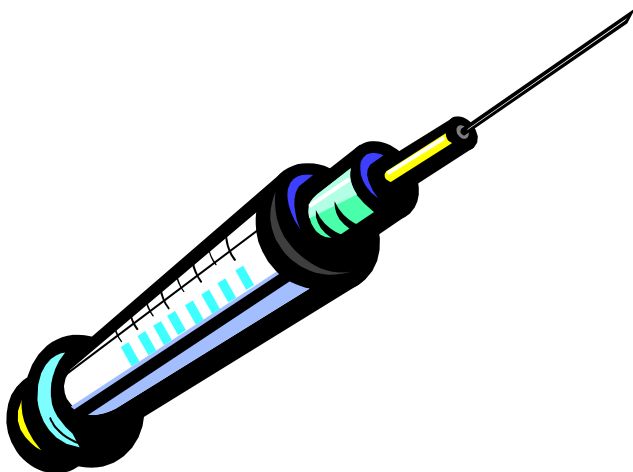


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# MALAWI NATIONAL IMMUNIZATION PROGRAMME

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## Financial Sustainability Plan



Ministry of Health and Population  
Lilongwe - Malawi  
November 2003



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## **EXECUTIVE SUMMARY**

Malawi is a small land-locked country located in the south of the Sahara desert. It has an estimated population of 10,650,426, five percent of which are children under the age of one. The country's infant mortality rate is estimated at 104 deaths per 1,000 births. Other health indicators are equally bad, comparing less favorably with other countries in the sub-Saharan region.

The Expanded Programme of Immunization was established in 1976 with the overall objective of reducing infant mortality by making immunizations readily available to the whole target population. The EPI is among the most successful programmes in the Ministry, having attained the universal coverage of fully immunized children at their first birthday. The programmes current objectives include the reduction of wastage of vaccines, maintaining and eventually improving coverage levels and strengthening surveillance of diseases meant for eradication and elimination.

In the year 2000, Malawi secured support from the Global Alliance for Vaccines and Immunizations for the introduction of a new pentavalent vaccine. By the year 2002, the new vaccine was available for use countrywide. The programme however appreciates the high cost implications of using the new pentavalent vaccine. It is further appreciated that support from GAVI in meeting the procurement costs of the vaccine, will be available for five years only. This plan puts in place measures, which will ensure the financial sustainability of the EPI when the GAVI support phases out.

This FSP is developed taking into consideration the current macroeconomic trends, the and various reforms taking place at the macro level such as Decentralization and health sector reforms, which among others include the introduction the Essential Health Care Package and SWAps. Most of these reforms are at an advanced stage. In addition, Government has developed a Poverty Reduction Strategy Paper, which places health among the priority sectors.

The FSP is dependent on resources originating from both Government and donor partner sources. The Government is expected to meet most of the operational costs to ensure equitable distribution, utilization and coverage of immunization services throughout the country, while the donors will be expected to meet the costs of vaccines and A-D syringes. The estimation of the current expenditure is based on the base line data before the introduction of new vaccines in the year 2000 and data in the first year of introduction of new vaccines in the year 2002. It is important to note that the cost of the introduced Pentavalent vaccine is 92% of the total cost of all vaccines provided in the immunization schedule in Malawi.

The FSP has attempted to project the financial gap in implementation of the immunization services up to the year 2011. However, through the ICC, different partners have pledged to meet the total cost of all the resource and vaccine requirements in collaboration with Government up to the year 2011. It is, therefore, understandable that the gap that exists is due to the fact that the pledges are not guaranteed.

The FSP has also developed a strategic plan to address the anticipated future problems like the reliability of pledged funds, high wastage of vaccines and high vaccine cost among others. These problems are addressed through strategies and actions that have a timeframe and monitoring indicators. The strategic plan component outlines strategies and activities to be implemented in the short, medium and long term. The FSP also includes indicators for monitoring inputs, outputs and outcomes. These indicators will be complemented by the DHS, which is used to monitor impact of health service utilization like child survival.

## **1.0 COUNTRY AND HEALTH SECTOR**

### **1.1 Background information**

Malawi is a land locked country located in the south of the sub-Saharan Africa. It is bordered to the north and northeast by the United Republic of Tanzania; to the east, south and southwest by the People's Republic of Mozambique; and to the west and northwest by the Republic of Zambia. A quarter of the surface area is covered by Lake Malawi.

The country is 901 kilometers long and ranges in width from 80 to 161 kilometers. It has a total area of 118,484 square kilometers of which 94,276 square kilometers is land area. The remaining area is mostly composed of Lake Malawi, which is about 475 kilometers long and runs down Malawi's eastern boundary with Mozambique.

The population of Malawi in 2002 was projected at 10, 650, 426, with an infant mortality rate of 104 per 1,000 live births. Under five mortality stands at 189 per 1,000 live births and maternal mortality at 1,120 per 1000,000 live births (DHS, 2000). The population grows at an annual rate of 1.9% as estimated during the 1998 national census as children under the age of one year constitute five percent of the total population. Malawi has a low urbanization rate, with eighty-six percent (86%) of the population living in the rural areas.

### **1.2 Health Care Delivery System**

The Ministry of Health and Population is the largest provider of health services, owning sixty percent of health facilities. The Christian Hospital Association of Malawi (CHAM) provides 37% of the health care services while private institutions provide 3%. All these service providers offer immunization services.

The Expanded Program on Immunisation was initiated in 1976 as a pilot programme. The programme became fully operational in 1978 and currently offers measles, DPT-HepB+Hib, Polio and BCG vaccines to children under 1 year of the age and tetanus toxoid vaccine to pregnant women and women of child bearing age.

Vitamin A supplementation is also administered alongside immunization services. The capsules are routinely administered to children from 6 months up to 59 months at an interval of 6 months.

The new vaccine (DPT-HepB+Hib) was introduced in January 2002 and targets all children under one-year old. All children who received 1<sup>st</sup> and 2<sup>nd</sup> dose of DPT restarted, while those who completed the three doses of DPT were not eligible because they had already completed the recommended schedule for DPT.

High routine EPI coverage for all childhood immunization has been sustained since 1989. The decline in immunization coverage in the year 2000 can be attributed to various factors such as the global shortage of Polio, BCG and DPT vaccines due to manufacturers problems. Immunization sessions at outreach clinics, which provide 80% of the immunization services, were cancelled because of transport and cold chain problems. All these problems

adversely affected the operations of immunization services. In addition, the change of the denominator from the 4% to 5% of the population resulted into a lower calculated coverage.

### **1.3 Macroeconomic Trends**

Malawi is one of the poorest countries in the world, with a per capita income of US\$170 in 2000.<sup>1</sup> Over the last decade, it has ranked among the bottom fifteen countries on the HDI rank, with a Human Development Index averaging 0.350. Poverty is “widespread, deep and severe”<sup>2</sup> - in 1998, the last year for which data is available, up to 65% of the population was economically categorized as poor. Thirty percent of the population was further classified as “ultra poor”, or lacking the basic necessities for survival.

Malawi’s economy is largely depended on the agriculture sector, which contributes approximately 40% of gross domestic product (GDP). The structure of the economy makes it highly vulnerable to external shocks, such as adverse climatic conditions and worsening terms of trade for cash crops, particularly for tobacco the major foreign exchange earner.

Consequently, the economy usually registers low annual growth rates below 6%, which is the recommended minimum required to deliver widespread welfare gains to the population. Coupled with the slow growth is a huge external debt burden, which hovers around 150% of GDP. This has a negative impact on the discretionary government expenditure levels to priority sectors.

On the domestic scene, government budget also operates in deficit. For instance, only 59% of planned total expenditure for FY 2002/3 was to be financed from locally generated revenue; the shortfall of 41% was to come from grants or domestic borrowing. It is consensually acknowledged that for some time, government will continue to rely on grants and domestic borrowing as means for bridging the budget deficit. This is in view of the economy’s low tax base, which is further dwindled by reducing trade tariffs in keeping with international trade harmonization protocols. However, reliance on foreign sources of financing, such as grants has proved to be risky as there is a lot of uncertainty on both the levels and timing of inflows. Disbursements may also be tied to fulfillment of certain conditionalities, ranging from meeting macroeconomic targets and governance issues. Where the funds are not forthcoming, government resorts to domestic borrowing. This eventually translates into budget cuts for government departments, as domestic borrowing usually attracts high interest rates.

On a positive note, Malawi is on track with the HIPC initiative for which it qualified a few years ago. The interim qualification for HIPC has resulted in a considerable reduction in annual debt service requirements, resources of which are channeled to priority poverty expenditures, in various sectors including health. This has translated into an increased budgetary allocation to the Ministry of Health and Population, which stood at 12.8% of overall government budget in 2002/03, including statutory expenditure. Upon reaching the HIPC completion point, Malawi’s debt stock will be reduced by a net present value of US\$643 million.

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<sup>1</sup> 2000 Economist Intelligence Unit report

<sup>2</sup> Malawi Poverty Reduction Strategy Paper



## **1.4 Government Priority Setting**

The advent of multiparty politics ushered a new political party into government, which made poverty reduction its overarching policy objective. This augured very well with the requirement for governments to prepare Poverty Reduction Strategy Papers (MPRSP) in order to qualify for HIPC debt relief. To that end, the Malawi Government in collaboration with stakeholders recently completed and launched Malawi's Poverty Reduction Strategy Paper. The MPRSP provides a framework for pro-poor interventions, which will be implemented with support from government, donors and civil society. The health sector features highly in the MPRSP, as a key component of human capital development. In particular, the "core-business" of the publicly financed health sector (e.g. government, donor and NGO funded sector) is to provide an Essential Health Package (EHP). The EHP has been defined and will provide integrated services orientated to common illnesses that most affect the poor masses. It aims at providing some essential services (including immunization services) to all, as opposed to providing all services to a few people.

Government will operationalize the MPRSP through its annual budgets. Budget formation and the financial system in general are currently undergoing reform, aimed at moving away from the historic incremental system of inputs to a Medium Term Expenditure Framework (MTEF). In the MTEF, the budgets are activity-based and ceilings are allocated to sectors based on priority; at present based on those activities highlighted in the MPRSP. To ensure discipline in spending within these ceilings, the government introduced a cash budgeting system whereby departments and ministries can only spend funds that are available (e.g. no overdrafts or credits), ensuring that expenditures remain within the ceiling limits. These reforms can only strengthen the provision of basic, priority services, such as the immunization services contained within the EHP.

## **1.5 Government-wide Reforms**

There are a number of public sector reforms that will impact on the health sector in general and specifically on immunization services. The following are the key reforms, currently under implementation:

### **1.5.1 Functional Review of Ministries**

A functional review of all Ministries was undertaken in 1999 with the aim of increasing the efficiency of the Malawian civil service. The exercise reviewed all positions in the Ministry and upgraded several positions. It also recommended the introduction of performance related contracts for the civil service and streamlined the government's organizational structure to enhance and ensure synergy in the mix of staff competencies.

The Ministry of Health and Population (MoHP) has started implementing the functional review recommendations, but considerable work remains to be done in this area. When fully implemented, the recommendations are expected to contribute towards staff retention and motivation. However, in view of other developments, such as the Sector-wide Approach, further organizational review of the Ministry may be necessary.

### **1.5.2 Devolution to Local Government**

Malawi developed a devolution policy and later a Local Government Act, which was passed in 1999. The Act provides for the transfer of authority to local assemblies to manage all public services and resources within the local authority. The center will retain responsibilities over policy formulation and enforcement, standard setting and international representation, among others. In line with the policy, the MOHP is strengthening the district health management teams in various aspects of resource management.

It is hoped that with careful preparation, devolution will have a positive impact, as it utilizes opportunities for local ownership and hence improved accountability and control of resources. Local management of services may also threaten the provision of health services generally and immunisation services in particular, if local assemblies are not well versed with health priorities.

### **1.5.3 Sector Wide Approaches (SWAPs)**

Malawi adopted SWAp as an approach to development at the Consultative Group (CG) meeting of year 2000. The health sector has made progress in the movement towards the SWAp, and has recently completed the design work for a programme to be jointly supported by government and development partners. It is envisaged that the SWAp will bring in considerable efficiency and equity gains in the Malawi health system.

As the sector progresses towards a SWAp, short-term risks to vertical service delivery structures, such as the immunization programme are likely. There will have to be a careful process of managing the change, to ensure that individual MoHP “success stories” (such as the EPI programme) are not compromised in an attempt to improve the performance of the overall health system.

## **1.6 Health Sector Reforms**

In addition to the above government wide reforms, there are also sector specific reforms taking place in the health sector. These are summarized below.

### **1.6.1 Essential Health Package (EHP)**

In view of the poor and continuously deteriorating health indicators, the health sector recently reviewed its way of doing business, and defined a package of basic health services, which will become the core business of the MoHP. Provision of services in this basic package, known as the Essential Health Package (EHP), is viewed as the most cost-effective means of dealing with the many health problems affecting the majority of Malawians. In line with the MPRSP, these services will be accorded financing priority from both government and development partners.

The EHP represents a genuine sea change in Malawi’s approach to publicly financed health care. Whereas all health systems are characterized by an imbalance between health needs and available resources, Malawi’s situation is particularly acute. Historically, however, this resource imbalance has been rationed implicitly through drug stock-outs, human resource

unavailability, closed wards, lack of ambulatory transport and so on. The EHP represents a shift to explicit rationing through limiting the range of services to be provided.

In limiting the range of services but expanding access to these services to all Malawians, the EHP will address both demand and supply-side issues that face publicly funded health services. On the demand side, the EHP is orientated around the 11 conditions that predominantly affect the rural poor. The majority of these conditions are preventable and communicable diseases, and thus non-treatment incurs societal costs, as well as costs to the individual.

On the supply side, improved health systems and standardized services at “closer-to-client” levels will reduce the financial and geographical barriers to accessing the EHP. Considerable work is ongoing in improving health systems. Some are discussed below, but a non-exhaustive list includes: the Essential Medical Laboratory Services Programme that is ready for national roll-out; considerable recent progress in transport management; recent strengthening in planning and budgeting systems; central medical stores (CMS) reform; and, an in-place strategy for managing devolution and a training programme to go with it. Remaining systems strengthening (e.g. designing supervision and monitoring systems) is planned for the next year. To effectively standardize services, and move them closer-to-the-client, the EHP envisages a massive expansion of the community level of health delivery, with for example one health surveillance assistant (HSA) per 1,000 of the population, and for limited drug disbursement to occur at this level.

### **1.6.2 Health Care Financing Developments**

Following the definition of the EHP, the Ministry of Health and Population elaborated its policy regarding the financing of the EHP services, where these services will be provided free of charge at the point of service. This deliberate policy is aimed at ensuring access to these services by the entire population, regardless of an individual's financial status. This policy is based on available evidence, which reveals the extent to which financial barriers limit access to essential health services<sup>3</sup>. As immunization services form part of the EHP, they will likewise be accessed free of charge.

Nevertheless, other health financing options are being explored in the country. Among others, they include voluntary payment of user fees for expanded “hotel” services, to be provided through Outpatient Department 1 (OPD1) and paying inpatient wards. These services, targeting those who have the ability to pay, are aimed at decongesting free services and thus enhancing access to the EHP in general and immunization services in particular.

Over a longer-time frame, voluntary user fee schemes will be complemented by a health care insurance financing system, which will target all formal sector employees. It is believed that when the scheme is in place, more public resources will be freed up and channeled towards the EHP services.

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<sup>3</sup> [1999 National Health Accounts, TB Equity Programme, Qualitative Impact Monitoring Survey \(QUIMS\)](#)

### **1.6.3 Central Medical Stores Reforms (CMS)**

Reforms at CMS are aimed at bypassing bureaucratic procurement and rationalizing the supply of essential medicines and medical supplies. Reforms will lead up to the establishment of CMS as a semi-autonomous trust. In parallel, it is foreseen that CMS is re-capitalized to the point where stocks ensure over 90% availability of essential items at all times. Improvements will focus in procurement, inventory or warehouse management and distribution systems.

The SWAp will also have implications for CMS and drug procurement in general. It is likely the procurement of an increasing proportion of essential pharmaceuticals will be coordinated and managed by CMS. Since this may have a impact on the procurement of vaccines, the general view is to exempt vaccines from a uniform CMS system. The current procurement, distribution and stock management system of vaccines is good enough and less risky.

## **2.0 BUDGET PROCESS AND FINANCIAL MANAGEMENT**

### **2.1 Budgeting process**

The MoHP's budget system is a continuous cycle of preparation, execution and monitoring activities, with feedback at all points of the cycle.

The preparation of the budget begins with the issuing of tentative ceilings for cost centres for the forthcoming financial year. These ceilings are based on advice from the Ministry of Finance and a systematic, pro-poor, resource allocation formula is applied. Cost centres then draw-up their implementation plans (at district level these are called District Implementation Plans, or DIPs), and cost them. Reprogramming then occurs to fit DIPs under the ceiling communicated. A supplementary list of activities, "List B", is also prepared in case additional funding can be secured. The activities contained in the DIPs reflect the latest policy priorities of the MoHP and from FY 2002/3 are orientated around EHP services. DIP budgets are consolidated by MoHP HQ, and then submitted to the Ministry of Finance, which in turn submits the budget to Parliament for approval.

From the beginning of the financial year, there is a regular process of funding, spending, accounting for and auditing the budget. In addition, from FY 2002/3 cost-centres will be monitored quarterly against their performance, based on the activities highlighted in their DIPs. This will help strengthen the link between the inputs and outputs of the budget, and in turn will help feed into budget preparations for the following financial year.

Currently the shortcomings in the budgeting process are:

- i) Actual funding levels are often below those approved in the budget, which adversely affects budget implementation;
- ii) Budget monitoring, both in terms of financial inputs but particularly in terms of outputs and performance, is currently weak. Not all cost-centres refer to their DIPs for managerial decision-making, and thus prioritization and expenditure effectiveness slips. The capacity of the centre to supervise and oversee this process is also inadequate.

The budgetary problems highlighted above clearly impede the ability of the health sector to deliver the EHP in general and immunization services in particular. However, it is important to stress the positive steps the Ministry is taking to combat these areas of difficulty:

- i) Ongoing and advanced discussions with development partners should soon yield a district "top-up" recurrent fund which will stabilize and augment erratic government funding;
- ii) Overall fiscal performance of the government is close to satisfying IMF conditions for the resumption of Balance of Payments support;
- iii) Monitoring and reporting functions at both district and central level are being strengthened, with a new district support office envisaged.

## **2.2 Disbursement Systems**

For government funding, the Ministry of Finance gives indicative funding figures on quarterly basis to Ministry of Health. However, the actual funding is done monthly. Ministry of Finance directly funds the cost centers and gives copies of the funding details to the MoHP Headquarters.

There are currently several funding modalities using donor agency finance. Funding is sometimes timely but in some cases can take a very long time before being effected. Usually specific activities are funded. When funds are released by the donor and have been received by the Ministry, usually in form of a cheque, the funds are deposited into a specific MoHP holding account. When an activity that requires the use of the funds falls due, the funds are transferred from the holding account to a specific MoHP operating account.

Payments to service providers are made by cheque directly to them. However, for convenience, some payments e.g. for allowances for participants to workshops, seminars etc are paid to an accounting officer who is supposed to make payments and account for the total paid at the end of the activity. The accounting officer accounts for the money to the programme coordinator who in turn accounts for the whole activity to the donor.

## **2.3 Accounting and Auditing**

The accounting system is still largely manual, despite the widespread use of spreadsheets. As such, the forthcoming roll-out of IFMIS (Integrated Financial Management Information Systems) will significantly improve the accounting services of the MoHP. IFMIS is currently in a pilot phase at 4 government departments.

IFMIS will help address some of the current weaknesses in budget execution and compliance. For instance, overspending against a budget line will require appropriate authorization, as additional requests for expenditure against a line item that already has expenditure and commitments equaling the total budget for that line, will automatically be rejected.

In conjunction with IFMIS reforms, the MoHP will seek to restructure the accounting code classifications in its budget to allow more accurate monitoring of EHP services, by level of provision as well as by service. This will benefit the tracking of funds for EHP services, including immunization.

Auditing of the Ministry's activities and records according to the Finance and Audit Act is the responsibility of the Auditor General. The Auditor General is independent of the executive and reports directly to Parliament. Apart from the Auditor General, the Ministry has an Internal Audit Section, which reports directly to the Secretary for Health and Population. The Internal Auditor is also actively involved in the auditing of the activities and records of the Ministry. In addition, the Auditor General approves use of private auditors by ministries especially in donor-funded projects.

## 2.4 Financial Information Systems

Current financial information is provided in the form of monthly expenditure returns, quarterly reports and other ad hoc reports prepared, broken down between the different cost centres.

IFMIS again will help address some of the current shortcomings in financial information systems, e.g. delays in submission of returns/reports and to some extent the question of data integrity.

## 2.5 Procurement Arrangements

MoHP cost-centres handle internal procurement below K100,000.00 through their administration departments. At least 3 quotations are obtained from approved suppliers before making a purchase. For all purchases above K100,000.00 the Procurement Section of the Ministry is required to go through Central Government Stores who should examine and approve the purchase before it is effected.

For all purchases above K500, 000.00 the Ministry is supposed to submit its requests to Government Contracting Out Unit (GCU) for approval and processing. The Government Contracting Out Unit issues a pre-qualified list of suppliers yearly that is sent out to ministries for use in their day-to-day procurements/purchases.

## 2.6 Financial Management Shortcomings

- i) **Disbursement:** Volatility of government funding has been documented in the previous section. However, there are also some problems with the disbursement of donor funds. There have been cases when there have been long delays by accounting officers in accounting for the funds after completion of an activity. The delay has sometimes affected further funding from donors and, therefore, has delayed other activities from being conducted on time. To address the question of delays, accounting officers have now been instructed to account for the funds by at least 7 days after the completion of an activity.
- ii) **Procurement:** It can take a long time for delivery of goods procured through the GCU. If materials for immunization were to be procured using this process, there would be need to take into account the length of the procurement cycle because it could easily create problems.
- iii) **Audit:** The Office of the Auditor General lacks capacity mainly in terms of:
  - a. Staffing - There is a mismatch between the number of spending centers and number of staff working under Auditor General. As a result, it has not been possible to conduct audits of cost centers on a year as is required.
  - b. Funding : The budget that is allocated to the Auditor General's Office is small and under-funded in practice. This makes it difficult for the office to honour all of its programmes.

The SWAp should facilitate audit queries through resourcing private audit firms to fill the capacity gaps within the Auditor General's Office and the MoHP's internal audit department.



### 3.0 PROGRAMME CHARACTERISTICS, OBJECTIVES AND STRATEGIES

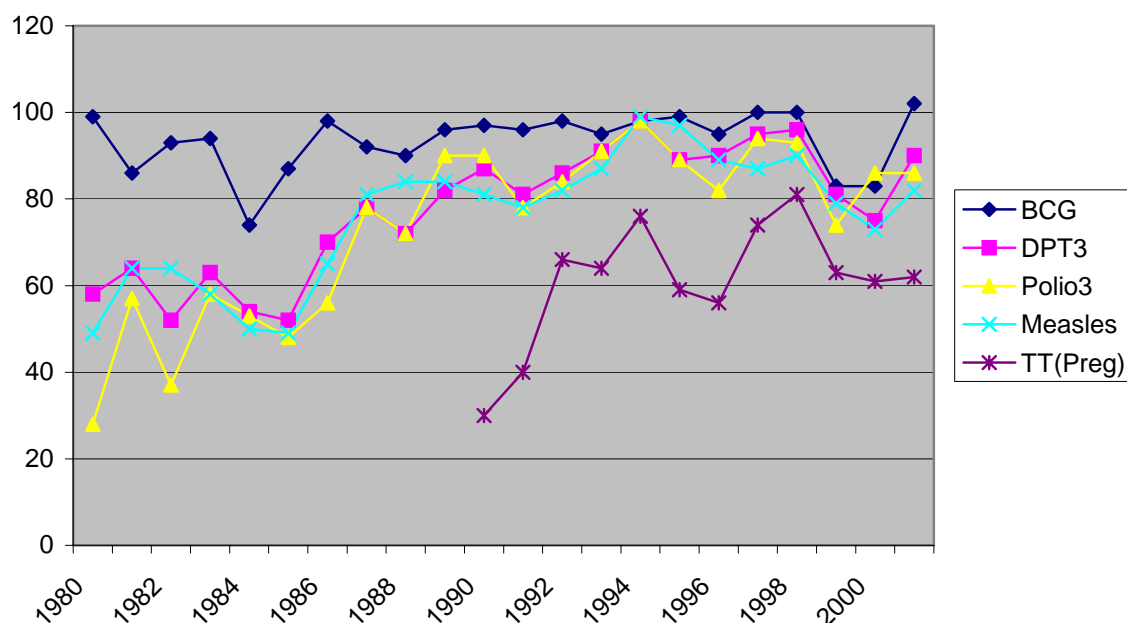
#### 3.1 Programme Status

Since the attainment of Universal Childhood Immunization (UCI) goals by the EPI programme in Malawi in 1989, immunization coverage for all antigens has been maintained at  $\geq 80\%$  (see Fig 1 below). Immunization services are presently delivered through a total of about 3,400 static as well as out-reach clinics nationwide.

In January 2002, Malawi introduced Hepatitis B and Haemophilus influenzae type b (Hib) into its routine immunization programme (see table 1 below for EPI schedule), presently in a pentavalent formulation (DPT-HepB+Hib) with support from the Global Alliance of Vaccines and Immunizations (GAVI). In addition, the use of autodisable syringes (ADs) bundled with safety boxes was introduced at the same time for all antigens, in accordance with the 1999 WHO/UNICEF/UNFPA policy on safe injections.

The other traditional antigens are being supported by DFID and KFW up to 2004. In the event that adequate financial resources are not mobilized, the continuation with pentavalent and ADs shall pose a big challenge for the programme.

**Figure 1: Status of Immunization Coverage in Malawi: 1980 - 2001**



**Table 1: Malawi Immunization and Vitamin A supplementation Schedule**

Age	Vaccine
At birth or first contact	BCG
At birth up to 2 weeks	OPV '0'
At 6 weeks	OPV 1 and DPT-HepB+Hib 1
At 10 weeks	OPV 2 and DPT-HepB-Hib 2
At 14 weeks	OPV 3 and DPT-HepB-Hib 3
At 10 months	Measles
First contact (15-45 yrs and Pregnant women)	TT 1
At 4 weeks after TT1	TT 2
At 6 months after TT2	TT 3
At 1 yr after TT3	TT 4
At 1 yr after TT 4	TT 5
At 6 months and every 6 months up to 59 months	Vitamin A (children)
Up to 2 months after delivery	Vitamin A (post natal mothers)

### 3.2 Programme Goal

The goal of the Expanded Programme on Immunization is to reduce infant morbidity and mortality rates due to childhood vaccine preventable diseases by making immunizations readily available to all targets.

### 3.3 Programme Objectives

- To fully immunize infants against childhood immunizable diseases before attaining the age of 12 months
- To vaccinate all pregnant women and women of childbearing with at least two doses of tetanus toxoid vaccine
- To sustain high community awareness on the importance of completing the immunization schedule

### 3.4 Specific Objectives

- Achieve >90% coverage for all antigens among under one year children
- Achieve >80% coverage for tetanus toxoid vaccination among expectant mothers
- Detect at least one case of Acute Flaccid Paralysis (AFP) per 100,000 population of <15 years age
- Collect two stool specimens between 12 to 48 hours within 14 days of onset of paralysis
- Report less than one case of neonatal tetanus per 1,000 live births in each district
- Collect blood specimens from >80% suspected measles cases

### 3.5 Strategies

The latest comprehensive EPI Review conducted in 1999 identified three major areas for programme improvement i.e.:

- Decreasing trends in polio, DPT and TT coverages
- Transport problems for mostly outreach services
- Inadequate supportive supervisory visits

In order to address these areas a five-year plan of action (2001-2005) was developed outlining recommendations for the above, which among others include:

- Sustaining high routine immunization coverage by improving accessibility and utilization (reduction in drop out rate, missed opportunity)
- Ensuring safe injection practices
- Improving transport by proper timely maintenance of district vehicles
- Improve supportive supervisory visits
- Reducing wastage rates

### 3.6 Targets

The major targets set in the plan are:

- Soliciting adequate financial support from government and donors
- Vaccine supply: maintain adequate stock of vaccine at all levels by ensuring reduction in wastage and proper focusing
- Routine Immunization: each district to achieve at least 90% coverage for all childhood antigens and 80% for TT2 for pregnant women
- Improvement of cold chain infrastructure in health facilities
- Introduction of innovations e.g. new vaccines, ADs, solar refrigerators in some health facilities and construction of incinerators in health facilities depending on recommendations made
- Disease surveillance
  - AFP: detect at least one case of AFP per 100,000 <15 populations in each district per year until certified polio-free
  - Measles: Collect blood specimens from all suspected measles cases
  - NNT: Report less than one case on NNT per 1,000 live births year each
- Conduction of supplemental immunization activities accordingly
- Training of health workers on vaccine administration technique and ensuring that districts adhere to accepted proportions of wastage rates.

### 3.7 Programme Support

Immunization services are integrated within the preventive health services and funded by the government national budget. In addition, EPI is however heavily assisted by collaborating partners and donors for procurement of logistics, cold chain supplies and vaccines.

The Ministry of Health and Population has introduced a number of reforms, which include SWAPs and EHP. These reforms may slightly modify the management and institutional location of the programme. However EPI indicators will be maintained to expected levels but expenditure is likely to reduce with these reforms.

The partners in EPI include UNICEF, WHO, KFW, DFID, JICA, and Rotary International among many others. See Table 2 below for the roles and responsibilities of partners in immunization services.

**Table 2 Roles and Responsibilities of Donors and Partners**

<b>Donor/Partner</b>	<b>Roles and Responsibilities</b>
UNICEF	Technical and financial support for most EPI services
WHO	Technical and financial support for most EPI services
JICA	Vaccines and Cold Chain
CHAM	Service delivery
Rotary	Vaccine and other polio-associated activities
DFID	Vaccine, logistics and transport through UNICEF
KFW	Vaccine, logistics and transport through UNICEF
NORAD	Financial support trainings
USAID	Financial support
CIDA	Training and procurement of vitamin A
GAVI	Provision of new vaccine bundled with AD syringes and safety boxes
UNF	Support for 2002 measles and vitamin A campaign (CDC and American Red Cross)
ICC	Mobilization of resources for programme implementation

### **3.8 Safe Injection Policy**

The Ministry of Health and Population pursues the policy that all injections given for immunizations in the public and private sectors must be safe. This means that each dose of vaccination injection must be given using a single sterile syringe and sterile needle, which is then safely disposed of after use.

The EPI introduced the use of AD syringes and safety boxes in January 2002 for all routine and supplemental immunization services. Currently, vaccination for BCG uses re-usable syringes and needles until such time as the AD syringes for BCG are available in the near future.

The methods of disposal for used injection equipment are:

- Incineration of all filled safety boxes and if incinerators are not available, full safety boxes are burnt in small numbers
- Residues (ashes) from incineration or burning are safely removed and properly buried in an appropriate pit.

### **3.9 Vaccine Wastage Rate**

Wastage rates in 2001 for BCG, OPV, measles and TT were high except for DPT which was within acceptable limit as shown in Annex 2. In view of the introduction of new vaccines which are very expensive and not readily available, it is imperative for districts to ensure that acceptable wastage levels are adhered to and vials used during each immunization session are well documented and analyzed.

Vaccine wastage could be reduced by:

- Ensuring that refrigerators are provided with adequate paraffin/gas in a period.
- Ensuring that vaccines are immediately transferred to the nearest health facility in case of cold chain breakdown.
- Ensuring that all health workers adhere and practice multi-dose vial policy.
- Ensuring that health workers apply proper technique when administering vaccines.
- Ensuring that health workers use and appropriately interpret cold chain monitor cards.
- Ensuring that all health workers who handle and administer vaccines adhere to cold chain procedures

## **4.0 BASELINE AND CURRENT PROGRAMME COSTS AND FINANCING**

### **4.1 Baseline Costs**

The baseline expenditure figures presented in the GAVI Application for Malawi were for the year 2000. The immunisation programme in Malawi is largely supported by cooperating partners. Before the vaccine fund, a large portion of the programme operating costs, including the procurement of vaccines and other supplies as well as improvement of the cold chain were met by donors. Most of these donors channel their resources through UNICEF. The resources are usually pooled, and made available to the programme at intervals and on request, for specified activities.

Broadly, expenditure figures include programme recurrent costs and capital items. On recurrent costs, total expenditure figures for items such as transport, disease surveillance programme monitoring, supplies and salaries for full time staff are presented. Shared salaries are a sum of proportions of salaries including allowances, for staff involved in immunisation activities. The proportions were determined based on the assumed level of involvement in immunisation activities of various staff categories. Figures for capital costs represent the total expenditure on procurement of the capital items.

Total programme expenditure for the year was approximately US\$3.7 million, of which US\$2.97 was recurrent expenditure. It is worth noting that in the year 2000, Malawi did not conduct any supplementary immunization activities, having conducted one in 1998, where a national coverage of over 95% for measles vaccination and vitamin supplementation A were achieved.

Table 3.1 gives details on actual expenditure for the programme in the year 2000 prior to vaccine fund support.

### **4.2 Programme Costs After Initiation of Vaccine Fund Support-2002**

Programme costs for the year 2002 ie after the introduction of the new vaccine are presented in the Table 3.2. A sharp increase in overall programme costs may be observed, from US\$3.72 million in year 2000 to US\$10.5 in 2002. Recurrent costs for routine services alone shot up from US\$2.97million in year 2000 to US\$9.66million in 2002. The increase of US\$6.69million is largely explained by the introduction of the new vaccine, which accounts for approximately 82% of the recurrent cost escalation. This is in addition to an expenditure of approximately US\$1 million on traditional antigens.

There are however significant fluctuations in expenditure levels of some items. A drop in monitoring and evaluation may be noted as well as an increase in disease surveillance expenditure. The programme strengthened its disease surveillance system, which involves several field supervision trips, hence the reduced requirement for monitoring and supervision.

The marginal drop in salaries expenditure is however a result of depreciation of the local currency against the US dollar. Nevertheless salaries, which account for approximately 6% of recurrent expenditure, are entirely paid by the Malawi Government. Government contribution to the programme is however assumed to be higher, as it goes beyond salaries to such items as transport (fuel and vehicle maintenance) and office accommodation for the programme. The structure of the expenditure information makes the estimation of government contribution under these items rather difficult.

**Table 3.1 Actual Programme Costs in 2000**

1,2	Vaccines (New and Under-used vaccines)				
2	Injection supp	849,700.00			849,700.00
3	Personnel	23,000.00			23,000.00
4	Transport	278,900.00			278,900.00
5	Maintenance and overhead				
6	Short term training				
7	IEC social m	50,800.00			50,800.00
8	Monitoring an	121,800.00			121,800.00
9	Disease Surv	127,200.00			127,200.00
	Optional Information				
10	Shared Personnel				
10,1	Salaries	667,700.00			667,700.00
10,2	Incentives/per diems				
11	Stationery	166,800.00			166,800.00
	<b>Sub-Total Optional</b>	<b>2,972,000.00</b>			<b>2,972,200.00</b>
B	Capital Cost				
	Required Information				
12	Vehicles	591,614.00			591,614.00
13	Cld Chain Eq	165,900.00			165,900.00
	Optional Information				
14	Building				
15	Other Equipment				
16	Long term Training				
17	Other (specify)				
	Sub-Total Capital				
C	Unspecified				
18	Unspecified(non-itemized costs)				
19	Unspecified(non-itemized costs)				
	Sub-Total Unspecified				
	<b>GRAND TOT</b>	<b>3,729,514.00</b>			<b>3,729,514.00</b>

- Note: i) Malawi did not conduct any Supplemental Immunization Activities (SIAs) in the year 2000.
- ii) The EPI Programme got a lot of support from its partners and donors where about 17 vehicles and 37 motorcycles were procured to improve transport system



**Table 3.2 Programme Costs in 2002**

		Total Immunization Specific Cost				
Item No	Component	Routine Services	Polio NIDs/SNIDs	Measles NIDs	Other SIAs	Total
(A)	Operation Cost	US\$	US\$	US\$	US\$	US\$
Required Information			Not Applicable		Not Applicable	
1	Vaccines			345,867.00		345,867.00
1.1	Traditional 6 a	1,065,000.00				1,065,000.00
1.2	New Vaccines	5,512,074.00				5,512,074.00
2	Injection supp	1,250,000.00		138,346.00		1,388,346.00
3	Personnel	21,589.00		249,025.00		270,614.00
4	Transport	286,281.00				286,281.00
5	Maintenance and overhead					
6	Short term training					
7	IEC social m	40,800.00		262,859.00		303,659.00
8	Monitoring an	38,500.00				38,500.00
9	Disease Surv	796,533.00				796,533.00
10	Operation Cost			387,370.00		387,370.00
Optional Information						
10	Shared Personnel					
10.1	Salaries	626,594.00				626,594.00
10.2	Incentives/per diems					
11	Stationery	25,000.00				25,000.00
<b>Sub-Total Optional</b>		<b>9,662,371.00</b>		<b>1,383,467.00</b>		<b>11,045,838.00</b>
B	Capital Cost					
Required Information						
12	Vehicles	191,000.00				191,000.00
13	Cld Chain Eq	584,000.00				584,000.00
Optional Information						
14	Building					
15	Other Equipment					
16	Long term Training					
17	Other (specify	108,500.00				108,500.00
Sub-Total Capital						
C	Unspecified					
18	Unspecified(non-itemized costs)					
19	Unspecified(non-itemized costs)					
Sub-Total Unspecified						
<b>GRAND TOT</b>		<b>10,545,871.00</b>		<b>1,383,467.00</b>		<b>11,929,338.00</b>

## **5.0 FUTURE RESOURCE REQUIREMENTS AND PROGRAMME FINANCING**

During the vaccine fund period, various cooperating partners including GAVI, UNICEF, DFID, KFW and NORAD/SIDA have financed the vaccine and safe injection requirements as well as other operating costs for the programme. Financial resources from the latter four sources are made available into a pool fund coordinated by UNICEF, and made available to the programme on request in line with the programme requirements at a particular time.

### **5.1 Projections of Resource Requirements**

The new pentavalent vaccine and the use of AD syringes in routine immunization services were introduced in January 2002. However, AD syringes for BCG were introduced in early 2003.

Table 4.2 presents the projected resource requirements for the Immunisation Programme both during the vaccine fund and post fund periods. These projections take into account the current and projected coverage and wastage rates. The programme is aiming at improving its operational efficiency. It aims to reduce the BCG wastage rates to 50% in 2005, from the current level of 70%. Similarly, wastage rates for other antigens are expected to reduce to acceptable proportional levels. Gains from the efficiency improvements will enable the programme reach its coverage target of 90% for all antigens by the year 2005 as projected in the multi year plan of action.

The projected resource requirements for the EPI in the period 2003 to 2006 are to the tune of US\$ 41,398,201. Out of the total amount, 95% are programme recurrent costs. It is also worth noting that 66% of the total projected expenditure will go towards the procurement of vaccines and injection supplies. Salaries, which are entirely paid by the Malawi Government, account for approximately 15% of the total projected expenditure. However, the share of Government contribution to the programme costs is assumed to be higher, as other expenditures such as transport and maintenance of physical assets may also come from the government budget, particularly at the district level, where a lot of resource sharing between programmes occurs.

A major upward change in salary costs may be noticed between the years 2003 and 2004. This is due to the reforms taking place in the country, which recommend an improvement of remuneration packages for health workers as a means for their retention, in line with the implementation strategy of the EHP. The recently created Health Services Commission will facilitate this. Coupled with remuneration improvement will be accelerated filling of the many vacant posts with recent graduates, trained under the Emergency Health Worker Training Programme, supported by HIPC and other resources. The filling of vacancies is expected to

continue in the two subsequent years, as more health workers graduate under the Emergency Training Programme.

For the post vaccine fund period, up to the year 2011, the total projected resource requirements amount to US\$55,794,035. Again 95% of the requirements are recurrent in nature. There is a slight increase in the share of vaccines and injection supplies to approximately 67% of the total programme costs. Salaries will on average constitute 21% of the total expenditure.

During the Post Vaccine Fund, government will continue benefiting from HIPC and Japanese Debt relief funds, part of which will be utilized for the procurement of cold chain equipment, vehicles and other logistics.

Furthermore, under the Malawi Government/German financial cooperation, KFW will continue to support the EPI with some programme logistics for a period of 4-5 years. Under the same programme, KFW will procure pentavalent vaccines, traditional vaccines and other supplies for a period of two years. JICA has also expressed interest to continue supporting the immunization programme and it is considering supporting the provision of pentavalent and other vaccines from the year 2008 to 2011.

## **5.2 Alternative Scenarios for Resource Requirements**

Based on the commitments so far made by various collaborating partners, the programme intends to continue administering the new vaccine during the Post Vaccine Fund. However, in a situation where partners fail to meet their commitments in full or withdraw their support completely, the Malawi Government will have difficulties sustaining the programme. In such a scenario the EPI programme may revert to the use of DPT and re-usable syringes and needles. Alternatively, the programme may continue using the pentavalent vaccine albeit at a much reduced coverage rate. This alternative is however not in line with the programme plan of action of achieving 90% coverage rate. Cost cutting measures, aimed at scaling down other programme inputs may not result in significant reduction in the overall programme costs, hence not worth considering.

## **5.3 Projections of Future Financing Levels and Patterns**

During the vaccine fund period, funding is secured to meet all programme costs, except supplemental immunization activities. The sources of funding include the Malawi Government, GAVI and KFW.

However, during the post vaccine fund period only funds for personnel and operational costs may be said to be guaranteed. Funds for all other resource requirements are not guaranteed. Total probable financing for all requirements is available through collaboration with cooperating partners as indicated in Table 4.1.

**Table 4.1 Total Probable Financing for the Immunisation Programme 2003-2011**

YEAR	GOM	GAVI	UNICEF	KFW	DFID	NORAD/SIDA	JICA	TOTAL(US\$)
2003	X	X	X	X	X			8,491,768
2004	X	X	X	X	X	X		10,978,316
2005	X	X	X	X	X	X		9,960,309
2006	X	X	X	X	X	X		11,967,808
2007	X		X	X	X	X		10,509,856
2008	X		X	X	X	X		10,908,942
2009	X		X		X		X	11,221,692
2010	X		X		X		X	11,438,986
2011	X		X		X		X	11,714,559

**Vide:** Table 4.2 and Annex 4 section 4.4

**Note:** The total pledges are equal to the total requirements and therefore there is no funding gap. Partners will supplement Government during all the years shown above.

#### **5.4 Estimates of the Gap Between Resource Requirements and Available Financing**

During the vaccine fund period, there is no financing gap both in terms of pledges and fulfillment of the pledges. Funding pledges for Supplemental Immunization Activities (SIAs) for polio and measles in years 2004 and 2006 have been made but not guaranteed.

During the post vaccine fund period, the financing levels are also equal to the resource requirements. However, a gap exists in the sense that funds, though likely to be made available, are not guaranteed in any way. The levels of funding have been determined through the ICC.

#### **5.5 Risk Assessment**

The future of the programme looks promising given the fact that during both the vaccine and post vaccine period, the financing levels are equal to the resource requirements and funding is either secured (Risk 1) or more likely to be made available although not guaranteed (Risk 2), see figure 2. The programme costs for years 2004 and 2006 are on the higher side because of the supplemental immunization activities for polio and measles, respectively. There are however no costs in Risk 3.

Figure 2 : Graph Showing Risk Pattern During VF and Post VF Period



Table 4.2 TOTAL FINANCING BY COMPONENT FOR NATIONAL IMMUNIZATION PROGRAMME												
		2003	2004	2005	2006	Total	2007	2008	2009	2010	2011	Total
1	Vaccines	6,135,680	6,344,877	6,465,680	6,595,594	25,541,831	6,717,265	6,892,353	7,023,312	7,157,389	7,293,426	35,083,745
1.1	Traditional antigens	518,591	518,141	527,878	545,534	2,110,144	552,203	567,986	578,808	589,989	601,158	2,890,144
1.2	new and underused antigens	5,617,089	5,826,736	5,937,802	6,050,060	23,431,687	6,165,062	6,324,367	6,444,504	6,567,400	6,692,268	32,193,601
2	injection supplies	408,752	418,079	426,067	434,175	1,687,073	442,543	453,952	462,507	471,549	482,803	2,313,354
3	Personnel	23,460	35,190	35,893	36,611	131,154	36,978	37,347	37,721	38,098	38,479	188,623
4	Transport	314,909	330,654	347,187	355,866	1,348,616	362,982	370,042	377,647	381,424	385,238	1,877,333
5	Maintenance and overheads	17,256	18,119	19,025	19,976	74,376	17,256	18,119	19,025	19,976	20,975	95,351
7	IEC Social Mobilisation	58,928	58,928	61,976	61,976	241,808	65,024	65,024	63,072	68,072	68,072	329,264
8	Monitoring and surveillance	141,288	141,288	148,596	148,596	579,768	155,906	155,906	163,212	163,212	163,212	801,448
						-						-
		7,100,273	7,347,135	7,504,424	7,652,794	29,604,626	7,797,954	7,992,743	8,146,496	8,299,720	8,452,205	40,689,118
10	Shared personnel					-						-
10.1	Salaries	739,427	1,478,853	1,794,342	2,153,210	6,165,832	2,039,883	2,243,872	2,392,700	2,456,505	2,579,330	11,712,290
10.2	Incentives/perdiems					-						-
11	Other operational costs	129,944	130,204	130,465	130,726	521,339	130,987	131,249	131,510	131,775	132,038	657,559
						-						-
		869,371	1,609,057	1,924,807	2,283,936	6,687,171	2,170,870	2,375,121	2,524,210	2,588,280	2,711,368	12,369,849
						-						-
	Total recurrent	7,969,644	8,956,192	9,429,231	9,936,730	36,291,797	9,968,824	10,367,864	10,670,706	10,888,000	11,163,573	53,058,967
						-						-
	Capital Costs					-						-
	Vehicle	328,680	328,680	328,680	328,680	1,314,720	328,680	328,680	328,680	328,680	328,680	1,643,400
	Cold chain equipment	193,444	193,444	202,398	202,398	791,684	212,352	212,398	222,306	222,306	222,306	1,091,668
						-						-
	Total capital	522,124	522,124	531,078	531,078	2,106,404	541,032	541,078	550,986	550,986	550,986	2,735,068
						-						-
	SIAs for polio		1,500,000			1,500,000						-
	SIAs for Measles				1,500,000	1,500,000						-
						-						-
	<b>GRAND TOTAL</b>	<b>8,491,768</b>	<b>10,978,316</b>	<b>9,960,309</b>	<b>11,967,808</b>	<b>41,398,201</b>	<b>10,509,856</b>	<b>10,908,942</b>	<b>11,221,692</b>	<b>11,438,986</b>	<b>11,714,559</b>	<b>55,794,035</b>

**Table 4.3 Summary of Estimated Future Financing Requirments During Vaccine Fund Support (VF) Period:2003-2006**

Item no.	Component	Projected	Total	Total	Total	SOURCES OF FINANCING				
		Requirements for VF-Period	Secured Financing (Sum of all 1s)	Probable Financing (Sum of all 2s)	Possible Funding (Sum of all 3s)	Government	Risk assessment (Type 1,2 or 3)	GAVI/ Vaccine Fund	Risk Assessment (Type 1,2 or 3)	Other External Donors
		US\$	US\$	US\$	US\$					
(A)	Operational Cost									
Required Information										
	Vaccines									
	*Vaccines(traditional 6 antigens)	2,110,144	2,110,144						*	1
	*Vaccines (new and underused vaccines)	23,431,687	23,431,687					*	1	1
	Injection Supplies	1,687,073	1,687,073					*	1	1
	Personnel	6,296,986	6,296,986			*	1		*	
	All other operational costs	2,765,907	2,765,907			*	1			
	Sub Total Operational									
(B)	Capital Cost									
Required Information										
	Vehicle	1,314,720	1,314,720			*	1		*	1
	Cold Chain Equipment	791,684	791,684						*	1
	Subtotal Capital									
(C)	Unspecified									
	SIAs for Polio	1,500,000		1,500,000					*	2
	SIAs for Measles	1,500,000		1,500,000					*	2
	Subtotal Unspecified									
	<b>GRAND TOTAL</b>	<b>41,398,201</b>	<b>38,398,201</b>	<b>3,000,000</b>						

1US\$=MK96.00

**Table 4.4 Estimated Future Financing Requirements During Post Vaccine Fund Support (Post-VF) Period:2007-2011**

Item no.	Component	Projected	Total	Total	Total	SOURCES OF FINANCING				
		Requirements for PVF-Period	Secured Financing (Sum of all 1s)	Probable Financing (Sum of all 2s)	Possible Funding (Sum of all 3s)	Government	Risk assessment (Type 1,2 Or 3)	GAVI/ Vaccine Fund	Risk Assessment (Type 1,2 or 3)	Other External Donors
US\$	US\$	US\$	US\$	US\$						
(A)	Operational Cost									
Required Information										
	Vaccines									
	Traditional	2,890,144	2,890,144						*	1
	New	32,193,601		32,193,601					*	2
	Injection Suppl	2,313,354		2,313,354				*	2	
	Personnel	11,900,913	11,900,913			*	1			
	All other opera	3,760,955	3,760,955			*	1		*	1
	Sub Total Operational									
(B)	Capital Cost									
Required Information										
	Vehicle	1,643,400		1,643,400		*	2		*	2
	Cold Chain Eq	1,091,668		1,091,668					*	2
	Subtotal Capital									
(C)	Unspecified									
	Unspecified(non-itemized costs)									
	Unspecified(non-itemized costs)									
	Subtotal Unspecified									
	<b>GRAND TOTAL</b>	<b>55,794,035</b>	<b>18,552,012</b>	<b>37,242,023</b>						
	1 US\$=MK96.00									



## **6.0 SUSTAINABLE FINANCING STRATEGIC PLAN AND INDICATORS**

### **6.1 Problem Analysis and Strategies**

The preceding chapters have provided a background and context within which the immunisation programme operates. Information relating to the sustainability problems of the programme has also been presented. Among the key constraints highlighted, which will be addressed in this strategic plan, are:

- Reliability of resources
- Efficient use of resources
- Competing priorities in the health sector
- High cost of innovations (new vaccines and AD syringes)

#### **6.1.1 Reliability of resources**

At present, steps have been taken through the ICC to mobilize adequate resources for the projected financial requirements. Various collaborating partners have made pledges to meet these requirements for the entire period under consideration. However, given the length of the time over which resource projections were made, a lot of caution ought to be taken, as consistency of government policies and priorities may not be guaranteed. This may pose a risk to fulfillment of what was assumed to be government responsibility. Likewise, the fulfillment of the longer-term pledges by external partners may not be guaranteed as this may also depend on several external factors.

##### **6.1.1.2 Strategies**

The strategies adopted to address uncertainty on the fulfillment of pledges are as follows:

- Advocate for the maintenance or increase of the Malawi Government budgetary share allocated to the Ministry of Health and Population.
- Periodic review of pledges made by donors through the ICC.
- Involvement of GAVI to advocate for continued support from partners.

#### **6.1.2 Efficient use of resources**

The current vaccine wastage rates are very high for all antigens, except TT. This is due to poor maintenance of cold chain equipment, problems with the supply of fuels, non-compliance with Multi Dose Vial Policy (MDVP), poor techniques and overstocking of vaccines, leading to their early expiry. If the wastage rates are not contained, programme costs are likely to be higher than those assumed in the projections thus affecting the sustainability of the programme.

### **6.1.2.1 Strategies**

In order to address the problem of high vaccine wastage, the following strategies will be employed:

- Timely planned preventive maintenance of cold chain equipment, vehicles and motorcycles in collaboration with the existing Physical Assets Management Programme.
- Improving logistics management at the district level hence ensuring consistency in the provision of fuels for refrigerators.
- Capacity building through training in vaccine management especially on stock levels and MDVP.
- Introduction of AD syringes for BCG vaccination.

### **6.1.3 Competing Priorities in the Health Sector**

The country is currently experiencing numerous public health problems, over and above immunization preventable diseases. The other health problems, such as malaria and HIV/AIDS usually attract the attention and support of donor partners. As the magnitude of the health problems increases, there is a potential danger of shifting attention and resources away from EPI to the other perceived public health problems.

#### **6.1.3.1 Strategy**

In line with the MPRSP, government should continue according priority to the health sector and allocate adequate resources. In the same vein, the EPI programme should remain a priority programme at sectoral level as outlined in the EHP. This should be followed by the introduction of indicators for monitoring implementation of immunization services at district level. Furthermore, funds for procuring vaccines should be protected and probably ring-fenced at the national level, within the SWAp pool fund.

### **6.1.4 High Cost of Vaccines and AD syringes**

The high cost of new vaccines and AD syringes has a bearing on the implementation of the FSP, as the government, if not supported, cannot sustain it. For instance 92% of the total vaccine cost requirements for children under the age of one in Malawi, is for pentavalent vaccine alone.

#### **6.1.4.1 Strategy**

- Advocacy at ICC and international levels by all partners including GAVI, bilateral and multilateral agencies to continue, for the reduction of vaccine costs.

## **6.2 Opportunities for Sustaining Financial Strategic Plan**

The Health Sector in Malawi is moving towards a Sector Wide Approach. Through this process, a joint sector programme has been designed to support priority interventions as defined in the EHP. This will be used as a tool for mobilizing more resources and reprogramming external support to priority programmes including EPI.

## **6.3 Overall Monitoring of FSP**

The ICC will put in place a mechanism for a formal quarterly review to monitor progress of FSP. The annual joint programme review proposed under the SWAp will also be an opportunity for assessing sustainability of the EPI.

**TABLE 5 PROBLEM ANALYSIS AND STRATEGIES FOR SUSTAINING FINANCIAL STRATEGIC PLAN**

Problem	Strategies	Activities	Time	Responsible person	Indicator	
Reliability of resources	Advocating the maintenance of share of budgetary allocation to the Ministry of Health and Population	Production of annual budget estimates and negotiating with the Treasury	Annually	DOF SHP	Annual budget estimates produced annually  % share of domestic resources over total programme expenditure	
		Monitoring the funding levels and expenditure pattern	Monthly	DOF	% share of actual expenditure to amount budgeted for	
	Periodic review of pledges through the ICC	Conduct quarterly ICC meetings	Quarterly/ On-going	ICC Chairperson	Proportion of quarterly ICC meetings conducted	
	Involvement of GAVI to advocate for continued support from partners	Submission of annual comprehensive reports to GAVI	Annually	ICC Chairperson	Annual comprehensive report submitted to GAVI	
Efficient use of resources	Planned preventive maintenance of the cold chain, vehicles and motorcycles	Develop manual for the planned preventive maintenance schedule in collaboration with PAM	Jan 2005	MOHP	Manual developed  Trends in wastage rates over time	
	Consistent provision of adequate fuel for refrigerators	Determine paraffin and gas requirements for cold chain	Jan 2005	DHO	Paraffin and gas requirements determined	
		Develop a logistics management system		MOHP	Logistics management system in place	
	Capacity building in vaccine management especially on stock levels and MDVP	Training health workers on vaccine management especially on stock levels and MDVP	1 <sup>st</sup> Q 2004	EPI Unit	Number of health workers trained in MDVP  Proportion of health facilities practicing MDVP	
			Active distribution of vaccines	Monthly	MOHP	Vaccines distributed according to requirement monthly
			Conduct supportive supervision	Quarterly	MOHP	Number of supportive visits conducted
Competing priorities in the Health sector	Maintenance of the current priority status of the health sector	Annual review of the health budget allocation	Annually	DOF  MOHP (Planning)	Review conducted Share of health expenditures on immunisation (National Health Accounts)	

Problem	Strategies	Activities	Time	Responsible person	Indicator
	Introduction and use of indicators for monitoring implementation of immunization services at district level	Develop minimum indicators for monitoring implementation of immunization services at district level	1 <sup>st</sup> Q 2004	MOHP	Indicators developed
	Ring-fencing of funds for vaccines	Collaborate with SWAP partners on ring-fencing funds for vaccines	Annually	MOHP	Funds for vaccines ring-fenced
High cost of vaccines and AD syringes	Advocacy at ICC and international level by all partners	Advocate for reduction of vaccine costs at ICC meetings and inter-country meetings	As necessary	ICC Chair	Vaccine costs reduced within the vaccine fund period
		Conduct regional / international advocacy meetings	Annually	GAVI	Number of regional/ international advocacy meetings conducted

## 7.0 STAKEHOLDER ENDORSEMENT AND COMMENTS

### 7.1 Signature by ICC Members

Agency/ Organisation	Name/Title	Date Signature	Agency/ Organisation	Name/Title	Date Signature
MOH &P	Dr H. Somanje	Director of Preventive Health Services	DFID	Ms Susan Mshana	Assistant Health Advisor
UNICEF	Dr Juan Ortiz	UNICEF Programme Coordinator	MOF	Mrs Dorothy Banda	Budget Officer
WHO	Dr William Aldis	WHO representative			
JICA	Ms Rie Kawahara	Head of Health			
NORAD	Michael Tawanda	First Secretary			

## **7.2 Comments by ICC Members**

The development of this document has been compiled with a wide range of consultations including ICC members. The ICC has therefore endorsed this Financial Sustainability Plan and will ensure that adequate resources are made available to sustain the achievements made in EPI.

**Annex 1 Childhood Immunization coverage and drop out rates by district, Jan-Dec, 2001**

District	OPV1	OPV3	Drop out rate	OPV3 Coverage (%)	DPT1	DPT3	Drop out rate	DPT Coverage (%)	BCG	Coverage (%)	Measles	Coverage (%)	BCG-Measles (drop-out rate)
1. Chitipa	5927	5343	10	79	6015	5422	10	80	6065	90	4731	70	22
2. Karonga	9720	10317	-6	99	11058	10478	5	100	10773	103	9514	91	12
3. Mzimba	29467	26281	11	78	30342	27351	10	82	29686	89	24962	74	16
4. Nkhata Bay	8611	7463	13	82	8144	8271	-2	91	9000	99	7708	85	14
5. Rumphi	8247	6919	16	100	8287	7185	13	103	9018	130	7452	107	17
<b>North</b>	61972	56323	9	84	63846	58707	8	88	64542	97	54367	81	16
6. Dedza	23350	20084	14	91	23488	20273	14	92	25020	114	18881	86	25
7. Dowa	23148	18933	18	87	23219	19731	15	90	26806	123	19463	89	27
8. Kasungu	23337	19586	16	74	23271	19575	16	74	22798	86	17296	66	24
9. Lilongwe	65192	62944	3	86	64642	61814	4	84	64285	88	61187	83	5
10. Mchinji	17180	12518	27	74	17831	13890	22	82	17462	103	13268	78	24
11. Nkhota kota	11663	9854	16	77	12091	10417	14	82	11971	94	9659	76	19
12. Ntcheu	18849	17577	7	94	19223	18113	6	97	19039	102	16016	86	16
13. Ntchisi	7673	6543	15	72	7905	6886	13	75	7507	82	6166	67	18
14. Salima	14420	11656	19	70	14898	12812	15	76	15053	90	10565	63	30
<b>Centre</b>	204812	179695	12	83	206568	183411	11	84	209941	96	172581	79	18
15. Balaka	11816	10200	14	77	13551	12258	10	93	13407	102	11389	86	15
16. Blantyre	40968	36839	10	87	40462	36631	9	87	40903	97	33483	79	18
17. Chikwawa	16564	13630	18	78	17165	14800	14	85	15265	87	13579	78	11
18. Chiradzulu	11868	10004	16	83	11994	10543	12	87	11613	96	9518	79	18
19. Machinga	24905	21776	13	114	24480	23305	5	122	24312	127	19253	101	21
20. Mangochi	29027	22175	24	70	31454	26957	14	85	32265	102	22279	71	31
21. Mulanje	18999	16295	14	76	20263	16319	19	76	20595	96	13564	63	34
22. Mwanza	8863	7547	15	107	8945	7628	15	108	9159	129	7243	102	21
23. Nsanje	10514	8350	21	84	11242	9770	13	98	11506	116	8158	82	29
24. Phalombe	15962	13042	18	111	15474	14032	9	119	16481	140	10218	87	38
25. Thyolo	27249	24481	10	105	27568	25229	8	109	33160	143	25831	111	22
26. Zomba	29561	29727	-1	104	30351	30070	1	105	30505	107	29424	103	4
<b>South</b>	246296	214066	13	90	252949	227542	10	96	259171	109	203939	86	21
<b>Malawi</b>	513080	450084	12	86	523363	469660	10	90	533654	102	430887	82	19



## Annex 2

## Vaccine wastage rates by district and antigen – 2001

DISTRICT	B C G			D P T			O P V			M E A S L E S			T T		
	Doses used	Child. Vacc.	Wastage rate(%)	Doses used	Child. Vacc.	Wastage rate(%)	Doses used	Child. Vacc.	Wastage rate(%)	Doses used	Child. Vacc.	Wastage rate(%)	Doses used	Total Vacc.	Wastage rate(%)
1. Chitipa	13540	6368	53	20480	17339	15	22880	20233	12	6630	5448	18	15820	13224	16
2. Karonga	31780	10891	66	40100	32500	19	46440	36093	22	17370	10043	42	36580	28217	23
3. Mzimba	110540	30264	73	139480	96710	31	174120	100435	42	68060	18887	72	137860	74272	46
4. Nkhata Bay	37200	9197	75	40000	25311	38	57000	30363	47	15500	8425	46	38980	21436	45
5. Rumphu	18440	9399	49	28800	23735	18	47340	29741	37	9690	7976	18	31900	21132	34
<b>North</b>	<b>211500</b>	<b>67119</b>	<b>68</b>	<b>268860</b>	<b>195595</b>	<b>27</b>	<b>347580</b>	<b>216865</b>	<b>38</b>	<b>117250</b>	<b>50779</b>	<b>57</b>	<b>261140</b>	<b>160763</b>	<b>38</b>
6. Dedza	64840	25660	60	82080	66924	18	140420	76566	45	34730	20444	41	85880	62193	28
7. Dowa	68080	28208	59	83020	66989	19	116540	75584	35	37790	21434	43	84520	56883	33
8. Kasungu	93280	23288	75	123300	65910	47	165300	74586	55	42300	18542	56	119180	61388	48
9. Lilongwe	188280	66642	65	206580	195160	6	357420	214366	40	83760	63610	24	196820	253775	-29
10. Mchinji	59580	18050	70	69960	49438	29	112740	53728	52	32760	14805	55	66280	45371	32
11. Nkhota kota	51660	12364	76	48240	34929	28	71420	38532	46	26490	10927	59	45320	26783	41
12. Ntcheu	81840	19246	76	91940	57488	37	131840	64417	51	38700	16541	57	80560	43383	46
13. Ntchisi	34400	7694	78	38900	22932	41	54600	24820	55	24700	7104	71	34500	17933	48
14. Salima	136140	15274	89	102240	42929	58	96240	45372	53	44200	11501	74	99480	34568	65
<b>Centre</b>	<b>778100</b>	<b>216431</b>	<b>72</b>	<b>846260</b>	<b>602699</b>	<b>29</b>	<b>1246520</b>	<b>667971</b>	<b>46</b>	<b>365430</b>	<b>184908</b>	<b>49</b>	<b>812540</b>	<b>585077</b>	<b>28</b>
15. Balaka	48000	13688	71	54000	39682	27	58000	38780	33	19000	12495	34	24460	39165	60
16. Blantyre	108220	41369	62	121320	118699	2	165960	136246	18	53700	34930	35	56000	108282	30
17. Chikwawa	66700	15470	77	65760	49516	25	73500	52024	29	33300	16312	51	71260	38991	45
18. Chiradzulu	42360	11965	72	59780	34454	42	86160	39050	55	25700	9745	62	65580	24085	63
19. Machinga	95900	25455	73	118960	73616	38	137040	77041	44	52900	20690	61	112140	69820	38
20. Mangochi	89540	33598	62	117720	89515	24	124600	88776	29	48660	23633	51	111120	67931	39
21. Mulanje	77340	20947	73	79420	56143	29	95140	60773	36	27430	14428	24	84840	39865	53
22. Mwanza	35520	9477	73	42080	26227	38	53400	30130	44	20880	7873	62	50120	22841	54
23. Nsanje	45300	11955	74	47640	33105	31	55000	35486	35	18370	9153	50	51240	29452	43
24. Phalombe	52320	17185	67	57840	46055	20	69300	48336	30	26230	11555	56	60520	42911	29
25. Thyolo	69700	33252	52	84400	79714	6	88600	87672	1	37000	26017	30	86440	83003	4
26. Zomba	83200	30903	63	98300	90264	8	129400	101017	22	49950	30279	39	89400	54754	39
<b>South</b>	<b>814100</b>	<b>265264</b>	<b>67</b>	<b>947220</b>	<b>736990</b>	<b>27</b>	<b>1136100</b>	<b>815331</b>	<b>28</b>	<b>413120</b>	<b>215106</b>	<b>50</b>	<b>1004320</b>	<b>618392</b>	<b>38</b>
<b>Malawi</b>	<b>1803700</b>	<b>548814</b>	<b>70</b>	<b>2062340</b>	<b>1535284</b>	<b>26</b>	<b>2730200</b>	<b>1700167</b>	<b>38</b>	<b>895800</b>	<b>450793</b>	<b>50</b>	<b>2078000</b>	<b>1364242</b>	<b>34</b>

### Annex 3: Calculation of Vaccine requirements by year and antigen 2003-2011

2003

Antigens	Target Pop	Number of doses	Wastage factor	Coverage Target	Total Doses Needed	Vials Required	Total Cost (US\$) including freight charges
BCG	599,074	1	2.5	100	1,497,685	74,900	96,262.00
OPV	542,637	4	1.33	100	2,886,829	144,350	273,385.00
DPT-Hep+Hib	542,637	3	1.05	100	1,709,306	854,700	5,617,089.00
Measles	542,637	1	1.33	100	721,707	72,200	102,062.00
TT	599,074	2	1.33	90	1,434,183	71,750	46,882.00
<b>Total Vaccine Cost</b>							<b>6,135,680.00</b>

2004

Antigens	Target Pop	Number of doses	Wastage factor	Coverage Target	Total Doses Needed	Vials Required	Total Cost (US\$) including freight charges
BCG	621,445	1	2	100	1,242,890	62,200	79,939.00
OPV	562,903	4	1.33	100	2,994,644	149,800	283,710.00
DPT-Hep+Hib	562,903	3	1.05	100	1,773,144	886,600	5,826,736.00
Measles	562,903	1	1.33	100	748,661	74,900	105,879.00
TT	621,445	2	1.33	90	1,487,739	74,400	48,613.00
<b>Total Vaccine Cost</b>							<b>6,344,877.00</b>

2005

Antigens	Target Pop	Number of doses	Wastage factor	Coverage Target	Total Doses Needed	Vials Required	Total Cost (US\$) including freight charges
BCG	633,252	1	2	100	1,266,504	63,400	81,482.00
OPV	573,598	4	1.33	100	3,051,541	152,600	289,010.00
DPT-Hep+Hib	573,598	3	1.05	100	1,806,834	903,500	5,937,802
Measles	573,598	1	1.33	100	762,885	76,300	107,858.00
TT	633,254	2	1.33	90	1,516,010	75,800	49,528.00
<b>Total Vaccine Cost</b>							<b>6,465,680.00</b>

2006

Antigens	Target Pop	Number of doses	Wastage factor	Coverage Target	Total Doses Needed	Vials Required	Total Cost (US\$) including freight charges
BCG	645,284	1	2	100	1,290,568	64,600	83,024.00
OPV	584,496	4	1.33	100	3,109,519	155,500	294,502.00

DPT-Hep+Hib	584,496	3	1.05	100	1,841,162	920,581.00	6,050,060.00
Measles	584,496	1	1.33	100	777,380	77,750	109,908.00
TT	645,284	2	1.33	100	1,716,455	85,850	56,100.00
<b>Total Vaccine Cost</b>							<b>6,593,594.00</b>

2007

Antigens	Target Pop	Number of doses	Wastage factor	Coverage Target	Total Doses Needed	Vials Required	Total Cost (US\$) including freight charges
BCG	657,544	1	2	100	1,315,090	65,760	84,515.00
OPV	595,601	4	1.33	100	3,152,640	157,640	298,555.00
DPT-Hep+Hib	595,601	3	1.05	100	1,876,150	938,080	6,165,062
Measles	595,601	1	1.33	100	792,150	79,220	111,986.00
TT	657,544	2	1.33	100	1,749,070	87,460	57,147.00
<b>Total Cost for Vaccine</b>							<b>6,717,265.00</b>

2008

Antigens	Target Pop	Number of doses	Wastage factor	Coverage Target	Total Doses Needed	Vials Required	Total Cost (US\$) including freight charges
BCG	674,536	1	2	100	1,349,080	67,460	86,700.00
OPV	610,993	4	1.33	100	3,250,170	162,510	307,778.00
DPT-Hep+Hib	610,993	3	1.05	100	1,924,630	962,320	6,324,367.00
Measles	610,993	1	1.33	100	812,630	81,270	114,884.00
TT	674,544	2	1.33	100	1,794,290	89,720	58,624.00
<b>Total Cost for Vaccine</b>							<b>6,892,353.00</b>

2009

Antigens	Target Pop	Number of doses	Wastage factor	Coverage Target	Total Doses Needed	Vials Required	Total Cost (US\$) including freight charges
BCG	687,353	1	2	100	1,374,710	68,740	88,345.00
OPV	622,602	4	1.33	100	3,312,250	165,620	313,668.00
DPT-Hep+Hib	622,602	3	1.05	100	1,961,200	980,600	6,444,504.00
Measles	622,602	1	1.33	100	828,070	82,810	117,061.00
TT	687,353	2	1.33	100	1,828,360	91,420	59,734
<b>Total Cost for Vaccine</b>							<b>7,023,312.00</b>

2010

Antigens	Target Pop	Number of doses	Wastage factor	Coverage Target	Total Doses Needed	Vials Required	Total Cost (US\$) including freight charges
BCG	700,412	1	2	100	1,400,824	70,100	90,093.00
OPV	634,431	4	1.33	100	3,375,173	168,800	319,691.00
DPT-Hep+Hib	634,431	3	1.05	100	1,998,458	999,300	6,567,400.00
Measles	634,431	1	1.33	100	843,793	84,400	119,308.00
TT	700,412	2	1.33	100	1,863,096	93,200	60,897.00
<b>Total Cost for Vaccine</b>							<b>7,157,389.00</b>

2011

Antigens	Target Pop	Number of doses	Wastage factor	Coverage Target	Total Doses Needed	Vials Required	Total Cost (US\$) including freight charges
BCG	713,719	1	2	100	1,427,438	71,400	91,764.00
OPV	646,485	4	1.33	100	3,439,300	172,000	325,751.00
DPT-Hep+Hib	646,485	3	1.05	100	2,036,428	1,018,300	6,692,268.00
Measles	646,485	1	1.33	100	859,825	86,000	121,570.00
TT	713,719	2	1.33	100	1,898,493	95,000	62,073.00
<b>Total Cost for Vaccine</b>							<b>7,293,426.00</b>

#### Annex 4: Safe Injection Supplies Requirements 2003-2011

##### 4.1 : Safe Injection Supplies for BCG

		Formula	2003	2004	2005	2006	2007	2008	2009	2010	2011
A	Target children		599,074	621,445	633,252	645,284	657,544	674,536	687,353	700,412	713,719
B	Number of doses on schedule	1	1	1	1	1	1	1	1	1	1
C	Number doses	A x B	599,074	621,445	633,252	645,284	657,544	674,536	687,353	700,412	713,719
D	A-D syringes (+10% wastage)	C x 1.11	665,000	689,850	702,950	716,270	729,900	748,750	762,970	777,500	792,250
E	A-D syringes buffer stock	D x 0.25	166,250								
F	Total A-D syringes	D+E	831,250	689,850	702,950	716,270	729,900	748,750	762,970	777,500	792,250
G	No. doses per vial	20	20	20	20	20	20	20	20	20	20
H	No. re-constitution syringes (+10% wastage)	C x 1.11/G	33,250	34,500	35,150	35,850	36,500	37,500	38,150	39,000	39,650
I	No. safety boxes(+10% extra need)	(F+H)x 1.11/100	9,596	8,050	8,200	8,350	8,510	8,750	8,900	9,100	9,250
J	Cost for AD syringes	(F x price US\$)	64,048	53,153	54,163	55,189	56,239	57,692	58,787	59,907	61,043
K	Cost for Mixing Syringes	(H x price)	1,148	1,587	1,617	1,650	1,679	1,725	1,755	1,794	1,824
L	Cost for Safety Boxes	(I x price)	7,063	5,925	6,036	6,174	6,264	6,440	6,550	6,698	6,808
M	Total Cost (J+K+L)		72,259	60,665	61,806	63,013	64,182	65,857	67,072	68,399	69,675

## 4.2: Safe Injection Supplies for Measles

		Formula	2003	2004	2005	2006	2007	2008	2009	2010	2011
A	Target children for Measles Vaccination		542,637	562,903	573,598	584,496	595,601	610,993	622,602	634,431	646,485
B	Number of doses on schedule	1	1	1	1	1	1	1	1	1	1
C	Number of Measles doses	A x B	542,637	562,903	573,598	584,496	595,601	610,993	622,602	634,431	646,485
D	A-D syringes (+10% wastage)	C x 1.11	602,327	624,850	636,694	648,790	661,120	678,220	691,100	704,220	717,600
E	A-D syringes buffer stock	D x 0.25									
F	Total A-D syringes	D+E	602,327	624,850	636,694	648,790	661,120	678,220	691,100	704,220	717,600
G	Number of doses per vial	10	10	10	10	10	10	10	10	10	10
H	No. re-constitution syringes (+10% wastage)	C x 1.11/G	60,250	62,500	63,700	64,900	66,120	67,850	69,150	70,450	71,650
I	Number of safety boxes(+10% extra need)	(F+H)x 1.11/100	7,400	7,630	7,800	7,950	8,100	8,300	8,450	8,600	8,800
J	Cost for AD syringes	(F x price)	42,948	44,552	45,397	46,259	47,138	48,357	49,276	50,211	51,165
K	Cost for Mixing Syringes	(H x price)	2,425	2,875	2,931	2,986	3,042	3,122	3,181	3,241	3,296
L	Cost for Safety Boxes	(I x price)	5,447	5,616	5,741	5,852	6,109	6,220	6,330	6,477	
M	Total Cost (J+K+L)		50,820	53,043	54,069	55,097	56,289	57,699	58,787	59,929	63,261

### 4.3: Safe Injection Supplies for TT

		Formula	2003	2004	2005	2006	2007	2008	2009	2010	2011
A	Target children for TT Vaccination		599,074	621,445	633,252	645,284	657,544	674,536	687,353	700,412	713,719
B	Number of doses on schedule	2	2	2	2	2	2	2	2	2	2
C	Number of TT doses	A x B	1,198,148	1,242,890	1,266,504	1,290,568	1,315,088	1,349,072	1,374,706	1,400,824	1,427,438
D	A-D syringes (+10% wastage)	C x 1.11	1,329,950	1,379,610	1,405,820	1,432,550	1,459,750	1,497,470	1,525,950	1,554,950	1,584,500
E	A-D syringes buffer stock	D x 0.25									
F	Total A-D syringes	D+E	1,329,950	1,379,610	1,405,820	1,432,550	1,459,750	1,497,470	1,525,950	1,554,950	1,584,500
G	Number of doses per vial	20	20	20	20	20	20	20	20	20	20
H	Number of safety boxes(+10% extra need)	F x1.11/100	14,800	15,350	15,650	15,950	16,250	16,650	16,950	17,500	18,000
I	Cost for AD syringes	(F x price)	94,826	98,367	100,235	102,141	104,080	106,770	108,800	110,868	112,975
J	Cost for Safety Boxes	(H x price)	10,893	11,298	11,519	11,740	11,960	12,255	12,476	12,880	13,248
K	Total Cost (I+J)		105,719	109,663	111,754	113,881	116,040	119,025	121,276	123,748	126,223

#### 4.4: Safe Injection Supplies for DPT-HepB+Hib

		Formula	2003	2004	2005	2006	2007	2008	2009	2010	2011
A	Target children		542,637	562,903	573,598	584,496	595,601	610,993	622,602	634,431	646,485
B	Number of doses on schedule	3	3	3	3	3	3	3	3	3	3
C	Number of doses	A x B	1,627,911	1,688,709	1,720,794	1,753,488	1,786,803	1,832,979	1,867,806	1,903,293	1,939,455
D	A-D syringes (+10% wastage)	C x 1.11	1,806,900	1,874,500	1,910,100	1,946,400	1,983,400	2,034,650	2,073,300	2,112,700	2,152,800
E	A-D syringes buffer stock	D x 0.25									
F	Total A-D syringes	D+E	1,806,900	1,874,500	1,910,100	1,946,400	1,983,400	2,034,650	2,073,300	2,112,700	2,152,800
G	No. doses per vial	2	2	2	2	2	2	2	2	2	2
H	No. reconstitution syringes (+10% wastage)	C x 1.11/G	903,500	844,400	860,400	876,750	893,450	916,500	933,950	951,650	969,750
I	No. safety boxes(+10% extra need)	(F+H) x1.11/100	27,104	30,180	30,800	31,350	31,950	32,800	33,400	34,050	34,700
J	Cost for AD syringes	(F x price)	128,832	133,652	136,190	138,779	141,417	145,071	147,827	150,636	153,495
K	Cost for Mixing syringes	(H x price)	31,172	38,843	39,579	40,331	41,099	42,159	42,962	43,776	44,609
L	Cost for Safety Boxes	(I x price)	19,950	22,213	22,669	23,074	23,516	24,141	24,583	25,061	25,540
M	Total Cost(J+K+L)		179,954	194,708	198,438	202,184	206,032	211,371	215,372	219,473	223,644