Ministry of Health and Family Welfare
Government of the People’s Republic of Bangladesh

**Comprehensive Multi-year Plan: 2011-2016**

**Expanded Programme on Immunization (EPI)**

**Bangladesh**

Expanded Program on Immunization
Directorate General of Health Services
Ministry of Health and Family Welfare
Government of the People’s Republic of Bangladesh

Comprehensive Multi-Year Plan: 2011-2016
Expanded Programme on Immunization (EPI) Bangladesh

May 2010
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<td>Bacillus Calmette-Guerin (tuberculosis vaccine)</td>
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<tr>
<td>BDT</td>
<td>Bangladesh Taka (national currency unit)</td>
</tr>
<tr>
<td>CAO</td>
<td>Chief Accounts Officer</td>
</tr>
<tr>
<td>C&amp;AG</td>
<td>Comptroller and Auditor General</td>
</tr>
<tr>
<td>CGA</td>
<td>Comptroller General of Accounts</td>
</tr>
<tr>
<td>CMMU</td>
<td>Construction Management and Maintenance Unit</td>
</tr>
<tr>
<td>CPTU</td>
<td>Central Procurement Technical Unit</td>
</tr>
<tr>
<td>CRS</td>
<td>Congenital Rubella Syndrome</td>
</tr>
<tr>
<td>DGFP</td>
<td>Directorate General of Family Planning</td>
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<td>DGHS</td>
<td>Directorate General of Health Services</td>
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<td>DPs</td>
<td>Development Partners</td>
</tr>
<tr>
<td>DPT or DTP</td>
<td>Diphtheria-Tetanus-Pertussis vaccine</td>
</tr>
<tr>
<td>DQA</td>
<td>Data Quality Audit</td>
</tr>
<tr>
<td>DT</td>
<td>Diphtheria-Tetanus toxoids</td>
</tr>
<tr>
<td>DTaP</td>
<td>Diphtheria-Tetanus-acellular Pertussis vaccine</td>
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<tr>
<td>EPI</td>
<td>Expanded Programme on Immunization</td>
</tr>
<tr>
<td>ESP</td>
<td>Essential Service Package</td>
</tr>
<tr>
<td>EVSM</td>
<td>Effective Vaccine Store Management</td>
</tr>
<tr>
<td>FAPAD</td>
<td>Foreign Aided Project Department</td>
</tr>
<tr>
<td>FSP</td>
<td>Financial Sustainability Plan</td>
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<td>FWC</td>
<td>Family Welfare Centre</td>
</tr>
<tr>
<td>GAVI</td>
<td>Global Alliance for Vaccines and Immunization</td>
</tr>
<tr>
<td>GoB</td>
<td>The Government of Bangladesh</td>
</tr>
<tr>
<td>HCP</td>
<td>Health care providers</td>
</tr>
<tr>
<td>HepB</td>
<td>Hepatitis B vaccine</td>
</tr>
<tr>
<td>HFWC</td>
<td>Health and Family Welfare Centre</td>
</tr>
<tr>
<td>Hib</td>
<td>Haemophilus Influenza type b (disease or vaccine)</td>
</tr>
<tr>
<td>HLC</td>
<td>High Level Committee (Multi-Sectoral)</td>
</tr>
<tr>
<td>HMIS</td>
<td>Healthcare Management Information System</td>
</tr>
<tr>
<td>HNP</td>
<td>Health, Nutrition and Population</td>
</tr>
<tr>
<td>HNPSP</td>
<td>Health, Nutrition and Population Sector Programme</td>
</tr>
<tr>
<td>ICC</td>
<td>Inter-Agency Coordinating Committee</td>
</tr>
<tr>
<td>IMED</td>
<td>Implementation Monitoring and Evaluation Division (of the Ministry of Planning)</td>
</tr>
<tr>
<td>LLP</td>
<td>Local Level Planning</td>
</tr>
<tr>
<td>MDVP</td>
<td>Multi-Dose Vial Policy</td>
</tr>
<tr>
<td>MICS</td>
<td>Multiple Indicator Cluster Survey</td>
</tr>
<tr>
<td>MMR</td>
<td>Measles, Mumps and Rubella vaccine</td>
</tr>
</tbody>
</table>
Comprehensive Multi-Year Plan of the Expanded Programme on Immunization (EPI) of Bangladesh 2011-2016

MOHFW  Ministry of Health and Family Welfare
MTBF  Medium Term Budgeting Framework
MTEF  Medium Term Expenditure Framework
NID  National Immunization Day(s)
EPI  Expanded programme on immunization
OPV  Oral Polio Vaccine
PHC  Primary health care
PPC  Programme Preparation Cell
PSO  Programme Support Office
PWD  Public Works Department
SIA  Supplementary Immunization Activity
SWAP  Sector-Wide Approach
TC  Technical Committee
Td  Tetanus and Diphtheria Toxoid for adults
UHS  Upazila Health System
UNICEF  United Nations Children’s Fund
USAID  United States Agency for International Development
VPD  Vaccine Preventable Disease
VVM  Vaccine Vial Monitor
WB  World Bank
WHO  World Health Organization
Executive Summary

Immunization has been one of Bangladesh’s greatest public health success stories. It has prevented an estimated 2 million deaths from 1987-2000, and continues to prevent approximately 200,000 deaths each year. However, in order to ensure that all children of Bangladesh benefit equitably from this intervention, a strategic, i.e., long-term approach to planning and implementation is essential.

This comprehensive Multi Year Plan (cMYP) provides a framework to plan activities to achieve important objectives of the expanded programme on immunization, as contained in the national health policy. This plan sets out the medium-term (2011-2016) strategic goals of the immunization program, the related objectives, indicators, milestones, key activities and the associated costing and funding plan.

Bangladesh cMYP for the immunization program is based on the Global Immunization Vision and Strategy (GIVS) - ratified by the World Health Assembly in May 2005. The approach involved three-steps: (a) identifying the key issues, (b) developing the plan, and (c) articulating the implementation, monitoring and evaluation approaches.

**Identifying the Key Issues** An extensive situation analyses showed that the country has made significant progress in some key socio-demographic indices. The infant mortality rate, for example, has declined from 97.5 per 1000 live birth in 1991 to 52.0 per 1000 in 2007. However, about 27% of the people live in urban areas (in 2006, the urban population was about 34.6 million) and the number of slum dwellers in urban areas has also increased from 7 million in 1985 to 12 million in 1999, and this poses special challenges for immunization services. Analyses of the significant barriers and enablers of an effective immunization program in Bangladesh are summarized in the table below.

### Situation Analyses Matrix & Summary Table

<table>
<thead>
<tr>
<th>Key Barriers</th>
<th>Key Enablers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to immunization and other health services</td>
<td></td>
</tr>
<tr>
<td>Immunization program – Specific Issues</td>
<td></td>
</tr>
<tr>
<td>• Sustaining outreach supervisory visits due to inadequate staff, logistics and funds</td>
<td>• Availability of wide network of Community Clinics and Outreach Sites to support immunization services in rural areas</td>
</tr>
<tr>
<td>• Vacant posts, especially at lower levels</td>
<td>• Strong linkage with communities</td>
</tr>
<tr>
<td>• Unavailability of proper primary health care delivery system (infrastructure) at city corporation level.</td>
<td>• Motivated and committed staff at service delivery level</td>
</tr>
<tr>
<td>• Non availability or under utilization of the following vaccines in the National EPI schedule which are proven to be capable to reduce the current childhood morbidity</td>
<td>• Availability of review meetings at all levels</td>
</tr>
<tr>
<td></td>
<td>• Availability of regular supportive supervision mechanism from higher levels</td>
</tr>
<tr>
<td></td>
<td>• Availability of trained manpower, many of whom have had MLM training</td>
</tr>
<tr>
<td></td>
<td>• GAVI funds for staff recruitment</td>
</tr>
<tr>
<td>Key Barriers</td>
<td>Key Enablers</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>and mortality in Bangladesh: Pneumococcal, Rotavirus, Rubella, Measles-2, dT, Hepatitis-B birth dose.</td>
<td>at lower levels</td>
</tr>
</tbody>
</table>

**Immunization Coverage and Performance**

- Complete immunization coverage among under one year, at national level is 75%
- Low TT5 coverage (53%) among child bearing age women
- 163/64 (20%) districts having less than 80% coverage for DPT3 and 11/64 (17%) for Measles
- High staff turnover in some districts
- Implementation of TT-5 dose schedule
- 39/64 districts high-performing districts
- Consistent national BCG coverage more than 95%
- Improving OPV3 coverage (96% in 2009)

**EPI Logistics**

- Lack of training for technical EPI staff at all levels.
- Inadequate cold chain storage capacity for new vaccines at all the levels
- Availability of computerized logistics management system
- Trained logistics staff in most districts
- Logistics reporting, requisition, and distribution mechanism in place

**Injection Safety**

- Non availability of safe and environmental friendly waste disposal system for disposal of EPI waste
- Use of AD syringes for all vaccination
- Local production of AD syringes
- AEFI surveillance system in place

**Accelerated Disease Control**

- Possibility of Polio importation from neighbouring countries
- Need to put extra effort to maintain MNT elimination status due to high percentage of home deliveries (80%)
- Still Significant measles morbidity and mortality prevailing in the county
- High quality and high coverage SIAs
- Good routine coverage
- Strong active EPI surveillance system with high consistently quality indicators

**Financing**
Developing the Plan

The major elements of this multi-year plan are the mission, goals, strategic objectives, key activities, and the costing / financing plan. These were developed based on the situation analyses, including the global goals and national priorities.

Mission

The mission of the immunization program during the period 2011 – 2016 is as follows:

To reduce the burden of vaccine preventable diseases through high-quality immunization services and SIAs, using currently available vaccines & new and underused vaccines, in such a way so that the overall health system could be strengthened.

The principles that would guide the efforts to accomplish this mission are Quality and safety – to ensure immunization services based on best practices; Maximal coverage and reach - to overcome access barriers at all levels; Equity and gender equality - to give priority to the underserved and hard-to-reach and high risk groups; Sustainability through technical and financial capacity building and Excellence in Program Management – to ensure effective use of resources following result-based principles and evidence-based practices.
National Objectives, Strategies and Key Activities 2011-2016

During the six-year period, 2011 – 2016, the major strategic objectives and strategies are as follows:

**Objective 1:** At least 90% fully immunization coverage among under one children at national level and 85% full immunization coverage at district level.

**Objective 2:** TT5 coverage among women of childbearing age reached at least 80% at national level and 75% at each district level.

In view of reaching the objective 1 & 2, further improvement and expansion of the EPI during the coming years is mandatory. This may includes setting new feasible targets, researching new techniques and exploring the means to be more effective, equitable and efficient service delivery at all levels.

Failure to reach expected level of immunization coverage targets in Bangladesh EPI are related to a number of programmatic factors, such as often limited capacity of the especially vaccinators at the rural settings, non availability of proper primary health care delivery system (infrastructure) at urban settings, lack of social mobilization, lack of supportive supervision, lack of mechanism to address immunization needs of slum areas (where rapid population migration regularly taking place) & difficult to reach areas in the in rural settings.

To address the above mention programmatic factors, following broad Strategies are incorporated into the cMYP

- Implement RED strategy in every district, giving special emphasis to the low coverage areas
- Establishment of proper primary health care delivery system at city cooperation level
- Incorporate regular supportive supervision at each level
- Strengthen coordination with development partners and local NGOs/GoB
- Strengthening of coverage and VPD surveillance system in all districts
- Ensure sufficient, timely and potent vaccines and quality injection devices available at all level with no stock out
- Periodical review of the National EPI program performance at each level and take timely and appropriate measures accordingly.
- Develop & implement staff recruitment plan with budget.

**Objective 3: Maintain polio free status**

By effectively implementing Acute Flaccid Paralysis (AFP) Surveillance, conducting supplementary OPV vaccination (NIDs/SNIDSs), mop-up OPV campaigns, and maintaining high routine OPV coverage Bangladesh managed to maintain the polio free status since 2006. In the presence of on-going polio outbreaks in neighbouring India and presence of few districts with relatively low OPV coverage, Bangladesh need to put extra effort to intensify the above strategies in coming years to maintain the polio free status in the country.

**Objective 4: Maintain maternal and neonatal tetanus elimination status**

Achieved elimination status of MNT in Bangladesh (2008) is a major public health success, but significant challenge remains to maintain this status especially due to the fact that 80% of deliveries still taking place out side the institutions. Other than that TT complete coverage (TT5) among child bearing age females remain around 53%.
In view of maintaining this MNNT elimination status, following broad Strategies are incorporated into the cMYP

- Maintain high coverage of TT5 among childbearing age women
- Maintain high TT protection at birth
- Intensify current NT surveillance
- Introduce dT among school age children

Objective 5: Achieve national level 95% measles coverage and reaching measles elimination status by 2016

In 2009, EPI programme has managed to reach national level measles-1 coverage among infants over 90%, still 11 out of 64 (17%) districts reported measles coverage less than 80%.

Over the last few years Bangladesh EPI programme managed to control the morbidity and mortality associated with measles up to a significant level by maintaining high coverage of measles-1 among infants, immunizing 35 million children from age 9 months to 10 years during the measles catch up programme in 2006 and immunizing all children aged nine months to sixty months during measles follow-up campaign in year 2010. To achieve the measles elimination status by 2016, Bangladesh EPI programme need to intensify the measles control activities in coming years. For that, following broad Strategies are incorporated into the cMYP

- Maintain high MCV1 coverage among infants with special emphasis to the low coverage districts
- Intensity measles surveillance
- Introduction of Measles 2nd dose to the EPI schedule

Objective 6: Prevention of diseases protected by new and underused vaccines

Bangladesh Government and EPI programme is planning to introduce Pneumococcal vaccine, Rota vaccine, Birth dose of hepatitis B vaccine, second dose of measles vaccine and dT vaccine in to the national EPI programme in coming years with GAVI support. To achieve this objective following broad Strategies are incorporated into the cMYP

- Identify priorities for vaccine introduction based on epidemiological evidence
- Strengthen coordination with development partners, local NGOs/GoB
- Establishment of surveillance system for diseases covered by new antigens.
- Introduction of new vaccines according to the planned timeline
- Ensure the future financial sustainability

Objective 7: Ensure safe injection practices and waste disposal

For the last few years Bangladesh EPI programme exclusively use AD syringes for all EPI vaccinations. When we consider the number of antigens administered, reported number of AEFI seems to be far less than the expected. Though under HPSP and later HNPSP, government of Bangladesh identified medical waste management as a priority area, still there is no proper EPI waste management mechanism in place. Majority of the Upazila use pit burning method to dispose medical wastes. To address this important area in future, following broad Strategies are incorporated into the cMYP.

- AEFI surveillance system strengthened
- Implementation on national plan on sharp and waste management for EPI waste
- Strengthen AEFI surveillance system
- Ensure injection safety
Section I: Situational analysis

This section examines the current status, performance challenges and gaps that formed the basis for the strategies and key activities contained in this plan. It outlines the socio-demographic and health sector contexts, and the status of the immunization program components and the immunization program initiatives.

1.1 Country profile

Basic facts
Bangladesh is located in South Asia, bordered by Bay of Bengal, Myanmar and India. It is located within Geographic coordinates: 24 00 N, 90 00 E. Most of Bangladesh lies within the broad delta formed by the Ganges and Brahmaputra rivers and is exceedingly flat, low-lying, and subject to annual flooding that often hampers access to affected communities and immunization service delivery.

Socio-demographic status

Bangladesh is one of the most densely populated countries in the world, with a surface area of 147,570 sq. km and the population is 146.2 million as of 2008. The country is home to about 3.6 million children under 1yr (i.e., 2.5% of population), to 18.9 million, under 5 year age (12.9% of total population) and to 36.2 million women of child bearing age (24.7% of total population).

Bangladesh has made significant progress in recent times in many of its social development indicators particularly in health. This country has made important gains in providing primary health care since the Alma Ata Declaration in 1978. All health indicators show steady gains and the health status of the population has improved. Infant mortality (from 97.5 per 1000 live birth in 1991 to 52 per 1000 in 2007), maternal mortality (574/100,000 live births in 1991 to 290/100,000 live births in 2007) and under-five mortality (from 151 per 1000 in 1991 to 65 per 1000 in 2007.) rates have all decreased over the last decades, with a marked increase in life expectancy at birth (56.1 in 1991 to 66 years in 2008). But some of this progress is uneven and there still exists inequalities between different groups and geographical regions.

Bangladesh has also witnessed rapid urbanization, with the urban areas growing at over 6% per annum during the last 30 years. About 27% of the people live in urban areas. In 2006, the urban population was about 34.6 million, and the number of urban poor has also increased from 7 million in 1985 to 12 million in 1999, and this has led to a large population of urban poor – posing special challenges to reach the urban poor with immunization services.
1.2 Health system

Like most transitional societies, a wide range of therapeutic choices are available in Bangladesh, ranging from self care to traditional and western medicine. The public sector is largely used for in-patient and preventive care while the private sector is used mainly for outpatient curative care. Primary Health Care (PHC) has been chosen by the Government of Bangladesh as the strategy to achieve the goals of “Health for all” which is now being implemented as Revitalized Primary Health Care.

Administratively, Bangladesh is divided into six Divisions (Dhaka, Chittagong, Rajshahi, Khulna, Sylhet and Barisal). Divisions are further divided into 64 Districts and 6 city corporations. The Districts are further divided into 482 Upazila (sub-districts) and 223 Municipalities. Each Upazila has several Unions (average 10; range 5-27), and each union consists of 3 Wards. The urban areas of the country are administered by Six City Corporations and Major Municipalities.

The primary care in the public sector is organized around the Upazila Health Complex (UHC) at sub-district level which works as a health-care hub. These Units have both in- and out-patient services and care facilities too. The public sector field-level personnel are comprised of Health Assistants (HAs) in each union and Family Welfare Assistants. The number of health assistants is determined according to the size of the population. The Health Assistants and Family Welfare Assistants are supervised by a Health Inspector (HI) and a Family Planning Inspector (FPI) respectively, posted at the union level. The UHC is staffed by qualified allopathic practitioners and supporting staff, while the Union Health and Family Welfare Centers (UHFWCs) are staffed by professionals such as a Medical Assistant (MA/SACMO) and mid-wife (Family Welfare Visitor), both trained in formal institutions.

The Ministry of Health and Family Welfare (MOHFW) provides the preventive health services in the rural areas (approximately 73% of the total population), while the Ministry of Local Government Rural Development and Cooperatives (MOLGRD&C) - through the City Corporations & Municipalities - is responsible for the urban areas. However the MOHFW has responsibility for overall health policy guidelines and logistics for providing primary health care services.

1.3 Immunization and Health Sector Policy Implementation

Within the broader context of Bangladesh National Strategy for Economic Growth, Poverty Reduction and Social Development (Bangladesh PRSD), the Government’s vision for the health is articulated in the strategic goal of the Ministry of Health and Family Welfare (MOHFW) which seeks to “create conditions whereby the people will have the opportunity to reach and maintain the highest level of health. It is a mission that recognizes health as a fundamental human right”. As a vehicle to deliver the essential development goal, the Government of Bangladesh (GoB) established a Health, Nutrition and Population Sector Program (HNPS) to increase the availability of and utilization of user-centered effective and efficient equitable, affordable and accessible quality services for a defined Essential Services Delivery (ESD) which includes immunization.

The first HNPS was a 5-year program (1998-2003) that incorporated a sector-wide approach to health services, emphasizing integration of Health & Family Planning wings and decentralization of management and financial responsibilities. As follow-on
to the first HNPSP, a Strategic Investment Plan (SIP) for 2006 – 2011 is currently being implemented (and is expected to be further extended).

Under the HNPSP, EPI is one of several programs of the “Essential Services Delivery” (ESD) that is administered by the Director, Primary Health Care (PHC) and Line Director, ESD. Under him, the Program Manager (PM), Child Health & Limited Curative Care, Deputy Program Managers EPI, ARI, CDD and School Health assists the PM in managing EPI activities and other child health activities. However, cold chain, logistics, training, surveillance, and communication, under the HNPSP are the responsibilities of the various Line Directors responsible for each of the respective sector areas (e.g., Logistics, Training, Unified Management Information System, and Behavioral Change & Communication). This therefore indicates an increased need for effective coordination and collaboration with other Line Directors in order to assure effective immunization program.

The HNPSP is funded by both the GoB and pooled funding from Development Partners (DPs). DPs’ contribution for HNPSP (2003-2010) has been estimated amounting to US$ 1,799 million.

### Priority objectives and indicators with benchmarks and targets for 6th 5-year Plan 2011-2015

<table>
<thead>
<tr>
<th>6th 5-year Plan 2011-2015</th>
<th>Unit of Measurement</th>
<th>Benchmark (with Reference Period and Source)</th>
<th>Projected Target Mid-2010</th>
<th>Projected Target Mid-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reducing Maternal Mortality</td>
<td>Proportion of births attended by skilled health personnel</td>
<td>18% (BDHS 2007)</td>
<td>43%</td>
<td>50%</td>
</tr>
<tr>
<td>Maternal deaths per 1,000,000 live births</td>
<td>320 (BMMS, 2001)</td>
<td>275</td>
<td>143</td>
<td></td>
</tr>
<tr>
<td>Reducing the Total Fertility Rate</td>
<td>Total fertility rate (TFR)</td>
<td>2.7 (BDHS 2007)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Reducing Malnutrition</td>
<td>% of underweight children age 6 to 59 months</td>
<td>41% (BDHS 2007)</td>
<td>34%</td>
<td>33%</td>
</tr>
<tr>
<td>% of stunting children age 6 to 59 months</td>
<td>43% (BDHS 2007)</td>
<td>25%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reducing Infant and Under-five Mortality</td>
<td>Infant deaths per 1,000 live births</td>
<td>52 (BDHS, 2007)</td>
<td>37</td>
<td>32</td>
</tr>
<tr>
<td>Deaths in children under 5 per 1,000 live births</td>
<td>65 (BDHS, 2007)</td>
<td>52</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>Reducing the Burden of HIV/AIDS, TB, malaria</td>
<td>Case detection: Proportion of estimated new smear positive TB cases detected in a given year</td>
<td>73% (NTP, 2008)</td>
<td>80%</td>
<td>75%</td>
</tr>
</tbody>
</table>
### 1.4 Immunization programme

#### Historical perspective of EPI programme

EPI in Bangladesh was launched on April 7, 1979 (World Health Day). As vaccination centers were few and were located mainly in health care facilities in urban areas, the EPI coverage remained less than 2% by 1984. In 1985, the Government of the People’s Republic of Bangladesh committed to the Global Universal Child Immunization Initiative (UCI), and began a phase-wise process of EPI intensification from 1985-1990. During this time period, EPI was intensified throughout 476 Thanas (Upazila – to be explained), 92 major Municipalities and 6 City Corporations. EPI was made available to all target groups (infants and pregnant mothers) by 1990.

EPI intensification consisted of establishing the cold chain system from EPI HQ to District and Upazila level and capacity to maintain cold chain down to the vaccination points in rural and urban areas, procuring and managing logistics needs for about 134,000 EPI outreach sites, and providing basic EPI training for thousands of mid-level managers, supervisors and field workers in the public and private sectors.

In the year 1993 GoB endorsed TT5 dose schedule for women of child bearing age initially from 15 to 45 years age and later extend o 15 to 49 years age.

Polio eradication and Maternal & Neonatal tetanus elimination activities initiated in 1995. As a part of this AFP, Measles and Neonatal tetanus surveillance initiated in 1997.

During the last few years, based on the data on disease burden, new vaccines for selected emerging diseases such as Hepatitis- B (2003) and Hib Disease (2009) have been introduced into the EPI schedule. Hepatitis B vaccine was incorporated inti the programme with GAVI phase 1 support bundle with injection safety supply. Vit A supplementation was added to the programme in 1990. In view of enhancing the injection safety AD syringes were introduced in to the programme from 2004.

Since 1995 to 2010, 18 National immunization days were conducted with very high (around 90%) coverage in Bangladesh in view of eradicating Polio. Measles catch up programme was conducted in 2005/05.

<table>
<thead>
<tr>
<th><strong>6th 5-year Plan 2011-2015</strong></th>
<th><strong>Unit of Measurement</strong></th>
<th><strong>Benchmark (with Reference Period and Source)</strong></th>
<th><strong>Projected</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>and other diseases</td>
<td>Cure rate: Proportion of registered smear positive TB cases successfully treated under DOTS in a given year</td>
<td>92% (NTP, 2008)</td>
<td>88% 95%</td>
</tr>
<tr>
<td></td>
<td>HIV prevalence</td>
<td>&lt; 1%</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

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**Note:**
- **TB (Tuberculosis):** Proportion of registered smear positive TB cases successfully treated under DOTS in a given year
- **HIV prevalence:** Less than or equal to 1%

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**Source:**
- NTP, 2008
- GoB”
National Immunization schedule - Bangladesh
According to the current Immunization Schedule for Bangladesh, all the children during their first year of life should be immunize with BCG, OPV, Pentavalent and Measles before reaching the age of one year. Other than that all the females of child bearing age (15-49 Years) should receive five doses of TT.

Vaccination schedule for under 1 year children

<table>
<thead>
<tr>
<th>Name of the disease</th>
<th>Name of the vaccine</th>
<th>Amount of dose</th>
<th>No of dose</th>
<th>Interval between doses</th>
<th>Starting time for vaccination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuberculosis</td>
<td>BCG</td>
<td>0.05 ml</td>
<td>1</td>
<td>-</td>
<td>After Birth</td>
</tr>
<tr>
<td>Diphtheria</td>
<td>DPT</td>
<td>0.5 ml</td>
<td>3</td>
<td>4 Weeks</td>
<td></td>
</tr>
<tr>
<td>Pertussis</td>
<td>DTP</td>
<td></td>
<td></td>
<td>1st Dose -6 weeks</td>
<td></td>
</tr>
<tr>
<td>Tetanus</td>
<td>HepB Hib Vaccine</td>
<td></td>
<td></td>
<td>2nd Dose -10 weeks</td>
<td></td>
</tr>
<tr>
<td>Hib Disease</td>
<td></td>
<td></td>
<td></td>
<td>3rd Dose -14 weeks</td>
<td></td>
</tr>
<tr>
<td>Measles</td>
<td>OPV</td>
<td>2 Drops</td>
<td>4</td>
<td>4 Weeks*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1st Dose -6 weeks</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2nd Dose -10 weeks</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>3rd Dose -14 weeks</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>4th Dose -38 weeks</td>
<td></td>
</tr>
<tr>
<td>Poliomyelitis</td>
<td>OPV</td>
<td>2 Drops</td>
<td>4</td>
<td>4 Weeks</td>
<td></td>
</tr>
<tr>
<td>Measles</td>
<td>OPV</td>
<td>0.5 ml</td>
<td>1</td>
<td>-</td>
<td>After completion of 9 Months</td>
</tr>
<tr>
<td>Night Blindness</td>
<td>Vitamin-A</td>
<td>1 (Blue)</td>
<td>1</td>
<td>-</td>
<td>With Measles</td>
</tr>
</tbody>
</table>

Vaccination schedule for 15-49 years women

<table>
<thead>
<tr>
<th>Dose number</th>
<th>Interval between doses</th>
<th>Amount of dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>TT-1</td>
<td>Just after 15 years of age</td>
<td>0.5 ml</td>
</tr>
<tr>
<td>TT-2</td>
<td>28 days after TT-1</td>
<td>0.5 ml</td>
</tr>
<tr>
<td>TT-3</td>
<td>6 months after TT-2</td>
<td>0.5 ml</td>
</tr>
<tr>
<td>TT-4</td>
<td>1 year after TT-3</td>
<td>0.5 ml</td>
</tr>
<tr>
<td>TT-5</td>
<td>1 year after TT-4</td>
<td>0.5 ml</td>
</tr>
</tbody>
</table>

Immunization programme objectives
Bangladesh immunization programme has effectively controlled most of the traditional vaccine preventable diseases through superior levels of sustained coverage. The unique feature of the immunization services in Bangladesh is that for nearly two decades, it is integrated with other primary health care services at all the level.
Therefore service providers and other logistics are shared with other activities as a routine.

The objectives of the country’s EPI programme are as follows for the period of 2011-2016.

1. **Coverage Target**
   At least 90% fully vaccination coverage at National level and 85% full vaccination coverage at district level by 2016.

2. **Disease reduction target**
   - Maintain polio free status.
   - Maintain MNT elimination status.
   - To achieve national level 95% measles coverage and reached measles elimination status by 2016.
   - To achieve 25% national level coverage of birth dose of hepatitis B vaccine by 2016.
   - Reduction of mortality of under 5 children by 90% due to Hib disease by 2016 compared to 2007 (25000 in 2007).

**Immunization service delivery**

The Bangladesh Immunization program with the support of development partners has taken a number of measures since EPI intensification during late 1980s to improve utilization of EPI services and injection safety. The key interventions and achievements include:

- Providing training for supervisors and field workers; at all levels in the country;
- Mid-level managers’ training - conducted to improve quality service;
- Monthly EPI Review sessions – conducted by Upazila, City Corporation, Municipality and District managers to identify problems and solutions at the local level;
- Periodic NT campaigns - conducting in high risk areas;
- Measles catch-up campaign
- NIDs/SNIDs for polio
- Annual CES evaluations - to monitor Division/ District/ City Corporation specific coverage, dropout rates and other performance issues

GAVI funds have been supportive of the Immunization program. The major activities funded using GAVI award and reward funding are recruitment of District Immunization Medical Officers, different training, procurement of logistics, and extension of cold and dry store space at different level, communication activities, and additional support for hard-to-reach and high risk areas.

**EPI services in rural areas**

The service delivery mechanism for providing EPI services in rural areas relies on a system of 64 Districts, 482 Upazilas, 4,498 Unions, 13,494 Wards, and 108,000 sub-blocks within the wards. Each sub-block has an EPI outreach site where routine EPI services are provided monthly for catchments of approximately 1,000 populations.
Vaccination at rural wards is provided primarily by the Health Assistant (HA), an employee of the health wing of MOHFW and is usually assisted by Family Welfare Assistant (FWA), an employee of family planning wing of MOHFW. In some instances wherever the post of HA is vacant, the primary responsibility of vaccination is carried out by FWA. Inadequate number of Health Assistants who are trained to carry out vaccination at EPI outreach sites may have a negative impact on reaching expected immunization coverage and quality targets.

Porters deliver vaccines from the Upazila Health Complex to the vaccination site/distribution points where the field workers collect and deliver the vaccines to vaccination sites.

Almost all EPI outreach sites are within 15-20 minutes walking distance, and field workers are instructed to conduct home visits to register newborns (in the EPI Registration Book) and invite parents to bring their target children to come to vaccination sessions prior to the day of session thus performing an important social mobilization role.

Currently there are about 6000 to 7000 vacant Health assistant (vaccinator) posts prevail in all 64 districts. This may be one of the main obstacles to reach expected coverage targets at district level.

Important challenges of this mechanism include the inconsistency of home visits (either for registration or for invitation for services) by the health workers, which may contribute to immunization drop-out rates.

Lack of supervision on the EPI activities at grassroots’ level by union level supervisory officers (sometimes due to vacant posts) also contribute to the poor performance in some districts.

**EPI Services in the urban areas**

The large and increasing population in urban areas has led to increased attention to urban health, and this is a critical issue, to sustain the high levels of immunization coverage. Historically, development of urban healthcare facilities was focused more on developing secondary and tertiary (specialized) care with relative neglect of primary care sector. As a result, there exist an acute lack of primary care facilities. Large number of slum areas and rapid population migration aggravate the situation. The responsibility for providing urban primary and preventive health care services rests with the City Corporations and Municipalities. Accordingly, the City Corporations and Municipalities have established Immunization sites, based mainly on the population size of the wards.

The urban EPI services, especially in the City Corporations are heavily supported by NGOs associated with two major projects, the Smiling Sun Franchise Program (SSFP), which is funded by USAID, and the Urban Primary Health Care Project (UPHCP), which is funded by a consortium led by the Asian Development Bank (ADB) that includes also DFID, SIDA and UNFPI. Both SSFP and UPHCP subscribe to the concept of one-stop services and discourage the use of outreach and doorstep service delivery.
Funding for the 5-year UPHCP project ($60 million) is provided primarily by the ABD-lead consortium ($40 million), United Nations Population Fund (UNPFA) ($5 million), and the Nordic Development Fund ($3.5 million), in addition to the government contributions (~$11.5 million). The UPHCP is developing primary care infrastructure that may later on be taken over by the city governments (corporations) so as primary care is institutionalized within the system of government-provided health services. The government sets the standards, manages a competitive bidding process, contracts with NGOs and the private sector, and supervises the contract to ensure that contracted services are delivered. If levels of health or specific targets are met or surpassed cash bonuses are awarded. This performance-based reward system is intended to boost high immunization coverage. Currently operating UPHCP and SSFP project will end in 2011. Hopefully, GOB may be able to find necessary funding sources to continue the provision of primary health care services through NGOs at urban areas in coming years. However, sustaining the funding for the services after the UPHCP and SSFP come to an end remains a challenge.

Majority of the vaccinators who are attached to the urban vaccination clinics are contract workers funded by NGOs. Recruitment of NGO staff is done against explicit professional standards. Their quantity is enough for routine immunization but severely insufficient for campaigns. Also of a problem is high turnover among contracted workers – they tend to switch to better positions as soon as there is a chance. Institutionalization of services is expected to counteract this tendency (in the future).

Immunization coverage performance

Immunization has been one of Bangladesh’s greatest public health success stories. The programme has prevented an estimated 2 million deaths from 1987-2000, and continues to prevent approximately 200,000 deaths each year. The trend of immunization coverage – a key measure of immunization system performance, shows that the Immunization program has strong capacity to reach children with BCG (94%), DPT-3 (96%), Polio-3 (96%) and Measles (98%). However, only 75% of children one year of age are fully immunized with all doses of vaccines which they are supposed to receive during the first year of life. At the same time, significant disparity can be observed regarding the immunization coverage among districts as 13 out of 64 (20%) districts are having DPT-3 coverage less than 80%, and 11 out of 64 (17%) districts are having Measles coverage less than 80%.

These are the key areas that EPI programme need to address in the future in view of achieving and sustaining the vaccine preventable disease control. It is noteworthy that in the past five years, the percentage of fully immunized children has shown a substantial increase (from 64% in 2005 to 75% in 2009).

TT coverage among pregnant women shows that 93% of children were protected at birth from NNT. The TT coverage among 15-49 years women is 97% for TT-1, 95% for TT-2, 86% for TT-3, 70% for TT-4 and 52% for TT-5 (complete protection). Fifty-five out of 64 districts (86%) have TT-2+ coverage (received more than 2 doses of TT at the time of pregnancy) less than 50%. There is therefore a need to ensure that the performance is improved especially for TT vaccination for 15-49 years women and to focus on strengthening the weak districts in view of maintaining the NNT elimination status.
Vaccine wastage

For the year 2009 Bangladesh EPI programme has reported exceptionally high vaccine wastage for all the vaccines. Reported vaccine wastage for each individual vaccine is as follow, BCG - 85%, DPT- 43%, Hepatitis B – 43%, Oral polio – 33%, Measles – 71% and TT – 30%. Those reported vaccine wastage figures were more or less similar to that of the previous year (2008). It is essential to take effective steps to reduce vaccine wastage for all the vaccines used in the EPI programme. The issue of vaccine wastage will gain even more importance due to high cost of new vaccines which are planned to be introduced to the EPI programme in near future.

EPI Logistics

Effective logistics management is essential for Immunization program performance. However, an added challenge and opportunity is the need to strengthen the coordination between ESD directorate and the Centre for Medical Store Depot (CMSD) to ensure that routine EPI logistics, including AD syringes, safety boxes and accessories for maintaining vaccination, injection safety, record keeping and reporting forms are made available in adequate quantities at all levels. (at the moment all the logistics apart from cold chain equipment is procured through EPI – therefore no delays)

Vaccine procurement

All the EPI vaccines used in the EPI programme are procured through UNICEF. The quality of vaccine is assured by obtaining vaccines from suppliers’ recommended by the WHO for bulk purchase for UN agencies and by looking into the criteria of ‘good manufacturing practices’ as laid down by the WHO. Prevailing complex vaccine procurement procedures cause delays in vaccine procurement. Still Bangladesh EPI programme managed to provide adequate amount of vaccines to all districts without any interruption during the last few years. Usually, six months buffer stocks of EPI vaccines are stored at the EPI HQ stores.

Vaccine and other EPI logistic distribution

Distribution of vaccines and other logistics to each district is currently done on a monthly basis, based on request on requirement of each item from each district. All the districts have their own cold chain storage facility to store vaccines and other immunization logistics. The responsibility of transportation of vaccines and other logistics to the districts rests with the private sector contractors. EPI unit monitors the process and provides cold boxes. This mechanism of distribution of vaccines and other logistics from the EPI HQ store to districts is well elaborated and operates well during last few years.

From district stores vaccines and other logistics are distributed monthly to Upazila level stores located within Upazila Health Complexes. Upazila level stores have enough cold chain capacity to store one month buffer stock of vaccines. Every day porters deliver vaccines from the Upazila Health Complex to the vaccine distribution points at Union level where the field workers collect and deliver the vaccines to vaccination sites. To transport vaccines from Upazila level into field, they use vaccine carriers.
Every evening, remaining unused vaccines are returned to the Upazila level store using similar transport mechanism.

**Central level stores**

Bangladesh has well equipped central level vaccine store with a computerized logistics management system at EPI headquarters. Central cold room complex is equipped with computerized temperature monitoring system and backup generators. During last few years the delay in receiving request from Districts has improved, so there is no undue delays in distribution of logistics from the central stores to the districts. The following constrains were identified during latest (2009) cold chain inventory review following:

- Current central level vaccine storage capacity is just adequate for storing six months buffer stock of EPI vaccines. Current central level total vaccine storing capacity is nearly 623 cubic meters. Out of this total volume, 100 cubic meters belongs to old cold room complex and rest (523 cubic meters) belongs to new cold room complex. Old cold room complex is more than 24 years old, it needs proper repair or replacement soon.

- In the event of introduction of new vaccines to the EPI in future, it is essential to expand central cold room capacity accordingly.

- Due to inadequate space other vaccine logistic (AD syringes, diluents) are not properly stored in the EPI HQ store.

- Time consuming procedures to receive logistics delivered by Central Medical Supplies Division (CMSD). This led to Stock out of some logistics other than vaccines at the central stores store.

- Inadequate number of cold chain technicians, store-keepers and minor employees.

- Lack of training opportunities for all categories of workers regarding new advancements of the cold chain technology.

In addition, proper training is essential in order to improve the quality of the vaccination program by the implementers, including district EPI Supervisors, Medical Technologists (EPI technicians), EPI Store-keepers and Field Workers. Periodical revision of record keeping and reporting forms will also be done based on the program need. *(misplaced paragraph)*

**District level stores**

All districts have their own vaccine storage facilities. These consist of number of separate refrigerator units (some districts comprise up to 30-40 refrigerator units). Cold chain technician is responsible for maintaining the cold chain at district stores. All districts have adequate number of cold boxes and vaccine carriers for transporting vaccines from the National level and down to Upazila level.

At the district level, the following issues were identified in certain areas that need improvement for quality service delivery:

- Inadequate storage capacity to store three months buffer stock of vaccines. So central store has to sent vaccines to the districts monthly after introduction of Hib vaccine (as a component of Pentavalent vaccine);

- In the event of introduction of new vaccines to the EPI in future, it is essential to expand district cold room capacity accordingly;
Reuse of injection equipment is responsible for most of the infections that result from immunization. This can be prevented by using AD syringes. In Bangladesh introduction of AD syringes into the EPI programme with GAVI support was done in 2004 in order to ensure immunization safety and to improve the quality. For the last few years Bangladesh EPI programme exclusively use AD syringes for all EPI vaccinations. Since 2007, government is procuring AD syringes from the local manufacturer using its own funds.

Under HPSP and later HNPSP, government of Bangladesh included medical waste management as a priority sector as an activity under improved hospital services component. But Upazila and below level health centres were not considered in that initiative as they fall under the jurisdiction of primary health care.

At the immunization sites medical wastes are collected into the safety boxes. All filled safety boxes are transported to the corresponding Upazila and temporarily stored. Periodically those collected medical wastes are disposed off by burning. Out of 474 upazila only few (about 50) have incinerators that also most of the places currently not in an operational state. Majority of the Upazila use pit burning method to dispose medical wastes.

**AEFI Surveillance**

(The country has a well-established (ill-established) system of AEFI surveillance) As vaccine coverage increases over the time reports on adverse events following immunization (AEFI) also increases which may have a negative impact on the EPI programme. Availability of efficient AEFI surveillance system may be a key to increase immunization acceptance and improve the quality of services. For the year 2008, AEFI surveillance system had reported 2322 adverse cases out of that 8 were categorized as “serious”. When we consider the number of antigens administered in 2008, this figure seems to be far less than the expected.

**VPD surveillance**

EPI programme is assigned for management of AFP and VPDs surveillance system in Bangladesh. The diseases under surveillance are Polio (any age), AFP (< 15 years) Neonatal tetanus (< 28 days), Tetanus (any age after neonatal period), Measles (any age), Diphtheria (any age), Pertussis (any age) and Tuberculosis (< 5 years).

AFP and VPDs are reported from static health facilities on weekly basis using “AFP and EPI Diseases Weekly Line Listing Form for Hospitals and Upazila Health complexes”. Designated health facilities send weekly passive reports to civil Surgeons/Chief Health Officers. Civil Surgeons and Chief Health officers of all districts
and city co operations send the compilation of the passive reports to the EPI HQ. Currently 767 health facilities are under passive surveillance, In addition to passive reporting, weekly active surveillance is conducted for AFP, NNT and Measles in major hospitals. Currently 140 major hospitals are under active surveillance. In year 2009, all the stake holders involve in VPD surveillance at National, district and Upazila level were given a training opportunity regarding VPD surveillance. Same time clear written guidelines are available in this regard. Currently this system is operating smoothly. Through this system for year 2009, Bangladesh has reported 23 Diphtheria cases, 718 Measles cases, 121 NNT cases and 16 Pertussis cases.

**New vaccine introduction**
For the past two decades, in most developing countries, vaccination restricted only to the initial EPI vaccines. Where-as in most developed countries, several new vaccines such as HepB, Hib, meningococcal, pneumococcal, were gradually added to the initial EPI vaccines, thus widening the gap in protection against infectious diseases between the rich and the poor.

With the GAVI co-financing support EPI programme in Bangladesh successfully introduced the Hib vaccine in to the EPI schedule in the form of pentavalent vaccine in 2009.

Bangladesh Government and EPI programme is planning to introduce Pneumococcal vaccine, Rota vaccine, Birth dose of hepatitis B vaccine, second dose of measles vaccine and Td vaccine in to the national EPI programe in coming years with GAVI support. To work on this regard, in 2009 National committee on Immunization practice was established with the Chairmanship of secretary to the minister of Health. They have appointed Scientific and technical subcommittee. Those committees decided to introduce following antigens:

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

  Active surveillance study for acute respiratory illness among children of 5000 selected households living in urban community in Dhaka revealed that overall incidence of invasive pneumococcal disease among children less than 5 years of age was 447 episodes per 100000 child years. This limited study finding gives some insight about the high pneumococcal disease burden prevailing in Bangladesh. To establish this, country may need to have large scale burden study on pneumococcal associated disease burden, preferably before the introduction of pneumococcal vaccine into the national EPI Schedule

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

According to the hospital based surveillance study carried out in 2000 to 2006 in Bangladesh revealed 33% of all diarrhea admissions among children less than 5 years were due to Rotavirus. 56% of the reported rotavirus positive cases were less than 1 year. Based on that they have estimated that population based incident rates of rotavirus ranged from 10.8 to 19.6/1000 children less than 5 years of age. This study finding indicates that rotavirus is an important cause of childhood diarrhea in rural Bangladesh and this burden may be reduced with a rotavirus vaccination programme.

**Second dose of measles vaccine**

In view of reducing the morbidity and mortality associated with measles, EPI programme has decided to introduced second dose of measles vaccine for children age 15 -18 months into the EPI schedule from 2011. This will ensure the presence of protective antibody levels against measles among children. Until establishment of the 2nd dose of measles in the EPI schedule, EPI programme hope to continue with periodical measles follow up campaigns targeting all children aged from nine months to sixty months.

**Birth dose of Hepatitis B vaccine**

Bangladesh is grouped as intermediate endemic country for Hep B. It was estimated that nearly eight percent of Bangladesh’s total population are infected with the hepatitis B virus. According to the Liver Foundation of Bangladesh (LFB) nearly 3.5 percent of the pregnant mothers are affected by hepatitis B virus.

The main objective of hepatitis B immunization strategies is to prevent chronic hepatitis B virus (HBV) infection and its serious consequences, including liver cirrhosis and hepatocellular cancer (HCC). High coverage with the primary vaccine series among infants has the greatest overall impact on the prevalence of chronic HBV infection in children and should be the highest HBV-related priority.

A variety of schedules may be used for hepatitis B immunization in national programmes, depending on the local epidemiological situation and programmatic considerations. In countries where a high proportion of HBV infections are acquired perinatally, WHO recommend to give the first dose of hepatitis B vaccine as soon as possible (<24 hours) after birth.

Above epidemiological evidence justify the introduction of birth dose of Hep B into the EPI schedule.

**Low-dose diphtheria & tetanus toxoid (dT) vaccine**

In view of further strengthening of MNT control measures, it is planned that from the year 2011 Government of Bangladesh will introduce low-dose diphtheria and tetanus toxoid vaccine (dT) to the national EPI schedule. WHO position paper on Tetanus vaccination also advocates to introduce vaccine combinations containing diphtheria toxoid (D or d) and tetanus toxoid, rather than tetanus toxoid alone when immunization against tetanus is indicated.

According to new strategy and considering the three doses of DTP as two doses of TT the third dose of dT will be given at the age of school entry (class-I or 6 Years), the fourth and fifth dose of dT will be given at class-II (at the age of 7 years) and class-III
Comprehensive Multi-Year Plan of the Expanded Programme on Immunization (EPI) of Bangladesh 2011-2016 –

(at the age of 8 years). Children who could not be enrolled in the school will be followed up at community level and will be vaccinated accordingly.

The existing TT schedule for child bearing age women will also be continued till the new schedule fully operationalised.

- **Rubella vaccine**
  
  In 2006, surveillance system has reported 83 outbreaks of fever and rash. It confirmed by serology that, 34 of them were measles outbreaks and 26 were rubella outbreaks. In contrast 2007 has reported 102 rubella outbreaks but no measles outbreaks. These data indicate that rubella cases need attention for assessing rubella and CRS burden in Bangladesh. For year 2009 surveillance system has reported 1206 rubella cases.

Those epidemiological evidence warrant introduction of Rubella vaccine in to the national EPI schedule in future.

**Immunization Programme Advocacy, Social Mobilisation & IEC:**

Since the second half of the 1990s, the Bangladesh immunization program communication activities have been on an ad-hoc basis, such as during NIDs, Measles NT, Hib introduction Campaigns. Other than regular TV & Radio advertisements and few fixed advertisement boards, there has not been an effective, sustainable, coordinated (institutionalized) communication strategy implemented to support the behaviours of clients in favour of routine EPI. This may be essential to overcome the future challenges associated new vaccine introduction

1.5 **Accelerated Disease Control Initiatives**

Polio eradication, neonatal tetanus elimination and accelerated measles control are the major vaccine-preventable disease control initiatives in Bangladesh.

**Polio eradication**

Strengthening Acute Flaccid Paralysis (AFP) Surveillance, conducting supplementary OPV vaccination (NIDs/SNIDSs), mop-up OPV campaigns, and maintaining high routine OPV coverage are the key strategies for polio eradication in Bangladesh.

AFP Surveillance was strengthened with introduction of Surveillance Medical Officers (SMO) network in 1999. The AFP Rate was below 1 until year 2000 and the percentage stool adequacy was less than 80% until 2001. However, since active surveillance in 2002, AFP surveillance quality has improved significantly. The non-polio AFP rate increased from 0.1/100,000 children under 15 yrs in 1997 to 3.1 in 2007.

Confirmed polio cases peaked in 1999 with 29 confirmed cases. The last indigenous case was reported in 2000 and the country remained free from confirmed poliovirus till early 2006 for more than 5 years – in spite of the on-going polio outbreaks in neighboring India. In 2006 polio importation occurred in Bangladesh from neighboring Uttar Pradesh of India. A total of 18 polio cases in 12 districts were identified after importation in 2006. Timly response with very high coverage all rounds of NIDs, strong routine EPI programme and special effort to ensure “reaching the unreached” were the interventions for that Bangladesh was able to stop the virus circulation again. Bangladesh remains free from confirmed wild polio virus again since 2007.
Supplementary OPV Campaigns

Bangladesh has conducted 18 OPV National Immunization Days (NIDs) and many SNIDs to administer OPV to children under 5 years. The campaigns conducted between 1999 and 2010 were combined with NT campaigns (target group – CBAW). Since 18th NID carried out in 2010, the coverage has been more than 98%.

Neonatal tetanus Elimination

The World Health Assembly in 1998 set the goal of elimination of NT. In December 1999 UNICEF, WHO and UNFPA agreed to set the year 2005 as the target date for global elimination of neonatal tetanus. Toward achieving the global goal to reduce NT cases to less than 1 case per 1000 live births in every district of every country, UNFPA/UNICEF/WHO recommend the following three strategies for achieving MNT elimination:

- Provision of at least two doses of tetanus toxoid (TT) to all pregnant women, and, in high-risk areas, three TT doses to all childbearing aged women;
- Promotion of clean delivery services to all pregnant women;
- Effective surveillance for MNT.

Neonatal Tetanus was a major public health problem in Bangladesh. In 1985, death due to neo-natal tetanus was 41/1000 live births causing more than 100,000 neonatal deaths in a year. In Bangladesh, due to cultural reason most of the deliveries take place at home and are attended by traditional birth attendants.

With the expansion of EPI programme in Bangladesh, the number of deaths due to neonatal tetanus has decreased gradually over the last 15 years. There is relatively high TT2+ coverage among pregnant women now. Disease incidence surveys show that number of neonatal tetanus death has decreased from 6/1000 live births in 1994 to 2.3/1000 live birth in 2000.

In Bangladesh an integrated surveillance was developed in 1997, later on the guidelines have been revised. Emphasis has been given on weekly reporting of EPI diseases through both active and passive surveillance system.

Bangladesh conducted NT campaigns using high-risk approach in three phases. The first phase conducted in 1995 targeting approximately 3 million women of child bearing age. Second phase of NT campaigns was held through 1999 to 2001 targeting 2.6 million women of childbearing age which is around 15% of total population. The third phase was held in 2006 targeting around 3.5 million women of child bearing age. Bangladesh recently conducted a nation-wide coverage evaluation survey. The survey result revealed that national TT2+ is 94% among pregnant women and 93% of children is protected at birth (PAB) against neonatal tetanus.

In the beginning of immunization program vaccination only to pregnant women with TT has been in the EPI policy. Later on in 1993 national EPI has endorsed and promoted the TT five dose schedules to all child bearing aged (CBA) women of 15-49 years.

With the reduction of reported NT cases a comprehensive review of district level indicators for the risk of NT was conducted in 2008. Overall, the data supported the
claim of elimination but it was decided that a survey should be done for confirmation. In 2008, the Ministry of Health and Family Welfare carried out an evaluation using standard WHO protocol to determine whether neonatal tetanus had been eliminated in Bangladesh. Two community based surveys were performed in the 2 districts where children were considered to be at the highest risk from neonatal tetanus. According to the survey results Bangladesh has achieved MNT elimination.

The elimination of MNT in Bangladesh is a major public health success, but significant challenge remains. Maintaining the elimination status would require a continuous strengthening of routine TT immunization services. In addition, as a priority, a far greater percentage of women should be giving birth with trained attendants or in a health facility.

1.5 Accelerated Measles Control


The overall goal of the Measles Control Plan of Action 2004 – 2010 is to reduce the number of measles deaths by half by 2006 relative to 1999 estimates. The specific objectives are:

1. To achieve at least 90% measles containing vaccine (MCV1) coverage nationally and 80% MCV1 coverage in all districts by 2010
2. To achieve 90% completeness and 80% timeliness weekly reporting of measles cases and deaths, together with AFP, NT and other priority VPDs, from facilities including “0” reporting by 2010
3. To conduct case-based measles surveillance within an integrated VPDs surveillance
4. To investigate while ensuring adequate clinical case management of all measles outbreaks by 2009
5. To provide a second opportunity for measles vaccination for eligible children while ensuring more than 90% coverage nationally by 2010

In Bangladesh, baseline (pre immunization) measles data from 1984 WHO EPI study indicated that nearly 2.6 million cases of measles used to occur annually among children 0-4 years of age, with a case fatality rate 1.74%. Thus, there was an estimated 45,240 measles deaths among children of under 5 years in 1984. In 2009, EPI programme has managed to reach national level measles-1 coverage among infants over 90%, still 11 out of 64 (17%) districts reported measles coverage less than 80%. To achieve the National goal, Measles vaccination through the routine immunization program needs to be strengthened further with special emphasis to the poor coverage districts in the future.

Measles catch up campaign was successfully conducted targeting 35 million children from 9 months to 10 years in 2005-06. No measles outbreaks were confirmed in 2007 by laboratory testing, indicating that measles virus circulation has been reduced after catch-up campaign.
There has been a drop in the number of measles cases reported from outbreaks in the country since 2006. There were 2,095 measles cases reported from 34 laboratory confirmed measles outbreaks in 2006 and no measles outbreaks were reported in 2007. After supplementary immunization activities, number of reported measles cases has dropped to 2,249 in 2006 to 2,097 in 2007. Since these cases were not laboratory confirmed, diagnosis was limited to clinical suspicion. To overcome this Bangladesh EPI programme has introduced measles case based surveillance in all health facilities in 2008.

Government of Bangladesh has successfully conducted a measles follow-up campaign in year 2010 targeting all children aged from nine months to sixty months. It was also planned that a second dose of Measles vaccine will be introduced in the routine immunization program from 2011.
1.6 Key barriers identified during the situation analysis

1. Completed immunization coverage among under-one year, at national level is 75%.

2. Only 53% of the child bearing age women had fully TT protection (TT-5)

3. Significant disparity can be observed regarding the immunization coverage among districts

4. Prevailing of vacant posts, especially at lower levels in the EPI service delivery system.

5. Unavailability of proper primary health care delivery system (infrastructure) at city corporation level.

6. Lack of training for technical EPI staff at all levels.

7. Need to put extra effort to maintain the polio free status in the country due to presence of polio outbreaks in neighbouring India

8. Need to put extra effort to maintain MNT elimination status in the country due to:
   — Only 53% of child bearing age women being fully protected with TT.
   — Nearly 80% of the deliveries are home deliveries.
   — Significant disparity being observed regarding the immunization coverage for TT among districts

9. Need to put extra effort to maintain the current measles control status and reached measles elimination status in 2016

10. Non availability or under utilization of the following vaccines in the National EPI schedule which are proven to be capable to reduce the current childhood morbidity and mortality in Bangladesh: Pneumococcal, Rotavirus, Rubella, Measles-2, Td, Hepatitis-B birth dose.

11. Inadequate cold chain storage capacity for new vaccines at all the levels

12. Non availability of safe and environmental friendly waste disposal system for disposal of EPI waste

13. High Vaccine Wastage

14. Surveillance need be strengthened
## 2 Section II: Immunization program objectives and strategies

### 2.1 National priorities, EPI objectives and milestones

<table>
<thead>
<tr>
<th>Objective</th>
<th>Strategy</th>
<th>Key activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Service delivery</strong></td>
<td>1. RED strategy implemented in every district</td>
<td>1. Prepare Districts/Upazila level annual district/Upazila RED micro-plan to reach every children and child bearing age women</td>
</tr>
<tr>
<td></td>
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<td>2. Identify low performing districts/Upazila</td>
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<td>3. Regular supportive supervisory visit to each Upazila at least once per month by a supervisor</td>
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<td>4. Established proper primary healthcare delivery system to city cooperates</td>
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<td>5. Review district/Upazila and city cooperate coverage performance and vaccine wastage quarterly</td>
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<td>6. Prepare Districts/Upazila level annual district/Upazila micro-plan with especial emphasis to reduce the vaccine wastage</td>
</tr>
<tr>
<td><strong>Advocacy and Communication</strong></td>
<td>2. Strengthen coordination with development partners, local NGOs and GoB</td>
<td>1. Conduct regular ICC meetings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Broaden agenda and participation of ICC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Better involvement of NGOs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Involving community leaders linking community with immunization planning and implementation</td>
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<tr>
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<td></td>
<td>5. Develop district level community strategy and implement Social mobilization using community health workers/volunteers</td>
</tr>
<tr>
<td><strong>Surveillance</strong></td>
<td>3. Strengthening of immunization coverage and VPD surveillance system in all districts</td>
<td>1. Review and analyze coverage and VPD surveillance data at all level and disseminate feedback to stakeholders</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Availability and timely distribution of disease surveillance &amp; coverage format</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Introduction of case based laboratory surveillance for all VPD diseases</td>
</tr>
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<td></td>
<td>4. Training on VPD surveillance</td>
</tr>
<tr>
<td><strong>Vaccine supply Quality and logistics</strong></td>
<td>4. Ensure sufficient timeliness and availability of vaccine</td>
<td>1. Made timely and accurate vaccine forecast and procurement at national level</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Comprehensive Multi-Year Plan of the Expanded Programme on Immunization (EPI) of Bangladesh 2011-2016 –</th>
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<tbody>
<tr>
<td>potent vaccines and quality injection devices available at all level with no stock out</td>
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</table>

**Programme Management**

<table>
<thead>
<tr>
<th>5. Periodical review of the National EPI program performance at each level and take timely and appropriate measures accordingly.</th>
<th>1. EPI review is conducted quarterly at district and Upazila level and biannually at national level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Immunization sessions are monitored and supervised</td>
</tr>
<tr>
<td></td>
<td>3. Monthly reporting of routine immunization coverage data to central level in timely manner</td>
</tr>
<tr>
<td></td>
<td>4. Periodically VPD data are reviewed (both district &amp; National level) and take appropriate action</td>
</tr>
<tr>
<td></td>
<td>5. Conduct immunization coverage surveys periodically</td>
</tr>
<tr>
<td>6. Develop staff recruitment plan with budget.</td>
<td>1. Conduct audit to identify vacant post related to EPI service delivery at central, district and upazila level</td>
</tr>
<tr>
<td>Service delivery</td>
<td>Vaccine supply, quality and logistics</td>
</tr>
<tr>
<td>------------------</td>
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</tr>
<tr>
<td><strong>3. Maintain polio free status</strong></td>
<td><strong>5. Make available</strong></td>
</tr>
<tr>
<td>2. Conduct Periodic polio SIAs</td>
<td>1. Timely availability of adequate supplies</td>
</tr>
<tr>
<td>3. Maintain high coverage with quality OPV routine immunization</td>
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</tr>
<tr>
<td><strong>Advocacy and communication</strong></td>
<td><strong>Surveillance</strong></td>
</tr>
<tr>
<td>3. Strengthen polio eradication measures coordination with development partners, local NGOs and GoB</td>
<td>4. Strengthened AFP surveillance system</td>
</tr>
<tr>
<td>1. Conduct annual NIDs till polio is free in the region targeting under 5 children</td>
<td>1. Ensure active AFP surveillance in all district</td>
</tr>
<tr>
<td>2. Vitamin A, de-worming tablets and other health interventions are provided during NIDs</td>
<td>2. Improve timeliness and completeness of weekly and monthly reporting of AFP and other VPD data</td>
</tr>
<tr>
<td>3. Special emphasis shall be focused on low performing districts</td>
<td>3. Ensure quality of surveillance data</td>
</tr>
<tr>
<td><strong>Advocacy and communication</strong></td>
<td><strong>Vaccine supply, quality and logistics</strong></td>
</tr>
<tr>
<td>1. Conduct regular polio ICC meetings</td>
<td></td>
</tr>
<tr>
<td>2. Broaden agenda and participation of ICC meetings</td>
<td></td>
</tr>
<tr>
<td>3. Better involvement of NGOs</td>
<td></td>
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<tr>
<td>4. Regular communication with curative sector</td>
<td></td>
</tr>
<tr>
<td>5. Involving community leaders linking community with immunization planning and implementation</td>
<td></td>
</tr>
<tr>
<td>6. Sharing of surveillance data with stakeholders</td>
<td></td>
</tr>
<tr>
<td>7. Conduct advocacy meeting with different stakeholders</td>
<td></td>
</tr>
<tr>
<td><strong>Surveillance</strong></td>
<td><strong>Vaccine supply, quality and logistics</strong></td>
</tr>
<tr>
<td>4. Strengthened AFP surveillance system</td>
<td>5. Make available</td>
</tr>
<tr>
<td>1. Ensure active AFP surveillance in all district</td>
<td>1. Timely availability of adequate supplies</td>
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<tr>
<td>Programme management</td>
<td></td>
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<tr>
<td>----------------------</td>
<td></td>
</tr>
<tr>
<td><strong>1.</strong> Training of staff on AFP surveillance activities</td>
<td></td>
</tr>
<tr>
<td><strong>2.</strong> Review and analyze coverage and surveillance data at all level periodically and disseminate to stakeholders</td>
<td></td>
</tr>
<tr>
<td><strong>3.</strong> Regular review of polio status in neighbouring countries</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Service Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.</strong> Continue to follow TT5 schedule in routine immunization program among childbearing age women</td>
</tr>
<tr>
<td><strong>2.</strong> Special emphasis shall be focused on low TT coverage districts</td>
</tr>
<tr>
<td><strong>3.</strong> Practice clean delivery at community</td>
</tr>
<tr>
<td><strong>4.</strong> Improve institutional delivery by incentive scheme</td>
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<table>
<thead>
<tr>
<th>Advocacy and communication</th>
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</thead>
<tbody>
<tr>
<td><strong>1.</strong> Conduct regular ICC meetings</td>
</tr>
<tr>
<td><strong>2.</strong> Broaden agenda and participation of ICC meetings</td>
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<tr>
<td><strong>3.</strong> Better involvement of NGOs</td>
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<td><strong>4.</strong> Involving community leaders linking community with immunization planning and implementation</td>
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<tr>
<td><strong>5.</strong> Conduct advocacy meeting with different stakeholders</td>
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<tr>
<td><strong>6.</strong> Regular communication with curative sector</td>
</tr>
<tr>
<td><strong>7.</strong> Sharing of MNT surveillance data with stakeholders</td>
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<table>
<thead>
<tr>
<th>Surveillance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.</strong> Improve timeliness and completeness of weekly and monthly reporting of MNT and other VPD data</td>
</tr>
<tr>
<td><strong>2.</strong> Review and analyze coverage and surveillance data at all level and disseminate to stakeholders periodically</td>
</tr>
</tbody>
</table>

- Comprehensive Multi-Year Plan of the Expanded Programme on Immunization (EPI) of Bangladesh 2011-2016 –

- All the logistics for effective implementation of Polio eradication activities for SIAs at all level

- Timely availability of all logistics for AFP surveillance (stool containers, forms, guidelines, IEC materials, transport)

- Effective implementation of Polio eradication activities

- Training of staff on AFP surveillance activities

- Review and analyze coverage and surveillance data at all level periodically and disseminate to stakeholders

- Regular review of polio status in neighbouring countries

- Maintain high coverage of TT5 among childbearing age women

- Special emphasis shall be focused on low TT coverage districts

- Practice clean delivery at community

- Improve institutional delivery by incentive scheme

- Strengthen coordination with development partners, local NGOs and GoB

- Better involvement of NGOs

- Involving community leaders linking community with immunization planning and implementation

- Conduct advocacy meeting with different stakeholders

- Regular communication with curative sector

- Sharing of MNT surveillance data with stakeholders

- Intensify MNT surveillance

- Improve timeliness and completeness of weekly and monthly reporting of MNT and other VPD data

- Review and analyze coverage and surveillance data at all level and disseminate to stakeholders periodically

- Maintain maternal and neonatal tetanus elimination status

- Continue to follow TT5 schedule in routine immunization program among childbearing age women

- Special emphasis shall be focused on low TT coverage districts

- Practice clean delivery at community

- Improve institutional delivery by incentive scheme

- Conduct regular ICC meetings

- Broaden agenda and participation of ICC meetings

- Better involvement of NGOs

- Involving community leaders linking community with immunization planning and implementation

- Conduct advocacy meeting with different stakeholders

- Regular communication with curative sector

- Sharing of MNT surveillance data with stakeholders
### Vaccine supply, quality and logistics

<table>
<thead>
<tr>
<th>Ensure availability of all logistics for surveillance activities</th>
<th>Timely availability of all logistics for surveillance (forms, guidelines, IEC materials, transport)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make available all the logistics for Effective implementation of MNT elimination activities</td>
<td>Ensure availability of TT vaccines and related logistics</td>
</tr>
<tr>
<td>Ensure availability of dT vaccines and related logistics available</td>
<td></td>
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</tbody>
</table>

### Programme management

<table>
<thead>
<tr>
<th>Effective implementation of MNT elimination activities</th>
<th>Review and analyze coverage and surveillance data at all level periodically and disseminate feedback to stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Training of staff on MNT surveillance activities</td>
</tr>
<tr>
<td></td>
<td>Introduce dT among school age children</td>
</tr>
</tbody>
</table>

### Service Delivery

<table>
<thead>
<tr>
<th>Maintain high MCV1 coverage</th>
<th>Special emphasis shall be focused on low MCV1 coverage districts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Include routine MCV1 immunization for infants into district micro plans</td>
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</tbody>
</table>

### Advocacy and communication

<table>
<thead>
<tr>
<th>Strengthen coordination with development partners, local NGOs and GoB</th>
<th>Conduct regular ICC meetings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Broaden agenda and participation of ICC meetings</td>
</tr>
<tr>
<td></td>
<td>Better involvement of NGOs</td>
</tr>
<tr>
<td></td>
<td>Involving community leaders linking community with immunization planning and implementation</td>
</tr>
<tr>
<td></td>
<td>Conduct advocacy meeting with different stake holders</td>
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<tr>
<td></td>
<td>Regular communication with curative sector</td>
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<tr>
<td></td>
<td>Review and analyze coverage and surveillance data at all level and disseminate to stakeholders</td>
</tr>
</tbody>
</table>

### Surveillance

<table>
<thead>
<tr>
<th>Intensity measles surveillance</th>
<th>Improve timeliness and completeness of weekly and monthly reporting of Measles and other VPD data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Improve timeliness and completeness of collection of samples and reporting</td>
</tr>
<tr>
<td></td>
<td>Continue case base measles</td>
</tr>
</tbody>
</table>

5. Achieve national level 95% measles coverage and reaching measles elimination status by 2016
### Vaccine supply, quality and logistics

| 1. Timely availability of all logistics for surveillance (forms, guidelines, IEC materials, transport) |
| 2. Measles vaccines and related logistics available |
| 3. Measles vaccines and related logistics available for the 2nd dose of measles |

### Effective implementation of measles control activities

| 4. Make available all the logistics for |
| 5. Provide second opportunity of measles |

### Programme management

| 1. Data review and periodically give feedback to relevant stakeholders |
| 2. Ensure availability of logistics for the measles control activities |
| 3. Training of staff on VPD surveillance activities |
| 4. Introduction of Measles 2nd dose to the EPI schedule |

### Service Delivery

| 1. Introduction of pneumococcal vaccine by 2011 |
| 2. Introduction of and rota vaccine by 2012 |
| 3. Rubella vaccine is introduced by 2012 |
| 4. Introduce Hepatitis B vaccine birth dose by 2012 |
| 5. Introduction of dT vaccine by 2012 |
| 6. Introduction of Measles 2nd dose at second year of life by 2011 |

### Advocacy and communication

<p>| 1. Conduct regular ICC meetings |
| 2. Include new vaccine introduction into district micro plans |
| 3. Special emphasis shall be focused on low performing districts |</p>
<table>
<thead>
<tr>
<th>Coordination with development partners, local NGOs and GoB</th>
<th>2. Broaden agenda and participation of ICC meetings</th>
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<tbody>
<tr>
<td></td>
<td>3. Better involvement of NGOs</td>
</tr>
<tr>
<td></td>
<td>4. Involving community leaders linking community with immunization planning and implementation</td>
</tr>
<tr>
<td></td>
<td>5. Ensure financial sustainability of new vaccines</td>
</tr>
<tr>
<td></td>
<td>6. Develop targeted communication strategies and approach to reach mothers about new vaccines</td>
</tr>
<tr>
<td></td>
<td>7. Train interpersonal communication skills of all health staff</td>
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</table>

**Surveillance**

<table>
<thead>
<tr>
<th>8. Establishment of surveillance system for diseases covered by new antigens.</th>
</tr>
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<tbody>
<tr>
<td>1. Establish disease burden surveillance for targeted diseases</td>
</tr>
<tr>
<td>2. Incorporate new diseases into the existing VPD surveillance system</td>
</tr>
<tr>
<td>3. Introduce new surveillance formats</td>
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<tr>
<td>4. Close collaboration with academic institutions</td>
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</tbody>
</table>

**Vaccine supply, quality and logistics**

<table>
<thead>
<tr>
<th>9. Effective in-cooperation of new vaccine into national EPI program</th>
</tr>
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<tbody>
<tr>
<td>1. Vaccines and other logistics available for new vaccines introduction</td>
</tr>
<tr>
<td>2. Adequate cold chain storage space available at all level for new vaccines</td>
</tr>
<tr>
<td>3. Availability of storage capacity for other logistics</td>
</tr>
<tr>
<td>4. Effective cold chain maintenance operate at all level</td>
</tr>
<tr>
<td>5. Availability of VVM in all individual vaccine vials</td>
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</table>

**Programme management**

<table>
<thead>
<tr>
<th>10. Introduction of new vaccines according to the planned timeline</th>
</tr>
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<tbody>
<tr>
<td>1. Ensuring financial sustainability of newly introduced vaccines</td>
</tr>
<tr>
<td>2. Seek concurrence from ICC and NCIP for introduction of new vaccines and other under-used vaccines</td>
</tr>
<tr>
<td>3. Ensuring availability of potent and safe vaccines</td>
</tr>
<tr>
<td>4. Ensure availability of cold chain</td>
</tr>
<tr>
<td>7. Ensure safe injection practices and waste disposal</td>
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<tr>
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</tr>
<tr>
<td>1. AEFI surveillance system strengthened</td>
</tr>
<tr>
<td>2. Implementation on national plan on sharp and waste management for EPI waste</td>
</tr>
<tr>
<td>3. Ensure availability of other vaccines logistics</td>
</tr>
<tr>
<td>6. Staff are trained on new vaccines</td>
</tr>
<tr>
<td>7. Staff are trained on the management of AEFI</td>
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<table>
<thead>
<tr>
<th>Advocacy and communication</th>
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<tbody>
<tr>
<td>3. Making decision on the implementation of safe injection practices</td>
</tr>
<tr>
<td>4. Strengthen AEFI surveillance system</td>
</tr>
<tr>
<td>5. Ensure injection safety</td>
</tr>
<tr>
<td>1. All health centers report AEFI as part of surveillance system</td>
</tr>
<tr>
<td>2. Improve timeliness and completeness of AEFI reporting</td>
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<th>Surveillance</th>
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<tbody>
<tr>
<td>6. Make available all the logistics for implementation of safe injection practices</td>
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<tr>
<td>2. Proper maintenance of existing incinerators</td>
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<table>
<thead>
<tr>
<th>Vaccine supply, quality and logistic</th>
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<tbody>
<tr>
<td>6. Effective implementation of safe injection practices</td>
</tr>
<tr>
<td>2. Identify and recommend suitable places for install incinerators</td>
</tr>
<tr>
<td>3. Provision of incinerators</td>
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</table>
5. Train staff on AEFI management

<table>
<thead>
<tr>
<th>Maintenance of incinerators</th>
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<tr>
<td>5. Train staff on AEFI management</td>
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<tr>
<td>Discretion of problem</td>
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</tr>
<tr>
<td>1. Completed immunization coverage among under one year, at national level is 75%. 2. Only 53% of the child bearing age women had fully TT protection (TT -5) 3. Significant disparity can be observed regarding the immunization coverage among districts 4. Prevailing of vacant posts, especially at lower levels in the EPI service delivery system. 5. Non availability of proper primary health care delivery system at city cooperate level. 6. Lack of training opportunities for technical EPI staff at all levels.</td>
</tr>
<tr>
<td>2. TT5 coverage among women of childbearing age reached at least 80% at national level and 75% at each district level.</td>
</tr>
<tr>
<td>4. Need to put extra effort to maintain the polio free status in the country due to presence of polio outbreaks in neighboring India.</td>
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<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>5. Need to put extra effort to maintain MNT elimination status in the country due to:</td>
</tr>
<tr>
<td>- Only 53% of childbearing age women are fully protected with TT.</td>
</tr>
<tr>
<td>- Nearly 80% of the deliveries are home deliveries.</td>
</tr>
<tr>
<td>- Significant disparity can be observed regarding the immunization coverage for TT among districts</td>
</tr>
<tr>
<td>6. Need to put extra effort to maintain the current measles control status and reached measles elimination status in 2016</td>
</tr>
<tr>
<td>7. Non availability or under utilization of the following vaccines in the National EPI schedule which are proven to be able to reduce the current</td>
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</table>


childhood morbidity and mortality in Bangladesh.

9. Inadequate cold chain storage capacity for new vaccines at all the levels

| 8. Non availability of safe and environmental friendly waste disposal system for disposal of EPI waste. | 7. Ensure safe injection practices and waste disposal | Availability of safe operational EPI waste disposal system in :
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<tbody>
<tr>
<td></td>
<td></td>
<td>• 2012 – 10% of Upazilas.</td>
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<td></td>
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<td>• 2013 – 20% of Upazilas.</td>
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<tr>
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<td></td>
<td>• 2014 – 30% of Upazilas</td>
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<tr>
<td></td>
<td></td>
<td>• 2015 – 40% of Upazilas</td>
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<tr>
<td></td>
<td></td>
<td>• 2016 – 50% of Upazilas</td>
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<tr>
<th>40</th>
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<tbody>
<tr>
<td>vaccine by 2011</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Rota vaccine by 2012</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Rubella vaccine by 2012</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Hepatitis B birth dose in 2012</td>
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<td></td>
</tr>
<tr>
<td>• dT vaccine by 2012</td>
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<td></td>
</tr>
<tr>
<td>• Measles 2nd dose at second year of life by 2011</td>
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</tr>
</tbody>
</table>
2.2 Strategies and key activities

National Objectives, Strategies and Key Activities 2011-2016

Objective 1: At least 90% fully immunization coverage among under one children at national level and 85% full immunization coverage at district level.

Objective 2: TT5 coverage among women of childbearing age reached at least 80% at national level and 75% at each district level.

In view of reaching the objective 1 & 2, further improvement and expansion of the EPI during the coming years is mandatory. This may includes setting new feasible targets, researching new techniques and exploring the means to be more effective, equitable and efficient service delivery at all levels.

Failure to reach expected immunization coverage targets in Bangladesh EPI are related to a number of programmatic factors, such as often limited capacity of the especially vaccinators at the rural settings, non availability of proper primary health care delivery system (infrastructure) at urban settings, lack of social mobilization, lack of supportive supervision, lack of mechanism to address immunization needs of slum areas (where rapid population migration regularly taking place) & difficult to reach areas in the in rural settings.

To address the above mention programmatic factors, following broad Strategies are incorporated into the cMYP

- Implement RED strategy in every district, giving special emphasis to the low coverage areas
- Establishment of proper primary health care delivery system at city cooperation level
- Incorporate regular supportive supervision at each level
- Strengthen coordination with development partners and local NGOs/CBOs
- Strengthening of coverage and VPD surveillance system in all districts
- Ensure sufficient, timely and potent vaccines and quality injection devices available at all level with no stock out
- Periodical review of the National EPI program performance at each level and take timely and appropriate measures accordingly.
- Develop & implement staff recruitment plan with budget.

Objective 3: Maintain polio free status

By effectively implementing Acute Flaccid Paralysis (AFP) Surveillance, conducting supplementary OPV vaccination (NIDs/SNIDSs), mop-up OPV campaigns, and maintaining high routine OPV coverage Bangladesh managed to maintain the polio free status since 2006. In the presence of on-going polio outbreaks in neighbouring India and presence of few districts with relatively low OPV coverage, Bangladesh need to put extra effort to intensify the above strategies in coming years to maintain the polio free status in the country.

Objective 4: Maintain maternal and neonatal tetanus elimination status

Achieved elimination status of MNT in Bangladesh (2008) is a major public health success, but significant challenge remains to maintain this status especially due to the fact that 80% of deliveries still taking place out side the institutions. Other than that TT complete coverage (TT5) among child bearing age females remain around 53%.

In view of maintaining this MNNT elimination status, following broad Strategies are incorporated into the cMYP

- Maintain high coverage of TT5 among childbearing age women
- Maintain high TT protection at birth
• Intensify current NT surveillance
• Introduce Td among school age children

**Objective 5: Achieve national level 95% measles coverage and reaching measles elimination status by 2016**

In 2009, EPI programme has managed to reach national level measles-1 coverage among infants over 90%, still 11 out of 64 (17%) districts reported measles coverage less than 80%.

Over the last few years Bangladesh EPI programme managed to control the morbidity and mortality associated with measles up to a significant level by maintaining high coverage of measles-1 among infants, immunizing 35 million children from age 9 months to 10 years during the measles catch up programme in 2006 and immunizing all children aged nine months to sixty months during measles follow-up campaign in year 2010. To achieve the measles elimination status by 2016, Bangladesh EPI programme need to intensify the measles control activities in coming years. For that, following broad Strategies are incorporated into the cMYP

• Maintain high MCV1 coverage among infants with special emphasis to the low coverage districts
• Intensity measles surveillance
• Introduction of Measles 2\(^{nd}\) dose to the EPI schedule

**Objective 6: Prevention of diseases protected by new and underused vaccines**

Bangladesh Government and EPI programme is planning to introduce Pneumococcal vaccine, Rota vaccine, Birth dose of hepatitis B vaccine, second dose of measles vaccine and Td vaccine in to the national EPI programe in coming years with GAVI support. To achieve this objective following broad Strategies are incorporated into the cMYP

• Identify priorities for vaccine introduction based on epidemiological evidence
• Strengthen coordination with development partners, local NGOs/CBOs, institutions
• Establishment of surveillance system for diseases covered by new antigens.
• Introduction of new vaccines according to the planned timeline
• Ensure the future financial sustainability

**Objective 7: Ensure safe injection practices and waste disposal**

For the last few years Bangladesh EPI programme exclusively use AD syringes for all EPI vaccinations. When we consider the number of antigens administered, reported number of AEFI seems to be far less than the expected. Though under HPSP and later HNPSP, government of Bangladesh identified medical waste management as a priority area, still there is no proper EPI waste management mechanism in place. Majority of the Upazila use pit burning method to dispose medical wastes. To address this important area in future, following broad Strategies are incorporated into the cMYP.

• AEFI surveillance system strengthened
• Implementation on national plan on sharp and waste management for EPI waste
• Strengthen AEFI surveillance system
• Ensure injection safety
Section III Financial sustainability of the cMYP

3.1 Costs and financing of the Bangladesh National cMYP 2011-2016

Health Sector Analysis

The Government of Bangladesh is committed to providing appropriate vaccines of high quality in a quality manner for all children in each annual cohort. It is also committed to assuring that all pregnant women are adequately protected by TT vaccine prior to giving birth. Immunization is being provided as part of the Essential Services Delivery (ESD) package and is made available to target groups through the network of rural and urban health facilities – either public or nongovernmental. Sustaining immunization coverage for stated constituencies and developing it through introducing into the immunisation schedule new antigens will require increased financial resources.

Baseline Programme Cost and Financing

The year 2009 was chosen as the baseline for cost and financing projections because that is the most recent year for which full costing and financing information is available. EPI data for the estimations and projections were supplied by the EPI Central Store, WHO and UNICEF Country Offices, UPHCP-II Project. Economic data were obtained from the WHO NHA database and World Bank publications.

Baseline Program indicators of the EPI of Bangladesh are presented in the Table 3.1.

Table 3.1: Baseline Program indicators – EPI of Bangladesh

<table>
<thead>
<tr>
<th>Baseline Indicators</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Immunization-specific Expenditures</td>
<td>$100,730,741</td>
</tr>
<tr>
<td>Campaigns</td>
<td>$21,582,227</td>
</tr>
<tr>
<td>Routine Immunization only</td>
<td>$79,148,514</td>
</tr>
<tr>
<td>per capita</td>
<td>$0.5</td>
</tr>
<tr>
<td>per DTP3 child</td>
<td>$22.8</td>
</tr>
<tr>
<td>% Vaccines and supplies</td>
<td>31.9%</td>
</tr>
<tr>
<td>% National funding</td>
<td>35.3%</td>
</tr>
<tr>
<td>% Total health expenditures</td>
<td>3.1%</td>
</tr>
<tr>
<td>% Gov. health expenditures</td>
<td>12.4%</td>
</tr>
<tr>
<td>% GDP</td>
<td>0.10%</td>
</tr>
<tr>
<td>Total Shared Costs</td>
<td>$46,093,117</td>
</tr>
<tr>
<td>% Shared health systems cost</td>
<td>31%</td>
</tr>
</tbody>
</table>
In 2009, estimated total cost of the Bangladesh EPI was $146.8 million, including shared cost. Of the total Programme cost, $79.1 million (or 53.9%) were spent for routine immunization, estimated $21.6 million (14.7%) – for supplemental immunisation activities, whereas $46.1 million (31.4%) constituted Programme’s shared cost, mainly through shared healthcare service delivery staff and transportation cost. Minor routine capital costs accounted for just 0.4%.

Thus, immunization specific costs - $100.7 million - accounted for 68.6% of the total Programme cost. Figure 3.1 below presents the baseline cost structure for 2009.

**Figure 3.1. Baseline EPI Cost Structure – 2009**

Personnel cost – at $23.6 million for immunisation specific staff and $45.6 million for shared staff – turned out to be the biggest expenditure category of the EPI in 2009, accounting for roughly 48.3% of total outlays. It is worthwhile to note that the share of personnel cost has increased substantially since the last cMYP (prepared in 2004) as the average rate of salary rise in the health sector was much higher than that for other EPI inputs.

Procuring vaccines for routine immunisation accounted for $47.0M (32.8%) of the total 2009 EPI expenditures, with $21.7M (15.2%) being allocated for traditional vaccines and $25.3M (17.6%) – for new and underused vaccines: 2009 was the introductory year for the new Pentavalent DPT-HepB-Hib

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1 Although building maintenance cost is also in fact shared one, for the purpose of this projection that aspect was ignored as it is not a straightforward task to separate shared and specific building maintenance cost within the cMYP tool.
vaccine that not only replaced in the immunisation schedule DPT and Hepatitis-B vaccines but also added a new antigen to the EPI list – that of *Haemophilus influenzae* type b (Hib). As the vaccine started to be introduced mid-year, its cost impact on the total EPI outlays was not as dramatic as for the subsequent years, yet still significant. In the future, however, introduction of additional new and under-utilized vaccines into the national immunization schedule will be single most important factor impacting the Programme costs.

The next highest cost category in 2009 – $21.6M or 15.1% of total resources – were expenditures for supplemental immunisation activities, which included, apart from vaccine cost, injection supply for SIAs and campaign-related operational costs. Two campaigns were held in that particular year: a nationwide measles campaign and OPV NID both targeting a group of around 20 million children less than 5 years old.

While DPT vaccine was mostly procured in 10-dose presentations, Pentavalent vaccine is predominantly shipped in single-dose vials which implies increased demand for cold chain storage volume. Although national cold chain was able to address this increased demand through mobilising idle capacity and intensifying delivery schedule throughout the chain, in the future smooth EPI operation will inevitably require considerable expansion and upgrade of the available cold chain, especially in light of planned introduction of additional new vaccines and expanded use of traditional vaccines. Thus, during the lifetime of the discussed cMYP, the EPI is expected to additionally offer its clients Pneumococcal vaccine, Rotavirus vaccine, at birth dose of Hepatitis-B vaccine and second dose of Measles vaccine (with possibility being contemplated of replacing the latter vaccine with MR vaccine). All these changes are reflected in the updated vaccination schedule presented above.

At the same time, any introduction of additional new or under-utilized vaccines should be contingent on the country’s ability to support recurrent costs of such vaccines in the future as well as any necessary expansion of vaccine storage capacity.

The remainder of 2009 EPI expenditures were distributed between injection supplies for routine immunisation ($3.6M or 2.5%), the cost of cold chain equipment and its maintenance - 0.9% ($1.3M) and transportation cost ($0.7M or 0.5%). Detailed description of all the cost categories above mentioned is provided in Annex A-1.

Programme financing in the baseline year is represented on Figure 3.2 that demonstrates contribution by financing parties to Programme-specific cost (that is, financing of shared costs is not included).
Together with co-financing GAVI-supported vaccines, Government directly contributed around 29% of the Total Programme financing. If, however, one takes into account 70% of Government’s share in the Pooled Fund, the overall Government financing responsibility will rise to almost 62%.

GAVI provided 19.4% of total Programme-specific financing, being the second largest contributor to the program in 2009. Participants of Pooled Fund excluding GoB, were responsible for 14.5% of total financing (while the Pooled Fund as a whole provided 48.3% of funds).

WHO was directly responsible for 2.2% of Programme financing, while other bilateral partners combined accounted for 1.2% where UNICEF was 0.4%.

**Recurrent costs – analysis and projections**

**Vaccines and injection supplies**

With the introduction of the new and underused vaccines mentioned above, the EPI cost structure is expected to undergo substantial changes. On the one hand, the share of traditional vaccines in the total Programme cost will decrease to 10.5% against 15.2% in 2009 even in spite of substantial absolute increase in procurement cost for traditional vaccines – from $21.7M in 2009 to $40.2M in 2015. The latter is mainly explained by expected increase in coverage of child-bearing age women (CBAW) by TT5 vaccination up to 80%.

On the other hand, expanding Pentavalent vaccine coverage up to 90% and contemplated addition of Pneumococcal and Rotavirus vaccines will increase the share of new and underused vaccines in 2.5 times up to nearly 44% (or $144.1M) of the total projected Programme cost in 2015.
During the same period injection supplies will account for 6.3% to 5.1% of total expenditures. The share of vaccines procured for any campaigns conducted during the discussed cMYP period 2011-2016 will be considered an additional expense.

The OPV vaccine alone for the SIA rounds to be held annually during 2011-2016 will cost approximately $7.7M to $8.2M. Overall, campaign-related activities are expected to claim from 4.1% to 3.5% of Programme cost.

Figure 3.3 demonstrates projected relative shares of EPI cost components in 2015.

**Figure 3.3: EPI Cost Structure for 2015**

**Personnel costs**

As can be seen from Figures 3.1, 3.3 & 3.4, the proportion of total EPI costs represented by program personnel will drop substantially from 2009 to 2011 being ‘ousted’ by the new vaccine cost, after which it will resume gradual increase from 30.3% in 2011 to 33.8% in 2015, even though the absolute labour cost will go on rising significantly throughout the projected period.
Figure 3.4. EPI Staff Cost dynamics in 2011-2016

Vehicles & transport costs
Vehicle cost will remain a minor cost category throughout projected period, reflecting existing successful practice of contracting out vaccine transportation services on the National and District level as well as the fact that most of the vehicles being used by the EPI are shared with other healthcare programs.

Cold chain equipment
Cold chain will require substantial upgrade during the projected period. Otherwise, it will become the major bottleneck in implementing proposed EPI expansion as most of the vaccines proposed for introduction in 2011-2015 are single-dose ones and will require considerable storage capacity.

The cost of Cold chain expansion will fluctuate between $3.7M in 2011 (1.47%) and $2.2M (0.7%) in 2015, constituting on average 0.9% of the total Programme cost.

One important consideration should be made regarding cost categories that are much smaller than those dominating the Programme landscape - vaccine procurement and personnel costs. Being of smaller cost importance and requiring much less in terms of Programme budget allocations, these components are of tremendous importance to overall Programme performance and may disproportionately contribute either to its failure or success by becoming either the Programme bottleneck hampering otherwise well-financed components or a catalytic factor facilitating efficient use of well-targeted investment into vaccine procurement and staff expansion and/or maintenance.

The next cMYP therefore will also focus substantial part of its attention on providing sufficient resources for cold chain maintenance, staff training, disease surveillance, IEC & Social mobilization as well as programme management.

3.2 Training, Programme Management, Disease Surveillance, and IEC & Social Mobilization

Training activities are expected to consume around 0.1% of the total Programme cost, IEC & Social mobilization – around 0.06%, Programme Management – around 0.11% and Disease surveillance – around 0.95% of the estimated Programme cost.

Other Capital Costs
Other projected capital costs have to do mainly with providing office equipment and software update for the National cold chain facilities and are expected to consume negligible share of the total Programme cost (.003%), although, once again, being quite important in terms of assuring efficient functioning of the cold chain.
Projected EPI resource requirements

Table 3.2 below presents the summary of total resource requirements by Programme components while Figure 3.5 graphically presents projected Programme cost dynamics throughout 2011-2015.

<table>
<thead>
<tr>
<th>Costs by Program Component</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Delivery</td>
<td>26,112,850</td>
<td>28,800,509</td>
<td>31,674,887</td>
<td>34,836,420</td>
<td>38,313,808</td>
</tr>
<tr>
<td>Advocacy and Communication</td>
<td>300,000</td>
<td>300,000</td>
<td>100,000</td>
<td>105,000</td>
<td>110,000</td>
</tr>
<tr>
<td>Monitoring and Disease Surveillance</td>
<td>2,164,610</td>
<td>2,447,519</td>
<td>2,768,685</td>
<td>3,133,430</td>
<td>3,547,832</td>
</tr>
<tr>
<td>Programme Management</td>
<td>1,713,084</td>
<td>1,780,488</td>
<td>1,867,837</td>
<td>1,960,462</td>
<td>2,073,716</td>
</tr>
<tr>
<td>Supplemental Immunization Activities</td>
<td>10,246,198</td>
<td>10,522,759</td>
<td>10,811,679</td>
<td>11,113,681</td>
<td>11,429,534</td>
</tr>
<tr>
<td>Shared Health Systems Costs</td>
<td>50,678,740</td>
<td>55,727,925</td>
<td>61,274,601</td>
<td>67,374,639</td>
<td>74,083,309</td>
</tr>
<tr>
<td><strong>Total resource requirements</strong></td>
<td>251,473,922</td>
<td>286,137,339</td>
<td>295,253,200</td>
<td>312,741,112</td>
<td>329,132,036</td>
</tr>
</tbody>
</table>

Figure 3.5. Projection of Future Resource Requirements** – 2011-2016

**Shared costs excluded

Estimated total resource requirement for the Programme during 2011-2015 is $1.475 billion. On average, total Programme cost is expected to rise annually by 7% during 2011-2015.

As may be seen from Figure 3.5, the lion’s share of the Programme-specific cost is attributed to vaccine procurement.

Should new vaccines be implemented in the National immunisation schedule, the cost will dramatically rise from estimated $47M in 2009 to $139M in 2011, and then to $177 in 2015. Against such a background, other cost categories will experience a rather moderate growth (see Figure 3.6) and will not impact the Programme cost burden to the same extent as vaccine procurement.
The paramount role played in the total Programme cost by the vaccine procurement component highlights the importance of clearly specifying partners’ roles in making available necessary financing – this information is presented on the Figure 3.7.

Overall, Government of Bangladesh is expected to provide around 27% of the total resource requirements for the EPI during 2011-2015, GAVI funds are expected to account for approximately 48% of the total needs, whereas Pooled funding may account for 13% and WHO for around 1% of total financing.

### Analysis of funding gaps

Projected funding gap for the Bangladesh EPI will constitute around 8% of the total resource requirements in 2011 and will decrease to around 6% in 2015, provided probable financing is taken into account (see Table 3.4 below). At the same time, the lion’s share of probable financing is attributed to the expected GAVI financing of newly introduced vaccines – Pneumococcal and Rotavirus vaccines. Should GAVI support forthcoming country application for introducing these vaccines, the discussed funds
will be made available with a great certainty (that is, will change its tag from probable to certain). On the other hand, should the application not proceed as planned, the size of financing gap will be much smaller, taking into account currently available prices for these vaccines.

### Table 3.4: Funding gaps by type of financing and resource requirements by years

<table>
<thead>
<tr>
<th>Composition of the funding gap</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaccines and injection equipment</td>
<td>$134,209,901</td>
<td>$118,335,156</td>
<td>$116,691,102</td>
<td>$121,322,886</td>
<td>$96,443,605</td>
</tr>
<tr>
<td>Activities and other recurrent costs</td>
<td>$4,177,694</td>
<td>$4,528,007</td>
<td>$4,736,522</td>
<td>$5,198,892</td>
<td>$5,731,548</td>
</tr>
<tr>
<td>Logistics (Vehicles, cold chain and other equipment)</td>
<td>$3,808,655</td>
<td>$3,338,644</td>
<td>$2,131,967</td>
<td>$1,362,782</td>
<td>$2,188,432</td>
</tr>
<tr>
<td>Campaigns</td>
<td>$10,246,198</td>
<td>$10,522,759</td>
<td>$10,811,679</td>
<td>$11,133,681</td>
<td>$11,429,534</td>
</tr>
<tr>
<td>Total</td>
<td>$152,442,449</td>
<td>$136,724,566</td>
<td>$134,371,270</td>
<td>$138,998,241</td>
<td>$115,793,119</td>
</tr>
</tbody>
</table>

**Funding gap with PROBABLE financing**

| Activities and other recurrent costs                  | $2,013,084  | $2,080,488  | $1,967,837  | $2,065,462  | $2,183,716  |
| Logistics (Vehicles, cold chain and other equipment)  | $3,808,655  | $3,338,644  | $2,131,967  | $1,362,782  | $2,188,432  |
| Campaigns                                             | $10,246,198 | $10,522,759 | $10,811,679 | $11,133,681 | $11,429,534 |
| Total Funding Gap                                      | $16,067,937 | $15,941,891 | $14,911,484 | $14,541,925 | $15,801,682 |

As % of total resources required: 8% 7% 6% 6% 6%

Remaining funding gap is mostly formed by the programme components with funding sources not agreed with certainty as yet: purchase of vehicles, cold chain and other equipment, campaigns (vaccines and logistics) as well as activities and other recurrent costs.

Government is planning to address remaining gap by extending cooperation proposals to development partners once currently valid cooperation agreements run to an end.

### Future Financial Sustainability

The EPI long-term financial sustainability will depend on a range of factors, the most important of which are:

- success of forthcoming country application to GAVI for assistance in introducing Pneumococcal and Rotavirus vaccines
- addressing existing bottlenecks with mobilising GAVI HSS funds already earmarked for EPI
- Government success in taking over routine vaccine procurement currently performed from the Pooled fund
- Ability of the EPI itself to efficiently use available resources

The GoB is continuously monitoring financial situation with financing EPI to develop, in collaboration with DPs, the most effective scenarios for its development.
## Section IV Annual plan

<table>
<thead>
<tr>
<th>Service Delivery</th>
<th>Components and Activities</th>
<th>Responsible agency/unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Develop micro plans all level based on RED Strategy</strong></td>
<td>EPI, WHO, UNICEF</td>
<td></td>
</tr>
<tr>
<td><strong>Develop plan of action (PoA) to reach the unreached children, including crash program for low performing districts</strong></td>
<td>EPI, WHO, UNICEF</td>
<td></td>
</tr>
<tr>
<td><strong>Prepare monitoring &amp; supervision plan from national level</strong></td>
<td>EPI, WHO, UNICEF</td>
<td></td>
</tr>
<tr>
<td><strong>Review of microplans of 2011 to develop upazila level strategies for 2012</strong></td>
<td>EPI, WHO, UNICEF</td>
<td></td>
</tr>
<tr>
<td><strong>Need-based TT campaign in the high risk areas/institutes;</strong></td>
<td>EPI, WHO, UNICEF</td>
<td></td>
</tr>
<tr>
<td><strong>orientation meeting of TT5 doses schedule for professionals in 52 Public and Private Medical College Hospitals</strong></td>
<td>EPI, WHO, UNICEF</td>
<td></td>
</tr>
<tr>
<td><strong>Supervision and monitoring (National Staff)</strong></td>
<td>EPI, WHO, UNICEF</td>
<td></td>
</tr>
<tr>
<td><strong>Vaccination cost for Border posts</strong></td>
<td>GAVI</td>
<td></td>
</tr>
<tr>
<td><strong>AEFI Management:</strong></td>
<td>GAVI, WHO</td>
<td></td>
</tr>
<tr>
<td><strong>Programme Management Cost</strong></td>
<td>EPI, WHO, UNICEF</td>
<td></td>
</tr>
<tr>
<td><strong>Develop micro plans all level based on RED Strategy</strong></td>
<td>EPI, WHO, UNICEF</td>
<td></td>
</tr>
<tr>
<td><strong>Develop plan of action (PoA) to reach the unreached children, including crash program for low performing districts</strong></td>
<td>EPI, WHO, UNICEF</td>
<td></td>
</tr>
<tr>
<td><strong>Prepare monitoring &amp; supervision plan from national level</strong></td>
<td>WHO, UNICEF, GAVI</td>
<td></td>
</tr>
<tr>
<td><strong>Advocacy &amp; Communication</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Conduction of IEC / Sub Committee Meeting</strong></td>
<td>UNICEF, EPI</td>
<td></td>
</tr>
<tr>
<td><strong>Communication Material development</strong></td>
<td>UNICEF, EPI</td>
<td></td>
</tr>
<tr>
<td><strong>Advocacy and planning meetings, communication and social mobilization activities, monitoring and supervision of SIAs</strong></td>
<td>WHO, UNICEF,</td>
<td></td>
</tr>
<tr>
<td><strong>Surveillance</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Determine effectiveness of Rotarix oral vaccine for reducing diarrhoeal diseases</strong></td>
<td>EPI, WHO, UNICEF, ICDDR,B</td>
<td></td>
</tr>
<tr>
<td><strong>Conduct preparatory activities for introduction of new &amp; unused vaccine</strong></td>
<td>GAVI, EPI, WHO, UNICEF, ICDDR,B</td>
<td></td>
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<tr>
<td><strong>Printing of Surveillance Manuals and forms</strong></td>
<td>WHO</td>
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<tr>
<td><strong>Investigations of AFP cases</strong></td>
<td>WHO</td>
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<tr>
<td><strong>Investigation activities for VPD outbreak</strong></td>
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<tr>
<td><strong>Publication of Surveillance bulletin</strong></td>
<td>WHO</td>
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<tr>
<td><strong>Shipments of Isolates for Polio</strong></td>
<td>WHO</td>
<td></td>
</tr>
<tr>
<td><strong>Transport cost for specimens</strong></td>
<td>WHO</td>
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<tr>
<td><strong>Lab containment meetings and survey</strong></td>
<td>WHO</td>
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<tr>
<td><strong>VPD outbreak investigation activities</strong></td>
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<tr>
<td><strong>Vaccine Supply, Quality &amp; Logistics</strong></td>
<td></td>
<td></td>
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<tr>
<td>-------------------------------------------------------------------------------------------------</td>
<td>---------------------------------</td>
<td></td>
</tr>
<tr>
<td>Laboratory supplies and reagents for measles                                                   WHO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isolates shipping containers for measles                                                        WHO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport cost for specimens for measles                                                        WHO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stationary, courier service, maintenance of equipment for measles lab purpose                    WHO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Printing of communication materials, supervision checklist, temperature monitoring chart, tally sheet, EPI coverage dropout monitoring chart</td>
<td>UNICEF, GAVI, EPI</td>
<td></td>
</tr>
<tr>
<td>Procurement of cold chain equipment and maintenance of cold &amp; freezer plant of EPI HQ and TEMO-II; Improvement of Central Cold Chain Unit;</td>
<td>GAVI, EPI, UNICEF</td>
<td></td>
</tr>
<tr>
<td>Procurement of vaccines for routine EPI (BCG, Pentavalent, Measles, TT &amp; OPV)                    Pool Fund, EPI, UNICEF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procurement of polio vaccines for NIDs                                                           Pool Fund, EPI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procurement of measles vaccines, advocacy and planning meetings, communication and social mobilization activities, monitoring and supervision of measles follow-up campaign</td>
<td>EPI, Pool Fund, UNICEF, WHO</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Program Management</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Providing personnel cost for District Immunization Medical Officers (DIMOs), Admin &amp; Finance Assistants and Drivers</td>
<td>GAVI</td>
</tr>
<tr>
<td>Provide personnel cost for Surveillance Networks                                                WHO</td>
<td></td>
</tr>
<tr>
<td>Purchase and maintenance of equipment for national level                                        EPI &amp; GAVI</td>
<td></td>
</tr>
<tr>
<td>Construction of EPI Store at different level                                                    GAVI</td>
<td></td>
</tr>
<tr>
<td>Finalization and dissemination of National Immunization Policy                                  EPI &amp; WHO</td>
<td></td>
</tr>
<tr>
<td>Conduct of national CES 2011 and dissemination workshop                                         WHO &amp; UNICEF</td>
<td></td>
</tr>
<tr>
<td>Conduction of National Certification Committee for Polio Eradication Meetings                    WHO</td>
<td></td>
</tr>
<tr>
<td>Conduction of Expert Review Committee (ERC) meeting                                              WHO</td>
<td></td>
</tr>
<tr>
<td>Strengthening AEFI surveillance                                                                  WHO</td>
<td></td>
</tr>
<tr>
<td>Workshop to review AEFI surveillance activities                                                  WHO</td>
<td></td>
</tr>
<tr>
<td>Training on AEFI investigation                                                                  WHO</td>
<td></td>
</tr>
<tr>
<td>Study on abscess following Immunization                                                         WHO</td>
<td></td>
</tr>
<tr>
<td>Support for computerized “Routine EPI Data Management System”                                  WHO, UNICEF &amp; GAVI</td>
<td></td>
</tr>
<tr>
<td>Develop &amp; print supervision manual, conduct TOT and training of first line supervisor for low performing districts (including UNJI)</td>
<td>WHO, UNICEF &amp; GAVI</td>
</tr>
<tr>
<td>Training of Store Keeper and MT-EPTs on Store Management                                         WHO, UNICEF &amp; GAVI</td>
<td></td>
</tr>
<tr>
<td>On the job training, monitor &amp; supervise activities of field workers providing BR services through regular EPI outreach sites in 15 districts</td>
<td>WHO, UNICEF &amp; GAVI</td>
</tr>
<tr>
<td>Event Description</td>
<td>Organizers</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>(including UNJI) and coordinate BR supplies</td>
<td>GAVI</td>
</tr>
<tr>
<td>Divisional quarterly meeting (1 meeting per division per quarter) Multi sectoral meeting</td>
<td>GAVI</td>
</tr>
<tr>
<td>Half yearly Meeting, Performance evaluation &amp; Retreat for DIMOs &amp; HQ level personnel</td>
<td>GAVI</td>
</tr>
<tr>
<td>Training/Orientation of Doctors, Medical students, nurses and paramedics</td>
<td>WHO, UNICEF &amp; GAVI</td>
</tr>
<tr>
<td>Different Meeting, workshop, seminar etc. (Meeting of different Committees, Sub-committees, ICC, TSC, TEC, TOC etc.)</td>
<td>GAVI</td>
</tr>
<tr>
<td>Refresher training for DCs, SMOs and DIMOs on VPD surveillance</td>
<td>WHO</td>
</tr>
</tbody>
</table>
Section V Annexes

Annex I. Multi-Year Plan Costing for Bangladesh (in US$) - Summary Table

<table>
<thead>
<tr>
<th>Cost Category</th>
<th>2009</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
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</thead>
<tbody>
<tr>
<td><strong>Routine Recurrent Costs</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccines (routine vaccines only)</td>
<td>$47,002,312</td>
<td>$139,253,503</td>
<td>$165,152,782</td>
<td>$165,959,120</td>
<td>$173,721,011</td>
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<tr>
<td>Traditional</td>
<td>$21,178,961</td>
<td>$40,194,570</td>
<td>$32,711,480</td>
<td>$33,533,915</td>
<td>$33,966,976</td>
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<tr>
<td>Underserved</td>
<td>$25,283,351</td>
<td>$40,928,287</td>
<td>$41,786,658</td>
<td>$42,518,735</td>
<td>$43,099,426</td>
</tr>
<tr>
<td>New</td>
<td>$39,130,646</td>
<td>$90,594,673</td>
<td>$89,906,472</td>
<td>$96,624,609</td>
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<tr>
<td>Injection supplies</td>
<td>$3,568,042</td>
<td>$15,770,967</td>
<td>$16,092,827</td>
<td>$16,323,690</td>
<td>$16,549,683</td>
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<tr>
<td>Personnel</td>
<td>$23,552,092</td>
<td>$25,907,302</td>
<td>$28,579,808</td>
<td>$31,437,789</td>
<td>$34,581,568</td>
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<tr>
<td>Salaries of full-time NIP health workers (immunization specific)</td>
<td>$23,182,157</td>
<td>$25,500,373</td>
<td>$28,130,478</td>
<td>$30,943,526</td>
<td>$34,037,876</td>
</tr>
<tr>
<td>Pre-diems for supervision and monitoring</td>
<td>$369,935</td>
<td>$406,929</td>
<td>$449,330</td>
<td>$494,263</td>
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<tr>
<td>Transportation</td>
<td>$178,192</td>
<td>$205,549</td>
<td>$220,701</td>
<td>$237,099</td>
<td>$254,852</td>
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<tr>
<td>Fix site strategy (incl. vaccine distribution)</td>
<td>$133,414</td>
<td>$151,524</td>
<td>$163,975</td>
<td>$177,537</td>
<td>$192,312</td>
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<tr>
<td>Outreach strategy</td>
<td>$28,867</td>
<td>$32,415</td>
<td>$34,035</td>
<td>$35,737</td>
<td>$37,524</td>
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<tr>
<td>Mobile strategy</td>
<td>$17,911</td>
<td>$21,610</td>
<td>$22,690</td>
<td>$23,825</td>
<td>$25,016</td>
</tr>
<tr>
<td>Maintenance and overhead</td>
<td>$7,71,506</td>
<td>$1,425,315</td>
<td>$1,973,866</td>
<td>$2,340,733</td>
<td>$2,584,004</td>
</tr>
<tr>
<td>Cold chain maintenance and overheads</td>
<td>$7,71,506</td>
<td>$1,418,481</td>
<td>$1,965,562</td>
<td>$2,330,963</td>
<td>$2,572,531</td>
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<tr>
<td>Maintenance of other capital equipment</td>
<td>$6,834</td>
<td>$8,323</td>
<td>$9,869</td>
<td></td>
<td>$11,474</td>
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<tr>
<td>Short-term training</td>
<td>$10,000</td>
<td>$230,000</td>
<td>$215,000</td>
<td>$215,000</td>
<td>$215,000</td>
</tr>
<tr>
<td>IEC/social mobilization</td>
<td>$50,000</td>
<td>$300,000</td>
<td>$300,000</td>
<td>$100,000</td>
<td>$105,000</td>
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<tr>
<td>Disease surveillance</td>
<td>$1,915,300</td>
<td>$2,164,610</td>
<td>$2,447,519</td>
<td>$2,768,685</td>
<td>$3,133,430</td>
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<tr>
<td>Programme management</td>
<td>$258,189</td>
<td>$278,598</td>
<td>$300,776</td>
<td>$324,892</td>
<td>$351,119</td>
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<tr>
<td>Other routine recurrent costs</td>
<td>$1,147,129</td>
<td>$1,204,485</td>
<td>$1,264,710</td>
<td>$1,327,945</td>
<td>$1,394,342</td>
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<tr>
<td><strong>Subtotal</strong></td>
<td>$78,642,762</td>
<td>$186,740,328</td>
<td>$216,548,011</td>
<td>$221,034,953</td>
<td>$232,890,010</td>
</tr>
<tr>
<td><strong>Routine Capital Costs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicles</td>
<td>$71,400</td>
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<tr>
<td>Cold chain equipment</td>
<td>$505,752</td>
<td>$3,698,495</td>
<td>$3,336,563</td>
<td>$2,129,844</td>
<td>$1,360,617</td>
</tr>
<tr>
<td>Other capital equipment</td>
<td>$38,760</td>
<td>$2,081</td>
<td>$2,122</td>
<td>$2,165</td>
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<tr>
<td><strong>Subtotal</strong></td>
<td>$505,752</td>
<td>$3,808,655</td>
<td>$3,338,644</td>
<td>$2,131,967</td>
<td>$1,362,782</td>
</tr>
<tr>
<td><strong>Campaign Costs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polio</td>
<td>$12,407,027</td>
<td>$10,246,198</td>
<td>$10,522,759</td>
<td>$10,811,679</td>
<td>$11,113,681</td>
</tr>
<tr>
<td>Measles</td>
<td>$9,955,200</td>
<td>$7,222,957</td>
<td>$7,634,940</td>
<td>$7,946,547</td>
<td>$8,062,890</td>
</tr>
<tr>
<td>Operational costs</td>
<td>$2,451,629</td>
<td>$2,523,241</td>
<td>$2,667,820</td>
<td>$2,863,133</td>
<td>$3,048,881</td>
</tr>
<tr>
<td>Vaccines and Injection Supplies</td>
<td>$6,575,200</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other costs</td>
<td>$2,690,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>$21,582,227</td>
<td>$10,246,198</td>
<td>$10,522,759</td>
<td>$10,811,679</td>
<td>$11,113,681</td>
</tr>
<tr>
<td><strong>Shared Health Systems Costs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Shared personnel costs</td>
<td>$45,619,347</td>
<td>$50,181,284</td>
<td>$55,206,594</td>
<td>$60,726,153</td>
<td>$66,796,769</td>
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<tr>
<td>Shared transportation costs</td>
<td>$473,770</td>
<td>$497,459</td>
<td>$522,331</td>
<td>$548,448</td>
<td>$575,870</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>$46,093,117</td>
<td>$50,687,740</td>
<td>$55,772,925</td>
<td>$60,726,153</td>
<td>$66,796,769</td>
</tr>
<tr>
<td><strong>GRAND TOTAL</strong></td>
<td>$146,823,858</td>
<td>$251,473,922</td>
<td>$286,137,339</td>
<td>$295,253,200</td>
<td>$312,741,112</td>
</tr>
</tbody>
</table>

**Routine Immunization** | $125,241,631 | $241,227,723  | $275,614,580  | $284,441,321  | $301,627,431  |

**Supplemental Immunization Activities** | $21,582,227  | $10,246,198   | $10,522,759   | $10,811,679   | $11,113,681   |