

# Case Study on the Costs and Financing of Immunization Services in Ghana

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*September 2001*

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# Abstract

This study estimates the current and future costs of Ghana's immunization program, including the additional costs proposed for improvements to the program, both to assist planning and to inform the international community about global immunization costs.

The estimated total cost of the national program, including national immunization days (NIDs) and surveillance, was about \$8.0 million in 2000—about \$0.41 per dose, \$16.63 per fully immunized child, and \$0.43 per capita. Forty percent of total cost was for personnel, 30 percent for vaccines, and 6 percent for capital costs. The estimated total cost of the routine program was \$3.7 million—with personnel comprising 42 percent, vaccines 25 percent, and capital costs 8 percent. The estimated total cost of NIDs and surveillance was about \$3.9 million, about 49 percent of total program costs. The largest cost component of NIDs was vaccines (37 percent), followed by personnel (34 percent) and social mobilization (16 percent). The recurrent, variable non-personnel costs of the program, for which the Ministry of Health must find financing each year, are approximately \$4.3 million, or about 55 percent of total estimated costs; vaccines account for 55 percent of these costs.

The annual cost of improvements proposed for the national immunization program range from \$650,000 to \$3,200,000 for catch-up campaigns, disease control campaigns, and cold chain improvements, to higher costs for the introduction of new vaccines. The cost of adding new vaccines is substantial and will vary on the presentation of the vaccine. If the DTP-HepB-HiB presentation is used, the new vaccine will cost \$7.3 to \$7.9 million for a full year; if DTP-HepB is used, the new vaccine will cost \$2.8 million to \$3.1 million annually; and if HepB is used, the new vaccine will cost \$0.7 to \$0.8 million. Cost savings can be realized in three ways: (1) improving vaccine distribution system, (2) decreasing vaccine wastage; and (3) motivating health workers to increase efficiency.

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# Acronyms

<b>AD</b>	Auto-Destruct (syringe)
<b>AFP</b>	Acute Flaccid Paralysis
<b>BASICS</b>	Basic Support for Institutionalizing Child Survival
<b>BCG</b>	Bacille-Calmette-Guerin (vaccine against tuberculosis)
<b>BMC</b>	Budget Management Center
<b>CA</b>	Cooperating Agency
<b>CDC</b>	U.S. Centers for Disease Control and Prevention
<b>CIDA</b>	Canadian International Development Agency
<b>DANIDA</b>	Danish International Development Agency
<b>DFID</b>	Department for International Development
<b>DHMT</b>	District Health Management Team
<b>DTP</b>	Diphtheria, Tetanus, Pertussis
<b>EPI</b>	Expanded Program on Immunizations
<b>FE</b>	Financial Encumbrance
<b>FIC</b>	Fully Immunized Child
<b>GAVI</b>	Global Alliance for Vaccines and Immunization
<b>GDP</b>	Gross Domestic Product
<b>GFCV</b>	Global Fund for Children's Vaccines
<b>GHS</b>	Ghana Health Service
<b>GoG</b>	Government of Ghana
<b>HepB</b>	Hepatitis B
<b>HiB</b>	Haemophilus Influenzae Type B
<b>HIPC</b>	Heavily Indebted Poor Country
<b>ICC</b>	Inter-agency Coordinating Committee
<b>IEC</b>	Information, Education and Communication
<b>IGF</b>	Internally Generated Funds
<b>MOF</b>	Ministry of Finance
<b>MOH</b>	Ministry of Health
<b>NID</b>	National Immunization Day

<b>NGO</b>	Non-governmental Organization
<b>NNT</b>	Neonatal Tetanus
<b>OPN</b>	Oral Polio Vaccine
<b>PHR</b>	Partnerships for Health Reform
<b>PHR<i>plus</i></b>	Partners for Health Reform <i>plus</i>
<b>PROAC</b>	Program Activity Funds
<b>SWAP</b>	Sector-wide Approach Program
<b>TT</b>	Tetanus Toxoid
<b>UNICEF</b>	United Nations Children's Fund
<b>USAID</b>	United States Agency for International Development
<b>WHO</b>	World Health Organization

**Exchange Rates:**

**1999:** 2800 Cedis = US\$ 1.00

**2000:** 6900 Cedis = US\$ 1.00

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Implementation of the study would not have been possible without the support of WHO, the Ministry of Health, the National Immunization Program, and collaborating agencies. In addition, we would like to thank Dr. Marty Makinen, PHR*plus*; Dr. Robert Pond, USAID; and Dr. Mercy Essel-Ahun, EPI Manager, Ghana Health Service, for their valuable comments.



# Executive Summary

With support from the Child Survival Division of USAID's Office of Health, the Partnerships for Health Reform (PHR) Project developed a Special Initiative on Immunization Financing. The goal of this initiative is to assist in the evaluation and development of country-level financing strategies for replacing donor funding and sustaining and expanding immunization programs with local resources. One of the main activities is to conduct several country case studies on immunization financing. These case studies provide lessons learned concerning country-level immunization financing strategies that other countries and the international health community can use in planning sustainable national immunization programs, including the introduction of additional vaccines. The studies also provide recommendations to the countries involved on ways to improve their immunization financing strategies.

Each case study examines the country's current financing strategies (in terms of their adequacy; sustainability; and impact on coverage, quality, equity, and efficiency); estimates the global costs of the program and the costs of adding new vaccines (under various scenarios) or other innovations; and analyzes and weighs various options to improve the financing and sustainability of the program. The options include: changing vaccine procurement mechanisms, increasing central government allocations to national immunization programs, reducing costs, increasing the role of the private sector in immunization service delivery, advocating for sustained donor support, and mobilizing resources through different types of cost recovery.

Ghana was chosen as one of the countries for the case studies because of its relatively high level of coverage, its low-income level, its involvement in a sector-wide approach (SWAP), and its decentralized flow of funds. The case study was conducted collaboratively with the World Health Organization (WHO)/Geneva. Dr. Sarah England of WHO focused specifically on issues related to the flow of funds through the system from the central level to the district level.

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## Costs

The estimated total cost of the national immunization program, including National Immunization Days (NIDs) and surveillance, was about \$8.0 million in 2000 – about \$0.41 per dose, \$16.63 per fully-immunized child, and \$0.43 per capita. Forty percent of total cost was for personnel, 30 percent for vaccines, and 6 percent was for capital costs. The estimated total cost of the routine Expanded Program on Immunization (EPI) component of the national program was \$3.7 million with personnel comprising 42 percent, vaccines 25 percent, and capital goods 8 percent. The estimated total cost of NIDs was about \$3.9 million, about 49 percent of total program costs.<sup>1</sup> The largest cost component of NIDs was vaccines (37 percent), followed by personnel (34 percent) and social mobilization (16 percent). The costs of surveillance activities were about \$0.3 million and went mostly towards personnel time (79 percent).

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<sup>1</sup> These costs make up a larger percentage of total costs than found in other PHR studies, because two sets of NIDs rather than one set were conducted.

The recurrent, variable non-personnel costs of the program, for which the Ministry of Health (MOH) must find financing each year, are approximately \$4.3 million, or about 55 percent of total estimated costs; vaccines are about 55 percent of these costs.

The cost of improvements proposed for the national immunization program range from a annual total of \$650,000 to \$3,200,000 for catch-up campaigns, disease control campaigns and cold chain improvements, to higher costs for the introduction of new vaccines. The cost of adding new vaccines is substantial and will vary according to the presentation of the vaccine. If the DTP-HepB-HiB presentation is used, the new vaccine will cost \$7.3 million to \$7.9 million for a full year; if DTP-HepB is used, the new vaccine will cost \$2.8 million to \$3.1 million; and if HepB is used, the new vaccine will cost \$0.7 to \$0.8 million. Cost savings can be realized in three ways: (1) improving vaccine distribution system, (2) decreasing vaccine wastage; and (3) motivating health workers.

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## Financing

The shares of the sources of finance for the national immunization program were the following: government of Ghana (GoG) and district assemblies (32 percent); the donor pool (23 percent), and non-pooled donors (45 percent). Sources of funding for the routine immunization program, NIDs, and surveillance differ.

For the routine immunization program, the largest source is the GoG (49 percent), followed by the British Department for International Development (DFID) (41 percent), donor pool (6 percent), and other donors (4 percent). For the NIDs, however, the main source of funding is donors (87 percent), followed by the GoG, (12 percent) and then district assemblies (1 percent). Surveillance activities are funded largely by the GoG (79 percent), since they are comprised largely of personnel costs.

If the sources of funding for the program-specific costs are examined, however, the picture is different. (Program-specific costs are those not shared by other services; these do not include costs of personnel, buildings, and vehicles.) Donors are paying for most of the program-specific costs. They pay for 79 percent of costs of the routine immunization program, 98 percent of the costs of NIDs, and 52 percent of the costs of surveillance.

The GoG has been asking some donors to earmark some of their funds for the purchase of vaccines and other supplies rather than put all of their contributions into the donor pool. However, in the longer term, it intends to pursue other sources of funding, such as its World Bank loan, to pay for these items.

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## Flows of Funding

Key findings of the study were that late disbursement of funding affects program implementation including routine EPI coverage and NID social mobilization.<sup>2</sup> Because the districts do not have a way of knowing the next year's allocation to the health sector, their budgets and plans take on a "wish list" quality. Sometimes as little as a quarter of the planned budget needs are met. The unreliability of disbursement in terms of timing and amounts results in ad hoc planning by districts.

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<sup>2</sup> One reason for the late disbursement of funds is that the districts are sometimes slow in liquidating their funds.

In addition, cash flow peaks do not correspond to the optimal time for outreach as determined by the weather. Late government funds and a heavy administrative load limit outreach in the first quarter. In February, donor-pooled funds can be used for outreach. These funds are usually supplemented by government funds from March to May. In June, the rains start, limiting travel. In August and September, government funds and donor funds can again be used for outreach. Fourth quarter budget freezes due to liquidity problems can limit travel for outreach at the end of the year.

Decentralization and the sector-wide approach have greatly improved the financial control, budgeting and planning process in the MOH, although some vertical initiatives, such as the guinea worm program, have suffered.

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## Future Financing

In the next five years, improvements to the immunization program can result in funding gaps as high as \$11.7 million per year due to the cost of the new vaccines that are being introduced. The cost of increasing coverage through the use of catch-up campaigns is relatively low while the cost of introducing new vaccines is relatively high. Since some of the funding for these expenditures has already been committed by Global Alliance for Vaccines and Immunization (GAVI) (the Global Fund for Children's Vaccines [GFCV]) and other donors (e.g., USAID for cold chain equipment), the actual gap between available funding and additional expenditures for the program with improvements is smaller during the next few years.

However, GAVI funding will end after five years<sup>3</sup>. It will be important for the policymakers and planners to plan how to finance the costs of the vaccines being introduced when GAVI funding ends. MOH policymakers and planners should carefully consider the implications of using any particular presentation of Hepatitis B in light of this financial need.

It seems likely that key donors and international organizations will continue to contribute to the immunization program, both through pooled and unpooled mechanisms. However, some fluctuations in funding are likely to occur as the program shifts from its concentrated effort on polio eradication to other program improvements.

In addition, now that Ghana is becoming a Heavily Indebted Poor Country (HIPC) country, it may have some leeway to increase its contribution to the immunization program to increase its stability over time.

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## Conclusions and Lessons Learned

The Ghana national immunization program has been successful in increasing its coverage in the last few years. It has increased its DTP3 coverage from 52 percent in 1995 to 68 percent in 1998. The GoG is now financing approximately 46 percent of its routine immunization program and 34 percent of the total costs of its program.

The program relied on donors to finance many of its recurrent costs such as vaccines and auto-destruct (AD) syringes and needles from "earmarked funds" in 2000. However, the country intends to

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<sup>3</sup> Ghana could extend GAVI funding to seven years by lowering the amount used each year.

use other mechanisms to finance its program in order to increase its financial sustainability. In 2001, it is using its World Bank loan to pay for these commodities.

Flows of funding from the central level to the district level were found to be late and unpredictable. The implementation of routine immunization activities is impeded by the irregularity of flows of funding. In addition, cash flow peaks do not correspond to the optimal time for outreach seasonally.

The GoG may be able to increase its funding for recurrent costs of the immunization program. Since its projected rate of increase in economic growth ranges from 4.5 percent to 5.5 percent, there is a potential for it to increase its contribution to the program. In addition, more funds should become available after Ghana becomes a HIPC country.

Shortages of vaccines and AD syringes were found in the Northern and Ashanti Regions, even though no vaccine shortages existed at the central level. Steps should be taken to improve the planning of logistics to ensure that these shortages are mitigated. Few materials for IEC for the routine program were observed during the field visits. Some funding for Information, Education and Communication (IEC) activities should also be sought.

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## Recommendations

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### Costs and Financing

The consideration and analysis of costs should be included in the program decision-making process on a more systematic and regular basis, along with considerations of effectiveness and quality.

The MOH should develop a plan for the introduction of new vaccines. In this plan, it should consider all of the issues involved in the presentation of these new vaccines. For example, the MOH approved the introduction of DTP-HepB-HiB this year without having done a financial analysis or burden of disease study on which to base its decision. In the short term, it will be important for this planning to be done with the involvement of the Inter-agency Coordinating Committee (ICC), which pays for the vaccines, to ensure that future funding needs are anticipated. However, the MOH should base its choice of vaccines in later years on an analysis of burden of disease and financial considerations.

The MOH should develop a long-term plan for procurement of immunization program commodities in light of its sector-wide procurement process. Routine vaccines should be included in this procurement process.

In order to ensure HIPC funding is considered for the national immunization program, a poverty reduction strategy paper identifying the immunization program as one of the interventions should be prepared.

Program managers and policymakers as well as members of the ICC should consider how to encourage sources of finance for polio eradication to shift funding to other immunization program improvements after polio eradication is achieved.

An educational campaign should be developed for district assembly members on the benefits of providing funding to routine immunization programs.

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## Program Management

To improve program logistics, build in contingencies for problems such as vehicle breakdown of cold vans to ensure that vaccine shortages do not occur.

Change the allocation of vaccines and supplies to be based on a needs-based system rather than a “push” system. With a needs-based system, fewer shortages or oversupply should occur.

The supply of AD syringes is often insufficient to provide the injections required in the immunization program. If the program chooses to continue using the AD syringes and needles, it should ensure that an adequate supply is available through bundling of vaccines and needles and syringes.

Incentives should be provided to health workers to encourage good performance and improve the efficiency of the program.

The national immunization program should plan to generate consumer demand for immunizations through increasing the number of IEC activities for routine immunizations.

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## Flow of Funds

Measures should be taken to regularize cash flow to the districts throughout the year so that plans can be implemented as designed and so that absorption capacity is not overwhelmed in periods of rapid cash flow. Cash flow should be ensured during the dry season, in particular, because it is the optimal time for outreach activities.

Although investment in infrastructure may be suspended temporarily in a crisis, it is vitally important that infrastructure investment be re-established. The SWAP partners should ensure that adequate provision is made and that infrastructure cuts do not become chronic.

The financial service that staff and suppliers provide to the immunization program through the extension of credit should be recognized and rewarded. It has proven essential to the provision of continuous service.

The payment mechanisms that were begun in 2000 in response to the economic crisis, i.e., checks and/or wire transfers or cash (depending on district), are preferred to the financial encumbrances as a disbursement mechanism. Bearing in mind the macroeconomic considerations, consideration should be given to retaining the current system of disbursement through the Ministry of Health Financial Controller’s office rather than through the Ministry of Finance Treasury when possible.

NID financing from districts should be built into district budgets and plans, acknowledging that much NID funding comes from outside the health sector.



# 1. Introduction

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## 1.1 Background and Purpose of Study

In recent years, national governments and the international health community have become increasingly concerned with the issues of financing childhood vaccines and immunization programs. Despite tremendous gains achieved in immunization coverage in the 1980s in nearly all developing countries with the establishment of national immunization programs, often called Expanded Program on Immunization (EPI), coverage rates in the 1990s reached a plateau or even declined in a number of countries, as donors reduced their funding for immunizations, as national health budgets declined with deteriorating economic conditions, and as other national health priorities consumed increasing attention and limited health funds.

With support from the Child Survival Division of USAID's Office of Health, the Partnerships for Health Reform (PHR) Project developed a Special Initiative on Immunization Financing, the goal of which is to assist in the evaluation and development of country-level financing strategies for replacing donor funding and sustaining and expanding immunization programs with local resources. One of the main activities of this special initiative is to conduct several country case studies on immunization financing in order to both provide lessons learned concerning country-level immunization financing strategies that other countries and the international health community can use in planning sustainable national immunization programs, including the introduction of additional vaccines; and to provide recommendations to the countries involved on ways to improve their immunization financing strategies.

Each case study examines the current financing strategies (in terms of their adequacy; sustainability; and impact on coverage, quality, equity and efficiency); estimates the global costs of the program and the costs of adding new vaccines (under various scenarios) or other innovations; and analyzes and weighs various options to improve the financing and sustainability of the program. The options include: changing vaccine procurement mechanisms, increasing central government allocations to national immunization programs, reducing costs, increasing the role of the private sector in immunization service delivery, and mobilizing resources through different types of cost recovery.

Ghana was chosen as one of the countries for the case studies because of its relatively high level of coverage, its low-income level, its involvement in a sector-wide approach (SWAP), and its decentralized flow of funds. The case study was conducted collaboratively with the World Health Organization (WHO)/Geneva. Dr. Sarah England of WHO focused specifically on issues related to the flow of funds through the system from the central level to the district level.

The technical team that undertook the study included PHR health economist Dr. Ann Levin, PHR program assistant Joanne Jorissen, Bertha Garshong of the Health Research Unit of the Ministry of Health (MOH), Dr. James Teprey from the MOH Disease Control Unit, and Dr. Sarah England of WHO. This team was advised by the Country EPI Manager, Dr. Mercy Essel-Ahun, as well as Dr. Sam Adjei, Deputy Director General, Ghana Health Service (GHS).

The first chapter of the paper describes the country context of the national immunization program in Ghana, while the second chapter presents the study objectives and methods. The third and fourth chapters present information on costs of the program as well as sources of financing. The fifth chapter describes the flow of funding within the immunization program, the sixth the future financing needs of the program, and the seventh chapter the immunization program financing strategies. The final chapter describes the conclusions of the study.

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## 1.2 Socioeconomic Context of Ghana

Ghana is located on the coast of West Africa, with Burkina Faso on the north, Togo on the east, Cote d'Ivoire on the west, and the Atlantic Ocean on the south. It has a landmass of about 238,537 square kilometers. The country has three vegetation zones: coastal savannah in the south, a forest belt in the center, and a dry savannah in the north. Ghana has ten administrative regions and 110 districts. The district has become the unit of planning and political administration, following the government's policy to decentralize the country.

The country's main exports are cocoa, timber, and pineapple and its principal mineral is gold. Agricultural production's importance has declined over time in terms of its contribution to the gross domestic product (GDP), dropping to only 36 percent. This decline corresponds with an increase in other sectors – industry and services. The growing tourist industry is becoming an additional source of foreign exchange.

Ghana faced severe economic challenges in the early 1980s but the economy has since improved as reflected in the growth of real national income at an average annual rate of 5.3 percent per year beginning in 1984. Its per capita income in 1999 was \$390.

Since mid-1999, however, the macroeconomic situation has deteriorated due to a decline in its terms of trade and shortfall in external assistance. Cocoa and gold prices fell while imported oil prices tripled. The nominal exchange rate has depreciated by 125 percent since September 1999. In order to offset the adverse effects of the external shock, the government has tightened monetary and fiscal policy.

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## 1.3 Characteristics of Health System

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### 1.3.1 Health Status Indicators

Ghana's population has increased rapidly since 1960 (see Table 1), nearly tripling by 1998. However, the family planning program gradually began to take effect in the 1990s, and the fertility rate in the country has begun to decline.

**Table 1. Health Status Indicators, 1960-1998/99**

	1960	1984	1988	1993	1998/99
Population Size	6.7 million	12.3 million			18.3 million
Infant Mortality	133	NA	77	66	61
Under 5 Mortality	NA	NA	154	119	110
Life Expectancy	45	NA	NA	NA	57
Total Fertility Rate	7.0	NA	6.4	5.5	4.6

Source: Ghana Statistical Services and Macro International, 1999.

Mortality has decreased over time in Ghana. Infant mortality decreased from 77 per 1000 births in 1988 to 61 in 1998, and life expectancy increased to almost 60 years.

Some regional diversity in mortality rates is found in Ghana due to a disparity in access to services (e.g., northern regions have higher mortality rates). Table 2 shows the infant mortality rates for 1988, 1993, and 1998 disaggregated by urban and rural areas. The rates in urban areas are considerably lower than rural areas. However, infant mortality in rural areas declined by 18 percent from 1993 to 1998.

**Table 2. Infant Mortality Rates, 1988-1998, by Location**

	1988	1993	1998
Urban	66	54.9	42.6
Rural	86.6	82.2	67.5

Source: Ghana Statistical Services and Macro International, 1989, 1994, 1999.

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## 1.3.2 Ghana's Health Care System

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### 1.3.2.1 Government Health System

The health system needs to be viewed in terms of the health sector reform that is taking place in Ghana. In 1997, the country shifted to a Medium Term Health Strategy and Five-year Program of Work. The new system has a three-tiered system – district, regional, and headquarters. The focal point of this new system is the district level, where the capacity to provide a basic package of services is to be strengthened.

The health system is organized at the following levels: national, regional, district, subdistrict, and community. At the national level, there are two arms of service – the Ministry of Health and the Ghana Health Service. The MOH focuses on sector-wide policy formulation, and monitoring and evaluation of progress in achieving targets. The GHS is the service arm of the Ministry and is expected to allocate resources as well as create partnerships with the private sector and communities. Since the system is new in Ghana, the modalities are still being refined.

At the regional level, the regional director of health services is involved in strategic planning and in monitoring performance. At the district level, a district health management team (DHMT) manages the Ghana Health Service. The DHMT is involved in planning and organizing services within the district as well as conducting training assessments and training for subdistrict levels. At the

subdistrict level, the subdistrict health management team is made up of the health center management team, heads of other technical units, and other health care providers in the subdistricts.

Clinical services are provided through regional hospitals, the district hospitals, subdistrict health centers, and through outreach services in communities. Immunization services are provided at all health facilities, provided cold chain equipment is available. Services are provided weekly in most sites.

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### 1.3.2.2 Role of the Private Sector

Prior to the health reforms, public health personnel provided child immunizations at private for-profit clinics. At private not-for-profit facilities, such as the mission and non-governmental organization (NGO) hospitals and clinics, the personnel could provide immunization services since they were considered quasi-governmental institutions.

As part of the activities under the health reforms, closer collaboration between the government and private for-profit sector is being promoted and private practitioners are being trained to provide immunizations from their sites. The MOH/GHS with funds from UNICEF is providing training to private providers (e.g., private midwives, nurses, and doctors) on provision of immunizations and storage of vaccines as well as providing some cold chain equipment, vaccines, and supplies. However, some private sector practitioners have ceased providing immunization, because it is not a profit-making proposition.

Also slowing the shift of provision of immunizations to the private sector is some resistance from the public sector because of the possibility that they may charge user fees.

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## 1.4 Summary of Ghana's National Immunization Program

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### 1.4.1 History of Ghana's Immunization Program

Ghana launched the Expanded Program on Immunization in 1978. Since 1985, EPI has been operational in all ten regions and 110 districts of the country. Mass campaigns were the main strategy used during the period of Universal Child immunization in the 1980s. After the government realized the limitations of this strategy in 1991, it shifted its program to routine immunization. The government has tried various initiatives to strengthen its peripheral service delivery. The Health Sector Investment Plan, started in 1996, has facilitated the process of building capacity and empowering districts to manage, plan, implement, and monitor their health service delivery. The number of static immunization points has increased to at least 700 out of the 1500 health facilities allowing more outreach to be conducted.

The antigens that are provided through the program include Bacille-Calmette-Guerin (BCG), diphtheria, tetanus, pertussis (DTP), measles, and oral polio vaccine (OPV). Since 1993, a policy of using auto-destruct (AD) syringes to ensure the safety of immunizations has been in effect. As can be seen from Table 3, coverage has increased rapidly during the last ten years, and the DTP3 coverage has increased approximately 200 percent since 1989.

**Table 3. Routine Immunization Coverage of Children (0-11 months) by Year and Antigen**

	<b>BCG</b>	<b>DTP3</b>	<b>Measles</b>	<b>OPV3</b>
1989	41	23	39	24
1992	61	40	43	30
1995	67	52	51	55
1998	86	68	61	67

Source: 1998 Joint Child Health Program Assessment in Ghana Statistical Service and Macro International, 1999

Despite the significant progress in the immunization program, the incidence of measles continues to be a problem among children, with 23,000 reported cases in 2000. In addition, Ghana continues to have a few polio cases (five in 2000) despite the large effort put into the polio eradication activities.

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#### **1.4.2 Cost Recovery**

No official fees are charged for immunizations although caregivers often have to pay for additional items such as paracetamol for their children. Some unofficial nominal fees are reported to be charged by health workers to pay for their travel expenses and other costs.

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#### **1.4.3 The Vaccine Stabilization Fund**

Ghana established a Vaccine Stabilization Fund with UNICEF in April 1996. The fund was capitalized with a donation from USAID of \$485,437. The objective of this fund is to support temporary shortfalls in vaccine and syringe procurement. When the government needs funds for vaccines, it sends a letter to UNICEF specifying the vaccines and syringes that it needs as well as how it plans to reimburse the fund, e.g., with donor funding.

This fund has been used to finance oral polio vaccine for routine immunization, as well as vaccine, needles, and syringes for responses to a meningitis outbreak.

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#### **1.4.4 The SWAP and Decentralization**

Ghana began using the sector-wide approach in 1997. As part of this approach, management of the health sector has been decentralized to facilitate local-level participation and decision making.

Budget and Management Centers (BMC) have been established at each level of the health system. Each of the ten regions has four BMCs (Office of the Regional Director, Regional Health Administration, Regional Public Health Unit, and Regional Institutional Care), while the districts and subdistricts have their own BMCs and receive fund allocations from the central government. BMCs at regional, district, and subdistrict levels sign contracts each year that indicate their commitment to achieve certain levels of performance for indicators. The districts have responsibility for the following activities (MOH 1995): planning, organizing, monitoring, and evaluation of the package of services, training needs assessment, operations research, capacity building at the subdistrict level, and the provision of technical and administrative support for implementation.

Resources are allocated to the BMCs based on resource allocation criteria of the Ministry of Planning. The envelope is made up of contributions from the government of Ghana (GoG), donor sources, and internally generated funds. Approximately 40 percent of GoG and donor health funds go to the districts. Regional health program managers have a supervisory role for public health. Money flows through the region to the districts for the most part, and accounting is reported from the districts to the regions.

The right to manage accounts at the district level is obtained through a rigorous assessment of the capacity of the district BMC. Where the BMC fails in any area of capacity, the region takes on financial management. As a result, there is strong motivation for districts to develop high levels of accountability and this has produced a robust health sector financial system with little leakage. Much of the push for this high level of transparency has come from the partners in the SWAP. In this system, donors and government meet together to agree on a work plan for the sector and the government is freed of many of the constraints traditionally tied to donor funds.

In most cases in Ghana, the district has demonstrated sufficient capacity to be a fully operational BMC. There are annual reviews of the district accounts that are carried out at regional level. There are also internal audits by the Ministry of Health and external audits by the GoG Auditor General's Office. In addition to the audits, there are quarterly performance hearings at district level where districts report. These hearings are attended by central-level MOH officials. The data presented is validated by consultants during field visits. This process is expensive, but has been critical in building accountability and gaining the confidence of stakeholders in the process.

Since immunization is considered a key public health service, coverage levels have been included as some of the indicators for performance of the sector-wide program. Some of the indicators at the subdistrict level, for example, include number of children immunized with DTP3 and measles. At the district level, coverage of DPT3 and measles is monitored as well as number of acute flaccid paralysis (AFP) cases detected and investigated.

Two exceptions to decentralization are the procurement of vaccines and the setting of immunization targets, which is conducted at the EPI office at the central level.

Cold chain maintenance takes place from both the regional and central levels. Minor parts are routinely supplied to regions, which are responsible for making repairs at district and subdistrict levels. Major spare parts are stock at the central level. Cold chain technicians conduct countrywide supervisory visits at regular intervals to update the inventory of equipment and to carry out preventive maintenance (MOH et al. 1998).

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#### 1.4.4.1 Inter-agency Coordination

The interagency coordination committee (ICC) is made up of government representatives and donors. It was formed in order to respond to the planning needs of polio eradication, applying for GAVI funding and resolving other issues of the immunization program. This committee was formed outside of the SWAP and has no legal standing with the Government of Ghana, but there is some discussion now of making it a sub-group of the SWAP.

Some of the coordination of the national immunization programs takes place through the process of the SWAP. The SWAP members agree on the workplan for the sector. As part of the SWAP, annual donor program reviews with visits to some of the regions.

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#### 1.4.5 Joint 1998 MOH/USAID/BASICS/Linkages/UNICEF/WHO Assessment

In 1998, a joint assessment by the MOH, USAID, BASICS, Linkages, UNICEF, and WHO reviewed the country's child health programs. The programs included the nutrition, immunization, and community programs. The assessment noted that immunization coverage has steadily increased in the 1990s. The national immunization program has also adopted many policies during the last few years: introduction of yellow fever immunization, the use of the "opened vial policy" and vaccine vial monitors to improve the efficiency of vaccine management, and introduction of AD syringes.

Some issues that the report pointed out include: 1) the delivery of immunization services is sometimes impeded by the lack of cold chain equipment at the subdistrict level as well as frequent power outages; 2) while the routine reporting of data was reported to be good, the use of the data was less than optimal; 3) vaccines are distributed based on a "push" system in which needs are determined at the central or regional level based on projected population sizes, without taking into account wastage rates or other factors; 4) shortages of AD syringes have been identified and may be associated with their high cost<sup>4</sup>; and 5) insufficient information, education, and communication (IEC) materials are available at the district and subdistrict levels.

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#### 1.4.6 Results of Field Visits

In undertaking this study, field visits were carried out to four regions: Northern, Ashanti, Central, and Volta. During this visit, the availability of cold chain equipment appeared to be adequate. However, in some cases, the cold room environment did not appear to be optimal. For example, air conditioners were not always available or functioning in the cold room, and in some cases, the equipment was old or not functioning.

Some logistical problems in transporting vaccines were identified. Vaccine shortages (BCG and measles) were found in the northern region and can be attributed to the late transport of vaccines from Accra region as a result of breakdowns in cold vans.

While AD syringes were available, several districts visited reported that the amount that they received was inadequate for the number of vaccines that they had received. A few districts were handling this problem through purchasing AD syringes with their internally generated funds (IGF). Some health workers also thought that AD syringes should be provided for all health services and not only for the routine immunization program.

The districts had received new population sizes for their districts based on the 1999 census. They were having some problems adjusting to the new census figures since these were lower than projected, leading to a smaller resource allocation.

Another problem related to the new population figures is that coverage rates have increased since the size of the target population was reported to be smaller. In the Northern Region, several of the coverage figures were greater than 100 percent. It will be important to determine whether these figures are attributable to population size estimates that are too low or other factors.

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<sup>4</sup> Another reason for these shortages could be that drivers fail to allocate sufficient space in cold vans for their transport.

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#### 1.4.7 Hard-to-Reach and Low-Coverage Areas

Although access to services is increasing with improvements in the cold chain system, it is still limited in some areas of Ghana. For example, communities bordering large lakes and rivers or living on islands are often not receiving regular health services. One example is the island communities near the Volta dam. Other areas have limited access to services because roads are inaccessible during the rainy season, e.g., communities near Afrang Plains in Ashanti (MOH et al. 1998).

Low-coverage areas include densely populated areas in cities, such as slum areas, and locations with large numbers of migrants.

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#### 1.4.8 Future Plans and Goals of Ghana's Immunization Program

The MOH plans to introduce Hepatitis B vaccine in 2001 since its application to GAVI for funding for Hepatitis B (HepB) was accepted in 2000. Recently the MOH was told that the combination vaccine that it applied for – HepB and DTP – is not available this year. Because of this availability problem, it has chosen to opt for the pentavalent combination – HepB – DTP-Haemophilus Influenza Type B (HiB) rather than use the monovalent Hepatitis B vaccine<sup>5</sup>. The financial considerations associated with this decision will be discussed later in the paper.

Other plans that the program has are to do catch-up campaigns to increase routine immunization in hard-to-reach communities and areas with at-risk populations.

The MOH also is intensively involved in efforts to eradicate polio in the country by 2002. It is spending considerable time and effort on carrying out NIDs and surveillance activities. In 2000, two sets of NIDs and one of Supplemental National Immunization Days (NIDs) were conducted. The effort appears to be paying off and only five confirmed polio cases have been reported this year in 2001. The program will continue its intensive effort through 2002, and will continue NIDs for at least three years after that.

The country also plans to eliminate neonatal tetanus and accelerate control of measles. In order to reduce neonatal tetanus incidence to less than one case per 1000 live births by 2004, the country plans to do the following: (1) increase health education on the importance of tetanus toxoid vaccine; (2) conduct immunization campaigns in priority areas; and (3) work with traditional birth attendants to advocate better delivery practices and have their clients obtain tetanus toxoid. To accelerate control of measles, the MOH plans to conduct supplemental measles immunization campaigns as well as increase routine measles coverage.

The EPI program is also planning to continue improving its cold chain. EPI refrigerators are being purchased with funding from USAID through UNICEF and are being distributed to all subdistricts so that access to services can be improved.

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<sup>5</sup> The monovalent vaccine is not preferred in many countries because of the potential for leakage because of the high demand by adults for this vaccine.

## 2. Study Objectives and Methods

The objectives of this study are to: (1) estimate the current and future costs of the country's immunization program, including the additional costs of introducing new vaccines and other innovations and improvements, both to assist Ghana in planning its program and to update and supplement the available information on immunization costs for the global community; (2) provide recommendations to the Ghana government on ways to improve its immunization financing strategies for the current program as well as for the introduction of additional vaccines and other innovations or improvements; (3) track the flow of funding from its sources through the various levels of the health system to the level of service provision; and (4) draw lessons learned concerning immunization financing strategies in Ghana that other countries and the international health community can use in planning sustainable financing of immunization programs with country resources.

This study considers the following types of current or potential future sources and strategies for financing immunization services: central government allocations; donor contributions; local government allocations or contributions; cost recovery mechanisms in the public sector, such as fees for vaccination cards or the use of curative care fees to cross-subsidize immunization and other preventive health services; out-of-pocket fees for services in the private sector. Various mechanisms for procuring and financing vaccines are also considered, including: direct procurement on the international open market through a tender and bid process or by negotiating directly with one or more suppliers. This case study will attempt to answer the following research questions:

### **Costs**

What are the annual costs of the current national immunization program in Ghana, including both recurrent and capital costs?

What are the costs of the National Immunization Days versus the routine program costs?

What are the projected program costs for the next five years, including the additional costs of improvements and changes under consideration?

Which areas can be targeted for possible cost savings? and what degree of cost savings can be expected?

### **Financing**

What mix of financing strategies has the country utilized to fund immunization services and procure vaccines?

How successful were these strategies in terms of:

securing sufficient funding for the immunization program, and for key components such as vaccines, cold chain equipment, outreach, refresher trainings, and personnel?

maintaining or increasing coverage?

preventing inequities in coverage (e.g., between urban and rural areas)?

maintaining or increasing the quality of the vaccines and the overall program?

mobilizing new resources for the national program?

encouraging the efficient use of resources (e.g., minimizing waste)?

How do immunization financing strategies compare with the strategies for all other health services? Is Ghana using the full range of financing strategies available in the country's health system? If not, why not?

How has decentralization affected the financing of immunization programs and NIDs?

How has the sector-wide approach affected the financing of immunization programs and NIDs?

### **Flow of Funds**

What path do funds follow from their source to the various levels of the health system?

What mechanisms is the GoG using to transfer funds to regional and district levels?

What percentage of the health service budget arrives on time? How is this broken down by source?

What structures are in place to ensure equitable distribution of funds?

How has the flow of funds improved or deteriorated since the beginning of the SWAP and decentralization?

What improvements could be made to the flow of funds?

### **Financing for the Future**

What is the five-year projection for available funding and what is the projected funding gap?

How can Ghana improve upon the current financing strategies and the mix of strategies being used for immunizations in order to be able to develop sustainable financing for the national immunization program, including other planned changes?

What are appropriate financing mechanisms for the planned improvements and changes? Can they be funded under existing strategies and funding sources or must new strategies be developed?

What findings are applicable to other countries with similar economic, health financing, and immunization program circumstances?

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## 2.1 Methodology

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### 2.1.1 Data Collection Process and Data Sources

The PHR team collected the cost and financing data in February and March of 2001. Information was gathered on government contributions, donors' contributions, district assembly contributions, contributions from the private for-profit sector, and internally generated funds. Researchers collected quantitative data on contributions of the central government, donors, international donors, and NGOs in Accra from EPI headquarters and international donors based in the capital. Qualitative data relating to the cooperative relationship between the public and private sectors was gathered during interviews with representatives from the Private Practitioners Group and the Ghana Registered Midwives Association.

The team developed questionnaires on the flow of financing and on costs and financing at the regional, district, and subdistrict levels. The questionnaires included program management issues such as logistics and worker motivation. A combination of questionnaires and interviews were used to gather information on the nature of cash flow in immunization finance in four regions of Ghana, to determine how cash flow influences program implementation and to ascertain how the system could be made more effective (see questionnaire in Annex A). Documents produced by the government of Ghana also were used as the source of statistics on expenditure, planning, sources of funds, budgeting, and performance.

The team covered four regions – Ashanti, Central, Northern, and Volta – conducting interviews at the regional, district and subdistrict levels in order to sample different types of financing mixes and also to allow for discussion of financing and costing issues as manifested at various levels of the health system. For example, the Northern Region was chosen because it is receiving financial assistance from agencies such as UNICEF. The wealthier region, Ashanti, was chosen, because it receives little external assistance. In each region, an urban and rural district was visited.

In-depth interviews were conducted with a large number of key informants from the MOH, UNICEF, WHO, USAID, and the Department of International Development (DFID) to assess future requirements of the program. Team members also visited the central stores and the cold room, the initial points of storage and distribution, where they interviewed managers and record keepers to obtain information on associated costs and the distribution process. During the field trips, researchers interviewed the community health nurses at the subdistrict level to discuss issues related to their service delivery.

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### 2.1.2 Methods of Analysis

The costs of the national immunization program in 2000 are estimated. The purpose of this analysis is to estimate actual costs of the program, in contrast to expenditures. Because it includes annualized, depreciated capital costs, this analysis provides an accurate picture of total costs based on needs rather than on budget allocations. The analysis presents a total for EPI, NIDs, and surveillance, as well as specific costs associated with each activity.

Since the cost analysis for this case study focuses on the costs of the program to the government of Ghana, the analysis does not estimate costs incurred by the users, such as costs of travel to a health facility and so forth. The study concentrates instead on current costs of the Ministry of Health and its

partners and future expenditures, which will ensure the provision of immunization services, with acceptable levels of quality and coverage.

This analysis was carried out as a cost estimation using existing data. More refined work on costs could be done if it were possible to collect primary data. This cost exercise uses a mix of available expenditure, budget allocation, and cost information in order to approximate the total annual costs of the national immunization program.

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## 2.2 Description of Variables

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### 2.2.1 Recurrent Costs

Calculating personnel costs necessitates apportioning salaries and benefits of staff involved in the management and provision of immunization services, based on percentages of total time spent on various immunization activities. The study team estimated cost of managerial personnel at the various levels of the health system (headquarters, region, and district) as well as personnel involved at the service delivery level areas (community health nurses, public health nurses, enrolled nurses, midwives, and disease control officers) and their supervisors. They obtained the average percentage of personnel time spent on immunization activities through interviews.

Vaccine costs are the cost of vaccines based on unit costs, as procured by UNICEF, coverage rates, target population size, and a calculated wastage factor (wastage coefficient), based on vials dispersed and doses administered. The cost of supplies includes the value of items such as syringes and needles (BCG, auto-destruct, and those used for dilution), safety boxes, road-to-health cards, and yellow cards.

The transport costs are those of transporting vaccines and supplies from the central level to the region, district, and subdistrict levels. They also include the cost of transporting commodities and supplies from the storage area to the outreach sites, and the transportation cost incurred by staff during outreach, NIDs, and surveillance activities.

Maintenance and overhead costs include electricity, kerosene/petrol (used for refrigerators and cold rooms), utilities, and building repairs, in addition to costs associated with maintenance of cold chain equipment. These costs are apportioned to the national immunization program.

Short-term training costs consist of expenses for short-term, in-service training related to immunization for any type of health personnel that take place annually.

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### 2.2.2 Capital Costs

Capital costs are the annual costs of resources with a useful life of more than one year; i.e., they are not consumed or replaced every year. The current purchase cost of capital goods such as equipment and buildings (also called capital investment) is distributed across the estimated useful life of the investment item, with adjustment by a factor that accounts for the opportunity cost of having money tied up in capital. This process is called amortization, or annualization. For the purposes of this analysis, the adjustment factor used was 5 percent.

The cost of buildings involves the annualization of EPI-related offices and building spaces using the opportunity cost of room space. The cost of equipment includes annualization of costs for cold chain and laboratory equipment. The cost of vehicles includes the annualized cost based on the type and numbers of vehicles used by the Ministry of Health for immunization activities with an adjustment for depreciation. Lastly, the cost of long-term education/training includes the cost of any long-term education, with or without a degree, that staff receive.

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### 2.2.3 Calculating Future Vaccine Needs

Researchers estimated the vaccine needs for the next five years by the population-based method. Target populations were estimated using the official global projected figures from the last census and demographic indicators (crude birth rate, infant mortality rate). Since BCG is given to newborns, the number of live children born during the year was used as the target population. For the other antigens, the average population for children under one was calculated, taking into account infant mortality rates. For tetanus toxoid, the population used was the number of live births, with an adjustment for spontaneous abortions. National wastage rates were obtained from EPI headquarters.

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### 2.2.4 Financing Analysis Methods

As a basis for the financing analysis, estimated costs are used rather than expenditures. This allows the accounting for all resources used in the program, several of which would not appear in expenditure reports, including costs of the use of capital goods. Since the cost analysis required a number of assumptions, the same considerations that apply to the cost analysis should be made when interpreting the results of the financial analysis.

Three different types of costs for the financing analysis are calculated. The first is the *total estimated costs* of running the EPI program, which does not consider the source of funds used to cover the costs. Total costs include a proportion of capital costs for health services – health facilities, vehicles, equipment, etc. – that is estimated to be used for immunization services. Total costs also include the estimated cost of health personnel that factors into the provision of immunization services.

The second type of cost estimate includes the “*program-specific*” costs of the immunization program. These include only the costs that are incurred specifically for the delivery of immunization services, over and above the costs shared with other health activities, and regardless of who pays for them. Program-specific costs include recurrent variable costs required to provide immunization services, such as vaccines, supplies, transportation, maintenance and overhead, and IEC/social mobilization costs that are related to the immunization program. Also included is the cost of immunization-related equipment, that is, cold chain equipment. Program-specific costs exclude health personnel costs and capital costs, since these costs are shared with other MOH programs and would be incurred by the MOH with or without the national immunization program.

Program-specific costs are useful to MOH and EPI program managers in determining the exact costs for the provision of immunization services and in planning program changes, such as how to eventually replace the NIDs or introduce the HepB vaccine. For the analysis of current financing of the program (Section 4), the financing picture is presented both in terms of *total costs* and *program-specific costs*.

A third set of costs, *recurrent, variable, non-personnel costs*, are costs that the MOH must mobilize each year for the national immunization program – either from its own budget or from

donors. These cost estimates are most useful to the MOH in planning the financing of the national immunization program. They include vaccines, syringes and other supplies, and other recurrent costs, such as maintenance, transportation costs incurred by the MOH, IEC, and short-term training. They exclude personnel costs, since health personnel giving immunizations are shared with other health programs. They also do not include equipment costs, since they do not constitute regular operating costs that the government must pay for each year.<sup>6</sup> In this analysis, these costs are used as the basis for estimating the additional costs of, and financing required for future planned improvements, such as improving the cold chain system (Section 6). They are also used as the basis for possible future financing scenarios presented in Section 7.

In order to adjust for inflation in prices, a moderate rate of inflation of 3 percent was applied to the projections.

While many of the costs were collected in cedis, they were converted to dollars for the analysis.

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## 2.3 Study Constraints and Limitations

Limited data on the contribution of non-MOH personnel for immunizations, such as private sector contributions, particularly for the NIDs, did not allow them to be included in the analysis. Similarly, the contributions from the district assemblies varied significantly between districts and thus the limited data obtained for this study does not provide a representative portrait of local government involvement in immunization programs.

Unfortunately, this study coincided with the annual review of district performance, so in many cases accounting files had been taken to the review. Therefore, data on dates of disbursement and amounts was more qualitative than would otherwise have been the case.

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<sup>6</sup> However, they do include costs of maintaining and operating equipment.

## 3. National Immunization Program Costs in 2000

The estimated costs of Ghana's national immunization program are presented in this chapter. The costs are disaggregated into routine EPI, NIDs and surveillance activities.

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### 3.1 Estimating Costs of the Routine EPI

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#### 3.1.1 Recurrent Costs

The recurrent costs of the national immunization program include those of personnel, vaccines, supplies, transport, training, social mobilization/planning activities, and maintenance and overhead.

In order to calculate personnel costs, the value of time spent on EPI was estimated. The percentage of total time that each type of worker spends on EPI was multiplied by his or her annual salary and benefits to obtain the cost of their time.

The cost of vaccines was calculated by estimating the amount of vaccine required for the target population, taking into account wastage and coverage rates. The costs of other categories were calculated through estimating average annual or monthly costs.

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#### 3.1.2 Capital Costs

Capital costs include those of buildings, vehicles, cold chain equipment, and long-term training.

The annualized value of services derived from the use of vehicles was determined by assessing the value of vehicles used by the EPI in 2000. With information on prices for each type of vehicle, number of each type of vehicles, useful life of the vehicles, and an interest rate of 5 percent, the total annualized cost was obtained.

The cold chain equipment costs were estimated through valuing the equipment that was used in 2000. The equipment includes refrigerators, cold boxes, and carriers. The items were valued using current prices, number of pieces of equipment, useful life, and an interest rate of 5 percent.

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### 3.2 Total Estimated Annual Costs of the Routine EPI

Table 4 shows the costs of the routine immunization program. The total cost of the routine immunization program was \$3.7 million, with the largest share going towards personnel salaries.

Other categories that represented sizeable shares of the total costs were vaccines and supplies<sup>7</sup>, followed by transport. Other recurrent costs constituted less than 3 percent of total costs.

It should be noted that personnel costs and a few other cost components (e.g., maintenance and building) constitute a smaller proportion of total costs than found in other studies (see Kaddar, Levin et al. 2000). One explanation for this finding is that the currency (cedi) was devalued by 50 percent in 2000 and salaries are a lower percentage of total costs than they would be if salaries were at their earlier level. Annex Table 1 (in Annex B) shows that if salaries were increased by 20 percent, the percent of total costs going towards personnel would be 50 percent.

The majority of the total costs were recurrent, while less than 10 percent were capital. The largest capital costs were the annualized costs of vehicles and equipment.

**Table 4. Estimated Costs of the Routine EPI**

Cost Category	Cedis (000s)	US\$	Percentage
<b>Recurrent Costs</b>			
Personnel	10,650,437	1,543,542	42%
Vaccines	6,346,443	919,774	25%
Supplies	4,158,336	602,657	16%
Transportation	1,799,288	260,766	7%
Short-term Training	28,445	11,180	0.3%
Social Mobilization	102,465	39,297	1.1%
Maintenance and Overhead	273,997	39,710	1.1%
Subtotal	23,359,411	3,416,927	92.3%
<b>Capital Costs</b>			
Buildings	459,165	66,546	1.8%
Vehicles	686,689	99,520	2.7%
Equipment	587,229	85,106	2.3%
Long-term Training	233,420	33,829	0.9%
Subtotal	1,966,504	285,000	7.7%
<b>Total Annual Costs</b>	<b>25,325,914</b>	<b>\$3,701,928</b>	<b>100%</b>

### 3.2.1 Estimated Annual Costs of the NIDs

In 2000, the total cost of NIDs was \$3.9 million, slightly more than those of routine EPI (see Table 5). The rationale for the high cost is that two sets of NIDs were held that year, due to the acceleration of the polio eradication activities.

The largest cost component of NIDs was vaccines, followed by personnel<sup>8</sup>. Other recurrent costs represented more than 35 percent and included, in order of importance, social mobilization, transport, short-term training, and maintenance and overhead.

<sup>7</sup> The cost of supplies is high because auto-destruct syringes have been introduced into the program.

<sup>8</sup> The target population was all children under five.

Most of the costs were recurrent (95 percent). However, some amortized cost of vehicles and cold chain equipment is included, resulting in some 5 percent of the costs being capital.

**Table 5. Estimated Cost of NIDs**

Cost Category	Cedis (000s)	US\$	Percentage
<b>Recurrent Costs</b>			
Personnel	9,295,682	1,347,200	34%
Vaccines	9,986,873	1,447,373	37%
Transportation	1,865,148	270,311	7%
Short-term Training	302,938	43,904	1%
Social Mobilization	4,270,477	618,910	16%
Maintenance and Overhead	170,456	24,703	0.6%
Subtotal	25,891,575	\$3,752,402	95%
<b>Capital Costs</b>			
Vehicles	1,222,418	177,162	4.5
Cold Chain Equipment	29,706	4,305	0.1
Subtotal	1,252,123	181,467	5%
<b>Total Annual Costs</b>	<b>27,143,699</b>	<b>\$3,933,869</b>	<b>100%</b>

### 3.2.2 Estimated Costs of Surveillance Activities

Another important activity of the national immunization program was acute flaccid paralysis surveillance. In order to improve its surveillance of AFP, the MOH, together with UNICEF, trained community-based surveillance volunteers to ensure that AFP cases are reported in a timely fashion.

The total cost of surveillance in 2000 was estimated to be about \$325,000 (see Table 6). The bulk of these costs were for personnel, followed by training. The only capital costs were for vehicles.

**Table 6. Cost of AFP Surveillance**

Cost Category	Cedis (000s)	US\$	Percentage
<b>Recurrent Costs</b>			
Personnel	1,762,063	255,371	79%
Transportation	151,144	21,905	7%
Short-term Training	236,870	34,329	11%
Maintenance	69,558	10,080	3%
Subtotal	2,219,635	321686	99%
<b>Capital Costs</b>			
Vehicles	22,704	3290	1.0%
<b>Total Annual Costs</b>	<b>2,242,340</b>	<b>\$324,977</b>	<b>100%</b>

Note: Estimates do not include cost of technical assistance and stool sample carriers.

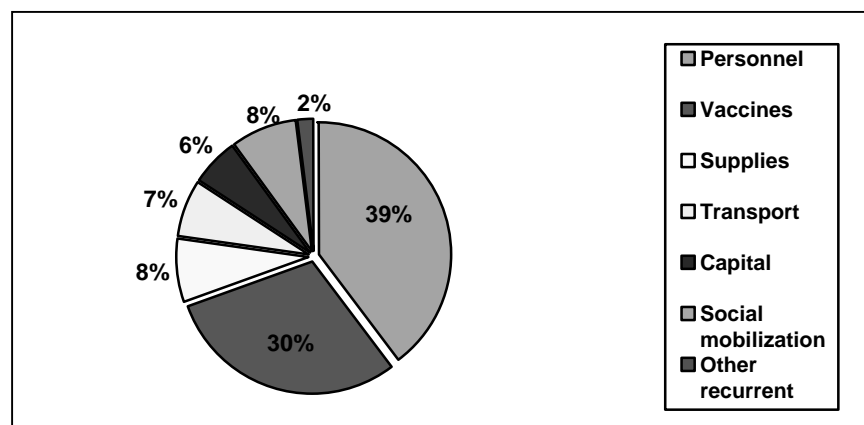
### 3.2.3 Estimated Total Cost of the National Immunization Program

The total cost of the national immunization program was \$8.0 million when the costs of routine immunization, NIDs and surveillance were totaled (see Table 7 as well as Figure 1, which shows the costs by component). The largest costs were for personnel time, followed by vaccines. Other categories that made up a significant share of cost include supplies, transportation, social mobilization, and vehicles. Some 50 percent of total costs were for NIDs, 46 percent for routine immunization, and 4 percent for surveillance. As noted earlier, the percentage of total costs going towards the program components differ from those found in earlier PHR studies due to the acceleration of the polio eradication activities.

**Table 7. Total Estimated Costs of the National Immunization Program, 2000 (US\$ 000s)**

	Routine Program Costs	NIDs Costs	Surveillance Costs	Total Program
Personnel	1,543,542	1,347,200	255,371	3,146,113 (40%)
Vaccines	919,774	1,447,373	NA	2,367,147 (30%)
Supplies	602,657	NA	NA	602,657 ( 8%)
Transportation	260,766	270,311	21,905	552,983 ( 7%)
Short-term Training	11,180	43,904	34,329	89,413 ( 1%)
Social Mobilization	39,297	618,910	NA	658,207 ( 8%)
Maintenance and Overhead	39,710	24,703	10,081	74,494 ( 1%)
Subtotal	\$3,416,927	\$3,752,402	\$321,686	\$7,491,015 (94%)
Capital Costs				
Building	66,546	NA	NA	66,546 ( 1%)
Vehicles	99,520	177,162	3,290	279,973 ( 4%)
Cold Chain	85,106	4,305	NA	89,411 (1%)
Long-term Training	33,829	NA	NA	33,829 (0.4%)
Subtotal	285,000	181,467	3,290	469,758 ( 6%)
Total Annual Costs	\$3,701,928 (47%)	\$3,933,869 (50%)	\$324,977 (4%)	\$7,960,774 (100%)

**Figure 1. Breakdown of Total Immunization Costs by Component, 2000**



The composition of costs of routine immunization and NIDs differ. The highest costs of the routine program were for health personnel, while the largest costs for the NIDs were for vaccines. The rationale behind the high cost of vaccine for the NIDs was that the target population was larger (included all children under five). In addition, social mobilization costs were also high for these activities. In contrast, supplies comprised a more important share for routine immunization due to the use of auto-destruct syringes.

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### 3.2.4 Recurrent, Variable, Non-Personnel Costs in 2000

The recurrent, variable non-personnel costs that are used as the baseline for the cost and financing projections for the national immunization program in the next five years are shown in Table 8. These include the costs of the routine program, national immunization days, and surveillance that the government must mobilize each year. No capital costs are included. The assumption made is that the number of sets of NIDs for polio eradication will decrease to one after 2002 when polio eradication is expected to have taken place.

**Table 8. Estimated Recurrent, Variable Non-Personnel Costs of the Immunization Program**

Cost Category	Cedis	US\$	Percentages
Vaccines	16,333,316,251	2,367,147	54.5%
Supplies	4,158,336,057	602,657	13.9%
Transportation	3,815,579,769	552,983	12.7%
Maintenance and Overhead	514,011,821	74,494	2.1%
IEC/Social Mobilization	4,541,628,973	658,207	15.2%
Short-term Training	616,951,066	89,413	1.7%
Total	29,979,823,937	\$4,344,902	100%



## 4. Immunization Financing in Ghana: Description and Assessment

### 4.1 Trends in Overall Health Financing

The proportion of total public sector expenditures on the health sector has hovered between 4 percent and 5 percent during the last few years. Total government expenditures on health in 1999 were approximately \$4.80 per capita (\$6.80 per capita with external assistance).

The public sector expenditure as a percent of GDP, including internally generated funds (funds generated from user fees at facilities), was 1.18 percent in 1997, 1.32 percent in 1998, and 1.34 percent in 1999 (World Bank website). This percentage is similar to that found in the neighboring country of Cote d'Ivoire in 1997 (1.3 percent) (see Kaddar, Tanzi, and Dougherty, 2000).

#### 4.1.1 Government Budget Allocations

Actual expenditures on the health sector decreased from 1997 to 1999 (see Table 9). This is because, while expenditures on recurrent costs increased, expenditures on capital goods decreased.

Regarding funding by source, GoG expenditures increased from 1997, when decentralization began, to 1998 but then remained at the same level in 1999. Internally generated and donor funds, while fluctuating, increased during the same three-year period (with the exception of a drop in donor contributions in 1998). However, commercial credits, used to build hospitals in regional capitals of Ghana, have declined.

**Table 9. Expenditure on Health Sector (US\$ million)**

	1997		1998		1999	
	Program Targets	Actual	Program Targets	Actual	Program Targets	Actual
Recurrent Expenditures	87	89	96	108	107	119
Capital Expenditures	40	70	43	48	48	23
Total Expenditures	127	159	140	156	155	142
Sources of Funding:						
Government of Ghana	81 (64%)	68 (43%)	93 (66%)	85(54%)	108	83 (58%)
Internally Generated Funds	6 ( 5%)	13 (8%)	7 (5%)	14	7	16 (11%)
Donor Funds	40 (31%)	28 (18%)	40 (29%)	23	40	31 (22%)
Commercial Credits	0	50 (31%)	0	33	0	10 ( 7%)

Actual expenditures funded by GoG and donors were less than program targets during all three years. However, total expenditures in 1997 and 1998 were larger than planned due to the unplanned use of commercial credits and greater than expected use of internally generated funds. The decline in total expenditures in 1999 occurred because the use of commercial credits was discouraged given the heavy debt that the government of Ghana already has.

Table 10 shows that, since the beginning of the decentralization in 1997, the largest share of resources (nominal) has been allocated to the district level, followed by expenditures on regional level activities. The share of expenditures remaining at the headquarters level sharply decreased between 1997 and 1998.

**Table 10. Expenditures on Health Sector by Level (Billion Cedis)**

	1997	1998	1999
Headquarters	71 (22.7%)*	31.2 (8.4%)	37.3 (9.3%)
Tertiary	59 (18.2%)	53.1 (14%)	60.2 (15.1%)
Regional	84 (26.8%)	123.2 (33.3%)	112.8 (28.2%)
District	99 (31.6%)	162 (43.9%)	189 (47.3%)
TOTAL	313	369.9	399.4

\* Expenditures for headquarters high in 1997 due to investment costs.

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#### 4.1.2 Allocation of Funding to the Health Sector

The availability of funds for discretionary spending<sup>9</sup> has been constrained by GoG obligations to repay its debt. The total debt was approximately \$4 billion in 1998, or 81 percent of the GDP. The debt servicing was \$522 million in 1999, compared to total government expenditures of \$2.1 billion in 1999 (\$1.4 billion excluding debt and pensions). However, the GoG recently decided to join the World Bank's HIPC. It will be obtaining some debt relief because of this and should have more discretionary funding available for the health sector in the future.

The percent of total health sector spending on the national immunization program (routine immunization, NIDs, and surveillance activities), assuming that total expenditures on health were the same in 2000 as those in 1999, is 3 percent, a relatively small part of total spending.

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#### 4.1.3 Spending on Consumables

According to the procurement program for the year 2000 (MOH 2000), total expenditures for consumables were \$27,785,044. Of this total, some \$4,728,042 (17 percent) were for expenditures for the immunization program (vaccines, needles, and syringes as well as efforts to control yellow fever and meningitis). For routine immunization activities, the consumables are less: \$2,998,676, or 11 percent. If estimated costs of consumables of the immunization program are compared, rather than expenditures<sup>10</sup>, the amount is even lower, \$2,635,406 (approximately 9 percent of the total).

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<sup>9</sup> Discretionary funds are those available for spending after mandatory payments have been made.

<sup>10</sup> Costs differ from expenditures since they measure actual use of resources, in-kind contributions, and annualized capital costs.

It should be noted that the share of total expenditures or costs going towards consumables for the immunization program is higher than the share of government health sector spending on the immunization program. This is because vaccines and related products are a particularly large part of Ghana's annual procurement, and, at this time, donors pay for most (90 percent) of the consumables required for the immunization program. The GoG, on the other hand, finances approximately \$15 million annually for drugs and other consumables. Subtracting out reimbursements from "cash and carry"<sup>11</sup> items,<sup>12</sup> the total amount that the GoG must contribute is about \$10 million, about 8 percent of total recurrent expenditures. If the GoG were also to pay for routine immunization consumables, the amount would increase to approximately \$13 million, or about 11 percent of its recurrent expenditures.

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## 4.2 Current Financing of Immunization Services

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### 4.2.1 Sources of Immunization Financing

The current sources of funding for the immunization program and their relative importance are discussed below.

#### **Central Government**

The central government pays for personnel salaries, maintenance and overhead costs, some supply costs, and building costs. The personnel salaries, maintenance, and supplies are paid through the recurrent budget while expenditures on construction of buildings are paid through the capital budget.

#### **District Assemblies**

District assemblies receive at least 5 percent of the central government's domestic tax revenue. This funding is then allocated to three sectors: health (including water and sanitation), education, and local governmental capacity building. In terms of the national immunization program, the district assemblies provide funding for operational costs for NIDs, but little for operational costs for routine immunization. It should be noted that there is wide variation among district assemblies regarding the amount allocated to the health sector. Most district assemblies do not contribute any funds to the routine health sector, perhaps because they do not appreciate the need for additional resources at this level.

#### **Internally Generated Funds**

Internally generated funds are obtained from user fee charges for drugs, consumables, and consultation fees.<sup>12</sup> These funds are discretionary funds to be used at the facility level. Generally, they are used for expenditures such as social mobilization, transport, and purchase of supplies. Visits to the field indicated that health workers sometimes use these funds to purchase AD syringes and needles when their supplies become low.

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<sup>11</sup> In Ghana, cash and carry refers to payments for drugs at health facilities.

<sup>12</sup> Exemptions from user fees pertain to preventive services such as antenatal care and immunizations for children. In addition, exemptions are applied to services for children under five and persons over the age of 65.

A few district health managers have been particularly innovative in their use of these funds. For example, in one district of Volta Region, the funds have been used to construct residences for health personnel as well as other purposes.<sup>13</sup>

These funds have become an important source of financing for the program and comprised 13-15 percent of recurrent funding in 1997-1999. The funds amount to \$0.85 per capita. Although these funds are an important source of financing for the program, there is a tension regarding increased use of these fees and ensuring that these are not a barrier to utilization of government health services.

### **Donors and International Organizations**

Contributions from donors come in two forms: through the donor pool (called the Health Fund) and via earmarked funds. The donor pool provides approximately 11 percent of total public expenditures on the health sector.

Donors are providing significant support to the national immunization program. DFID partially finances vaccines and supplies (including AD syringes) for the routine immunization program while Japan pays for vaccines for the NIDs. USAID provides technical assistance to the immunization program, as well as financing of the cold chain and support for the NIDs. UNICEF acts as the procurement agent for vaccines, supplies, and equipment and provides support for training for routine immunization, NIDs, and surveillance. The Danish International Development Agency (DANIDA) provides support for immunization services through its projects (e.g., Northern Region) and indirectly through its contributions to the donor pool.

Other donors focus their support on the NIDs and surveillance activities: WHO and Rotary International finance operational costs, social mobilization, and planning activities, the Canadian International Development Agency (CIDA) some operational costs and a vehicle for surveillance, and the U.S. Centers for Disease Control and Prevention (CDC) some funding for operational costs.

### **World Bank Loan Funds**

Ghana's World Bank loan is tapped into from time to time to pay for some vaccines and supplies for the immunization program. For example, it was used to purchase vaccines in 1997 and again in 2001.

### **Private Sector**

As mentioned in Section 1, some of the for-profit providers as well as NGOs provide immunization services in their facilities. Since the GoG is providing the vaccines, some supplies, some cold chain equipment and training<sup>14</sup>, the main contributions of this sector to the immunization program are personnel time, some cold chain equipment, some supplies, and building space.

The private sector is also providing support for the NIDs. In the Kumasi District, for example, various contributors to the NIDs included the Ghana Private Transport Union (vehicles and fuel), Coca-Cola (drinks), breweries (minerals), December 31<sup>st</sup> Women's Movement (loaves of bread), Mobil Oil (fuel), and Kumasi Traders (cash) (see Table 11).

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<sup>13</sup> In many health centers in Ghana, personnel do not have residences and must commute long distances to their work.

<sup>14</sup> The GoG also provides personnel salaries for some of the mission facilities.

**Table 11. Community Contributions to Second Set of NIDs, Kumasi 2000**

Community Organization	Donation	Cedis
Mobil Oil	Diesel Fuel	880,000
Breweries	10 crates drinks	336,000
Coca-Cola	10 crates drinks	336,000
Castelo Mines	Banners	NA
Kumasi Traders	Cash	200,000
December 31 <sup>st</sup> Women's Movement	Bread for Volunteers	105,000
Ghana Private Transport Union	Vehicles for Transport	NA

### Household Contributions

No official fees for immunization services exist in public facilities, although it is likely that some unofficial fees are charged from time to time by workers to pay for their transport and other costs.<sup>15</sup> Consumers are also paying indirect costs to obtain immunization services, i.e., travel costs, travel time, and waiting time. They also are asked to pay for some immunization-specific drugs and supplies at health facilities such as drugs (paracetamol) and Road to Health book covers.

### 4.2.2 Estimated Annual Costs of Routine EPI by Source of Financing

The estimated cost of routine services by source of financing is shown in Table 12. The GoG finances 49 percent and pays for personnel salaries, supplies, transportation, planning, maintenance, buildings, and training. The donor pool finances 6 percent and pays for various operational costs. Various individual donors finance other program costs: DFID the vaccines, supplies, and vehicles<sup>16</sup>; USAID the social mobilization/planning and cold chain equipment; and UNICEF short-term training activities.

**Table 12. Annual Estimated Costs of Routine EPI by Source of Financing, 2000 (in US\$)**

	GoG and Donor Pool	DFID	USAID	UNICEF	Total
Recurrent Costs:					
Personnel	1,543,542				1,543,542
Vaccines		919,774			919,774
Supplies	103,163	499,494			602,657
Transportation	260,766				260,766
Short-term Training				11,180	11,180
Social Mob/Planning	1,080		38,217*		39,296
Maintenance	39,710				39,710
Subtotal	1,948,261	1,419,268	38,217	11,180	3,416,926

<sup>15</sup> Since information on the magnitude of this unofficial charging is not known, the EPI program should assess whether it is limiting attendance at immunization sessions.

<sup>16</sup> Although DIFD contributes to the donor pool, the GoG has asked it to set aside "earmarked funds" to pay for immunization program commodities.

Capital Costs:					
Building	66,546				66,546
Vehicles		99,520**			99,520
Equipment			85,106		85,106
Training	33,829				33,829
Subtotal	100,375	99,520	85,106		285,001
Total	\$2,048,636** (55%)	\$1,518,788 (41%)	\$123,323 (3%)	\$11,180 (0.3%)	\$3,701,927

\* Amount was financed by USAID and implemented by UNICEF.

\*\* Assuming that the donor pool was 11 percent of GoG expenditures based on information from the Annual Reviews (1999 and 2000), the government contribution was 1,823,286 (49 percent) and donor pool 225,350 (6 percent).

The program-specific costs are shown in Table 13. These include costs specific to the immunization program, i.e., do not include costs shared by other programs such as personnel, buildings and vehicles. When the program-specific costs for routine immunization are examined (i.e., costs specific to the immunization program), the largest contributor to the program is DFID, rather than the GoG.

**Table 13. Annual Estimated Program-specific Costs of Routine EPI by Source of Financing, 2000 (in US\$)**

	GoG and Donor Pool	DFID	USAID	UNICEF	Total
Recurrent Costs:					
Vaccines		919,774			919,774
Supplies	103,163	499,494			602,657
Transportation	260,766				260,766
Short-term Training				11,180	11,180
Social Mob/Planning	1,080		38,217		39,297
Maintenance	39,710				39,710
Subtotal	404,719	1,419,268	38,217	11,180	\$1,873,384
Capital Costs:					
Building					
Vehicles					
Equipment			85,106*		85,106
Training					
Subtotal			85,106		85,106
Total	\$404,719 (21%)	\$1,419,268 (72%)	\$123,323 (6%)	\$11,180 (0.6%)	\$1,958,490

\*Cold chain equipment was procured through UNICEF.

### 4.2.3 Estimated Annual Costs of NIDs by Source of Financing

Donors finance over 80 percent of total costs of NIDs, while the GoG and other domestic sources such as district assemblies play a smaller role (12 percent) as a source of financing (see Table 14).<sup>17</sup> The government of Japan was the largest source of financing, followed by Rotary International. Other donors/ international organizations finance the remaining 21 percent of costs of NIDs.

**Table 14. Estimated Costs of NIDs by Source of Financing, 2000**

	GoG and Donor Pool	District Assemblies	WHO	Rotary Int.	Japan	WHO/CIDA	WHO/USAID	Total
Recurrent Costs:								
Personnel	428,578			479,492			41,335	1,347,200
Vaccines					1,447,373			1,447,373
Transportation		38,070	32,408	6,094		193,739		270,311
Short-term Training						43,904		43,904
Soc Mob/Planning			138,616	290,324			189,970	618,910
Maintenance	24,703							24,703
Subtotal	453,281	38,070	171,024	1,173,705	1,447,373	237,643	231,305	3,752,401
Capital Costs:								
Vehicles							177,162	177,162
Equipment							4,305	4,305
Subtotal							181,467	181,467
Total	\$453,281 (12%)	\$38,070 (1%)	\$171,024 (4%)	\$1,173,705 (30%)	1,447,373 (37%)	237,643 (6%)	412,773 (11%)	\$3,933,868

Table 15 shows the estimated program-specific costs of NIDs by source of financing. Donors finance about 98 percent of program-specific costs. The largest financiers of the program-specific costs were Japan and Rotary International.

<sup>17</sup> Other contributions from the private sector and organizations in the community are not shown because they weren't fully captured.

**Table 15. Estimated Program-specific Costs of NIDs by Source of Financing, 2000**

	GoG and Donor Pool	District Assemblies	WHO	Rotary Int.	Japan	WHO/CIDA	WHO/USAID	Total
Recurrent Costs:								
Personnel Per Diem				877,287			41,335	918,622
Vaccines					1,447,373			1,447,373
Transportation		38,070	32,408	6,094		193,739		270,311
Short-term Training						43,904		43,904
Soc Mob/Planning	24,703		138,616	290,324			189,970	618,910
Maintenance	24,703							24,703
Subtotal		38,070	171,024	1,173,705	1,447,373	237,643	231,305	3,323,823
Capital Costs:								
Equipment							4,305	4,305
Subtotal							4,305	4,305
Total	24,703 (1%)	38,070 (1%)	171,024 (5%)	1,173,705 (35%)	1,447,373 (43%)	237,643 (7%)	235,610 (7%)	\$3,328,128

#### 4.2.4 Estimated Costs of Surveillance by Source of Financing

The GoG (Table 16) financed most surveillance costs. Other sources of financing provided funding for training (UNICEF) and vehicles (CIDA). When program-specific costs are examined, the percentage that UNICEF finances is slightly greater than that of the GoG and donor pool combined.<sup>18</sup>

**Table 16. Estimated Costs of Surveillance by Source of Financing**

					Program-specific Costs		
	GoG and Donor Pool	WHO/CIDA	UNICEF	TOTAL	GoG and Donor Pool	UNICEF	TOTAL
Recurrent Costs:							
Personnel	255,371			255,371			
Transportation	21,905			56,234	21,905		21,905
Short-term Training			34,329*			34,329	34,329
Maintenance	10,080			10,080	10,080		10,080
Subtotal	287,356		34,329	321,685	31,985	34,329	66,314
Capital Costs:							
Vehicles		3,290		3,290			
Total	\$287,356 (88%)	\$3,290 (1%)	\$34,329 (11%)	\$324,975 (100%)	\$31,985 (48%)	\$34,329 (52%)	\$66,314

\*This funding is training for community-based surveillance and is probably from a CDC grant.

<sup>18</sup> It should be noted that USAID also provided funding (\$300,000) in 2000 for procurement of equipment, travel, and training for integrated disease surveillance.

## 4.2.5 Estimated Total Costs of the National Immunization Program by Sources of Financing

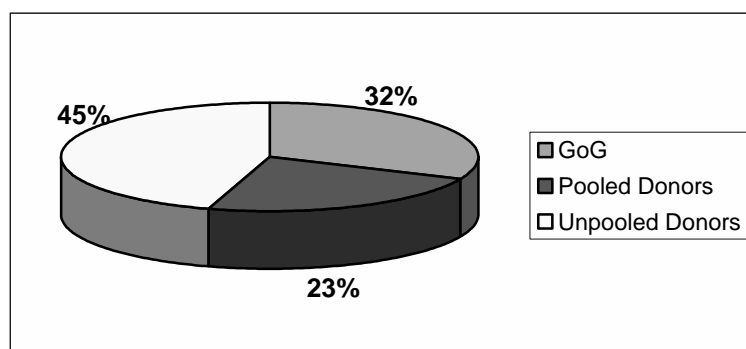
When the sources of financing for the total costs of the immunization program are examined, the donors contribute more than 60 percent (Table 17 and Figure 2), not surprising given the acceleration of polio eradication activities. When the program-specific costs are examined, donors finance more than 90 percent of total costs.

**Table 17. Annual Estimated Total Costs of Immunization Program by Source of Financing, 2000 (in US\$)**

	Total Costs			Program-specific Costs		
	GoG and Dist. Assem.	Donor Pool plus DFID Earmark	Non-pooled Donor	GoG and Dist. Assem.	Donor Pool plus DFID Earmark	Non-pooled Donor
Recurrent Costs:						
Personnel	2,227,491		918,622			
Vaccines		919,774	1,447,373		919,775	1,447,373
Supplies	34,563	568,094		34,563	568,094	
Transportation	132,774	187,967	232,241	132,774	187,967	232,241
Short-term Training			89,413			89,413
Social Mob/ Planning	961	119	657,127	961	119	657,127
Maintenance	24,958	49,535		24,958	49,535	
Subtotal	2,420,747	1,725,489	3,344,766	193,256	1,725,489	2,426,154
Capital Costs:						
Building	66,546					
Vehicles		99,520	180,452			
Equipment			89,411			89,411
Training	33,829					
Subtotal	100,375	99,520	269,863			89,411
<b>Total</b>	<b>\$ 2,521,122</b> (32%)	<b>\$1,825,009</b> (23%)	<b>\$3,614,639</b> (45%)	<b>\$193,256</b> (4%)	<b>\$1,725,489</b> (39%)	<b>\$2,515,565</b> (57%)

Note: Assumed that donor pool was 11 percent of GoG expenditures.

**Figure 2. Percentage Share of Total Costs by Source of Financing, 2000**



#### 4.2.6 Estimation of Cost-effectiveness Measures

The cost per dose, per fully immunized child and per capita were determined, assuming that the percentage of fully immunized children (FIC) was 65 percent<sup>19</sup> (Table 18). The cost per FIC for Ghana is \$16.63. When the cost per dose is compared to that of Cote d'Ivoire, it was found to be relatively similar (Kaddar, Tanzi, and Dougherty, 2000a). However, the cost of fully immunizing children is lower in Ghana, probably reflecting the undervaluation of salaries. A simulated total cost was also calculated, assuming that salaries were increased by 20 percent (see Annex B, Table 2). In this case, the cost per FIC would increase to \$17.50.

**Table 18. Cost-effectiveness Measures**

	Ghana		Cote d'Ivoire	
	Output	Cost-effectiveness Ratio	Output	Cost-effectiveness Ratio
Number of Doses Administered:				
Routine	6,134,900	\$0.60	NA	NA
NIDs	13,260,402	\$0.30	7,890,000	\$0.21/dose
Total	19,395,302	\$0.41	NA	NA
Number of FIC/Total	478,719 (65%)	\$16.63	393,740 (65%)	\$24.29
Total Population	18,412,247	\$0.43	15,695,251	\$0.61

#### 4.2.7 Adequacy of Current Financing Strategy

The current financing of the program appears to be adequate for obtaining vaccines and supplies for the routine immunization program. Its strategy of using a Vaccine Stabilization Fund, and earmarking some of the donor pool funds to purchase vaccines and supplies is ensuring that these commodities are purchased in a timely fashion. The use of a Vaccine Stabilization Fund also ensures that funding is available for vaccines when outbreaks or shortages unexpectedly arise.

Sources of finance for some routine immunization program components appear to be lacking. The program appears to have inadequate funding for transport and outreach as well as IEC activities. Regarding IEC materials, some were found for the NIDs but few were found at facilities that promote the benefits of routine immunization services. As noted earlier, funding for salaries is low since the devaluation of the cedi.

The financing of the NIDs has also not been adequate, particularly when the decision was made to intensify NIDs and go door-to-door. Funding for transport and other logistics at the local levels has sometimes been insufficient to cover all the costs.

<sup>19</sup> The percentage of fully immunized children under the age of 12 months is not routinely calculated in Ghana. However, because the Demographic and Health Survey 1998 found that the percentage of fully immunized children was 51 percent, the percentage in 2000 was assumed to be 65 percent.

## 5. Flows of Funding

This section presents findings on flows of funding for the immunization program from the central to the regional, district, and subdistrict levels and assesses how well the funding that is obtained at the national level is being distributed to the levels of service delivery. Data presented were collected through interviews and information from questionnaires collected at the district and regional levels.

The reader should keep in mind that the procedures used to allocate funding were changed somewhat in 2000 and 2001 after Ghana's financial crisis, which led to the devaluation of the cedi. (See Section 1 for more details.)

### 5.1 Modes of Financing Immunization

Modes of financing health services in Ghana are described in Table 19. These mechanisms include (1) the use of GoG checks to pay for salaries, (2) government transfers known as financial encumbrances (FEs) to pay for administrative costs, other recurrent costs, and infrastructure, and (3) government-financed exemptions from user fees for certain services and age groups. Many of these mechanisms have only been in effect since the financial crisis in 2000. The advantages and disadvantages are discussed in sections 5.2 and 5.3.

**Table 19. Government Mechanisms of Transferring Funding**

Mechanism of Funding	Description of Fund
Government of Ghana/Salaries, Item 1	<p><i>Source:</i> Government of Ghana budget</p> <p><i>Form:</i> Checks to regions and districts from the Accountant General of the Ministry of Finance (MOF)</p> <p><i>Pays for:</i> Salaries</p> <p><i>Decision-making process:</i> Budget request followed by parliamentary decision in the first quarter of the year.</p> <p><i>Disbursement:</i> Quarterly, directly paid by the MOF</p>
Government of Ghana/Administration, Item 2	<p><i>Source:</i> Government of Ghana budget</p> <p><i>Form:</i> FE through regional and district treasuries</p> <p><i>Pays for:</i> Travel allowances and overhead (electricity, water) at regional and district level; capital investment at national level.</p> <p><i>Decision-making process:</i> Budget request followed by parliamentary decision</p> <p><i>Disbursement:</i> Through the Ministry of Health Financial Controller, quarterly</p>
Government of Ghana/Service, Item 3	<p><i>Source:</i> Government of Ghana budget</p> <p><i>Form:</i> FE through regional and district treasuries</p> <p><i>Pays for:</i> Recurrent costs associated with service provision</p> <p><i>Decision-making process:</i> Budget request followed by parliamentary decision</p>

	<i>Disbursement:</i> Through MOH Financial Controller provided with cash through special arrangement with MOF, quarterly
Government of Ghana/Capital, Item 4	<p><i>Source:</i> Government of Ghana budget</p> <p><i>Form:</i> FE to district treasuries</p> <p><i>Pays for:</i> Infrastructure</p> <p><i>Decision-making process:</i> Budget request followed by parliamentary decision</p> <p><i>Disbursement:</i> From the MOF Treasury through district councils, subject to freezes, specified by item and limited in flexibility. Payment based on invoice.</p>
Exemption Fund	<p><i>Source:</i> GoG budget for services provided free of charge to exempted services (services for children under 5, immunization, antenatal care, care to those over 70 or to the very poor, and tuberculosis treatment).</p> <p><i>Form:</i> FE</p> <p><i>Pays for:</i> Flexible, as determined by the district health director</p> <p><i>Decision-making process:</i> Financial returns are generated by the districts and forwarded through the region to the national government for full or partial reimbursement. Each region has a ceiling imposed by the Treasury.</p> <p><i>Disbursement:</i> Through the Treasury. Irregular. Can be an advance. Is not matched to returns generated by districts but rather is based on funds available.</p>

A few other mechanisms are available for financing of the health sector (Table 20). These include the use of internally generated funds from user fees at the district and subdistrict levels. Other mechanisms include the use of checks to transfer donor-pooled funds, and the transfer of individual donor funds to district and subdistrict levels.

**Table 20. Mechanisms for Funding the Health Sector**

Internally Generated Funds (IGF)	<p><i>Source:</i> User fees and cash and carry payments for drugs.</p> <p><i>Form:</i> Cash paid to facility. Kept at the facility where it is recovered.</p> <p><i>Pays for:</i> Flexible terms of use but must be fully accounted for.</p> <p><i>Decision-making process:</i> Use determined by district health director and unit heads at district level.</p> <p><i>Disbursement:</i> Flexible</p>
Donor-pooled Funds/Health Fund	<p><i>Source:</i> Donors contribute approximately 60 percent of funds to a pool deposited with the Bank of Ghana.</p> <p><i>Form:</i> Checks paid to regions and districts as well as hard currency disbursements direct to procurement agencies for imported goods</p> <p><i>Pays for:</i> Flexible terms of use, according to plan of work agreed with donors.</p> <p><i>Decision-making process:</i> Use is determined in consultation with donors in periodic meetings at which 5-year and annual plans are agreed upon.</p> <p><i>Disbursement:</i> Through the Ministry of Health Financial Controller, quarterly.</p>
Programme Activity Funds (PROAC)	<p><i>Source:</i> Funds that the donor insists must be earmarked for a specific activity</p> <p><i>Form:</i> Check from donor to FC of MOH. FC then sends checks to regions/districts</p> <p><i>Pays for:</i> Specific activity agreed to by donor and MOH</p> <p><i>Decision-making process:</i> Grant agreement between donor and MOH</p> <p><i>Disbursement:</i> Through the MOH FC at the request of implementing health officials</p>
Donor-managed Funding	<p><i>Source:</i> Donor or donor-funded co-operating agency (CA)</p> <p><i>Form:</i> Direct payments from the donor or CA to the implementing health officials or to a vendor for procurement of goods</p> <p><i>Pays for:</i> Items identified in the agreement with the donor</p>

	<i>Decision-making process:</i> Variable, role of GoG is sometimes not well-defined <i>Disbursement:</i> Directly from donor or CA to health officials or vendors
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## 5.2 Special Aspects of Health Sector Finance in Ghana

Relative to other sectors, Ghana’s health sector is considered to be well off. Donor finance in Ghana is generally pooled, which results in lower transaction costs and a more coherent health sector budget. In addition, by acting together in concert with the Ministry of Health, the donors can exert considerable influence on the Ministry of Finance to safeguard health sector financing in times of crisis and to support a high priority for health sector spending. It is important to note that funding for polio National Immunization Days has usually been delivered as an earmarked grant through the PROAC mechanism (see above). In exceptional circumstances, as noted elsewhere in this report, it has been delivered directly with the attendant problems of assuring accountability to the GoG as well as to other stakeholders.

During the financial crisis of 2000, the health sector donors supported the Ministry of Health in its negotiations with the Ministry of Finance to protect the health budget. As a result of the negotiations, the Ministry of Finance deposits much of the MOH budget directly into a bank account administered by the MOH Financial Controller. (Salaries continue to be paid directly through the Ministry of Finance.) Under this arrangement, the MOH Financial Controller can issue cheques through the regions. This gives the Ministry of Health more control over disbursement and an easier disbursement process. In contrast, other ministries can only use FEs administered by the Ministry of Finance. The FEs can be frozen during the year in response to liquidity issues at central level. Also as a result of the negotiations, funds not spent by the end of the fiscal year can be retained, whereas FEs disappear at the end of the fiscal year if they are not spent.

As a result of this intervention, there is a higher level of expenditure in the health sector. Approximately 75 percent of the health budget was protected during the crisis, whereas other ministries saw their budgets cut to 10 percent or less. The portion that was not disbursed was the budget for infrastructure, which, though significant, is considered the lowest priority.

Although this is an interim measure, the Ministry of Health may seek to extend this arrangement. The Financial Controller’s office would like to continue this system and to receive 100 percent of health sector financing as a block. This will require convincing the Ministry of Finance that the Ministry of Health financial control is sound. However, doing so will free time in the Ministry of Finance, allowing it to divert its resources to monitoring.

The economic crisis also influenced the availability of foreign exchange. The Ministry of Health retained control of the hard currency it received from donors. The currency was kept in a separate Bank of Ghana account. In addition, the MOH requested that DFID retain foreign exchange in an offshore account for the purchase of strategic imports such as vaccines.

Another way the health sector is protected is through the guarantee of utilities. When the budget for recurrent costs is frozen, the government-controlled utilities are advised to continue services to the health sector so that hospitals, cold rooms, and other essential infrastructure retain electricity and water. This does not function without a certain amount of anxiety on the part of the concerned health staff, and there are occasional stoppages of water service to MOH offices.

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### 5.2.1 Salaries and the Ghana Health Service

Of the Ghanaian government's contribution to the health sector operating costs, approximately 70 percent are for salaries. Although the salary bill of the Ghana health sector is large, the number of personnel means that wages are not sufficient to maintain motivation and quality of service. This can be compensated for in some areas by supplementation with internally generated funds. However, in the absence of user fees for immunization, low wages remain a barrier to the delivery of quality immunization services. The Ghana Health Service was devised to cover health sector staff with different rules from the rest of the Ghanaian civil service. Unfortunately, there was no slack in the budget, and the GHS did not result in higher wages. Instead, staff are paid for "extra duty" hours, whether they are worked or not, in an effort to retain staff and stave off dissatisfaction. In some areas, unofficial user fees are charged by staff to cover the cost of transportation for outreach and other incidental costs, which are not covered by salaries.

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### 5.2.2 Cash Flow Impact on Planning and Budgeting at District Level

Because of delays in cash flow to the district level and uncertainty regarding the amounts to be disbursed each quarter, district level planning is by necessity ad hoc. Plans drawn up in advance often cannot be implemented as scheduled. Outreach and other activities, which require funds above basic salaries, are either postponed or financed through credit from suppliers and staff, or funded through internally generated funds in richer areas. Poorer regions often cannot access credit for such activities. When funds arrive late and in large amounts, absorptive capacity is overwhelmed. Where funds are delivered as FEs, they cannot be kept past the budget period, so they are quickly spent on such items as vehicle repairs, rather than directly on service provision.

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### 5.2.3 Cash Flow for National Immunization Days

National Immunization Days for polio eradication are financed separately from routine immunization and much of the funding comes from outside the health sector. Although funds do arrive before the NID dates, they usually do not arrive early enough to finance planning and training activities beforehand. Although district assemblies contribute financially to NIDs, this is generally not planned in advance as NIDs are considered to be the responsibility of the health sector. Therefore, funding is ad hoc and involves stretching local budgets. When NIDs are at the end of the year, the financial pressure can be acute.

NIDs are largely funded by WHO, UNICEF, Rotary, Japan, and USAID. These agencies require accounting for money spent to include submission of receipts for spending. Regions have not responded well to the request for receipts. The problem seems to be that volunteers are not signing (or giving a thumbprint) for their per diems. This could be because they are not getting the full amount, or it could be simply difficult to administer the collection of these receipts. At district level, several program managers stated that it is difficult to identify the source of the money, so it is hard to know which receipts should go to what agency. As a result, UNICEF and WHO have been unwilling to release the full NID funding for social mobilization in subsequent rounds.

Because of frustration with the banking system and the urgency of NID financing, one donor has experimented with direct payment of cash to the programme managers at district level. This has the danger of potentially encouraging corruption because it bypasses regional level control. The GoG would prefer that NIDs be financed through the MOH Financial Controller.

NID funds have also been held up through banking mishaps. In Greater Accra, money was transferred for the NID on time, but then the money was held up by the Bank of Ghana during the wire transfer. There have also been problems using cheques in some areas. The current system uses Barclay's banker's cheques, which seems to work better.

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#### 5.2.4 Deflation of the Cedi

Deflation of the cedi has had both positive and negative effects on the health sector budget. On the one hand, GoG funds are in cedis, so their buying power has stayed the same for domestic goods and decreased for the purchase of imported goods. On the other hand, the donor pool fund buying power has increased within Ghana. Because more than half the recurrent budget is from donor funds (pooled and earmarked), the health sector can actually gain buying power in devaluation. The MOH retains control of the foreign exchange from donors through a separate account at the Bank of Ghana. This can give it leverage in negotiations with the Ministry of Finance. For example, the donors have supported the Ministry of Health by insisting that the health budget be protected in times of financial crisis.

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#### 5.2.5 Fund Transfer Issues

As discussed above in regard to cash flow, the Ghanaian banking system can be slow at times, leading to distrust of wire transfers in some areas, and a dislike of cheques in others. Banks sometimes refuse to clear cheques until they are presented with the cancelled cheque as proof that it has actually been cleared by the system. Similarly, they can refuse to acknowledge a wire transfer until presented with hard evidence that it has been made. In the interval, the bank is collecting interest on the funds in transfer. Stories are circulating about NID funding that was lost in the banking system for six months.

Because of banking system weaknesses, a great deal of cash circulates outside the system and banks can become starved of cash. In cash-poor regions, local bank liquidity can prove inadequate when many districts come to cash NID cheques on the same day. This can lead to frustration, particularly when the cheques are late in arriving and are the bottleneck in the process.

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#### 5.2.6 Overall Cash Flow Trends

Planning and budgeting are very good. On the other hand, in general, funds do not flow to the end users on time, and the full amount budgeted is not received. Budgets are top-down based on national targets, but spending is determined by districts based on bottom-up priorities. Therefore, budgets and actual spending often do not match.

Due to macroeconomic issues, GoG funds do not flow uniformly throughout the year. The flow of funds is especially slow in the first quarter, before the budget is approved by parliament. There is an interim budget in the first quarter. This interim budget includes salaries, which are paid directly, and 20 percent of the total budget proposed to parliament. The second quarter budget theoretically is 30 percent of the total and the last two quarters 25 percent each. However, in practice, funds are not disbursed so evenly: Cash flow in the first two quarters is very slow. Flows speed up in the second half of the year, but this adversely affects the quality of implementation as districts rush to spend suddenly available funds. One quick and easy way to spend money is on vehicle repairs, so this item tends to be supported at the expense of other priorities at the end of the year. Approval of the budget

before the start of the fiscal year is a potential solution to this problem, but would involve a change in the national system of financial administration.

There is an election every four years. When a new government takes over, it tends to examine the proposed budget in detail. The new government that took over in 2001 took on this budget review, resulting in substantial delays in the approval of the national budget in 2001.

In contrast to the regular pattern of a cash flow peak at the end of the year, the 1999 and 2000 budgets were frozen at the end of the year due to liquidity issues. In these years there was actually less to spend at the end of the year as cash ran out. During the economic crisis, disbursement of government funds was sporadic and on a first come, first served basis, rather than based on priorities. As discussed earlier in this section, this was one of the principal arguments in favor of a sheltered MOH budget.

Donor-pooled funds are especially useful in bridging the cash flow gap at the beginning of the year. The majority of funds are released conditional on the receipt of statements from the districts on past spending.<sup>20</sup> Roughly 60 percent of districts submit their statements of expenditure on time in December. The rest tend to be a few weeks to one month late. Donor pool cheques are usually collected by mid February.

At the time of an International Monetary Fund review, the Bank of Ghana may not honor cheques. Even cheques from the donor-pooled funds may not be honored, as the Bank of Ghana holds these funds. This raises the question of whether the donor-pooled funds should remain in the Bank of Ghana. From a macroeconomic point of view, they should remain there, but from a practical MOH point of view, they may be more accessible if held elsewhere.

Liquidity problems in the Bank of Ghana may also slow the clearance of cheques written by the MOH Financial Controller to the regions and districts. In remote areas, the local bank may also have trouble meeting the cash requirements of several districts which arrive at the same time to cash cheques from central level.

Internally generated funds have helped Ghana improve recording and accounting and provide incentives for service quality. They may provide some level of financial sustainability for health services. However, they may be too expensive for the poor.

At present, the exemption policy does not result in sufficient subsidization of care for the very poor and for children. Districts often determine the exemption policy arbitrarily. Central government could provide greater subsidies to those districts that cannot access substantial internally generated funds and which serve a higher proportion of the very poor, but there is currently no capacity for determining resource allocation of this sort. Donor money could be used for exemptions, but in practice this is complex and hard to control. Of interest will be the study on the role of exemptions conducted by the Health Research Unit that will be released soon.

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<sup>20</sup> It should be noted that some of the donors (DANIDA and DFID) have indicated their willingness to de-link disbursement from receipt and review of expenditure statements, while most disbursements from the World Bank have gone directly to vendors.

## 6. Future Plans for the Program

This section presents projections of program costs of the National Immunization Program for the next five years under two scenarios – the first with the program continuing as is and the second incorporating the improvements and changes desired by the MOH. The section then discusses projected budgets and funding gaps.

### 6.1 Projected Costs of the Existing National Immunization Program

Table 21 shows the projections of the recurrent, variable, non-personnel costs of continuing the existing immunization program for the next five years (2001-2005). Projections are based on the estimated costs of the program in 2000 from Section 3 with an annual increase assuming the population would increase by 2.4 percent. Vaccine costs were assumed to decline after 2002 because only one set of NIDs for polio eradication would be conducted after that year if polio eradication were achieved. Assuming no changes, the program will cost the MOH approximately \$4.5 million annually in 2001 and 2002, with vaccines making up approximately 55 percent of total costs. After that, the estimated costs will be approximately \$3.5 million.

**Table 21. Recurrent, Variable, Non-personnel Costs of Continuing the Existing National Immunization Program, 2001-2005 (in US\$)**

Cost Category	2001	2002	2003	2004	2005	Total
Vaccines	2,423,959	2,482,134	1,764,653	1,807,004	1,850,372	10,328,122
Supplies	617,121	631,932	647,098	662,628	678,531	3,237,310
Transport	552,983	552,983	395,922	395,922	395,922	2,293,732
Short-term Training	89,413	89,413	52,062	52,062	52,062	335,011
IEC/Social Mobilization	468,237	468,237	253,767	253,767	253,767	1,697,776
Maintenance/Overhead	74,494	74,494	33,132	33,132	33,132	248,385
Total	4,416,176	4,489,162	3,241,619	3,299,501	3,358,772	18,805,230
Total w/inflation	\$4,416,176	\$4,623,837	\$3,439,033	\$3,605,454	\$3,780,327	\$19,864,828

### 6.2 Planned Program Improvements

Several improvements are planned for the immunization program. First, the program will continue to increase routine coverage through strengthening district health delivery systems with catch-up campaigns. Other plans include continued upgrading, replacement, and expansion of the cold chain to ensure that all facilities have up-to-date cold chain equipment, to reduce measles incidence, to reduce neonatal tetanus incidence, to prevent and control yellow fever, and to introduce hepatitis B vaccine into routine EPI. The projected costs of these improvements are shown in the following sub-sections.

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## 6.2.1 Strengthening District Health Service Delivery Systems

Besides the provision of regular static services and outreach to communities without health facilities that are already incorporated into the program, other activities that will strengthen district health delivery systems include periodic catch-up campaigns for hard-to-reach communities and areas with at-risk populations. Based on the 2000-2004 EPI strategic plan, at-risk populations include those with low coverage, frequent outbreaks of vaccine-preventable diseases (e.g., polio, measles, neonatal tetanus, yellow fever), poor surveillance information, densely populated areas, displaced persons, migrant populations, or persons living along borders or in areas with heavy migration.

A second way to improve the immunization program would be to generate consumer demand for immunizations through the promotion of immunizations. Some ways to do so would be (1) to produce IEC materials on the benefits of immunization to parents and (2) to develop radio and television spots on immunization benefits.

The estimations were conducted beginning in 2002, since the heavy involvement in polio eradication activities precludes many other activities in 2001. The assumption made is that the population will increase each year by 2.4 percent, leading to increases in the vaccines and supplies required each year. Vaccines included in the campaigns are BCG, DTP, OPV, measles, yellow fever, and tetanus toxoid (TT). Personnel costs were not added since they were not additional costs. However, if per diems will be paid to the personnel for these activities, these expenditures should be added in as well.

The estimated costs of these catch-up campaigns are shown in Table 22. The cost of strengthening the immunization program through IEC activities is estimated to be \$210,000.

**Table 22. Estimated Costs of Catch-up Campaigns (in US\$)**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>
Vaccines	94,048	96,305	98,616	100,983
Supplies	17,497	17,917	18,347	18,787
Transport	65,355	65,355	65,355	65,355
Social Mobilization	15,085	15,085	15,085	15,085
Training	1,500	1,500	1,500	1,500
Total	195,487	198,165	200,907	203,715
Inflation Factor	3%	3%	3%	3%
Total w/inflation	\$201,352	\$210,233	\$219,537	\$229,283

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## 6.2.2 Upgrading of Cold Chain Equipment

The country has a three-year plan to upgrade its cold chain equipment, starting in 2000. Equipment is being purchased for subdistricts both to increase access to services in areas without cold chain equipment and to upgrade existing equipment. In addition, some equipment is being given to private sector providers of immunizations that currently do not have any. These purchases began in 2000 and will continue for the next two years. Table 23 presents the costs of procuring the cold chain equipment in the years 2001 and 2002.

**Table 23. Costs of Cold Chain Equipment to Be Procured in 2001 and 2002**

	Type of Equipment	Quantity	Unit Cost	Subtotal	Freight and Handling	Total Cost
2001	RCW 50 EG-CFC Free	500	1141.3	570,650	85,598	\$656,248
	Spare Parts	50	47.3	2,365	355	\$ 2,720
	Total	550		573,015	85,952	\$658,967
2002	RCW 50 EG-CFC Free	200	1141.3	228,260	34,239	\$262,499
	Spare Parts	20	47.3	946	142	\$ 1,088
	Total	220	1188.6	229,206	34,381	\$263,587

### 6.2.3 Measles Control

Ghana had 23,000 cases of measles in 2000, the highest incidence of any of the vaccine-preventable diseases. One of the EPI program objectives is to lower the incidence of this disease among children. The activities planned to lower measles incidence include raising routine measles coverage to at least 80 percent in 80 percent of districts by 2004, conducting supplemental measles immunization campaigns in high-risk areas, conducting nationwide measles mass campaigns beginning in 2003, improving surveillance, and monitoring mortality caused by measles. The target population for this campaign is children nine months through 14 years of age since 50 percent of measles cases occur in children who are aged five years or greater. The number of regions targeted by the campaign will be gradually increased to include all regions by 2004. Table 24 shows that costs would increase substantially in 2004 when the campaign expands nationwide. In 2005, periodic campaigns would take place in places with relatively low routine coverage.

The assumption made here is that measles campaigns and surveillance would cost a similar amount, as did those in the polio eradication campaigns. Other costs included those of auto-destruct syringes.

**Table 24. Estimated Additional Cost of Measles Control in Ghana, 2001-2005**

	2001	2002	2003	2004	2005
Vaccines	\$138,864	\$142,197	\$284,394	\$1,491,046	\$305,366
AD Syringes	\$52,650	\$53,914	\$107,828	\$565,328	\$115,779
Social Mobilization	\$9,469	\$9,469	\$18,938	\$47,345	\$18,938
Transport	\$23,930	\$23,930	\$47,860	\$119,650	\$47,860
Training	\$4,093	\$4,093	\$8,186	\$32,744	\$8,186
Surveillance	\$4,643	\$4,643	\$9,286	\$46,430	\$9,286
Total	\$233,650	\$238,246	\$ 476,492	\$2,302,543	\$ 505,415
Total w/inflation	\$233,650	\$245,394	\$505,511	\$2,516,051	\$568,850

### 6.2.4 Reduction of Neonatal Tetanus Incidence

Ghana plans to reduce neonatal tetanus (NNT) incidence to less than one case per 1000 by 2004. A detailed NNT Elimination plan has been prepared, with 59 districts identified as high-risk districts. The activities planned for this include: health education to reduce the gap between TT2 coverage (52

percent in 1998) and antenatal care coverage (89 percent), special efforts to target women who do not attend antenatal care, supplemental immunization campaigns in priority districts and/or high risk areas/populations. Table 25 shows the estimated costs of the neonatal tetanus immunization activities, assuming an annual increase of population of 2.4 percent. The costs increase in 2003 when the target population is doubled.

**Table 25. Cost of Activities to Lower Neonatal Tetanus**

	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>
Health Education, including Targeting Non-antenatal Care Users	3,371	3,371	10,113	10,113	15,170
Supplemental Immunization Campaigns	75,407	75,407	150,814	150,814	150,814
Total	\$78,779	\$78,779	\$160,927	\$160,927	\$165,984
Total w/ Inflation	\$78,779	\$81,142	\$170,727	\$175,849	\$186,816

## 6.2.5 Yellow Fever Control

Ghana plans to control its yellow fever outbreaks through the following activities: (1) raise routine yellow fever coverage in high-risk populations, (2) implement mass vaccination campaigns in high risk populations, (3) include yellow fever epidemic preparedness and management plans, (4) introduction of surveillance, (5) implement vector control interventions in high risk areas, and (6) supplemental immunizations to control outbreaks. The projected costs, shown in Table 26, assume a population growth of 2.4 percent. For supplemental immunizations, it is assumed that one outbreak could happen during this five-year period and the costs are spread out over the five years.

**Table 26. Estimated Costs of Yellow Fever Reduction Activities, 2001-2005**

	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>
Raise Routine Yellow Fever Coverage	\$32,705	\$33,152	\$33,610	\$34,079	\$34,560
Surveillance	\$ 4,643	\$ 4,643	\$ 4,643	\$ 4,643	\$ 4,643
Implement Vector Control	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
Supplemental Immunizations	135,081	138,089	141,170	144,325	147,555
Total	\$182,428	\$185,885	\$189,424	\$193,048	\$196,759
Inflation Rate		3%	3%	3%	3%
Total w/Inflation	\$182,428	191,461	200,960	210,948	221,454

## 6.2.6 Introduction of New Vaccines

Ghana has successfully applied for Global Fund for Children's Vaccines (GFCV) funding to introduce Hepatitis B vaccine. As mentioned earlier, due to limited worldwide availability of the combination vaccine DTP-Hepatitis B, the EPI program has had to choose between two other

presentations: monovalent Hepatitis B vaccines and the pentavalent combination: DTP-Hepatitis B-HiB. The MOH and the Interagency Coordinating Committee have chosen to introduce the pentavalent combination. While the costs of the new vaccine will be covered for the first five years, the MOH will then need to find sources of funding after that time. In Table 24, the costs of different presentations of Hepatitis B vaccine are presented, assuming costs that have been negotiated by Global Alliance for Vaccines and Immunization (GAVI). The costs of reconstitution needles are also added. However, the additional costs of cold chain storage are not included. The unit costs are based on current prices that have been negotiated with manufacturers for the next three years (see Annex B, Table 3).

As can be seen from Table 27, the total cost is relatively low for monovalent Hepatitis B, about three times as high for the DTP-Hepatitis B combo, and about nine times as high for the DTP-Hepatitis B-HiB combo.

**Table 27. Estimated Annual Expenditures Required for Hepatitis B Vaccines, by Presentation, 2001**

	<b>Monovalent Hepatitis B</b>	<b>DTP-Hepatitis B</b>	<b>DTP-Hepatitis B-HiB</b>
Unit Cost	0.28	1.10	3.25
Target Population	736,490	736,490	736,490
Wastage	25%	25%	15%*
Desired Coverage	85%	85%	85%
Subtotal	699,386	2,747,586	7,202,320
Syringes	173,996		
Minus Cost of DTP	-	103,674	103,674
Cost of Reconstitution Needles	8,545	8,545	42,726
<b>Grand Total</b>	<b>\$881,927</b>	<b>\$2,652,457</b>	<b>\$7,141,372</b>

Note: Since the probable wastage rate for two-dose vials is not known due to lack of field tests and 5 percent is the estimated rate for one-dose vials, an intermediate wastage rate was assumed.

### 6.3 Summary of Estimated Expenditures Required for the Planned Improvements

Table 28 shows the total outlays required for the national immunization program over the next five years with the improvements planned. The costs of the “basic” program decrease in 2003 since it is assumed that fewer activities for polio eradication will take place after 2002.<sup>21</sup>

<sup>21</sup> Polio is expected to be eradicated in 2002.

**Table 28. Estimated Expenditures of the National Immunization Program with Planned Additional Improvements, 2001-2005**

Improvement	2001	2002	2003	2004	2005	Total
"Basic" Program	4,416,176	4,489,162	3,241,619	3,299,501	3,358,772	18,805,230
Recurrent Costs of Improvements:						
Catch-up Campaigns and IEC	-	405,487	408,165	410,907	413,715	1,638,274
Measles Control	233,650	238,246	476,492	2,302,543	505,415	3,765,346
Neonatal Tetanus Reduction	78,779	78,779	160,927	160,927	165,984	645,396
Yellow Fever Control	182,428	185,885	189,424	193,048	196,759	947,544
New Vaccines*	3,570,686	7,312,765	7,488,271	7,667,990	7,852,022	33,891,734
Capital Costs of Improvements:						
Upgrading the Cold Chain	152,221	156,788	161,491	166,336	171,326	808,262
Minus Cost of DTP	51,837	106,162	108,710	111,319	113,990	
<b>Total</b>	<b>\$8,582,103</b>	<b>\$12,895,625</b>	<b>\$12,215,193</b>	<b>\$14,395,885</b>	<b>\$12,971,558</b>	<b>\$61,060,364</b>
Total w/Inflation	\$8,582,103	13,282,493	\$12,959,099	\$15,730,773	\$14,599,602	\$65,154,071
Percent Increase	94%	187%	277%	336%	286%	225%

\*Calculation assumes a unit price of \$3.25 for all five years.

The projections indicate that the cost of the improvements will cause the total cost of the program to increase annually from 94 percent to 336 percent, largely due to the additional costs of introducing the new combo vaccine.

## 6.4 Projected National Immunization Program Budget and Funding Gap

To estimate the current government funding for the immunization program, the noninflated estimated program costs were used as a basis. To project available government funding for the immunization program for the next five years, potential funds for vaccines available from the GoG's World Bank loan are included. The projected increase in government contribution of 3 percent assumes an annual economic growth rate of 5 percent based on Ministry of Finance's assumptions<sup>22</sup>, minus a population growth rate of 2 percent. However, it should be noted that if economic growth is less than expected and lower than population growth, no increase in the government contribution would be likely.

The gap between potential government funding and total expenditures with improvements if DTP-HepB-HiB is introduced is shown in Table 29.<sup>23</sup> It ranges from \$9.2 million to \$11.6 million, assuming that the program will continue to use the DTP-HepB-HiB. If, however, the country switches instead to another combo such as DTP-HepB (see Table 30), the gap will be considerably smaller, ranging from \$4.5 million to \$6.8 million. It will be even smaller if the monovalent Hepatitis B option is used, ranging from \$2.2 million to \$4.4 million (see Table 31). Figure 3 illustrates the gaps in government funding, by option.

<sup>22</sup> The Ministry of Finance is assuming that the real growth rate will be 4.5 percent in 2001, 5.5 percent in 2002, and 6 percent in 2003.

<sup>23</sup> It should be noted, however, that the estimates do not take into account the estimated costs of additional cold chain storage that may be required to introduce this vaccine.

**Table 29. Program and Projected Government Funding for Program Expenditures for the Immunization Program if DTP-HepB-HiB is Introduced, 2001-2005**

	2001	2002	2003	2004	2005	Total
Total Basic Expenditures	4,416,176	4,489,162	3,241,619	3,299,501	3,358,772	18,805,230
Additional Cost Improvements if DTP-HepB-HiB	4,165,927	8,271,788	8,776,160	10,790,432	9,191,230	41,195,537
Total w/ Improvements	8,582,103	12,895,625	12,215,193	14,395,885	12,971,558	61,060,364
Total Expenditures w/Inflation Factor	8,582,103	13,282,493	12,959,099	15,730,773	14,599,602	65,154,071
GoG Funding	2,596,139	2,674,023	2,754,244	2,836,871	2,921,977	13,783,254
World Bank Funding	599,425	613,811	632,226	647,399	662,937	3,155,798
Total Funding	3,195,564	3,287,834	3,386,470	3,484,270	3,584,914	16,939,052
Difference between Government Funding and Total Expenditure if DTP-HepB-HiB	\$5,386,539	\$9,994,659	\$9,576,312	\$12,250,274	\$11,018,550	\$48,226,335

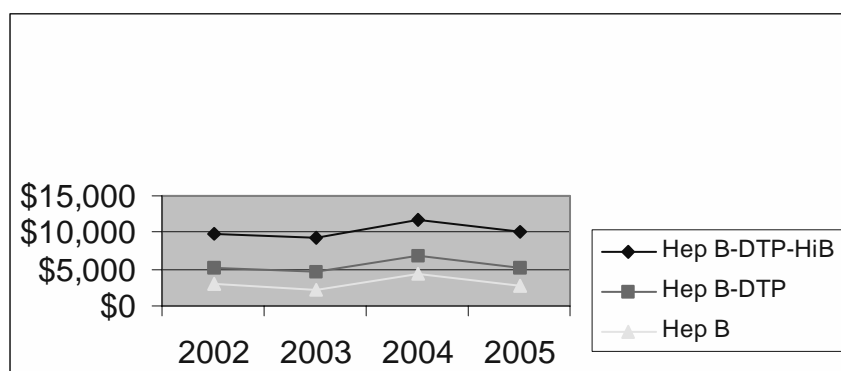
**Table 30. Program and Projected Government Funding for Program Expenditures for the Immunization Program if DTP-HepB is Introduced in 2002, 2001-2005**

	2001	2002	2003	2004	2005	Total
Total Basic Expenditures	4,416,176	4,489,162	3,241,619	3,299,501	3,358,772	18,805,230
Additional Cost of Improvements if DTP-HepB	4,217,764	3,840,075	4,238,087	6,143,445	4,432,715	22,820,250
Total w/ Improvements	8,582,103	8,329,238	7,479,706	9,442,946	7,791,487	41,625,479
Total Expenditures w/Inflation Factor	8,582,103	8,579,115	7,935,220	10,318,562	8,769,388	44,184,387
Difference between Government Funding and Total Expenditure if Use DTP-HepB	\$5,386,539	\$5,291,280	\$4,552,433	\$6,838,063	\$5,188,336	\$27,256,651

**Table 31. Program and Projected Government Funding for Program Expenditures for the Immunization Program if Monovalent HepB is Introduced in 2002, 2001-2005**

	2001	2002	2003	2004	2005	Total
Total Basic Expenditures	4,416,176	4,489,162	3,241,619	3,299,501	3,358,772	18,805,230
Additional Cost of Improvements if Monovalent HepB in 2002-2005	4,165,927	1,692,382	2,038,849	3,891,425	2,126,647	13,915,230
Total w/ Improvements	8,582,103	6,181,544	5,280,468	7,190,926	5,485,419	32,720,460
Total Expenditures w/Inflation Factor	8,582,103	6,366,991	5,602,048	7,857,719	6,173,888	34,582,748
Difference between Government Funding and Total Expenditure if Use Monovalent HepB	\$5,386,539	\$3,079,156	\$2,219,262	\$4,377,220	\$2,592,836	\$17,655,013

**Figure 3. Gap in Government Funding and Total Expenditure, 2002-2005 (in US\$000s)**



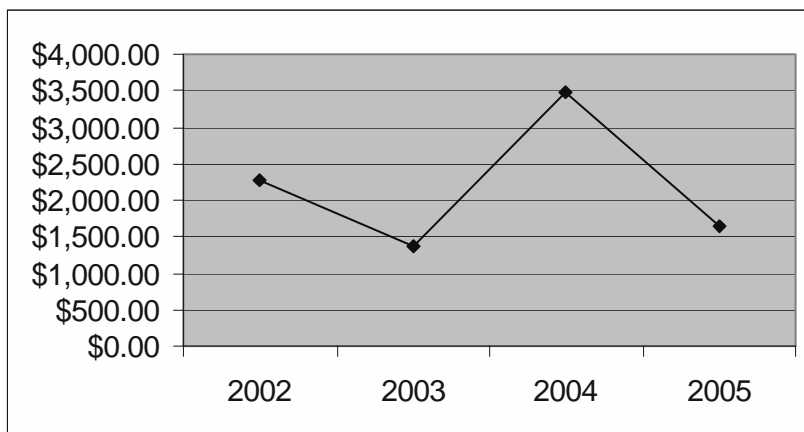
If, however, the funding gaps are calculated taking into account GAVI funding for the new vaccines and USAID funding for cold chain equipment, then the gaps are substantially smaller, as can be seen in Table 32 and Figure 4.

The adequacy of financing of the funding gap between available government funding and the basic program with improvements will depend on whether donors and other sources will continue to support the program. The amount that will require funding from donors and other sources will become much larger when the funding from GAVI ends after five years.

**Table 32. Gap between Basic Expenditures and Government Funding Taking into Account GAVI and USAID Funding Commitments**

	2001	2002	2003	2004	2005	Total
Total Basic Expenditures	4,416,176	4,489,162	3,241,619	3,299,501	3,358,772	18,805,230
Net Expenditures of Improvements without costs of new vaccines and cold chain equipment	\$494,857	\$908,397	\$1,235,008	\$3,067,425	\$1,281,873	\$6,987,560
Total Net Expenditures	4,911,033	5,397,559	4,476,627	6,366,926	4,640,645	25,792,790
Total Net Expenditures/ inflation Factor	4,911,033	5,559,286	4,749,253	6,957,312	5,223,087	27,400,171
GoG Funding	2,596,139	2,674,023	2,754,244	2,836,871	2,921,977	13,783,254
World Bank Funding	599,425	613,811	632,226	647,399	662,937	3,155,798
Total Funding	3,195,564	3,287,834	3,386,470	3,484,270	3,584,914	16,939,052
Gap between Government funding and net expenditure	1,715,469	2,271,651	1,366,467	3,476,813	1,642,035	12,942,024

**Figure 4. Gap in Funding Taking into Account GAVI and Other Funding Commitments (US\$000s)**





## 7. Options for Building a Sustainable Immunization Program in Ghana

This section explores options for building a sustainable immunization program. These include ways to reduce costs of the program through improving the efficiency of the program, changing the mix of financing of the program, and mobilizing additional resources for the program.

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### 7.1 Ways to Reduce Current and Future Program Costs

Some ways to improve the efficiency of the program and lower costs are explored in this section.

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#### 7.1.1 Improving Vaccine Management

Both the 1998 EPI assessment and field trips to districts for this study indicated that vaccine management can be improved – i.e., some sites have too much or too little vaccine and shortages in vaccines and other supplies sometimes take place. Some ways in which the program can be enhanced include improvements in vaccine distribution and reductions in vaccine wastage.

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##### 7.1.1.1 Improving Vaccine Distribution System

Distribution of vaccines and supplies in Ghana is based on a “push” system. Vaccine needs at the district level are determined at the central or regional level based on forecasts of needs. This method of distribution has been inadequate because it does not take into account poor estimates of population, variations in wastage rates, and other factors that can affect utilization rates. The result is that districts often have the inadequate or surplus quantities of vaccines and supplies. If a different system is introduced such as a “pull” system that is based on better estimates of population, wastage rates and other factors, the system would work better and some wastage would be reduced.

Another problem that has been identified is that an inadequate number of AD syringes is provided with the vaccines, possibly because cold van drivers prefer not to transport needles and syringes.<sup>24</sup> One way to avoid this problem is to bundle AD syringes with the vaccines.

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##### 7.1.1.2 Reducing Vaccine Wastage Rates

The 1998 EPI assessment indicated that some wastage of vaccines is taking place. Some ways to reduce wastage are: (1) increase attendance at sessions through such strategies as increased use of IEC, (2) increase use of WHO-recommended opened vial policy, and (3) ensure that children are the right age for the particular antigen.

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<sup>24</sup> The other possibility is that some pilferage of needles and syringes is taking place.

Wastage is high when attendance is low at immunization sessions. If the average number of children that attend each session can be increased, the amount of wastage of vaccine will be decreased. On the other hand, reluctance by health workers to open vaccine vials when only a few children attend a session can also lead to reductions in access to immunization services. A better strategy is for the program to introduce IEC materials that could increase awareness of session times and frequency that could increase attendance at sessions rather than refusing immunizations to children.

The revised multi-dose vial policy involves using vials of vaccines after they have been opened and helps reduce vaccine wastage. The policy is already in effect in Ghana, but it is only used sporadically. As cold chain equipment becomes more widely available, it will be easier to implement this policy and reduce wastage. The policy applies to certain vaccines: OPV, DTP, Hepatitis B, and liquid formulations of Hib vaccines.

Finally, when children's ages are not calculated correctly, they may be given an immunization at the wrong age when it is not effective, also leading to wastage of vaccines.

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### **7.1.2 Improvements in Health Worker Motivation**

Health personnel face several difficulties in carrying out their responsibilities. Irregular and inadequate staffing is found at the subdistrict and district levels. In addition, salaries are low, especially after the devaluation of the cedi. In addition, personnel often need to pay for their own transportation to provide outreach services and are not reimbursed promptly or fully. The result is that many workers have low levels of motivation to carry out their jobs effectively and efficiently.

Another way to motivate health workers would be to provide health insurance for them. In interviews, the workers indicated that at times when they become ill, they cannot cover the costs of their own medical bills.

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## **7.2 Changing the Mix of Financing and Mobilizing Additional Resources for the Immunization Program**

In order for the program to pay for its planned improvements and ensure that its funding is adequate if any of the donors reduces their current level of funding, potential ways to change the mix of financing of the program should be assessed.

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### **7.2.1 Increasing Central Government Budget Allocations**

The central government has been constrained in the last few years as to the amount of funding that it can allocate to the immunization program for two reasons: (1) the devaluation of the cedi, and (2) high debt servicing obligations. At this time, it is paying for personnel salaries, some operational costs, building costs, and long-term training but does not pay for other costs of the program such as vaccines, AD syringes, social mobilization, vehicles, and equipment.

The potential for the central government to increase its contribution has been low, given its macroeconomic situation. However, in its interim Poverty Reduction Strategy Paper: 2000-2002, the Ministry of Finance has forecast annual rates of economic growth ranging from 4.5 percent in 2001 to 5.5 percent in 2002. In addition, Ghana has just chosen to join HIPC and be relieved of some of its

debts. After it has become part of HIPC, it will be less constrained in its ability to spend on social services and should be able to provide more funding for cost-effective health services such as immunization services (see Fairbank et al. 2000).

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### **7.2.2 The Role of Donors and International Organizations**

Donors and international organizations play an important role in providing support to the national immunization program. Besides the provision of technical assistance, they are an important source of finance for the program. It seems likely that they will continue to provide support for the program for the next several years. However, some of the donors have indicated that they would prefer to provide all of their funding through the pooled fund rather than earmark some of these funds for commodities such as vaccines and AD syringes.

The GoG has been using the World Bank loan sporadically. If it does not want to increase its debt and charge future generations for its present short-term needs, it may want to limit the use of its loan to purchases of investment/capital goods for the immunization program rather than for short-term costs such as vaccines.

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### **7.2.3 The Role of the Private Sector**

As part of the reforms taking place in the health sector, the MOH wants to encourage greater use of the private sector to provide health services, including immunizations. The MOH has begun to conduct training for private midwives and private practitioners. It also is providing vaccines, supplies, and some cold chain equipment to these providers. The relationship between the private and public sector is still tenuous but deserves increased attention since considerable potential exists for involvement of the private sector and for potentially lowering the costs of service delivery to the public sector over time.



## 8. Summary, Conclusions, Lessons Learned and Recommendations

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### 8.1 Summary of the Main Findings

The main findings of the study are as follows:

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#### 8.1.1 Costs

The estimated total cost of the national immunization program, including NIDs and surveillance, was about \$8.0 million in 2000 – about \$0.41 per dose, \$16.63 per fully-immunized child, and \$0.43 per capita. Forty percent of total cost was for personnel, 30 percent for vaccines, and 6 percent was for capital costs. The estimated total cost of the routine EPI component of the national program was \$3.7 million with personnel comprising 42 percent, vaccines 25 percent, and capital goods 8 percent. The estimated total cost of NIDs was about \$3.9 million, about 49 percent of total program costs.<sup>25</sup> The largest cost component of NIDs was vaccines (37 percent), followed by personnel (34 percent) and social mobilization (16 percent). The costs of surveillance activities were about \$0.3 million and went mostly towards personnel time (79 percent). The cost of the national immunization program represents approximately 5.6 percent of total expenditures on health.

The recurrent, variable non-personnel costs of the program, for which the Ministry of Health must find financing each year, are approximately \$4.3 million, or about 55 percent of total estimated costs; vaccines are about 55 percent of these costs.

The annual cost of improvements proposed for the national immunization program in 2001-2005 range from a annual total of \$650,000 to \$3,200,000 for catch-up campaigns, disease control campaigns, and cold chain improvements, to higher costs for the introduction of new vaccines. The cost of adding new vaccines is substantial and will vary, depending on the presentation of the vaccine. If the DTP-HepB-HiB presentation is used, the new vaccine will cost \$7.3 million to \$7.9 million for a full year; if DTP-HepB is used, the new vaccine will cost \$2.8 million to \$3.1 million; and if HepB is used, the new vaccine will cost \$0.7 to \$0.8 million. Cost savings can be realized in three ways: (1) improving vaccine distribution system, (2) decreasing vaccine wastage; and (3) motivating health workers to increase efficiency.

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<sup>25</sup> These costs make up a larger percentage of total costs than found in other PHR studies because two sets of NIDs rather than one set were conducted.

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### 8.1.2 Financing

The shares of the sources of finance for the national immunization program were the following: GoG and district assemblies (32 percent); the donor pool (23 percent), and non-pooled donors (45 percent). Sources of funding for the routine immunization program, NIDs and surveillance differ.

The sources of funding for the routine immunization program, NIDs and surveillance differ. For the routine immunization program, the largest source is the GoG (49 percent), followed by DIFD (41 percent)<sup>26</sup>, donor pool (6 percent), and other donors (4 percent). For the NIDs, however, the main source of funding is donors (87 percent), followed by the GoG, (12 percent) and then district assemblies (1 percent). The GoG funds the majority of costs of surveillance activities (79 percent), since they are comprised largely of personnel costs.

If the sources of funding for the program-specific costs are examined, however, the picture is different. Program-specific costs are those not shared by other services; these do not include costs of personnel, buildings, and vehicles. Donors are paying for the most of the program-specific costs. They pay for 79 percent of costs of the routine immunization program, 98 percent of the costs of NIDs and 52 percent of the costs of surveillance.

The GoG has been asking some donors to earmark some of their funds for the purchase of vaccines and other supplies rather than put all of their contributions into the donor pool. While this is a reasonable short-term strategy for purchasing immunization commodities, over the long-term, a more consistent way of paying for these commodities should be determined.

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### 8.1.3 Flows of Funding

Key findings were that late disbursement affects program implementation including routine EPI coverage and NID social mobilization. Because the districts do not have a way of knowing the next year's allocation to the health sector, their budgets and plans take on a "wish list" quality. Sometimes as little as a quarter of the planned budget needs are met. The unreliability of disbursement in terms of timing and amounts results in ad hoc planning by districts.

In addition, cash flow peaks do not correspond to the optimal time for outreach as determined by the weather. Late government funds and a heavy administrative load limit outreach in the first quarter. In February, donor funds can be used for outreach. These funds are usually supplemented by government funds from March to May. In June, the rains start, limiting travel. In August and September, government funds and donor funds can again be used for outreach. Fourth quarter budget freezes due to liquidity problems can limit travel for outreach at the end of the year.

Decentralization and the sector-wide approach have greatly improved the financial control, budgeting and planning process in the Ministry of Health, although some vertical initiatives, such as the guinea worm program, have suffered.

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<sup>26</sup> Although DFID contributes most of its aid through pooled funds, some of its assistance was earmarked by the GoG in 2000 to pay for vaccines and supplies.

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#### 8.1.4 Future Financing

In the next five years, improvements to the immunization program can result in funding gaps as high as \$12.2 million per year due to the cost of the new vaccines that are being introduced. The cost of increasing coverage through the use of catch-up campaigns is relatively low while the cost of introducing new vaccines is relatively high. Since some of the funding for these expenditures has already been committed by GAVI (GFCV) and by other donors (e.g., USAID for cold chain equipment), the actual gap between available funding and additional expenditures for the program with improvements is smaller during the next few years.

However, GAVI funding will end after five years. It will be important for the policymakers and planners to plan how to finance the costs of the vaccines being introduced when GAVI funding will end. MOH policymakers and planners should carefully consider the implications of using any particular presentation of Hepatitis B in light of this financial need.

It seems likely that key donors and international organizations will continue to contribute to the immunization program, both through pooled and unpooled mechanisms. However, some fluctuations in funding are likely to occur as the program shifts from its concentrated effort on polio eradication to other program improvements.

In addition, now that Ghana is becoming a HIPC country, it may have some leeway to increase its contribution to the immunization program to increase its stability over time.

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#### 8.1.5 Impact of Health Reform on Immunization Program

As mentioned above, the impact of health reform on flows of funding for the immunization program has been for the most part favorable. The sector-wide approach has had a very positive effect on accountability in the health sector, reduction in transaction costs, sound planning and budgeting, and the protection of the health sector budget as a high priority within the government of Ghana. In addition, decentralization in general appears to have had a largely favorable impact since local program managers have more access to funding and additional mechanisms through which to receive their funding.

District assemblies are not yet giving any of their funding to routine immunization services. While they provide some funding to support NIDs, they do not appear to understand the benefits of supporting the routine immunization program. Some education efforts to explain the benefits of the immunization program to district assembly members should be undertaken.

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#### 8.1.6 Role of the Inter-agency Coordinating Committee

The ICC was formed outside of the SWAP in order to respond to the planning needs of polio eradication, applying for GAVI funding and resolving other issues of the immunization program. The ICC should consider mechanisms to allow for GAVI to be more closely associated with the process of the sector-wide approach.

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## 8.2 Conclusions and Lessons Learned

The Ghana national immunization program has been successful in increasing its coverage in the last few years. The GoG is now financing approximately 49 percent of its routine immunization program and 32 percent of the total costs of its program.

The program use a temporary mechanism for financing commodities in 2000. It asked donors to use “earmarked funds” to finance many of its recurrent costs such as vaccines and AD syringes and needles. However, the country intends to use other mechanisms to finance its program in order to increase its financial sustainability. In 2001, it is using its World Bank (International Development Association) loan to pay for these commodities.

Flows of funding from the central level to the district level were found to be late and unpredictable. The implementation of routine immunization activities is impeded by the irregularity of flows of funding. In addition, cash flow peaks do not correspond to the optimal time for outreach seasonally.

Irregular cash flow is having a damaging effect on planning and program implementation. This impact is worse in poorer areas where financial constraints are tighter and there is less access to credit from suppliers and staff. Irregular cash flow can lead to inappropriate resource allocation away from critical services such as outreach. Revolving funds at regional or district level are a possible mechanism for regularizing cash flow, but other options should also be explored.

The GoG may be able to increase its funding for recurrent costs of the immunization program. Since its projected rate of increase in economic growth ranges from 4.5 percent to 5.5 percent, there is a potential for it to increase its contribution to the program. In addition, more funds should become available after Ghana becomes a HIPC country. Another potential source of funding is the district assemblies.

The GoG has begun a policy of promoting the use of the private sector to provide immunizations and/or immunization support. This sector is likely to become more important over time and potentially could lower costs of service delivery for immunization as its share of target population served becomes larger.

Shortages of vaccines and AD syringes were found in the Northern and Ashanti Region, even though no vaccine shortages existed at the central level. Few materials for IEC for the routine program were observed during the field visits. Some funding for IEC activities should also be sought.

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## 8.3 Recommendations

The MOH should develop a plan for the introduction of new vaccines, with a consultation and consensus building process that involves donors and international organizations. In this plan, it should consider all of the issues involved regarding the presentation of new vaccines that it introduces. However, it should base its choice of vaccines in later years on an analysis of burden of disease for Ghana and financial considerations. It will be important for this planning to be conducted with the involvement of the ICC to ensure that future funding needs are anticipated. If the program chooses to continue using DTP-HepB-Hib, it will need to develop a plan to pay for this vaccine after GAVI funding ends.

The consideration and analysis of costs should be included in the program decision-making process on a more systematic and regular basis, along with considerations of effectiveness and quality.

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### **8.3.1 Vaccine Procurement and Supply**

The MOH should develop a long-term plan for procurement of immunization program commodities in light of its sector-wide procurement process.

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### **8.3.2 Financing**

In order to ensure HIPC funding is considered for the national immunization program, a poverty reduction strategy paper identifying the immunization program as one of the interventions should be prepared (see Fairbank et al. 2000 for examples).

An educational campaign should be developed for district assembly members on the benefits of providing funding to routine immunization programs.

Funding should be increased for transport for outreach and IEC materials as well as for logistics for NIDs.

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### **8.3.3 Program Management**

To improve program logistics, build in contingencies for problems such as vehicle breakdown of cold vans to ensure that vaccine shortages do not occur.

Change the allocation of vaccines and supplies to be based on a needs-based system rather than a “push” system. With such a system, fewer shortages or oversupply should occur.

The use of AD syringes for the immunization program should be evaluated within the context of the use of needles and syringes for other health services. If the program chooses to continue using the AD syringes and needles, it should ensure that an adequate supply is available through bundling of vaccines and needles and syringes.

Some incentives should be provided to health workers to encourage good performance and improve the efficiency of the program.

The national immunization program should plan to generate consumer demand for immunizations through increasing the number of IEC activities for routine immunizations.

A burden of disease study should be conducted for HiB in order to assess the impact of the vaccine on mortality and whether its use should be continued.

The feasibility of establishing a link between the ICC and the SWAP should be assessed.

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### 8.3.4 Flows of Funding

Measures should be taken to regularize cash flow to the districts throughout the year so that plans can be implemented as envisioned and so that absorption capacity is not overwhelmed in periods of rapid cash flow. Cash flow should particularly be ensured during the dry season, which is the optimal time for outreach activities.

Although investment in infrastructure may be suspended temporarily in a crisis, it is vitally important that infrastructure investment be re-established. The SWAP partners should ensure that adequate provision is made and that infrastructure cuts do not become chronic.

The financial service that staff and suppliers provide to the immunization program through the extension of credit should be recognised and rewarded. It has proven essential to the provision of continuous service.

The payment mechanisms that were begun in 2000 in response to the economic crisis, i.e., checks and/or wire transfers or cash (depending on district), are preferred to the FEs as a disbursement mechanism. Bearing in mind the macroeconomic considerations, consideration should be given to retaining the current system of disbursement through the Ministry of Health Financial Controller rather than through the Ministry of Finance Treasury when possible.

NID financing from districts should be built into district budgets and plans, acknowledging that much NID funding comes from outside the health sector.

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### 8.3.5 Research

In order to encourage use of the private sector for provision of immunization services, identify the present obstacles for use of this sector. It is also important to identify the conditions for integration, the legislation to be envisaged, initiatives to promote, objectives and realistic stages to involve the various parts of the private sector while respecting national recommendations.

# Annex A: Questionnaire for Regions and Districts on Flows of Financing

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## Background information:

1. What are the sources of finance for this region?
2. What is the budget for health services (apart from hospitals)?
3. How does the health services budget get broken down according to source:
  - Government of Ghana budget \_\_\_\_\_%
  - Internally Generated Funds \_\_\_\_\_%
  - Donor pooled Funds \_\_\_\_\_%
  - Earmarked donor funds \_\_\_\_\_%
  - Other (please explain) \_\_\_\_\_%
4. What is the budget for EPI?
5. How does the EPI budget get broken down according to source:
  - Government of Ghana budget \_\_\_\_\_%
  - Internally Generated Funds \_\_\_\_\_%
  - Donor pooled Funds \_\_\_\_\_%
  - Earmarked donor funds \_\_\_\_\_%
  - Other (please explain) \_\_\_\_\_%

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## Timing of disbursement

1. In general, what percentage of your total health service budget arrives on time according to the Plan of Work? (apart from hospital budget)
2. What percentage of the total health service budget arrives on time, broken down by source?
  - Government of Ghana budget \_\_\_\_\_%
  - Internally Generated Funds \_\_\_\_\_%
  - Donor pooled Funds \_\_\_\_\_%
  - Earmarked donor funds \_\_\_\_\_%
  - Other (please explain) \_\_\_\_\_%
3. What percentage of the EPI budget arrives on time according to the plan of work?
4. What percentage of the EPI budget arrives on time by source?
  - Government of Ghana budget \_\_\_\_\_%
  - Internally Generated Funds \_\_\_\_\_%
  - Donor pooled Funds \_\_\_\_\_%
  - Earmarked donor funds \_\_\_\_\_%
  - Other (please explain) \_\_\_\_\_%

5. What percentage of funds are transferred to the districts on time by source:
- Government of Ghana budget \_\_\_\_\_%
  - Internally Generated Funds \_\_\_\_\_%
  - Donor pooled Funds \_\_\_\_\_%
  - Earmarked donor funds \_\_\_\_\_%
  - Other (please explain) \_\_\_\_\_%
6. When funds don't arrive on time or are not sent to the districts on time, what are the reasons?
7. What are the potential solutions to these problems? What works well?

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## Amount of financing

1. What percentage of the total health services budget as indicated in the plan of work actually arrives at the region, by source:
- Government of Ghana budget \_\_\_\_\_%
  - Internally Generated Funds \_\_\_\_\_%
  - Donor pooled Funds \_\_\_\_\_%
  - Earmarked donor funds \_\_\_\_\_%
  - Other (please explain) \_\_\_\_\_%
2. What percentage of EPI budget as indicated in the plan of work actually arrives at the region, by source:
- Government of Ghana budget \_\_\_\_\_%
  - Internally Generated Funds \_\_\_\_\_%
  - Donor pooled Funds \_\_\_\_\_%
  - Earmarked donor funds \_\_\_\_\_%
  - Other (please explain) \_\_\_\_\_%
3. If not all of the intended funds were received, why not?
4. What are the potential solutions? What works well?

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## Mechanisms:

1. How are funds transferred to the region, by source (eg: cheques, wire transfer, cash, etc):
- Government of Ghana budget \_\_\_\_\_
  - Internally Generated Funds \_\_\_\_\_
  - Donor pooled Funds \_\_\_\_\_
  - Earmarked donor funds \_\_\_\_\_
  - Other (please explain) \_\_\_\_\_
2. How are funds transferred to the districts, by source
- Government of Ghana budget \_\_\_\_\_
  - Internally Generated Funds \_\_\_\_\_
  - Donor pooled Funds \_\_\_\_\_
  - Earmarked donor funds \_\_\_\_\_
  - Other (please explain) \_\_\_\_\_
3. Do all district funds flow through the region?
4. What are the problems encountered in the flow of funds?

5. What fund transfer systems work particularly well?
  6. What improvements could be made?
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## **Equity**

1. How is money divided between rich and poor regions, rich and poor districts?
  2. Does the current system promote fair distribution of money in the country and if not, how could it be improved?
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## **Impact of SWAP and decentralisation**

1. Has the flow of funds improved or deteriorated since the SWAP and decentralisation have taken place?
  2. What kind of impact has the SWAP and decentralisation had on flow of funds (amount and timing of financial flows)?
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## **Impact of financial flow pattern**

1. Have any EPI activities been delayed or cancelled because the funds in the plan of work did not arrive, only partially arrived, or arrived too late?
  2. Which EPI activities have been affected?
  3. Have any EPI activities (like mass campaigns) been implemented as a result of financial flow patterns (like a lot of money arriving all at once) even though they were not in the plan of work?
  4. What are the other impacts of the flow of financing on EPI activities?
  5. How could the situation be improved?
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## **Internally Generated Funds**

1. Are internally generated funds an important part of EPI finance?
2. How is the IGF used for EPI generated?
3. Are informal user fees charged for immunization?
4. What is the average user fee for immunization?
5. What are the impacts of user fees on mothers' behaviour?
6. What are the impacts of user fees on staff motivation and service quality?
7. Are there any other ways to pay for immunization, such as community pre-payment/insurance schemes? What is their potential in this region?
8. How could the situation be improved?

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## Decision making

1. Who decides on the use of funds at the regional level?
2. Who decides on the use of funds at the district level?

# Annex B: Simulations of Program Costs with Increases in Personnel Salary

**Table 1. Simulation of Routine Immunization Program Costs with Increase of Personnel Salary of 20 percent**

Cost Category	Actual Costs	%	Costs of Program with 20% Increase in Salary	%
Personnel	1,543,542	42%	1,852,250	46%
Vaccines	919,774	25%	919,774	23%
Supplies	602,657	16%	602,657	15%
Transportation	260,766	7%	260,766	7%
Short-term Training	11,180	0.3%	11,180	0.3%
Social Mobilization	39,297	1.0%	39,297	1%
Maintenance and Overhead	39,710	1.1%	39,710	1.0%
Subtotal	\$3,416,927	92.3%	\$3,725,635	92.9%
Buildings	66,546	1.8%	66,546	1.7%
Vehicles	99,520	2.7%	99,520	2.5%
Equipment	85,106	2.3%	85,106	2.1%
Long-term Training	33,829	0.9%	33,829	0.8%
Subtotal	285,001	7.7%	285,001	7.1%
Total Annual Costs	\$3,701,928	100%	\$4,010,636	100%

**Table 2. Simulation of Total Immunization Program Costs with Increase of Personnel Salary of 20 percent**

Cost Category	Actual Costs	%	Costs of Program with 20% Increase in Salary	%
Recurrent Costs				
Personnel	3,146,113	40%	3,591,611	43%
Vaccines	2,367,147	30%	2,367,147	28%
Supplies	602,657	8%	602,657	7%
Transportation	552,983	7%	552,983	6%
Short-term Training	89,413	1%	89,413	1%
Social Mobilization	658,207	8%	658,207	8%
Maintenance and Overhead	74,494	1%	74,494	0.9%
Subtotal	\$7,491,015	94.1%	\$7,910,026	94.4%

Capital Costs				
Buildings	66,546	1%	66,546	1%
Vehicles	279,973	4%	279,973	3%
Equipment	85,411	1%	85,411	1%
Long-term Training	33,829	0.4%	33,829	0.4%
Subtotal	469,758	5.9%	469,758	5.6%
Total Annual Costs	\$7,960,774	100%	\$8,379,784	100%

**Table 3. Prices Ranges for One Vial by Hepatitis B Vaccine Presentations**

	<b>2001</b>	<b>2002</b>	<b>2003</b>
Monovalent HepB (10-dose vial)	0.26 to 0.43	0.25 to 0.43	0.23 to 0.43
DTP-HepB (10-dose vial)	1.10	1.00	0.9
DTP-HepB+Hib (2-dose vial)	3.50	3.25	3.10

Source: GAVI Vaccine & Immunization Products Guideline for Countries eligible for support from the Global Fund for Children's Vaccines

## Annex C: References

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