Federal government, Federal Govt. Co-Financing of GAVI, and GAVI (ISS, NVS, HSS) grant (Figure 12).

In 2012, the Federal government was the largest financer of the EPI program which provided 36% of the total resources. The finances provided by the federal government (30%) were spent on procuring traditional vaccines and injection supplies, 18 ILRs and other equipment. The breakdown of this expenditure is presented in Figure 11. In addition, the federal government also provided 6% of the total resources through its share under Govt. Co-financing of GAVI vaccines.

GAVI (ISS, NVS, HSS) was the second largest financer of the EPI program which provided 35% of the total resources.

In 2012, the DHS (provincial government) was the third largest financer of the EPI program which provided 29% of the total resources. It included expenditure for payment of salaries and allowances (63%), transportation (4%) and maintenance of cold chains equipment and other recurring costs (21%). Despite spending nearly U121605 on immunization, the DHS remained heavily dependent upon the contributions from the Federal government and GAVI (ISS, NVS, HSS Grant (USD295607). This is a significant limitation in the contest of a narrow fiscal space for DHS (Figure 4).

Figure 13 presents immunization program baseline indicators. The analysis of indicators reveals that, the expenditure on routine immunization in 2012 was spent on an average of USD0.46 per capita or USD16.37 per DPT3 child (Figure 13). The future investments in human resources, cold chain equipment, vehicles and transportation will obviously increase per capita and per DPT3 child costs. In a situation where 67% of the total costs were borne by the public sector, both federal and CDA, the provincial managers will require to develop their skills in planning and management in order to compete with other government departments for allocation of additional resources but also to persuade the donor's for bridging the gaps in resource availability.

The CDA EPI management also plans to use these indicators as demand creation tools to deliver general awareness messages to the general population highlighting how much government is spending on every child in CDA. For example, in 2012, the government spent on average PKR1719 (USD16.4) on every child when he became 3 and a half month old. This expenditure rose up to PKR1848 when the shared health systems were also accounted for.

Figure : Immunization program baseline indicators

Baseline Indicators	2012
Total Immunization Expenditures (USD)	576,339
Campaigns (USD)	158,248
Routine Immunization only	418,092
per capita (USD)	0.46
per DTP3 child (USD)	16.4
% Vaccines and supplies	50%
% Government funding	67%

% Total health expenditures	2%
% Gov. health expenditures	15%
% GDP	0.04%
Total Shared Costs (USD)	31,867
% Shared health systems cost	5%
TOTAL (USD)	608,206

The next section present details on future resource requirements.

2. Future resource requirements

Figure : Future resource requirements by cost categories

COST CATEGORY	2014	2015	2016	2017	2018
	USD	USD	USD	USD	USD
ROUTINE IMMUNIZATION COSTS					
Traditional Vaccines	39,754	41,306	42,672	68,879	63,308
Underused Vaccines	236,598	244,004	248,155	256,605	268,193
New Vaccines	642,051	549,413	730,885	884,546	933,519
Injection supplies	25,134	27,514	29,508	32,267	32,369
Personnel	231,473	249,991	269,990	291,589	314,916
Transportation	62,648	67,660	73,073	78,919	85,232
Other routine recurrent costs	80,227	114,469	96,798	111,621	104,648
Vehicles	137,460				
Cold chain equipment	23,029	74,273			
Other capital equipment	10,740				
Routine Immunization Costs (Sub-Total)	1,489,115	1,368,629	1,491,081	1,724,426	1,802,185
CAMPAIGN COSTS					
Campaigns	581,473	292,485	311,382	506,452	354,452
GRAND TOTAL	2,070,588	1,661,115	1,802,463	2,230,877	2,156,637

Figure 14 presents details of the projected resource requirement for 5 years, from 2014 to 2018. The same information is also presented in Pakistani Rupees in Figure 15. The future resource requirement is separately presented for routine immunization costs and campaigns.

The routine immunization costs are further divided in seven categories: Vaccines and Injection Supplies, Personnel, Transportation, Vehicles, Cold chain equipment, other Capital equipment and other routine recurrent costs.

1. Vaccines and Injection Supplies

In the next 5 years, the DHS plans to improve the coverage rate of different vaccines (Annex 1). The financial projections for vaccines and injection supplies are based on the number of doses required per antigen including wastage rates and the price list provided available in the costing tool.

The Federal Government will provide resources for traditional vaccines and injection supplies. The underused vaccines and one new vaccine (PCV 10) will be financed through GAVI (ISS, NVS HSS) and Federal governments share of co-financing for GAVI vaccines. In addition, the government also plans to introduce two new vaccines: IPV and Rota vaccines in 2015 and 2016 respectively. Both of these vaccines will be financed through GAVI (ISS, NVS,

HSS); however, Rota vaccine will also be supported through Federal government's share of co-financing for GAVI vaccines. The introduction of new vaccines will have financial implication not only for the resource requirement for procurement of vaccines and injection supplies but also for cold chain equipment, overhead costs and training of personnel.

In order to achieve the immunization coverage targets, the additional resource requirement for purchasing vaccines and injection supplies will increase by almost 4.4 times in 2018. In comparison to the expenditure of USD0.21 million in 2012, the resource requirement will increase to USD0.94 million by the year 2018.

2. Personnel

The provincial EPI office plans to increase the availability of qualified human resources for the immunization program at provincial, district and union council levels (ISC Objective 2:).

At DHS level, new positions of EPI coordinator, communication officer, data management officer and cold chain technician will be created.

At UC level, 25 new vaccinators will be recruited for outreach immunization services in the rural areas.

The addition of new staff will require a substantial increase in resource allocation for immunization program. By 2018, the funds required for payment of salaries and allowances will be increased by 4 times as of 2012. The DHS will require USD314,916 in 2018 as compared to USD77,640 in 2012.

3. Transportation

Expansion in the EPI program coverage will result in increase in demand for resources for transportation. In 2012, 4% of the total resources were spent on transportation. By 2018, the immunization system will require 4.7% of the total funds for routine immunization on transportation. This requirement is closely linked with the increase in POL prices. Despite the costing tool has adjusted for inflation in POL prices, DHS EPI office will revise these estimates on yearly basis in order to ensure realistic projections for resource requirement.

4. Vehicles

The immunization system will require an amount of USD137,460 to procure vehicles required for the immunization staff and supply of vaccines. These projections are based on the price list provided by Federal EPI Cell and the total number of vehicles that are planned to be hired. The immunization program also plans to replace the existing vehicles that have completed their on-road life. The DHS staff will be provided vehicles for monitoring and supervision whereas motorbikes will be procured for 37 vaccinators for outreach immunization services.

5. Cold chain equipment

The immunization program plans to enhance the capacity of the cold chain system in order to meet the needs when new vaccines will be introduced in 2015 and 2016. It includes procurement of additional ILRs and Freezers for DHS EPI office. It also includes procurement of power stabilizers and other cold chain equipment. In 2012, the Federal

government provided new ILRs for 18 fixed EPI centers primarily working under public health sector. The DHS EPI also plans to procure 25 ILRs for private hospitals once the CDA-specific EPI policy is finalized. The main purpose will be to maintain an effective cold chain system. The DHS EPI office has estimated these projections by using the information on number of items required and the price list provided by the Federal EPI Cell.

It is estimated that USD97302 will be required to meet the needs of cold chain equipment.

6. Other capital requirement

The immunization system will require USD10740 for supplying other capital equipment (laptops, computers, photocopiers, furniture etc.) for the DHS office. These projections are estimated by using average unit costs as per the prevailing market rates.

7. Other recurrent costs

Other recurrent costs consist of funds required for cold chain maintenance and overheads, maintenance of other capital equipment, utility bills, short-term training, IEC/social mobilization, disease surveillance, programme management and other routine recurrent costs. The DHS EPI office has estimated the resource requirement under this category by breaking down each component into activities and determining the average cost per activity.

The financial projections indicate that the immunization program will require USD0.5 million to meet the expenditure planned under other recurrent costs.

In total, immunization system in CDA will require USD7.9 million to meet the needs of routine immunization system over a period of 5 years (2014-18) which will be 79% of the total resource requirement.

In addition to the routine immunization, the provincial government plans to conduct special immunization campaigns (SIAs) in the next 5 years. Majority of the campaign costs will be incurred on SIAs for Polio eradication - four rounds of polio vaccination per year with an average coverage of 95%. In addition to SIAs for Polio eradication, the government plans to conduct two measles campaigns with an average coverage of 95%, one each in 2014 and 2017. In order to achieve these coverage targets, the immunization system will require USD2 million.

Figure : Future resource requirements by cost categories (in Pakistani Rupees)

COST CATEGORY	2014	2015	2016	2017	2018
	PKR (million)	PKR (million)	PKR (million)	PKR (million)	PKR (million)
ROUTINE IMMUNIZATION COSTS					
Traditional Vaccines	4.2	4.3	4.5	7.2	6.6
Underused Vaccines	24.8	25.6	26.1	26.9	28.2
New Vaccines	67.4	57.7	76.7	92.9	98.0
Injection supplies	2.6	2.9	3.1	3.4	3.4
Personnel	24.3	26.2	28.3	30.6	33.1
Transportation	6.6	7.1	7.7	8.3	8.9
Other routine recurrent costs	8.4	12.0	10.2	11.7	11.0

COST CATEGORY	2014	2015	2016	2017	2018
	PKR (million)	PKR (million)	PKR (million)	PKR (million)	PKR (million)
Vehicles	14.4				
Cold chain equipment	2.4	7.8			
Other capital equipment	1.1				
Routine Immunization Costs (Sub-Total)	156.4	143.7	156.6	181.1	189.2
CAMPAIGNS					
Campaigns	61.1	30.7	32.7	53.2	37.2
GRAND TOTAL	217.4	174.4	189.3	234.2	226.4

The next section presents an analysis on future financing and funding gaps of the immunization program.

3. Future financing and funding gaps of the immunization program

Figure : Future Secure Financing and Gaps (shared costs excluded)

The financial projections presented in Figure 16 indicate that CDA (provincial government) and Federal government will be the main source of secure financing for immunization program in the next five years. Their collective contribution will increase from USD292,565 in 2012 to USD595,766 in 2018. In addition, Federal government will provide USD59,753 under co-financing for GAVI vaccines.

Although secure financing under GAVI (ISS, NVS, HSS) is available for 2014-15 only, it remains a substantial amount in terms of absolute numbers. GAVI will provide USD1.77 million for procuring underused and new vaccines which will be USD 0.3 million more than the total financing from the public sector. The contribution from the Government of China (USD51601) will be in providing cold chain equipment. It clearly highlights that for immunization services in CDA, EPI program will remain highly dependent upon foreign assistance and will have to ensure that these funds are available in future.

The financial analysis indicates that nearly USD 0.5 million is available for activities under PEI. In 2014-15, there are 4 rounds of Polio SIAs per year are planned for CDA. It is expected that zero incidence of Polio will be sustained by the end of 2015. In 2014, GAVI and JICA will also provide USD162660 and USD 30419 respectively for conducting a measles vaccination campaign with a coverage target of 95% among children below 10 years of age.

Considering only the secure funds, there is a substantial funding gap of USD3.93 million for the period of 5 years. The overall volume of the funding gap remains almost the same except a decrease in 2015. The main drivers of this funding gap are the costs required for hiring additional staff, their salaries and allowance, additional transport costs, cold chain equipment, other capital equipment and some aspects of program management. It also includes the resources required for conducting SIAs for Polio eradication and measles control from 2016 onwards.

Figure : Future Secure and Probable Financing and Gaps (shared costs excluded)

Figure 17 shows that the probable funding has potential to bridge the funding gap (highlighted in Figure 16) to a large extent. The major contributions for probable funding are from GAVI for vaccine procurement, Federal Governments co-financing for GAVI vaccines, potential financers of Polio SIAs and WHO, World Bank, UNICEF for social mobilization, program management and other recurrent costs.

The financial projection indicates that considering both secure and probable funding, there will remain a funding gap of USD1.57 million primarily required for meeting the needs pertaining to salaries and allowances, logistics (cold chain equipment and vehicles), other recurrent costs. It also includes financing for measles vaccination campaign for children below five years of age that has been planned for the year 2017.

4. Funding gap analysis

Figure : Composition of the Funding Gap with Secure Funding only (Immunization specific funding gap, shared costs are not included)

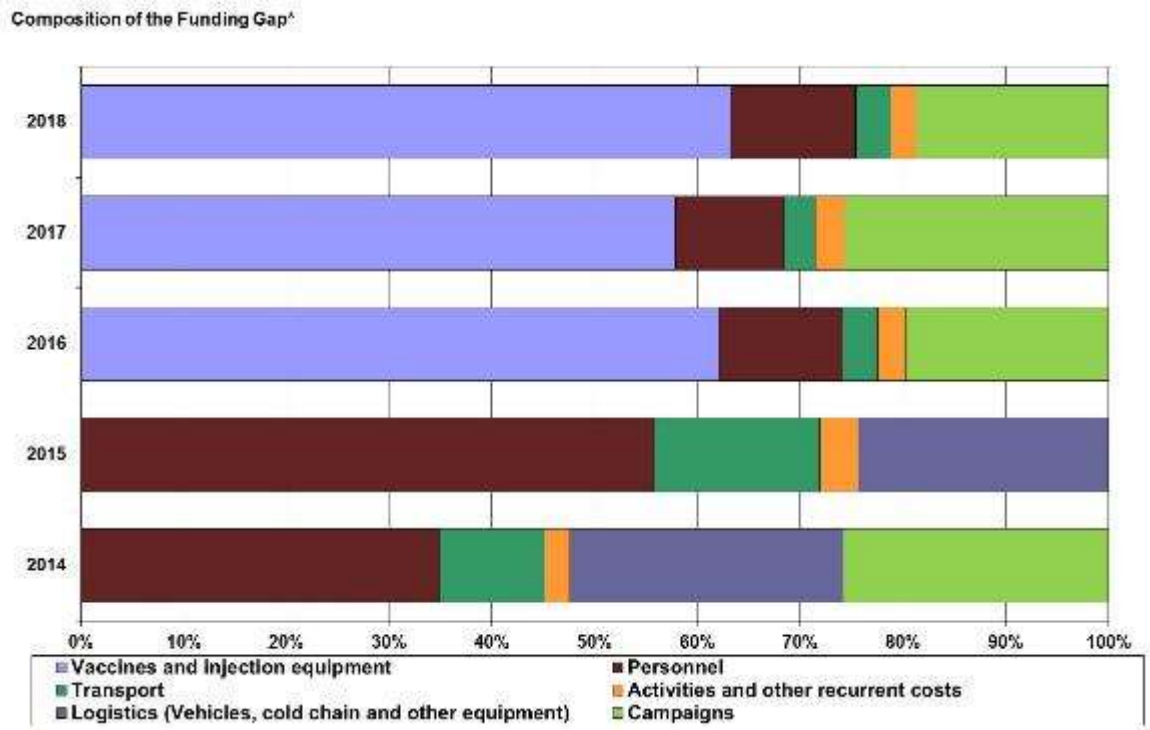

Figure 18 highlights the composition of the funding gap with secure funding only. It is quite evident that the composition of the funding gap remains almost same in terms of categories except 2014 and 2015 where costs for logistics (vehicles, cold chains and other equipment) are also required and GAVI will provide support for vaccine procurement. This funding gap is further analyzed under 6 categories: Vaccines and Injection equipment, Personnel, Transport, Activities and other recurrent costs, Logistics and Campaigns.

1. Vaccines and injection equipment

The immunization program is highly dependent upon GAVI for financing procurement of vaccines, especially underused and new vaccines. In addition it requires funding from the Federal government for traditional vaccines, co-financing for GAVI vaccines and injection equipment. The current fiscal situation of immunization system does not allow the CDA to provide additional resources to the required extent without an external support. If these required resources are not provided, it is not possible to achieve the potential gains by decreasing disease burden due to VPD. This situation clearly highlights that the continuity of immunization program is closely interlinked with Federal governments support in terms

of in-country financing but also success in mobilizing out-country resources from GAVI and other potential donors. In order to meet its requirement of vaccines and injection equipment, EPI in CDA requires an additional USD3.3 million for the period 2014 to 2018.

2. Personnel

The EPI in CDA is facing severe shortage of qualified technical staff for the management and implementation of immunization activities (Availability of qualified workforce:). In addition, 12 vaccinators cannot meet the immunization demands in the rural population. One of the major limitations is non-availability of health centers in the rural areas where fixed EPI centers can be established. If these resources are not provided, the capacity of the existing human resources is limited not only to develop a longstanding effective immunization program in collaboration with the private sector but also to meet the needs of the rural population that is already suffering on accounts: firstly, non-availability of PHC static centers, and secondly, absence of LHW program that could have bridged the gap between households and immunization system. In order to meet the requirement for hiring new human resources, EPI in CDA requires an additional USD 950,507 for the period 2014 to 2018.

3. Transport

The immunization system will also face a shortfall of USD55,355 per year from 2014 to 2018 after increasing the number vehicles both for the managerial staff and vaccinators. It will also include supply of vaccines and other logistics. Without a functional supply chain system and availability of transport for monitoring and supervision, achievement of the planned targets will be hard to imagine.

4. Activities and other recurrent costs

Besides other expenditures, this category requires resource allocation for Technical Assistance for developing Performance Management System, Technical Assistance for Third Party Monitoring, Formative research and EPI Coverage Survey. These activities are essential for developing and strengthening EPI in CDA. Under this category, CDA will face a shortage of USD 167,879 over the next five years. It is expected that World Bank, WHO and UNICEF may support the CDA government for these initiatives. However, without these important activities it will be impossible to improve the quality of immunization services through establishing performance-based practices and ensuring accountability in management practices.

5. Logistics (vehicles, cold chain and other equipment)

Presently, vehicles are available for the existing staff; however, these are outdated and have completed their road life. This requirement will further increase with hiring of new human resources. Of the required funds, 23% will be provided by GAVI and the Government of China. An amount of USD 105,746 will further be required for procurement of vehicles. In addition, CDA faces a shortfall of USD 10,740 that will be required to provide computers and accessory and other capital items for the existing and newly recruited staff. If the funding gap related to vehicles and other logistics is not addressed, it will affect monitoring and supervisory system which has already been identified as a significant weakness under program management.

6. Campaigns

The funding gap under the category of campaigns can be further subdivided into two sub-groups. Firstly, from 2016 onwards, PEI activities will also require mobilization of additional resources because the current PEI program covers the costs up to 2015 only. In order to conduct 4 rounds of Polio SIAs every year during 2016-18, the immunization program will require USD one million. If funding gap for polio campaigns remains, it increases likelihood of polio transmission and undermines previous investments in polio eradication.

Secondly, the government has planned for Measles campaigns in 2014 and 2017. GAVI will fund for procurement of vaccines and injection supplies in for measles campaign in 2014. It will also finance some of the operational costs. However, there still exists a funding gap of USD113256 required for operational costs in 2014. There is no secured or probable funding available for the measles campaign in 2017. Consequently, EPI in CDA is facing a shortfall of USD174470 which is required both for the operational costs as well as procurement of vaccines and injection supplies. If funding gap these campaigns remains, it increases likelihood of Measles epidemics and the associated morbidity and mortality.

5. Financial sustainability

Figure : Macroeconomic and Sustainability Indicators

Macroeconomic and Sustainability Indicators	2012	2014	2015	2016	2017	2018
Per capita GDP (USD)	1,256	1,332	1,372	1,414	1,456	1,500
Total health expenditures per capita (THE per capita USD)	30	32	33	34	35	36
Population (in thousands)	908	945	963	982	1,002	1,022
per DTP3 child (USD)	17.6	57	51	53	60	62
RESOURCE REQUIREMENTS FOR IMMUNIZATION AS % OF TOTAL HEALTH EXPENDITURES						
Routine and Campaigns (Includes Vaccines and Operational Costs)	2.23%	6.96%	5.34%	5.51%	6.48%	5.99%
Routine Only	1.65%	5.04%	4.42%	4.58%	5.04%	5.02%
Funding Gap						
With Secure Funds Only		1.45%	0.96%	4.71%	5.62%	5.16%
With Secure and Probable Funds		1.03%	0.91%	0.72%	1.25%	0.79%
RESOURCE REQUIREMENTS FOR IMMUNIZATION AS % OF GOVERNMENT HEALTH EXPENDITURES						
Routine and Campaigns (Includes Vaccines and Operational Costs)	22.31%	63.28%	48.54%	45.95%	54.02%	46.06%
Routine Only (Includes Vaccines and Operational Costs)	16.50%	45.80%	40.18%	38.18%	41.99%	38.65%
Funding Gap						
With Secure Funds Only		13.18%	8.72%	39.29%	46.84%	39.71%

With Secure and Probable Funds		9.36%	8.30%	5.97%	10.43%	6.10%
RESOURCE REQUIREMENTS FOR IMMUNIZATION AS % OF GDP						
Routine and Campaigns (Includes Vaccines and Operational Costs)	0.05%	0.17%	0.13%	0.13%	0.16%	0.14%
Routine Only (Includes Vaccines and Operational Costs)	0.04%	0.12%	0.11%	0.11%	0.12%	0.12%
RESOURCE REQUIREMENTS FOR IMMUNIZATION PER CAPITA						
Routine and Campaigns (Includes Vaccines and Operational Costs)	0.67	2.23	1.76	1.87	2.27	2.16
Routine Only (Includes Vaccines and Operational Costs)	0.50	1.61	1.46	1.56	1.76	1.81

The macroeconomic indicators listed in Figure 19 highlight that sustainability of immunization system is closely linked with resource allocation from the government health expenditures. The current financial projections indicate that the cost per DPT3 child will rise from USD17.6 in 2012 to USD62 in 2018.

It is expected that the government will continue its funding for immunization system. However, the resource requirement for immunization program as percentage of the government health expenditure will increase from nearly 22.3% in 2012 to 46% in 2018. High dependence on government funds is likely to reduce the available fiscal space for immunization system. Therefore, the immunization program plans to ensure financial efficiency and sustainability by employing the following strategies:

1. Enhance efficient utilization of human resources by developing synergies with other health initiatives (Strategy 3.1:)

2. Minimize wastage of resources under immunization program (Strategy 3.2:)

3. Advocacy for ensuring financial sustainability of immunization program (Strategy 3.3:)

4. Introduce mechanisms of accountability through third party monitoring (Strategy 1.4:)

5. Annexes

Annex 1: Immunization coverage targets for cMYP 2014-18

Type of Vaccine	Baseline	Coverage Targets				
	2012	2014	2015	2016	2017	2018
BCG	97%	97%	97%	98%	98%	98%
Measles	87%	88%	89%	89%		
OPV	87%	88%	89%	89%	90%	92%
Pentavalent	87%	88%	89%	89%	90%	92%
TT	25%	30%	35%	40%	50%	55%
Pneumococcal (PCV10)		88%	89%	89%	90%	92%
Rota vaccine				40%	80%	92%
IPV			40%	80%	90%	92%
OPV0	97%	97%	97%	98%	98%	98%
Measles Rubella (MR)					90%	90%

Annex 2: Expenditures and future resource requirements by cMYP components

	Expenditures		Future Resource Requ	
	USD	USD	USD	USD
cMYP Component	2012	2014	2015	2016
Vaccine Supply and Logistics (routine only)	320,789	1,150,540	987,153	1,102,947
Service Delivery	95,303	294,121	317,651	343,063
Advocacy and Communication	0	6,120	6,450	6,710
Monitoring and Disease Surveillance	0	8,772	29,289	30,473
Programme Management	2,000	29,562	28,086	7,888
Supplemental Immunization Activities (SIA) (includes vaccine and operation costs)	158,248	581,473	292,485	311,382
Shared Health Systems Costs	31,867	34,416	37,169	40,143
GRAND TOTAL	**608,206**	**2,105,004**	**1,698,284**	**1,842,606**

Annex 3: Composition of the Funding Gap with only Secured Financing (Immunization Specific Only)

Composition of the funding gap	2014	2015	2016	
	USD	USD	USD	
Vaccines and injection equipment	0	0	979,040	1,1
Personnel	153,178	170,130	188,532	2(
Transport	44,632	49,284	54,329	5
Activities and other recurrent costs	10,854	11,335	42,350	5
Logistics (Vehicles, cold chain and other equipment)	116,486	74,273	0	
Campaigns	113,256	0	311,382	5(
Total Funding Gap*	438,405	305,021	1,575,632	1,9

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

Annex 4: Sustainability indicators

Macroeconomic and Sustainability Indicators	2012	2014	2015	2016
Per capita GDP ($)	1,256	1,332	1,372	1,414
Total health expenditures per capita (THE per capita $)	30	32	33	34
Population	908,754	945,097	963,810	982,89
GDP ($)	1,141,395,024	1,258,869,106	1,322,347,108	1,389,811
Total Health Expenditures (THE $)	27,262,620	30,243,102	31,805,725	33,418,3
Government Health Expenditures (GHE $)	2,726,262	3,326,741	3,498,630	4,010,2
Resource Requirements for Immunization				
Routine and Campaigns ($)	608,206	2,105,004	1,698,284	1,842,6
Routine Only ($)	449,959	1,523,531	1,405,799	1,531,2
per DTP3 child ($)	17.6	57	51	53
Resource Requirements for Immunization as % Total Health Expenditures				
Routine and Campaigns (Includes Vaccines and Operational Costs)	2.23%	6.96%	5.34%	5.51%
Routine Only	1.65%	5.04%	4.42%	4.58%
Funding Gap				
With Secure Funds Only		1.45%	0.96%	4.71%
With Secure and Probable Funds		1.03%	0.91%	0.72%
Resource Requirements for Immunization as % Government Health Ex				
Routine and Campaigns (Includes Vaccines and Operational Costs)	22.31%	63.28%	48.54%	45.95%
Routine Only (Includes Vaccines and Operational Costs)	16.50%	45.80%	40.18%	38.18%
Funding Gap				
With Secure Funds Only		13.18%	8.72%	39.29%
With Secure and Probable Funds		9.36%	8.30%	5.97%

% GDP				
Resource Requirements for Immunization				
Routine and Campaigns (Includes Vaccines and Operational Costs)	0.05%	0.17%	0.13%	0.13%
Routine Only (Includes Vaccines and Operational Costs)	0.04%	0.12%	0.11%	0.11%
Per Capita				
Resource Requirements for Immunization				
Routine and Campaigns (Includes Vaccines and Operational Costs)	**0.67**	**2.23**	**1.76**	**1.87**
Routine Only (Includes Vaccines and Operational Costs)	**0.50**	**1.61**	**1.46**	**1.56**