

ASIAN VACCINATION INITIATIVE

Mongolia National Immunization Program

FINANCING ASSESSMENT

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Abbreviations

AD	auto-disable
ADRA	Adventist Development and Relief Agency
aTd	adult tetanus and diphtheria vaccine
AEFI	adverse effects following immunization
ARI	acute respiratory infection
BCG	anti-TB vaccine
CDC	Centers for Disease Control in Atlanta, Georgia (US)
CRID	Central Research Institution for Infectious Disease
DPT or DTP	diphtheria and tetanus toxoids and pertussis vaccine
DT	diphtheria and tetanus vaccine
EPI	Expanded Program on Immunization
GAVI	Global Alliance on Vaccines and Immunization
HIB	Haemophilus influenzae type B
HSDP	Health Sector Development Program
JICA	Japanese International Cooperation Agency
MOH	Ministry of Health
MR	measles rubella vaccine
NID	National Immunization Day
NGO	nongovernment organization
OPV	oral polio vaccine
SHI	State Health Inspectorate
STD	sexually transmitted disease
TB	tuberculosis
Td	diphtheria (reduced component) and tetanus vaccine
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
WHO	World Health Organization

Executive Summary

This financing assessment of the Mongolian national immunization program was made as part of the Asian Vaccination Initiative and in collaboration with the Government of Mongolia.

This assessment was made primarily to:

- Estimate the current and future costs of the program, including the additional costs associated with strengthening and expanding it
- Identify future sources of funding and determine any funding gaps
- Provide recommendations related to finance and finance policy to strengthen the program and improve its overall financial sustainability

The assessment was also intended to provide information that the Government could use in immunization financial planning, policy dialogues, and funding negotiations with donors and international agencies.

The Mongolian immunization program has an excellent record, with high rates of coverage and low incidence of several Expanded Program on Immunization (EPI) diseases. Most notably, polio and neonatal tetanus have been eradicated (the eradication of polio was certified in 2000), and only one case of pertussis and four of diphtheria (after an outbreak in 1995) were reported in 2000.

However, the Government must consolidate the advantages it has gained in disease control over the last 10 years by strengthening program quality and sustainability and making the program as cost-effective as possible. The following important areas must be addressed: the commitment of the national Government to funding routine EPI vaccines; financial planning and management; stock management and wastage analysis; laboratory and adverse effects following immunization (AEFI) surveillance systems; transport costs; and safe injection practices. Improvements in these areas will provide a stronger foundation for successful and sustained expansion of the program if new vaccines are introduced.

The national program cost about \$1.12 million in 2000. The Government contributed half of this amount (92 percent through local budgets), the Japanese Government 42 percent (including the total vaccine requirement), and the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) the remainder. Full immunization for children cost an average of \$22 in 2000. The cost varied between aimags, ranging from \$11 to \$13 in and around Ulaan Baatar to \$32 in some western aimags. It will cost at least \$4.9 million (excluding capital costs) to maintain the program at the same operating level over the next five years; on average, vaccines will account for 35 percent of this amount.

The Government's main priority for the immunization program is introducing new vaccines—pneumococcal (with an initial trial to determine efficacy), Hepatitis A, and Hib. Its other priorities for the program are eliminating measles; strengthening laboratory surveillance, program implementation in remote areas, and safe injection practices; and reducing its dependence on donors for vaccines and cold-chain equipment.

The Mongolian immunization program has an excellent record, with high rates of coverage and low incidence of several Expanded Program on Immunization (EPI) diseases

Sustainable resource mobilization strategies alongside efficiency measures are key to achieving these priorities. Costs may be reduced by rationalizing the national schedule, reducing wastage in aimags and soums, using wastage rates in planning, improving stock management, and exempting immunization supplies from clearance charges and value-added tax (VAT). Additional funding is required to strengthen laboratory surveillance, the national control laboratory, transport, the cold chain, and injection safety. Finally, extra funding will be required to expand the program in two areas: new vaccine introduction and measles eradication.

To implement all priority actions next year, apart from the pneumococcal vaccine trial twice the amount of resources used in 2000 will be needed. The majority of this (47 percent) will be taken up by a Hepatitis A campaign and the limited introduction of Hib vaccine. Capital equipment replacement and high-temperature incinerators, to be introduced, will account for 30 percent. Excluding Hepatitis A and Hib, improvements will increase the cost of the basic program by 70 percent, or by about \$460,000.

Over the next five years, operational costs will increase in the third year because of a measles campaign. However, by the fourth and fifth years the cost of the program will have stabilized at \$1.5 million per year (assuming Hib but not pneumococcal vaccine is introduced). All in all, operational costs will account for 89 percent of program cost, 42 percent of these costs for routine vaccines.

Over this same period, assuming the Government maintains current funding levels and contributes an increasing share of vaccine costs, the program will have an overall financing gap of \$7.3 million.

The Government passed the Law of Mongolia on Immunization in April 2000, showing its commitment to sustainable immunization. The law regulates activities for the “prevention of the Mongolia population from and immunization against infectious diseases.” An Immunization Fund has been established under this law to mobilize and manage funds for immunization from various sources.

The recommendations in this paper deal with immunization policies and financing. They take into account the reforms being made in the health system and the need to maintain high coverage of quality, safe vaccinations. As such, it is recommended that the Government:

- Improve sustainable financing and accountability by developing a *financial sustainability* plan; financing a proportion of routine EPI vaccines after 2002; creating and maintaining a national budget line for EPI specific vaccines; clearly defining the financing role of the Immunization Fund and seeking technical assistance for the Fund; exploring alternative financing strategies for local costs where necessary; ensuring that funding priorities are consistent with financial resources and program needs; and continuing to purchase vaccines through UNICEF until the Government itself becomes capable of purchasing vaccines
- Implement cost reduction strategies by rationalizing the national schedule; seeking technical assistance to improve vaccine forecasting, wastage calculations, and stock management; establishing a national inventory and monitoring system for cold-chain,

The Government’s main priority for the immunization program is introducing new vaccines—pneumococcal (with an initial trial to determine efficacy), Hepatitis A, and Hib

The Government passed the Law of Mongolia on Immunization in April 2000, showing its commitment to sustainable immunization

transport, and laboratory equipment and supplies; hiring a technical officer at the national level for cold-chain repairs; removing import clearance charges on cold-chain and transport equipment; and exempting immunization supplies from VAT

- Mobilize resources to strengthen the cold chain, transport infrastructure, laboratory capacity, the national regulatory authority (the State Health Inspectorate), and the National Control Laboratory; improve safe injection practices; eliminate measles; and introduce new vaccines *only* if their introduction is determined to be cost-effective

Finally, to make the program sustainable, donors should invest in it only if the Government commits itself over the long term to fund all core operational EPI costs including, and especially, vaccines and safe injection needs.

Introduction

Purpose

This assessment was made as part of the Asian Vaccination Initiative (AVI), an independent initiative of the Asian Development Bank.

By assessing financing issues in the Mongolian national immunization program, using available documents, this paper seeks to identify:

- The financial status of the program
- Financial options for strengthening the program
- Future funding requirements for the routine program
- Potential areas for new investment in the program, including the introduction of new vaccines or the implementation of disease control initiatives
- Anticipated and potential funding sources and financing gaps

A coherent analysis of financial requirements, available resources, and financing gaps is an important aspect of medium-term planning and program sustainability.

Methodology

Two consultants, one international and one domestic, made this assessment. The international consultant gathered data during a three-week field visit to Mongolia. Most of the data were national-level and were obtained through working documents and interviews with key Government and donor informants at the central and district levels. In addition, WHO provided substantial input into the cost analysis of the program.

The cost and financing analyses used data from the Central Research Institute for Infectious Disease (CRIID), the Ministry of Health (MOH), the Ministry of Finance and Economy (MOFE), the State Health Inspectorate (SHI), UNICEF, WHO, the Japanese Embassy, and the Japanese International Cooperation Agency (JICA). The analyses were also based on program documents, donor reports, and the findings of previous consultants.

Target populations are based on current demographic figures provided by the National Statistical Office of Mongolia. Projections were made using the average growth rate for the past three years. Prices are based on 2000 data relevant to the Mongolian program, and current contract prices of the Centers for Disease Control (Atlanta) and UNICEF.

A coherent analysis of financial requirements, available resources, and financing gaps is an important aspect of medium-term planning and program sustainability

Background

Socioeconomic Situation

Poverty is a profound problem in Mongolia and the major obstacle to development. There has been a substantial increase since 1990 in the number of poor people, and the benefits of recent economic growth have yet to reach a wider population

With the change to a democratic government in 1990, Mongolia began reforms to move from a centrally planned to a market-based economy. The transition took place at a difficult time, when aid flows from the former Soviet Union, which used to account for nearly 30 percent of Mongolia's gross domestic product (GDP), ceased and trade arrangements with the former socialist bloc of countries broke up. Negative growth compounded by high inflation precipitated a major financial and economic crisis. Between 1990 and 1993 the economy contracted by 23 percent. The increases in food prices were particularly sharp: the price of meat (a staple food) rose by about 30 percent. Public expenditure for health, education, and other services dropped by 49 percent in real terms between 1990 and 1996. Such cuts led to a rapid decline in both access to services and service quality.

Table 1 shows that there was continuous economic recovery from 1995 to 1999. The real GDP growth rate increased from 2.3 percent in 1994 to 3.0 percent in 1999 and peaked at 4.0 percent in 1997. However, the economy has been particularly vulnerable to external shocks and was significantly affected by the Asian economic crisis of 1998,¹ causing Government revenues to fall 16 percent below forecast. After that, severe winters and outbreaks of foot-and-mouth disease in 1999–2000 and 2000–2001 killed much of the livestock, a major resource. As a result, GNP per capita dropped from \$360 in 1996 to \$300 in 1999, and in 2000 GDP grew by only 0.5 percent while inflation rose to 11.6 percent. Mongolia fell from a world development ranking of 102 in 1996 to 171 in 1999.² On a more positive note, growth is projected to increase to about 3 percent in 2001 and to 4 percent in 2002.

Table 1: Macroeconomic Indicators, 1995-1999

Item	1995	1996	1997	1998	1999
GDP					
Per capita ^a (US\$)	240	278	352	341	360
Growth rate ^a (% change)		2.4	4.0	3.5	3.0
GNP per capita ^b (US\$)	274	348	260	265	265
Annual inflation rate ^c (%)	53.11	53.20	20.47	6.0	10.0
GNP deflator ^d	100	114.7	142.1	134.8	147.9
Government expenditure					
Total, as a % of GDP ^a	27.1	32.7	34.5	41.9	39.4
On health, as % of GDP ^a	2.9	3.3	3.2	4.0	3.7
On health, as % of total Government expenditure ^a	10.7	10.0	9.1	9.6	9.5

Sources: ^aNational Statistical Office of Mongolia, *Mongolian Statistical Yearbook* (1999); ^bInternational Monetary Fund; ^cNational Statistical Office of Mongolia; ^dMinistry of Finance and Economy

¹ The price of copper, Mongolia's largest foreign-currency earner, fell by nearly a fourth in the first four months of 1998.

² World Bank (2001).

With the transition to a market economy, rapid decentralization became a priority of the Government. Administrative and budgetary power was delegated to the aimags and soums, which thus took control over the financing and allocation of resources to basic social sectors, including education and health

Poverty is a profound problem in Mongolia and the major obstacle to development. There has been a substantial increase since 1990 in the number of poor people, and the benefits of recent economic growth have yet to reach a wider population. According to a study made by the United Nations Development Program in 1998, 36 percent of the population (33.1 percent in rural areas and 38.5 percent in urban areas) live below the poverty line. The lot of the urban poor has been worsened by a dramatic increase in unemployment due to economic restructuring, the privatization (and subsequent collapse) of the State-owned industrial sector, and an immature and unprepared private industrial sector.

Mongolia is administratively divided into 21 aimags (each one with an aimag center and soums, or rural areas), 347 soums (each with a soum center and bags), and 1,681 bags. A soum has about 3,000 people and a bag about 50 to 100 families. Each aimag and soum is governed by a political assembly, which nominates a governor for central Government approval.

With the transition to a market economy, rapid decentralization became a priority of the Government. Administrative and budgetary power was delegated to the aimags and soums, which thus took control over the financing and allocation of resources to basic social sectors, including education and health.³ Local governments in all but three aimags are authorized to raise revenue (including taxes), but this is not enough to cover expenditure and must be supplemented by grants from the central Government. The overall reduction in available public funds, coupled with a lack of local capacity for resource planning and management, has sapped the performance of the government sector.

Health sector allocations

Before independence, the Mongolian health care system was entirely financed out of the central budget, and all services were provided free of charge. The system is still primarily owned and funded by the Government,⁴ although the latter looks forward to an increasing share and role for the private sector as a strategic objective.

The sharp decline in both the national economy and Government revenue sources in the transition period brought about a decrease of almost 50 percent in real terms in Government expenditure for health as a percentage of GDP, from 6.7 percent in 1990 to 3.7 percent in 1999. Essential drugs and supplies became scarce, and buildings, equipment, and health facilities deteriorated (particularly in remote aimags and soums). However, a steady increase in nominal contributions over this period and the Government's commitment to health care raised health spending as a percentage of Government expenditure to an average of 9.8 percent between 1995 and 1999, up from 7.5–8.5 percent between 1980 and 1990.

³ The Law on Local Administrative Units guarantees the semi-autonomy of aimags, cities, and soums.

⁴ Including the Government's contributions to the Health Insurance Fund.

Demographic and Health Indicators

Preliminary results of the national census in 2000 indicate that Mongolia has a population of 2.4 million, 58 percent of these living in urban areas (including 32 percent in Ulaan Baatar). About half of the rural population of 42 percent is nomadic. Mongolia is one of the most sparsely populated countries in the world, with only 1.5 people per sq km, making the delivery of health services both difficult and relatively expensive.

Table 2: Demographic Indicators, 1990-2000

Indicator	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Estimated population (millions) ^a	2.10	2.15	2.18	2.19	2.22	2.25	2.28	2.31	2.35	2.38	2.41
Crude birth rate (1,000 population) ^a	35.3	32.9	29.1	21.5	23.4	23.7	22.2	20.9	20.6	20.4	21.6
Crude death rate (1,000 population) ^a	8.5	8.8	8.4	7.9	7.3	7.3	7.5	7.2	6.6	6.6	6.0
Population growth (annual %) ^b		2.25	1.47	0.39	1.50	1.51	1.38	1.27	1.44	1.24	1.43
Registered live births ('000)						54.3	51.8	48.8	49.3	49.5	
Population below 5 years (%)	15.6		14.8		12.5		12.6	12.8	10.0	10.0	
Fertility rate (total)	4.3		3.4		2.7	2.7	2.5	2.4	2.3	2.3	

Sources: ^aNational Statistical Office, *Monthly Bulletin of Statistics*; ^bMinistry of Health, *Mongolia Health Indicators* (2000)

The population has grown over the past decade, but the growth has been on a downward trend, from an average of 2.7 percent in 1960–1990 to 1.4 percent in 1990–1999. The fall-off in growth can primarily be attributed to a significant decrease in the crude birth rate and the fertility rate, which may in turn be linked to changes in national family planning policy. The Government has a population target of 1.8 percent. With the crude death rate also decreasing, Mongolia is in demographic transition. The health sector thus faces new challenges, particularly as most of the elderly live in the rural (and more inaccessible) areas.

Table 3: Health Indicators, 1991-2000

Indicator	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Infant mortality rate (per 1,000 live births) ^b	62.2	59.8	57.4	46.8	44.4	40.5	40.2	35.4	36	31.23
Under-5 mortality rate (per 1,000 live births) ^a	93.2	87.8	82.7	67.9	62	56.4	55.6	47.8	—	—
Maternal mortality rate (per 1,000 live births) ^a	1.33	2.05	2.6	2.2	1.85	1.75	1.45	1.58	1.75	1.58
Life expectancy at birth										
Male		60.7			62.1		61.1	62.7		
Female	—	64.9	—	—	65.4	—	67.7	67.6	—	—

Sources: ^aMinistry of Health; ^bNational Statistical Office

While official records show a drop in the infant mortality rate from 63.4/1,000 live births in 1990 to 31.2/1,000 in 2000, there may be considerable underreporting of deaths, as surveys made in the late 1990s suggest, and the actual figures may be up to 50 percent higher. In any case, relative to other countries with similar GDP levels, the current rate is high. Acute respiratory infections are the prime cause of death among infants (36 percent in 2000) and children below 5 years (38 percent). Maternal mortality is high; it rose from 1.3 in 1991 to 1.6 in 2000, and peaked at 2.6 in 1993. Life expectancy has, however,

improved and reached 65.3 in 1998, placing Mongolia in the mid-level range of human development.

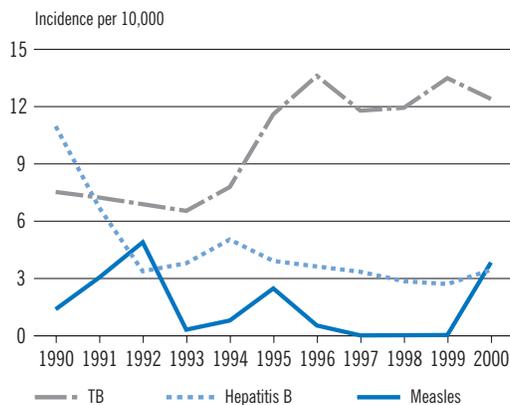
Reflecting a gradual epidemiological transition, noncommunicable diseases are now the primary cause of mortality. Diseases of the circulatory system, neoplasms, accidents and injuries, and diseases of the respiratory and digestive system accounted for almost 85 percent of all deaths in 2000. At the same time, infectious diseases remain a problem, with cases of sexually transmitted disease (STD), tuberculosis (TB), viral hepatitis, and brucellosis on the rise. The nutritional status of children is a key health concern; 30 percent of those between weaning age and 5 years suffer from stunted growth. Protein energy malnutrition is compounded by widespread deficiencies in micronutrients such as iodine, iron, and vitamin D. Poor access to safe water and sanitary conditions is a significant obstacle in the way of improvements in health. In general, a dramatic increase in poverty during the transition has adversely affected health.

Low population density, a severe climate, poor transportation, and inadequate infrastructure complicate the delivery of primary healthcare services to the rural population. Consequently, health status in the countryside is much worse than in cities: maternal mortality is twice as high and infant mortality almost 50 percent higher.

Adult literacy, which the 1989 national census placed at 96.5 percent, may have fallen to 90 percent, according to the *Human Development Report* (2000).

Vaccine-preventable diseases

Figure 1: Incidence of Measles, Hepatitis B, and TB, 1990–2000



High immunization coverage (more than 90 percent) has sharply reduced the incidence of several vaccine-preventable EPI diseases in Mongolia in the past decade. Most notably, immunization has done away with polio (as certified in 2000) and neonatal tetanus. Only one case of pertussis and four of diphtheria (after an outbreak in 1995) were reported in 2000. Following an outbreak in 1995, and the use of meningococcal (A+C) vaccine, the incidence rates of meningococcal meningitis have dropped to below 1/10,000. The introduction of Hepatitis B vaccine in 1991 has decreased Hepatitis B rates from 10.1 in 1990 to 3.5 per 10,000 in 2000. However, viral hepatitis remains highly endemic; of 9,235 cases reported in 2000, 89.3 percent were clinically diagnosed as Hepatitis A (mostly in children 2 to 9 years old). Very low levels of measles were reported between 1997 and 1999, but there were 83 serologically confirmed measles cases (mostly rubella) during an outbreak of rashes and fever in 2000 and by March 2001, laboratories had confirmed another 16 cases. TB is a major health (and social) problem; its incidence has almost doubled since 1993 to an average of 12.6/10,000 over the last three years (see Figure 1).

Health System⁵

The 1992 constitution of Mongolia protects the health of citizens and guarantees the right to medical care. The Health Law of Mongolia (1998) is the core legislation for the health

⁵ This section draws heavily on and, where indicated, quotes the *Mongolia Health Sector Review* (1999), the Government of Mongolia, and WHO.

The Mongolian health system was originally based on the Soviet model. Service delivery, human resources, and infrastructure were centrally planned and local communities had little participation in decision making

sector. It defines the system of health organizations and working principles, and outlines the priorities of the Government in the health sector. These priorities are:

- Eliminating unequal access to health services and health inequality between the rural and urban populations, and between the rich and the poor
- Protecting the health of women and children
- Improving the supply of drugs and injections

National health policy was first developed in 1990, when the 4th Congress of Health Workers approved the guidelines for the development of Mongolian people's health by the year 2005. These guidelines have since been revised and updated, with the aim of "introducing international management practices and improving effectiveness, efficiency and quality of the services." The current strategic objectives of the health sector are:

- Making health services more equally accessible to everyone
- Improving the quality, efficiency, and effectiveness of health services
- Providing for the sustainability of health services
- Ensuring accountability and control over health services
- Increasing the share and role of private facilities in the sector
- Promoting the decentralization of the health sector

Within this framework, the priorities are: "significant reduction of maternal mortality; steady reduction of infant and child morbidity and mortality; control of communicable diseases, with an emphasis on TB, brucellosis, viral Hepatitis B, STDs and HIV, and eradication of polio and tetanus." Government priorities are also reflected in national programs such as the National Immunization Program (1993–2001).

In addition, the 2000 Health Sector Action Program outlines the following objectives for the health sector: increased budget allocation for basic health care, the introduction of a primary healthcare system through family doctors, and the establishment of an immunization fund (see the discussion in the third main section of this report).

Structure and reform

The Mongolian health system was originally based on the Soviet model. Service delivery, human resources, and infrastructure were centrally planned and local communities had little participation in decision making. However, budgetary constraints alongside shifting healthcare priorities have progressively transformed the health sector over the last decade. Reforms have been made in health policy and healthcare financing. The implementation of healthcare services has been decentralized to local authorities; the private sector has increasingly been involved; a nationwide health insurance program has been set up; there has been a move away from curative to preventive care; and the highly specialized hospital system has been replaced with a more general system based on family doctors.⁶ The principle of free healthcare has been dropped and user fees have been gradually

⁶ Ministry of Health, *Draft Project Completion Report: Improving the Financial management of the Health System in Mongolia* (2001).

Alongside the current legal framework, decentralization also contributed to a separation of financial management and health data reporting

introduced. At the same time, the Government remains committed to maintaining universal access to basic health services.

Decentralization entrusted MOH with national regulatory and policy responsibility for the development of the health sector and the implementation of its programs and activities, while authorizing local agencies to “negotiate their share of financing directly with the local government,” and to “decide on the range of services they will provide.” However, appropriate planning, management, or accounting skills and instruments were not developed at the local level, and “roles, responsibilities and accountability relationships between health system levels” were unclear. This lack of clarity and capacity led to “sector inequities and made it difficult to maintain national priorities and policies.”

Alongside the current legal framework, decentralization also contributed to a separation of financial management and health data reporting. This has further limited the capacity of MOH to (i) monitor and supervise the implementation of national health policies and (ii) carry out strategic planning, budgeting, and appropriate resource allocation.

There are four levels of health services in Mongolia:

1. *Family doctors* in aimag centers and cities and *bag feldshers* in rural areas (feldshers are community health workers who provide basic primary healthcare including immunization). Access to health services is limited among the poor, the nomadic, and those living in remote areas (bags are up to 80 km from the soum center). Hence, where necessary, feldshers will visit patients in their own *gers*,⁷ typically on horseback or on motorcycles. Such mobile services account for about 25 percent of primary healthcare delivery.
2. *Public health centers* in aimag centers and cities, and *soum hospitals* in rural areas
3. *General hospitals* in aimag centers and city districts (aimag public health centers are found in aimag hospitals)
4. *National* reference level institutions in Ulaan Baatar

Small-scale medical practices, mostly in Ulaan Baatar, marked the start of private sector involvement in 1990. The private sector is mostly involved in three main areas: general medicine (outpatient or ambulatory services), specialized inpatient services (gynecology, ophthalmology, and a respiratory surgery center), and pharmaceutical sales. In 1998, about 70 percent of the 830 private health entities were in the capital. Low purchasing power limits opportunities for profit and hampers the growth of the private sector.

Health finance

In the public sector, health finance is derived from three sources: direct allocations from the Government, the national Health Insurance Fund, and, to a small extent, revenue raised by health facilities through (limited) user fees.

⁷Traditional housing.

MOFE sets the national health budget (to be approved by the Parliament), using yearly⁸ estimates submitted independently by MOH, central health institutions, and aimag governments. Once the budget is approved, each budgetary unit receives its allocation in several payments during the year. Soum allocations are the responsibility of aimag governments. MOFE also makes direct-debit payments for heating and electricity on behalf of health facilities and institutions. The relative contributions of the central and local governments are shown in Table 4.

Table 4: Health Budgets, 1993-2000

Year	Central Government		Local Government	
	Amount (Togrog million)	% of Total Budget	Amount (Togrog million)	% of Total Budget
1993	1,018	15.7	5,445	84.3
1994	2,348	20.2	9,262	79.8
1995	2,203	13.0	14,727	87.0
1996	2,731	12.2	19,659	87.8
1997	3,901	13.6	24,678	86.4
1998	4,493	13.6	28,421	86.4
1999	12,706	35.6	22,952	64.4
2000	16,853	36.7	29,098	63.3

Source: Ministry of Finance and Economy

In the public sector, health finance is derived from three sources: direct allocations from the Government, the national Health Insurance Fund, and, to a small extent, revenue raised by health facilities through (limited) user fees

MOH has no authority over its health budget. Instead, MOFE transfers funds to pay for external supplies and services as invoices are presented, or in tranches for internal expenditure. However, this system will change once the Public Sector Management and Finance Administration Act is passed and MOH gains allocative authority over its yearly budget.

Financial reports on government allocations are made directly to MOFE. MOH is obliged to report quarterly, and aimags and central health institutions every six months. MOH also gathers some financial information, often in conflict with MOFE data. Insurance and financial information is gathered separately; therefore “no institution controls or monitors total health expenditure in the country,” limiting overall planning and the evaluation of efficiency and equity in health sector financing.

The Insurance Fund accounted for 39 percent of health expenditure in 2000. It finances curative services, mainly for inpatients. Contributors to the Fund come in three categories: (i) civil servants and workers of State-owned enterprises, who contribute 6 percent of their salary; (ii) voluntary contributors; and (iii) vulnerable groups, whose contribution is paid entirely by the Government. The Government contributes 36 percent of the Fund.

MOH (with the support of the European Union) is reforming its financial management structure and processes as part of a broader financial restructuring program in the public

⁸ The fiscal year starts in January and ends in December.

MOH has no authority
over its health budget.

Instead, MOFE transfers funds to pay for external supplies and services as invoices are presented, or in tranches for internal expenditure

sector. Reporting and planning are being improved, and a new MOH chart of accounts is coming into use. This chart of accounts will help standardize, consolidate, and unify the recording of financial information in facilities and agencies. It is being piloted in several aimags and will also be linked to the financial database (still in its initial phases), which will help provide information on line-item expenditures and sources of revenues. Transparency and accountability should also increase with the planned introduction of international accounting practices.

The establishment of national costing guidelines (for monitoring the use of resources toward a particular outcome) and a comprehensive national health accounts system has been recommended as a follow-on project.

Donor support

About 20 bilateral and multilateral donor agencies are active in the health sector. In 1998, donor grants covered 12 percent of total health expenditure, as shown in Table 5. The use of soft loans to finance health activities has varied from year to year, with peaks in 1991 and 1995 (about \$5 million in each year).

Table 5: Donor Grants for the Health Sector, 1991–1998

Year	Health Expenditure (US\$ million)	Donor Support	
		(US\$ million)	% of National Health Expenditure
1991		6.8	16.0
1992	48.6	8.6	17.6
1993	21.4	3.2	14.9
1994	28.3	9.0	31.8
1995	35.4	5.3	14.9
1996	36.5	2.5	6.8
1997	34.8	3.4	9.7
1998	33.2	4.0	12.0

Source: World Health Organization, *Mongolia: Health Sector Review* (1999)

For programs in 1997–2002, the largest donors in the health sector are the Asian Development Bank (ADB) (\$16.5 million), the Japanese Government (\$5.2 million), the UN Fund for Population Activities (\$7.3 million), and WHO (\$3.6 million).

National Immunization Program

No comprehensive assessment of the national immunization program has been made in the last three years. However, a number of technical assessments (primarily concerning polio eradication), a limited-coverage survey, and donor funding reports provide insight into elements of the program.

Strategic Plan

Mongolia has an Immunization Program Plan for 1999–2004, but it remains in its 1999 draft form. The EPI team and MOH are updating this plan, and the new version is expected to be endorsed by the end of 2001.

The plan for 1999 sets two primary objectives:

- *To effectively eradicate, eliminate, or control vaccine-preventable diseases* by remaining polio-free, reducing measles cases to less than 1/100,000, diphtheria cases to less than 3/100,000, meningococcal disease to less than 80/100,000, and, by 2004, Hepatitis B carrier rate in children below 5 years to less than 2 percent
- *To sustain and improve routine immunization services* by ensuring more than 95 percent coverage nationwide and more than 90 percent in every aimag for all antigens, maintaining adequate supply of vaccine, raising disease surveillance and laboratory systems to international standards, providing all aimags and soums with appropriate equipment (including replacements when needed), and ensuring that by 2004 all injections are safe

More recently, measles eradication and the introduction of new vaccines (pneumococcal, Hepatitis A, and Hib) have also been identified as objectives.

MOH recognizes the following strengths of the immunization program: high coverage, recently upgraded cold-chain equipment, introduction of Hepatitis B vaccine, and good administrative reporting for disease surveillance. The weaknesses of the program are: laboratory surveillance, procurement of vaccines and cold-chain equipment (for which the Government depends on donors), implementation in remote areas, and safe injection practices.

Legal Framework

In April 2000, the Law of Mongolia on Immunization⁹ was passed, showing the Government's commitment to sustainable immunization. The law regulates activities pertaining to the "prevention of the Mongolia population from and immunization against infectious diseases." It sets State immunization policy, holding the Government (through aimag and capital city khurals¹⁰) responsible for ensuring the immunization of the people by:

⁹ An initiative of the President of Mongolia.

¹⁰ Governing assemblies.

In April 2000, the Law of Mongolia on Immunization was passed, showing the Government's commitment to sustainable immunization

- “allocating resources from the state budget for vaccination required by the national schedule” (Section 5.1.2)
- “adopting immunization expenditures and budgets and monitoring their utilization” (Section 5.3.1).

Violators of the law may be held criminally liable (under Article 193 of the Criminal Code of Mongolia) or may otherwise have to pay financial penalties.

The law also sets forth citizens’ rights and responsibilities regarding immunization, including the right to receive vaccinations required in the national schedule, free of charge.

Local health institutions are legally obliged to formally notify every citizen when their vaccinations are due

Immunization schedule

The current national immunization schedule, shown in Table 6, is mandatory for all Mongolian citizens. Local health institutions are legally obliged to formally notify every citizen when their vaccinations are due. To rationalize the schedule, WHO has recommended that two doses of BCG (8 and 15 years) and three doses of OPV (birth, and 2 and 8 years) be removed; and that the third dose of Hepatitis B vaccine be moved to 4 months, and the first dose of measles vaccine to 9 months and the second dose to 2 years. MOH has agreed to reduce OPV, and is waiting for the results of a survey to decide on booster doses of BCG. It has not agreed to the recommended changes in the schedule for Hepatitis B vaccination.

Table 6: Immunization Schedule

BCG	DPT	OPV	Measles	Hepatitis B	DT
Birth		Birth		Birth	
	2 months	2 months		2 months	
	3 months	3 months			
	4 months	4 months			
			8 months 12 months	8 months	
	2 years	2 years			
8 years 15 years		8 years			8 years 15 years

Note: Changes recommended by WHO are in shaded boxes

EPI vaccinations are carried out through State-owned health agencies. Private “family doctor group practices,” which have just been formed in pilot aimags under the ADB Health Sector Development Program (HSDP), provided outreach services in the recent (May 2001) rubella campaign but are not expected to begin routine vaccinations, although they are responsible for ensuring full vaccination of children in their catchment area.¹¹ “Voluntary” or nonroutine vaccinations, for a fee, will be introduced shortly.

¹¹ The ADB project at first assumed that these group practices would take over routine vaccinations. However, this responsibility was left with Government health centers because of logistic, administrative, and training constraints.

Organizational Structure

At the national level, the Central Research Institution for Infectious Disease (CRIID), administratively under the MOH (although funded directly by MOFE), is legally¹² responsible for:

- National standard and direction setting, establishment of immunization guidelines, monitoring, and epidemiological analysis
- “Procurement, storage, transportation, stocking and distribution of immunizing agents”
- Utilization of the Immunization Fund (see the third main section of this report), which was established as a separate legal body to manage immunization financing requirements

The CRIID Immunization Team in the Division of Surveillance and Management of Infectious Diseases manages the above activities. It is also responsible for training the aimags, and works closely with the Officer of Communicable Disease Control and the National EPI Manager in MOH. CRIID also houses two of the national reference laboratories (for measles and bacteriology). The reference laboratory for polio is housed in the Public Health Institute (PHI), as is the central cold room.

Routine immunization is delivered by feldshers in rural areas, soum hospitals, and public health centers in aimag centers and Ulaan Baatar. Each health center and soum hospital has an immunization room, a doctor responsible for immunization (who assesses each child before vaccination), and a vaccination nurse. Soum and aimag officials are held responsible for obtaining adequate coverage figures. Coverage is sometimes used as an indicator of personal performance, with linked remuneration.

The levels of vaccine-preventable diseases are the most powerful indicators of coverage, and Mongolia’s incidence rates attest to high coverage

Coverage

The levels of vaccine-preventable diseases are the most powerful indicators of coverage, and Mongolia’s incidence rates attest to high coverage. Since 1997 national coverage, according to administrative reports, has been greater than 90 percent for all routine infant EPI vaccinations. DPT3 coverage increased from 88 percent in 1995 to 90 percent in 1999. A rapid-assessment coverage survey, carried out in four soums within two aimags in 1999, showed little or no discrepancy between actual and reported coverage in three soums, and over-reporting by up to 30 percent in the fourth.

However, the national average masks low coverage in some soums, which often report coverage of between 65 percent and 80 percent (or less). Zavkhan aimag, for example, reported soums with measles vaccine coverage of between 19.9 percent and 47.7 percent in 2000. Low coverage is attributed to undermotivated or undertrained staff (or no staff at all), inadequate local financing and fuel for transport and outreach activities, and incorrect denominators due to internal migration. The EPI team responds to these

¹² Under Section 9.2 of the Law of Mongolia on Immunization.

Economic hardship during the transition period and as a result of the more recent winter disaster has caused significant internal migration

problem areas by increasing its social mobilization efforts, particularly toward local governors.¹³

Economic hardship during the transition period and as a result of the more recent winter disaster has caused significant internal migration. Many of the migrants do not register on arrival in new areas; as a result, about 5–6 percent of children (3,000–4,000) each year do not receive their scheduled vaccinations. Catchup campaigns in May and October every year seek to address this problem. Last year such campaigns identified an additional 2,000 children in Ulaan Baatar, which receives the majority of migrants.

Financial Structure

The immunization program is funded principally by the Government (national and local), JICA, UNICEF, and WHO. However, as with most programs, an accurate picture of the cost of delivering immunization services is difficult to obtain. Funding for vaccines, cold-chain equipment, safety boxes, and a proportion of operational costs such as transport equipment, syringes, social mobilization, and information, education, and communication materials (IEC) comes from the three donor agencies, whose reports have different formats, varying degrees of detail, and limited historical information.

In addition, local expenditure on immunization activities is not reported to the central level on a separate budget line, but is incorporated in more general budget lines, such as “salaries” (for all health clinic staff) and “medical supplies” (including syringes).

Government sources: National level

There is a national MOH budget line for immunization, but this has not yet been used for routine EPI immunization. However, at the start of each financial year, MOFE budgets funds to cover the following routine immunization costs:

- MOH administrative costs for the communicable diseases unit
- CRIID and PHI operational costs for the Immunization Team, relevant laboratories, and central cold room
- CRIID capital requirements for the program, although donor agencies now meet these costs where possible
- Program implementation costs of aimag khurals and, through the aimags, soum khurals

Table 7 summarizes actual expenditure and budget estimates for central financing of immunization. Actual expenditure is the total of two budget lines: “routine and nonroutine vaccines” and “emergency vaccines” (for epidemics). Expenditure to date has been limited to nonroutine vaccines, and the cost of transporting both routine and nonroutine vaccines to aimag centers.

¹³ In Zavkhan, the EPI team worked with the local governor to assign the responsibility for immunization to a specific person in each soum. The success of this cost-neutral solution will be known over the next year.

Most aimags have limited local sources of revenue (local taxes and license fees). However, these funds can be used to supplement national funding for immunization

Table 7: Central Immunization Budget (Routine and Nonroutine), 1999-2003 (US\$)

Year	Budget	Actual
1999	200,000	153,000
2000	332,000	283,000
2001	332,000	
2002	635,300	
2003	940,600	

Source: Fiscal Affairs Department, Ministry of Finance and Economy

Donor funding takes the form of goods, services, or cash transfer at the national level to MOH.

Government sources: Subnational level

Aimag and soum governments are responsible for transport costs for vaccine distribution and mobile services, infrastructure operational costs, cold-chain maintenance, salaries of health workers, costs of training below the aimag level, all supplies other than vaccines (including syringes), waste disposal costs, and, where possible or necessary, social mobilization and IEC costs.

Most aimags have limited local sources of revenue (local taxes and license fees). However, these funds can be used to supplement national funding for immunization. Health clinics also often cross-subsidize immunization with the income from user fees for curative services or from other fundraising activities such as rental of building space.

Immunization Fund

An Immunization Fund has been established under the Immunization Law (Section 9) to sustain immunization financing (for vaccines, bio-preparations, and syringes) by mobilizing and managing funds from various sources. Governed by a set of regulations approved as an attachment to Resolution 67 (March 2001), the Fund gives greater visibility to funding contributions and financing processes, and therefore increases transparency and accountability.

Structure

The Fund is an independent legal entity governed by a Fund Council, which is composed of officials of MOH, MOFE, and other relevant health organizations, and chaired by the Deputy Minister of Health. MOH is the Fund Governor, and CIHDR is the Fund Administrator.

The Fund Governor:

- Plans immunization activities and arranges for their timely implementation
- Develops guidelines and recommendations on program implementation

- Requests MOFE for funds for immunization activities
- Sees to the proper allocation of the funds
- Monitors and controls Fund use

The Fund Administrator:

- Administers the funds
- Procures vaccines directly from a WHO-prequalified supplier (up to a given amount)
- Prepares tender documents for the procurement of vaccines, syringes, and other supplies, and, after the documents are approved by the Fund Council, forwards them to the MOH Tender Unit
- Implements decisions of the Fund Council

At the start, the Fund is expected to manage the finances for nonroutine and emergency vaccines, and for transportation and fuel for delivering both routine and nonroutine vaccines to aimag centers. It will also administer the financial aspects of “volunteer” vaccinations (nonroutine vaccinations for travelers and others outside the targeted high-risk groups).

The Fund will eventually have a staff of two to three people and will be self-financing. As of now, however, only the Fund Manager has been hired and this position is funded by CIIDR.

The Fund Administrator reports on the activities and disbursement position of the Fund to the Fund Council every quarter.

Financing

The Fund was set up partly to unify donor, Government, and private sector financing (for routine and nonroutine vaccination at the central and local levels) in an independent Fund account. In practice, however, central Government funds will be transferred through a separate account under the authority of the MOH, which must approve any access by the Fund to its finances (despite the Fund’s independent legal status). Local governments are expected to donate money to the Fund (from local sources of income).

Requests for central financing must be submitted by the Fund Administrator to the Fund Council. Once approved by the Council, the request is forwarded to MOFE, which then creates a specific budget line for the Fund to the stated (or an agreed) value. However, supplies or services will be paid for on the basis of invoices presented. For this purpose, invoices must be forwarded to MOFE; after they are cleared, MOFE will transfer the required amount to the Immunization Fund account, for further transfer to the supplier.

The Government also expects the Fund to become self-supporting. To this end, the Fund will levy a charge on voluntary vaccinations, enough to produce a profit. The Fund Manager is also considering a proposal to centralize the procurement and payment of syringe supplies

At the start, the Fund is expected to manage the finances for nonroutine and emergency vaccines, and for transportation and fuel for delivering both routine and nonroutine vaccines to aimag centers

in the Fund, which would then charge aimags an administrative fee to cover its own costs and provide a surplus. Such a proposal would help the immunization program only if it were cost-neutral. Bulk purchasing would have to provide a discount large enough to cover the administrative fee and other (nonfinancial) costs¹⁴ while keeping the cost of syringes unchanged or lower than the amount now paid by aimags. Otherwise, local resources, already stretched, would gain an added financial burden (more expensive syringes). Whether the only syringe supplier in Mongolia will grant bulk discounts is unknown but, given the company's poor financial viability, is not deemed likely.

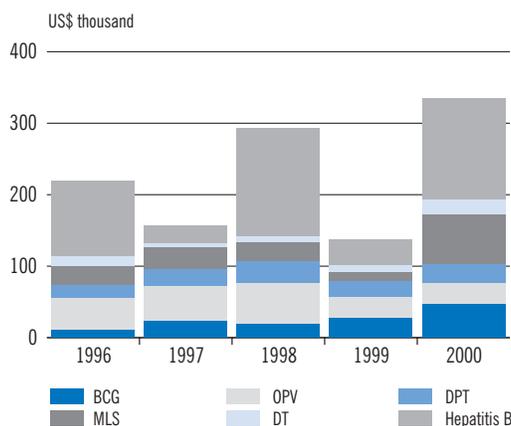
Past and Current Financing¹⁵

Vaccine costs

Since 1996, the Japanese Government has fully funded routine vaccine procurement under a five-year agreement. Year-to-year expenditure has been lumpy, as shown in Figure 2, but almost \$1.4 million in all has been provided, for an average of \$280,000 per year. Budget constraints have prevented the Government from contributing an increasing share of the costs, as provided for in the agreement. In 2000, vaccines cost \$297,355 (versus an expenditure of \$335,000), accounting for 26.5 percent of program cost.

The Government, however, finances the purchase of nonroutine vaccines. The fact that it spent almost \$200,000 in 2000 indicates that it has at least some funds for routine vaccines.

Figure 2: Routine Vaccine Funding, 1996-2000



Source: CRIID

Note: 2000 figures include vaccine for measles campaign

Total program costs

The national program cost about \$1.12 million in 2000, as shown in Table 8. The Government contributed half of this amount, 92 percent through local budgets. Almost all of the contribution was for recurrent costs such as personnel, transport, and injection supplies. Capital costs, including a significant investment in motorcycles, and cold-chain and computer equipment, accounted for 17 percent of program costs (see Figure 6).

Cost per fully immunized child

These data indicate that full immunization costs \$22 per child on the average. This cost varies between aimags and ranges from \$11 to \$13 in and around Ulaan Baatar to \$32 in some western aimags, as shown in Figure 3. Logically, the cost is higher in less densely populated aimags, where mobile services are more extensive. Figure 4 shows the distribution of transport cost by aimag.

¹⁴ There will be an extra financial transaction for the Government as a whole: central Government–aimag–Fund–supplier.

¹⁵ The costing tables and subsequent analyses were provided by Patrick Lydon, WHO.

Table 8: Cost of Routine EPI Program, 2000 (amounts in US\$)

Cost Item/Donor	Total Amount	Central Government	Local Government	Japanese Government	UNICEF	WHO
Recurrent Costs	927,728 (82.6%)	18,214	512,921	358,629	25,000	12,963
Personnel ^a	274,355 (24.4%)	10,262	264,092			
EPI personnel, national	8,311 (0.7%)	8,311				
National Cold Room personnel	1,952 (0.2%)	1,952				
EPI personnel, subnational	72,004 (6.4%)		72,004			
EPI personnel, regional	192,089 (17.1%)		192,089			
Vaccines ^b	297,321 (26.5%)	430		296,890		
BCG	40,617 (3.6%)			40,617		
DTP	19,825 (1.8%)			19,825		
DT	21,487 (1.9%)			21,487		
Hepatitis B	150,865 (13.4%)			150,865		
Measles	20,394 (1.8%)			20,394		
OPV	43,702 (3.9%)			43,702		
Vaccine clearance cost (airport)	430 (0.0%)	430				
Injection supplies ^c	32,516 (2.9%)		28,531	3,985		
Disposable syringes	28,531 (2.5%)		28,531			
Safety box	3,985 (0.4%)			3,985		
Cold-chain maintenance ^d	6,290 (0.6%)	6,290				
Cold-chain clearance cost (train)	3,432 (0.3%)	3,432				
National Cold Room overhead	2,857 (0.3%)	2,857				
Transport ^e	202,264 (18.0%)	554	201,710			
Central	554 (0.0%)	554				
Regional	82,298 (7.3%)		82,298			
Mobile-outreach	119,412 (10.6%)		119,412			
Short-term training (doctors and nurses)	34,837 (3.1%)			15,437	9,400	10,000
IEC and advocacy	21,722 (1.9%)			21,722		
Posters	1,000 (0.1%)			1,000		
Manuals and guidelines	20,722 (1.8%)			20,722		
Social mobilization ^f	25,304 (2.3%)			20,079	5,225	
TV, radio broadcasting	15,579 (1.4%)			15,579		
Newspaper advertisements	9,725 (0.9%)			4,500	5,225	
Maintenance and overhead ^g	19,265 (1.7%)	678	18,588			
Electricity	19,265 (1.7%)	678	18,588			
Monitoring and evaluation ^h	10,691 (1.0%)			316	10,375	
Surveillance	3,163 (0.3%)			200		2,963
Subtotal	927,728 (82.6%)	18,214	512,921	358,629	25,000	12,963
Capital Costs	194,878 (17.4%)	27,037		108,864	58,978	
Building and infrastructure ⁱ	27,037 (2.4%)	27,037				
Vehicles (motorcycles)	45,630 (4.1%)			27,230	18,400	
Cold-chain equipment	29,156 (2.6%)			29,156		
Refrigerator-freezer and parts	14,692 (1.3%)			14,692		
Generator	13,480 (1.2%)			13,480		
Generator parts	984 (0.1%)			984		
Other	85,444 (7.6%)			44,866	40,578	
Hospital materials	44,351 (4.0%)			44,351		
Computers	30,332 (2.7%)				30,332	
Printers	10,246 (0.9%)				10,246	

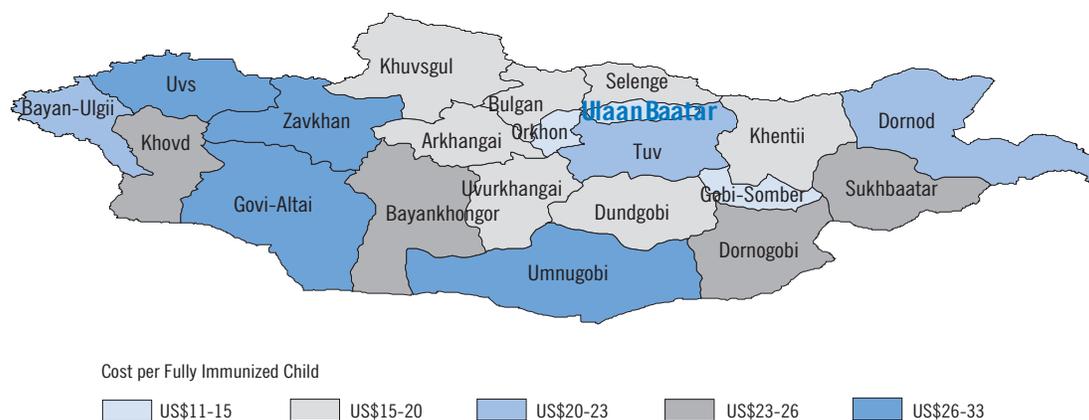
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Cost Item/Donor	Total Amount	Central Government	Local Government	Japanese Government	UNICEF	WHO
Miscellaneous office equipment	515 (0.0%)			515		
Long-term training	7,612 (0.7%)			7,612		
Workshops	4,699 (0.4%)			4,699		
Training in computers	2,913 (0.3%)			2,913		
Total	1,122,606 (100.0%)	45,251 (4.0%)	512,921 (45.7%)	467,493 (41.6%)	83,978 (7.5%)	12,963 (1.2%)

Sources: MOH, MOF, CIIDR, National Cold Room, JICA Country Office, UNICEF Country Office, WHO Country Office, and data collected from a district visit

Notes: ^a Estimates are based on information provided by EPI Team and expenditure statements from CIIDR. Salaries include estimates of employers' share of social insurance, health insurance, and pension. ^b Total expenditure on vaccines in 2000 was \$335,348. The cost of vaccines was lower and was calculated using the number of children vaccinated, the corresponding wastage rates of vaccines, and vaccine prices. The central Government has to pay a small clearance and administration fee when vaccine orders are received at the airport. ^c The disposable syringes come from the local government budget and are manufactured in Mongolia. Safety boxes were purchased by JICA through UNICEF. Note that syringes have 15% VAT. ^d The cold-chain clearance cost is about 11% for equipment arriving by rail. The majority of the equipment comes by rail. The central cold room overhead includes maintenance of the cold-chain equipment and the electricity and heating system during winter. ^e Transport figures were provided by CIIDR. This portion is likely to be underestimated as it includes only fuel costs. At the time of the consultant's visit, no information on maintenance of vehicles was available. ^f Social mobilization figures do not include costs covered by local government budgets. ^g Estimated on the basis of MOH budgets and expenditure statements. ^h "Monitoring and evaluation" includes supervision. ⁱ Estimated on the basis of MOH budgets and expenditure statements.

Figure 3: Cost of Full Immunization per Child, by Aimag, 2000



Note: As coverage rates are high in Mongolia the lowest coverage rate (per aimag) for an EPI vaccine was used as the proxy for a fully immunized child

Figure 4: Transport Cost, by Aimag, 2000

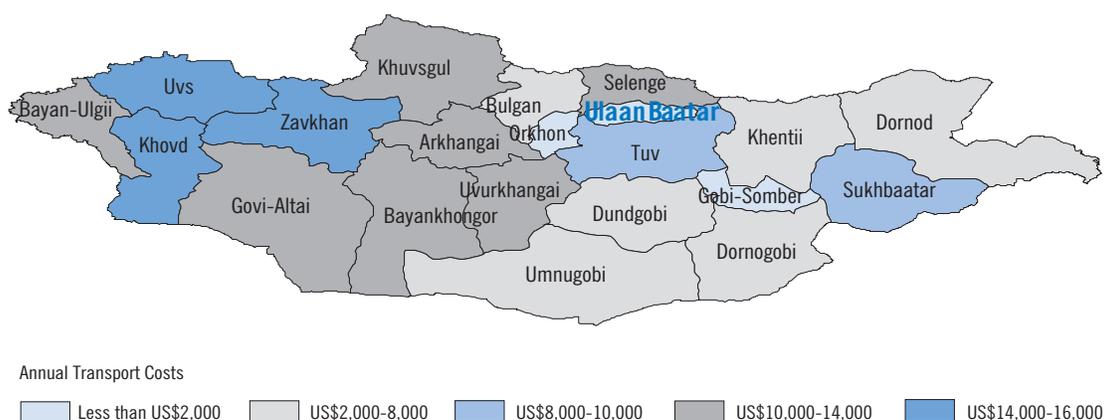
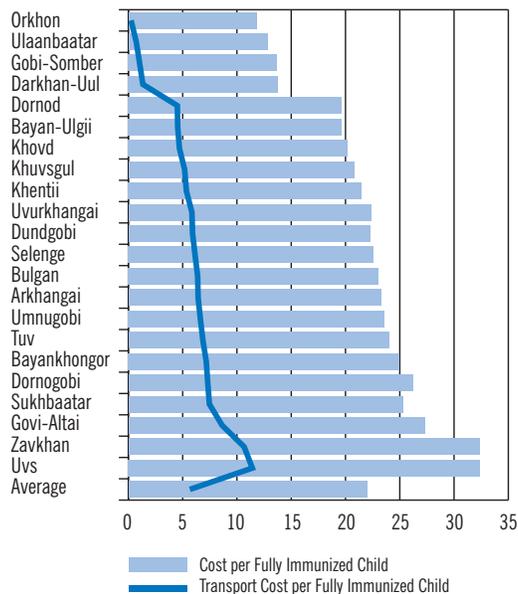


Figure 5: Total and Transport Costs per Fully Immunized Child, by Aimag, 2000



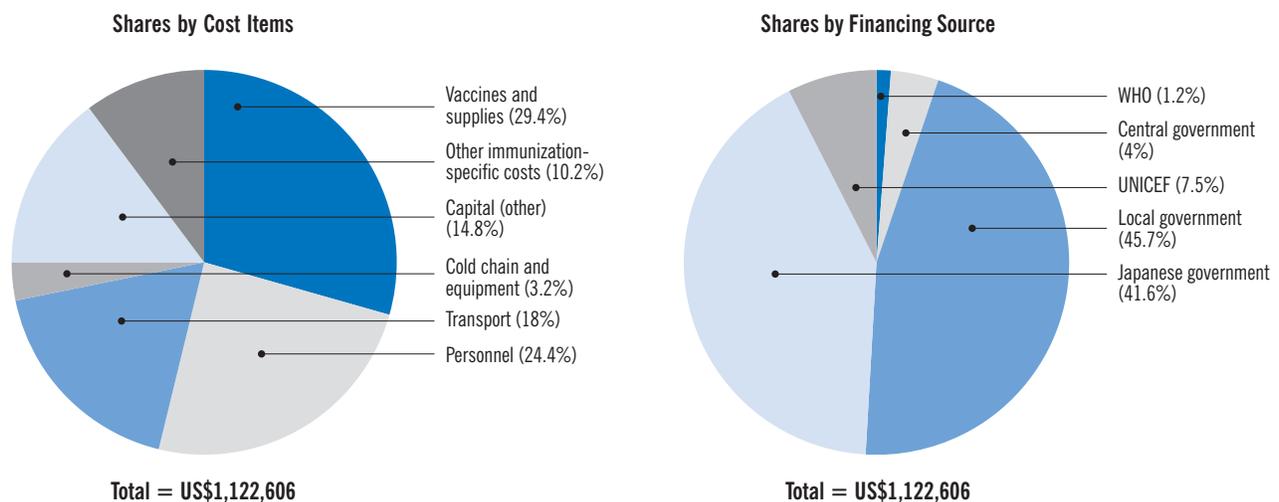
Transport cost accounts for at least 18 percent of program costs,¹⁶ and has a direct positive correlation with the cost per fully immunized child (FIC), as shown in Figure 5. As transport costs are financed locally, equitable access to services may be compromised in aimags with limited budgets.

Donors

The Japanese Government, which provided \$470,000 in support in 2000 and about \$1.2 million over the last five years (mainly for vaccines, supplies, cold chain, and technical assistance), is clearly the primary donor. UNICEF has contributed \$81,000 from its regular budget over the past three years, largely for training, monitoring, and IEC materials. WHO allocated \$164,000 for training, surveillance, and laboratory supplies in its budget for 2000–2001; as of 2000, only \$13,000 of this amount had been used. Figure 6 shows the relative contributions of these three donors in 2000. The Japanese Government provided 41.6 percent of costs, UNICEF 7.5 percent, and WHO 1.2 percent. All three donors have a strong working relationship with MOH and the EPI team.

UNICEF contributed \$253,000 and the Canadian Government (through UNICEF) contributed \$123,427 for the measles campaign in October 2000. These funds were largely used to procure vaccine, auto-disable (AD) syringes, laboratory equipment, motorcycles, computers, and training material. The rubella campaign in May 2001 was funded by WHO.

Figure 6: Shares of Cost Items and Financing Sources for Routine Immunization, 2000



Note: The total excludes supplemental immunization activities. The UNICEF contribution includes the purchase of motorcycles and computers with measles campaign funds.

¹⁶ Cost estimates, and not actual costs, are provided for transport from Ulaan Baatar to aimags; hence, total transport costs are underestimated.

Future Financing

Key Issues

The Mongolian immunization program has an excellent record, with low levels of EPI disease and high coverage. However, the Government must consolidate the advantages gained in disease control by strengthening program quality and sustainability, and maximizing cost-effectiveness. These important areas must be addressed: the commitment of the national Government to funding routine EPI vaccines; financial planning and management; stock management and wastage analysis; laboratory and AEFI surveillance systems; transport costs; and implementation of safe injection practices. Improvements in these areas will provide a stronger foundation for successful and sustained expansion of the program if new vaccines are introduced. Indicative future cost and financing aspects of these areas are discussed below, and policy and financing options are given in the next major section of this report.

Self-sufficiency in vaccines is a key goal for immunization sustainability.

A country is vaccine self-sufficient if it purchases or produces all of the routine EPI vaccines it needs

Vaccine supply

Self-sufficiency in vaccines is a key goal for immunization sustainability. A country is vaccine self-sufficient if it purchases or produces all of the routine EPI vaccines it needs. Until self-sufficiency is attained, a stable and adequate financing structure, including donor funding (where necessary), is an important element of sustainability. A critical component of sustainability is using only vaccines that are known to be of good quality.

The Japanese Government will supply vaccines until 2002, and has been requested to do so for 2003 as well. Any support provided from 2003 onward is likely to be on a year-to-year basis, rather than under a medium-term agreement as before. Beyond this, Mongolia does not have a strategy for vaccine procurement and financing. Such instability leads to inefficient use of resources and may compromise the continuity of supply. Proof of the Government's commitment to the purchase of EPI vaccines, particularly over the medium to long term, will improve program sustainability. Even with a relatively minor commitment, donor funds can be effectively leveraged over a period of time, creating an environment of stability, if not self-sufficiency. Purchasing vaccines, however, is not desirable if it comes at the expense of support for immunization service delivery infrastructure; for this, extra Government resources will need to be mobilized.

Rationalizing the national immunization schedule by reducing the number of doses for BCG and OPV, as recommended by WHO, provides an opportunity to decrease vaccine costs (and the associated storage, distribution, and delivery costs).

The Value Added Tax Law of Mongolia (provision 9.2.4) exempts vaccines procured through donor grant financing, but imposes VAT (15 percent) on vaccines procured by the Government.

Vaccines are fundamentally different from drugs and require specialized procurement knowledge and skills

Quality assurance

Vaccine importation must be managed by a national regulatory authority established by the proper laws. Even if vaccines are purchased through an international mechanism such as UNICEF, WHO recommends that the authority be independent and competent, and that it carry out at least the critical control functions of licensing and surveillance of vaccine field performance (safety and efficacy). If vaccines are procured directly from manufacturers, the additional functions of lot release¹⁷ and access to adequate laboratory services¹⁸ are required.

Vaccines are regulated by the Drugs Act (1998) and the corresponding decree on the registration of “drugs and bio-preparations.” The national regulatory authority is the State Health Inspectorate (SHI), which is responsible for licensing and surveillance, in collaboration with the National Control Laboratory (NCL) and the CIIDR (EPI Team). Both SHI and NCL have very limited capacity to provide the minimum surveillance required (especially AEFI surveillance¹⁹). NCL, which became responsible for vaccine control in 1994, is constrained by the slow development of technical skills and an inadequate budget for the provision of equipment and supplies. WHO has not assessed SHI’s capabilities.

SHI does monitor vaccine quality along the distribution chain (through visual checks of temperature records, vaccine vial monitors, and cold-chain monitors), but does not do so systematically. It also arranges for vaccines to be tested (in Japan) at the request of aimags, usually following a breakdown in the cold chain (every three months or so). Coordination between SHI and CIIDR, which is responsible for vaccine distribution and registration and for AEFI reporting, is considered weak. Both agencies are seeking to improve this.

Procurement

Vaccines are fundamentally different from drugs and require specialized procurement knowledge and skills. Routine vaccines are currently procured through the UNICEF Supply Division. However, independent procurement and logistic capacity is an important step toward self-sufficiency, and can facilitate cost-effective purchasing strategies such as multiyear contracts. In addition, WHO-prequalified manufacturers at times offer prices lower than the contract prices of UNICEF, which charges a 6 percent handling fee.

Under the Public Sector Management and Finance Act (to be adopted), Government procurement services (now managed by MOFE) will be decentralized and each line ministry will have its own procurement unit. Therefore, MOH will manage Government vaccine procurement through open-bid tender,²⁰ as the Procurement Law (2000) requires.

¹⁷ Lot release is a regulatory activity in both manufacturing and purchasing countries whereby each lot of vaccine is checked to determine or confirm its compliance with the regulations of the country. In purchasing countries this is done before distribution. Vaccine quality is subject to lot-by-lot variations.

¹⁸ To be used on demand when there are concerns about shipments, breakdowns in the cold chain, or adverse reactions following vaccination.

¹⁹ With low levels of vaccine-preventable disease, AEFI can significantly affect the use of immunization services. As such, efficient and effective AEFI surveillance and responsiveness is crucial.

²⁰ Tender documents would be prepared by the management of the Immunization Fund.

However, Mongolia has limited experience in the international procurement of routine vaccines and until it strengthens its capacity, and SHI can undertake the four functions of procuring countries noted above, WHO recommends the continued use of UNICEF as a supply mechanism.

As mentioned above, vaccines procured by donor agencies are not charged VAT (15 percent). However, once the Government procures its own vaccines, VAT will be levied.

Costs and financing

EPI vaccines will cost about \$340,000 in 2002, 88 percent of this for primary series vaccinations, as shown in Table 9. Requirements are forecast using the target population (full coverage for primary series) and average wastage rates for the last three years. Current stock levels and orders placed for 2002 have not been taken into account (see "Vaccine Management and Distribution" below). Over the next five years the total cost of EPI vaccines will be about \$1.76 million.

Table 9: Projected Costs of EPI Vaccines, Primary Series and Boosters, 2002–2006 (US\$)

Item	2002	2003	2004	2005	2006	Total
Primary						
BCG	41,921	42,508	43,018	43,534	44,056	215,037
DPT	21,460	21,760	22,022	22,286	22,553	110,081
OPV	47,651	48,318	48,898	49,484	50,078	244,429
Measles	22,466	22,781	23,054	23,331	23,611	115,242
Hepatitis B	167,127	169,466	171,500	173,558	175,641	857,292
Subtotal	300,624	304,833	308,491	312,193	315,939	1,542,080
Booster						
BCG	6,558	6,576	6,595	6,615	6,635	32,980
DT	15,343	15,386	15,430	15,476	15,524	77,160
OPV	20,814	21,105	21,381	21,661	21,944	106,905
Total	343,339	347,900	351,898	355,945	360,043	1,759,126

Note: The primary series comprises all vaccinations for children up to 12 months, plus the fourth DPT dose at 2 years. The booster series comprises all vaccinations given at 2, 8, and 15 years, apart from the fourth dose of DPT. Actual population figures for 1999, provided by the Ministry of Statistics, are projected at a growth rate of 1.4%, the average rate for the last five years. Coverage for the primary series is assumed at 100%, for BCG booster 50%, DT 100%, and OPV 80%—the approximate actual coverage for 2000. Current stock levels and orders placed for 2002 have not been taken into account (see "Vaccine Management and Distribution" below). All vaccine prices are based on actual (UNICEF) prices for 2000: BCG=\$0.099 DPT=\$0.06 OPV=\$0.175, measles=\$0.102, Hepatitis B=\$0.58, DT=\$0.118. Wastage factors were provided by the EPI team; they are based on the average over the last three years (see "Wastage Rates" below) as follows: BCG=7.4, DPT=1.6, OPV=1.2, and measles=1.8 for the primary series, and BCG=2, DT= 1.1, and OPV=1.2 for the booster series. The wastage factor for Hepatitis B vaccine of 1.8 was calculated using national stock levels for 2000. The final price includes freight charges and UNICEF handling fees (6%).

Confirmed Japanese Government funding of vaccines will end in April 2002 (the Japanese fiscal year starts in May and ends the following April, although supplies are expected to last until early 2003. Further funding (\$0.36 million) has been requested but no final decision has been made. If approved, the support is likely to be contingent on the Government's contributing part of the total cost. No other potential donors have been identified.

As noted above, the Immunization Law provides for Government funding for vaccines if there is no donor support. The law can thus be used to ensure Government funding. A funding request for \$290,000 for 2003 has already been submitted to MOFE.

As shown in Table 10, reducing the number of BCG and OPV doses in the national schedule would save about \$40,000 (11.4 percent of vaccine costs) per year. Supply, personnel, and transport costs associated with the delivery of these doses would also be reduced, generating more savings.

Table 10: **Cost Savings from a Rationalized National Schedule, 2002–2006** (US\$)

Year	BCG	OPV	Total Savings
2002	6,558	32,726	39,284
2003	6,576	33,184	39,761
2004	6,595	33,606	40,201
2005	6,615	34,032	40,647
2006	6,635	34,464	41,099
Total	32,980	168,012	200,993

Note: Assumes BCG vaccination is reduced to one dose (at birth) and OPV to three (at 2, 3, and 4 months).

Good vaccine management decreases cost and risk, and makes the national program more sustainable. Apart from tight stock control, good management requires accurate forecasting, thorough analysis of wastage rates, and a well-functioning cold chain

The 15 percent VAT (on Government purchases) will raise the cost of vaccines by about \$45,000 per year, or \$230,000 over the next five years. Any Government allocation for vaccine purchases must explicitly acknowledge this added cost and provide for it. Alternatively (and preferably), EPI vaccines should be exempt from VAT.

National Control Laboratory

By SHI estimates, at least \$82,000 in capital costs will be required to strengthen the National Control Laboratory. No source of funding for these costs has been identified. Yearly operating costs are yet to be determined.

Vaccine management and distribution

Good vaccine management decreases cost and risk, and makes the national program more sustainable. Apart from tight stock control, good management requires accurate forecasting, thorough analysis of wastage rates, and a well-functioning cold chain.

Forecasting and stock management

Vaccine needs are forecast annually on the basis of target population and average national wastage rates. The forecasts are not based on current stock levels, although wastage rates are sometimes adjusted to compensate for under- or over-stocking. Occasionally, an additional 25 percent is ordered to ensure a sufficient buffer stock. The amount of

Vaccine inventory control is done manually at all levels. Computers have been supplied to all aimags; with relevant and sufficient training, stock management may improve, particularly if a national monitoring system is established

vaccine to be distributed to the aimags is based on the total dosage required for the target population, considering three- to five-year averages provided by the aimag EPI managers (who use estimates from the soums). Central management uses the national average wastage rate to adjust this figure and adds 25 percent (for buffer stock). Clearly, vaccine forecasting can stand some improvement.

In February 2001, according to the report of a WHO consultant,²¹ the central storage room held large quantities of measles vaccine (480,000 doses) and BCG (980,000 doses). As orders do not take stock levels into account, almost a full year's requirement of measles vaccine (required=178,000 doses, ordered=158,000 doses) and more than a full year's requirement of BCG (required=481,000 doses, ordered=573,000 doses) were ordered for 2002. Such apparent over-stocking could result in (financial) losses from vaccine expiry.

Aimag stocks are not systematically monitored and controlled centrally, and although a physical count twice a year is mandatory, aimags are not required to report the results to the central management. This hinders the accurate distribution of vaccines, and can result in shortages and losses. It also makes it difficult to determine the quality of stock management in the aimags. Training at all levels in stock control and monitoring as well as forecasting (using correct wastage rates) would help make the system more efficient and thereby save costs.

Vaccine inventory control is done manually at all levels. Computers have been supplied to all aimags; with relevant and sufficient training, stock management may improve, particularly if a national monitoring system is established.

Wastage rates

Differences in the distribution of the Mongolian population (Ulaan Baatar, for example, has a birth cohort of about 14,000 children, while Gobi-sumber has only 275) dictate the use of different delivery strategies (open clinics, fixed sessions, mobile services) across the country. Wastage rates across the country would therefore also be expected to differ significantly. Some aimags and soums would be expected to have justifiably high rates since (i) about 20–30 percent of children receive vaccinations through mobile services, (ii) one-dose vials are not used, and (iii) only those centers that have 24-hour electricity follow the open-vial policy.

Even so, national wastage rates appear surprisingly low (BCG=14.8, DPT=1.6, OPV=1.2, measles vaccine=1.8). National rates are ostensibly the average of aimag wastage rates, which are calculated by comparing the amount of vaccine distributed from central stores against the number of children vaccinated in the aimag. As stock levels are not taken into account, this method often results in rates of less than 1, effectively the same as when central distribution and coverage figures are used. Wastage rates at the subnational level are therefore not calculated, much less regularly monitored.

²¹ Tomasiak (2001)

System wastage, often the largest contributor to overall rates, can be minimized by accurate forecasting, good stock control, timely distribution of vaccines, and a reliable cold chain

As stock data below the national level are not monitored, some wastage may not be detected. Ordering an additional 25 percent every time increases the likelihood that wastage rates are underestimated. Actual wastage is even more difficult to determine because the recording of discarded vials at the various service delivery points does not distinguish between wastage caused within the distribution system (e.g., a breakdown in the cold chain, vaccine expiry) and wastage at point of use. Hence, there is no overall analysis of areas in the program that generate wastage.

System wastage, often the largest contributor to overall rates, can be minimized by accurate forecasting, good stock control, timely distribution of vaccines, and a reliable cold chain (which includes the use of vaccine vial monitors). Wastage at point of use could be decreased by reducing the number of immunization sessions, thus improving the ratio between children and vials, or by using a combination of different-dose vials.

Unless wastage rates or vaccine usage patterns in aimags (or even soums) are analyzed, areas that need improvement cannot be identified. The use of accurate wastage rates can lead to more precise forecasting, decreasing the potential for over- or understocking and therefore minimizing cost. Further study is required to systematically assess sources of wastage and introduce the most effective strategies for minimizing it. This will have serious cost implications when new, more expensive vaccines are introduced into the program.

Cold chain

Although there has been no comprehensive assessment of the cold chain, the following concerns have been raised by a UNICEF survey on the use of cold-chain equipment in three selected soums, donor reports, and the EPI team:

- Limited knowledge and skills in the proper use of equipment. In some soums newly supplied refrigerators could not be used.
- Low technical capacity for repairs and maintenance of equipment, particularly at the lower levels
- Inadequate infrastructure in rural areas, specifically a chronic lack of and/or irregular electricity supply, making the cold chain vulnerable. Generators have been supplied to 90 percent of soums with no electricity (50 percent of the total), yet fuel shortages are frequent. In summer, when there is sometimes no electricity for more than 72 hours, vaccines are placed in a pit 3 meters deep, with a thermometer to monitor the temperature. Surprisingly, given the difficulties with electricity and severe winter temperatures, freezing is not seen as a problem.
- Lack of funding for spare parts

Good quality and timely maintenance of cold-chain equipment reduces costs. The EPI team provides training in general preventive maintenance in three to four aimags a year; this training must remain an integral part of the program. MOH proposes to establish both a Medical Equipment Service Center, responsible for maintenance, repair, centralized procurement, and training, and a management system for repairs and maintenance, in its Health Sector Action Program. Technical expertise in cold-chain equipment may be

included, although it is unclear how this will be coordinated with the EPI team. A donor for this project has yet to be found.

In addition, the national inventory is limited (it does not include functional status or the maintenance schedule, among others). While breakdowns in equipment are reported each quarter to the central level, the severity of the problem is often unknown in view of the low technical capacity for repairs at the subnational level. Such capacity needs to be strengthened, and the EPI team could include an in-house officer who will repair equipment as well as provide basic training in repairs. The EPI team has estimated replacement requirements at 10 percent per year, but a schedule based on needs has yet to be drawn up.

All cold-chain equipment entering Mongolia by train is subject to a clearance charge of about 11 percent. This is levied at the point of entry and is payable out of the CIIDR budget.²²

ADB's Health Sector Development Program supplied "family doctor group practices" with domestic refrigerators and vaccine carriers. The group practices participated in the rubella campaign in May, but it is not known to what extent the cold-chain equipment will be used in the future.

While breakdowns in equipment are reported each quarter to the central level, the severity of the problem is often unknown in view of the low technical capacity for repairs at the subnational level

Transport

Almost one-third of children receive their vaccinations through mobile services. The quality of transport in remote areas is therefore a key factor in maintaining and improving coverage in soums and bags. Sparse population and difficult terrain contribute to high transport costs, which represent a significant proportion of program costs (see "Past and Current Financing" above). Invariably, aimags with high demand for mobile services are low in socioeconomic status. As transport costs are paid for out of local budgets, limited budgets may compromise coverage, and therefore equitable access to services.

Lack of funding for vehicles and spare parts, limited technical capacity for repairs and maintenance, the low useful life of vehicles, the high cost of fuel (particularly in the more remote areas), and fuel shortages all hamper the efficiency and cost-effectiveness of transport. Unaccounted-for transport costs include the use of horses, camels, and other private transport.

The feasibility of providing supplementary funding for fuel costs in soums to maintain or increase coverage should be investigated.

As with the cold chain, a national inventory and monitoring and maintenance system would improve the management of the vehicle fleet (21 cars in the aimags and potentially up to 250 motorcycles in the soums). Replacements must also be scheduled (and financed).

²² Budget to be confirmed.

Costs and financing

Technical assistance of about \$50,000 is needed to establish a stock management system, hold associated training in the aimags, and implement wastage analysis and reduction strategies.

A request made to the Japanese Government in 2001 estimates \$140,000 in cold-chain capital investment costs for 2002 (including transport and clearance charges), as shown in Table 11. This request is expected to be approved.

Table 11: Cold Chain, Current Inventory and Capital Investment Costs, 2002

Item	Total Existing Units (2000)	Requested Units		
		No. of Units	Price per Unit (US\$)	Total Cost (US\$)
Generator	240	70	674	47,180
Voltage regulator	25			
Freezer	55	40	366	14,640
Refrigerator, E3/81	49			
Refrigerator, E3/15	764			
Ice-lined refrigerator, MK 074		70	490	34,300
Cold box, E4/05	57			
Cold box, E4/62	436		345	
Vaccine carrier	1,233	200	18	3,600
Thermometer	1,177			
Indicator	6,548			
Monitor	1,391	300	3	900
Subtotal				100,620
Transport (30%)				30,186
Clearance charges (11%)				11,068
Total				141,874

Source: EPI team

In view of the relative newness of the equipment and the availability of funding support, an annual replacement schedule of 10 percent of the total inventory is appropriate. Using the value of total inventory at the end of 2002, this approach will cost about \$124,000 per year, as shown in Table 12. Spare parts and maintenance costs will add \$50,000 more per year. Removing the clearance charges will save about \$11,000 in investment cost in 2002, as well as nearly \$10,000 in replacement cost every year thereafter. Should the Government fund the procurement of cold-chain equipment, VAT will be levied, adding about \$3,500 per year.

No source of funds has been identified for ongoing cold-chain procurement, including the purchase of spare parts, but the Canadian International Development Agency (CIDA), through the Adventist Development and Relief Agency (ADRA), will contribute about \$15,000 in cold-chain equipment over the next two years. UNICEF has not yet finalized its budget for its 2002–2006 program. Repair and maintenance costs will have to be covered by local budgets.

A request has been made to the Japanese Government in 2001 (expected to be met in 2002) for 100 motorcycles costing about \$112,000, including transport and clearance

Table 12: Cold Chain, Yearly Capital Replacement and Operating Costs

Item	Equipment Inventory		Spare Parts (US\$)	Repair and Maintenance (US\$)	Replacement (10% per year) (US\$)
	No. of Units	Price per Unit (US\$)			
Generator	310	674	6,268	6,268	20,894
Freezer	95	366	1,043	1,043	3,477
Refrigerator, E3/81 and E3/15	883	490	12,980	12,980	43,267
Voltage regulator	25				
Cold box, E4/05	57				
Cold box, E4/62	493	345			17,008
Vaccine carrier	1,433	18			2,579
Monitor		3			
Subtotal			20,291	20,291	87,733
Transport (30%)		6,087			26,320
Clearance charges (11%)		2,232			9,651
Total		28,611			123,704

Source: EPI team

Note: Costs of spare parts for generators, freezers, and refrigerators are 30% of unit price. Repair and maintenance costs are 3% of unit price.

charges. These will complete a major investment in EPI transport capacity (a car for each aimag and a motorcycle for each soum). As shown in Table 13, a replacement schedule based on 10 percent of the current number of vehicles would cost \$81,500 per year, plus an additional \$34,600 for repair and maintenance and for spare parts (assuming these are available in Mongolia). There is no identified source of finance for capital replacement, and as with cold-chain equipment, repair and maintenance costs will need to be met out of local budgets.

Table 13: Transport, Yearly Capital Replacement and Operating Costs

Item	Equipment Inventory		Spare Parts (US\$)	Repair and Maintenance (US\$)	Replacement (10% per year) (US\$)
	No. of Units	Price per Unit (US\$)			
Car	21	18,000	11,340	11,340	37,800
Maintenance tool kit	21	1,800			
Motorcycle	250	800	6,000	6,000	20,000
Subtotal			17,340	17,340	57,800
Transport (30%)					17,340
Clearance charges (11%)					6,358
Total		17,340		17,340	81,498

An investment in vehicles is not risk-free and must at least be accompanied by a plan for meeting all associated costs (running costs, driver training), particularly in the soums and bags, where fuel is often in short supply and local budgets are strained. Mechanisms for providing extra support in such circumstances, alongside intensified advocacy aimed at local budget decision-makers, are called for.

Intensive competency-based training in repair and maintenance, as well as ongoing technical supervision and support, must be built into any investment in cold-chain equipment or transport. Creating a position within the EPI team for a technical officer for

either cold-chain equipment or fleet management would cost about \$1,000 per position. Travel and training would cost extra; for the purposes of this study, travel and training costs are estimated at \$3,000 per year.

Surveillance

The four primary indicators requiring effective surveillance systems are vaccination coverage, incidence of vaccine-preventable disease, AEFI incidence, and sero-prevalence of population immunity. The routine reporting system (mainly through the telephone) for coverage and disease incidence is working well; however, the laboratories have limited capacity for disease and sero-prevalence confirmation.

Three main laboratories serve the EPI program and function as national reference laboratories: the National Polio Laboratory at the Public Health Institute, and the National Measles Laboratory and the Central Microbiological Laboratory at the CIIDR. Some aimags also have microbiological laboratories.

Previous consultants²³ have identified the lack of funding for equipment and a regular supply of test kits and reagents in these laboratories as a major constraint on the surveillance capacity of the national program. To prevent critical shortages of supplies, careful planning and steady funding are required. Staff capacity also needs strengthening, particularly in quality assurance, bio-safety, and internal and external quality control procedures. Regional microbiological laboratories must be developed, but the extent of support needed must first be assessed.

In general, laboratory services must improve infectious disease control and response. In particular, laboratory capacity is needed for rapid confirmation of disease in an outbreak and in the elimination phase of a disease. An objective of the Mongolian program is to eliminate measles. Although the measles laboratory has recently received about \$42,000 (mainly for capital equipment) from the Japanese Government, it, too, has experienced supply shortages and has no minimum budget for test kits for routine testing.

As a whole, laboratory equipment (especially in the Central Microbiological Laboratory) is aging and lacks ongoing maintenance. There is no national inventory or monitoring system for equipment; nor is there a schedule or budget for replacements.

Costs and financing

As estimated by the EPI team, maintaining laboratory supplies, including test kits and reagents, will cost about \$27,000 in 2002 and up to \$31,500 in 2006 (see Table 14). These estimates reflect plans to gradually improve laboratory capacity, increasing the number of specimens to be diagnosed and thus the cost. Strengthening rural laboratories will cost about \$54,000 and should ideally take place in 2002. There is no identified source of funds for either operating or capital costs.

Previous consultants have identified the lack of funding for equipment and a regular supply of test kits and reagents in these laboratories as a major constraint on the surveillance capacity of the national program

²³ Tomasiak and other WHO consultants, working primarily on polio eradication.

Table 14: Central Laboratories, Operating Costs, 2002–2006

Item	2002	2003	2004	2005	2006	Total
Test kits and reagents						
Diphtheros	72	80	88	96	104	440
Pertussis	2	2	2	2	2	10
Tetanus						—
Measles	675	900	900	900	1,125	4,500
Polio						—
Hepatitis B	3,040	3,550	3,550	4,590	6,120	20,850
On-costs	758	906	908	1,118	1,470	5,160
Subtotal	4,547	5,438	5,448	6,706	8,821	30,960
Serological surveys	11,337	11,337	11,337	11,337	11,337	56,685
Epidemic testing	8,706	8,706	8,706	8,706	8,706	43,530
Strengthening of rural labs	2,640	2,640	2,640	2,640	2,640	13,200
Total	27,230	28,121	28,131	29,389	31,504	144,375

Source: EPI team

Coverage: Training and advocacy

As noted above, an identified weakness of the program is low coverage and program implementation in remote soums and bags because of under-motivated staff, limited budgets, and low priority given to immunization at the local level. In addition, the high turnover of staff in “less attractive” regions makes training and mobilization difficult. In some cases, staff turnover reaches 50 percent a year. This puts pressure on central EPI staff (who are responsible for national training) to make sure that new immunization staff provide adequate service. Investing in one more staff member at the central level to coordinate training and undertake advocacy at the local level, particularly in areas of low coverage, would be well justified. In addition, where limited budgets affect coverage, ongoing advocacy toward local political counterparts is essential.

Granting incentives to EPI staff in remote areas may reduce or stabilize staff turnover. However, difficulty in recruiting and keeping staff in rural areas is not specific to immunization, and any incentive scheme would need to be part of a more comprehensive health sector approach. Several aimags and soums do offer incentive packages, but these are not uniform across the country and there remains a chronic shortage of health workers in some areas. Soum Health Funds were established in 1997 to increase local funding for local services, including the provision of incentives, but personnel gaps usually exist in areas that are least able to afford local contributions.

Health reforms undertaken in the ADB HSDP are designed to influence coverage rates. Although family group practitioners do not vaccinate children, their performance contracts require them to achieve immunization rates above 80 percent for all target groups of children in their catchment area. The success of this approach in maintaining or increasing coverage, and the speed with which reform will extend beyond pilot areas, is not yet known. Where this approach is being used, some practitioners who do not meet targets have been threatened with financial penalties.²⁴

²⁴ This has been the case in one health center visited by the consultants, but the threat has not had to be carried out.

Costs and financing

Mongolia's immunization partners (UNICEF, WHO, and JICA) have all provided assistance for social mobilization and staff training. UNICEF expects to continue to support these activities, at a rate similar to its assistance in previous years (\$15,000 per year). Having an extra staff member at the central level, for training and local advocacy, would cost a little under \$1,000 per year, to be paid for by the Government. Travel costs are estimated at an additional \$1,000 per year.

Improving safe injection practices is an objective of the EPI strategic plan. A national safe injection policy exists in draft form but has yet to receive ministerial endorsement

Injection safety

Improving safe injection practices is an objective of the EPI strategic plan. A national safe injection policy exists in draft form but has yet to receive ministerial endorsement. There is no safe injection plan. For all routine vaccinations Mongolia uses locally manufactured disposable syringes (purchased with local funds). Auto-disable (AD) syringes have been used in campaigns funded by donors. Although there may be a shortage of syringes for general health services, there appear to be enough syringes for immunization. There is no evidence (anecdotal or otherwise) that syringes are being reused.

The cost of syringes, whether locally produced or imported, includes VAT (15 percent) if purchased by the Government.

A joint WHO-UNICEF-UNFPA statement²⁵ calls for the exclusive use of AD syringes in all immunization programs by 2003. The local manufacturer, MONSAM, is a private Mongolian-Korean joint venture, which produces only disposable syringes. The Minister of Health is committed to supporting the local industry and so will not approve the importation of AD syringes using Government funding. However, the Minister has expressed interest in exploring financing options to cover technology transfers that will enable MONSAM to produce AD syringes locally. Should AD syringes be introduced, operating costs in the form of training and sensitization activities also need to be considered.

Safe injection practices also require safety boxes, a strict and supervised waste management policy, adequate waste disposal infrastructure (e.g., high-temperature incinerators), and technical assistance and training to ensure safe disposal of syringes. To date, WHO and JICA have supplied safety boxes for routine use in 2000–2001, and UNICEF for campaigns. There is no standard method for destroying used syringes in Mongolia, although most facilities have some system of disposal (usually burning or burying). In many cases the system is unsatisfactory, and alternative methods of disposal should be explored. Introducing a new waste management system will incur both capital costs and operating costs, including labor, fuel, and possibly transport.

If syringes are imported, attention must be paid to the procurement process. Currently local health agencies order syringes directly from MONSAM, not through a centralized procurement body. However, if the syringes were purchased abroad, centralized procurement would need to be introduced to take advantage of the benefits of bulk purchasing.

²⁵ WHO/V&B/99.25

Moreover, as imported syringes would be more expensive than locally produced AD or disposable syringes, the impact on local budgets would need to be considered. Mechanisms must be in place to ensure that aimags and soums with less resources are not forced to compromise on safety.

In September 2001, WHO will provide technical assistance for a “rapid assessment” of injection practices. This will include support for (i) the drafting of a national action plan of action and (ii) the development of a behavior change strategy.

Costs and financing

The primary series of routine EPI vaccinations will require 530,000 syringes a year, costing about \$24,000 for locally purchased disposable syringes (including \$3,000 for VAT), or \$52,000 for imported AD syringes (including \$12,400 for transport and VAT). Over five years, the cost would amount to \$124,000 (\$16,000 for VAT) for disposable syringes or \$300,000 (\$35,000 for VAT) for AD syringes.

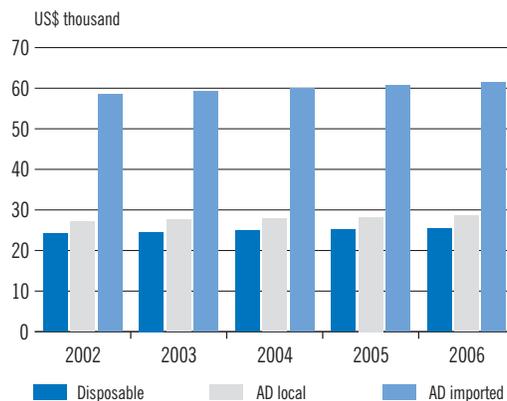
To produce AD syringes, MONSAM will require technology transfer and, most likely, an upgrade to western GMP/ISO 9002 standards. Star Syringe Ltd., the UK company with the patent on AD syringe technology charges a royalty of \$5 per 1,000 syringes (\$3 per 1,000 for curative/general healthcare syringes) for the transfer. This is payable quarterly, according to the number of syringes manufactured. The cost of an upgrade would be determined after a technical audit (by Star Syringe). The audit would cost about \$5,000²⁶ (travel expenses and fees), but this cost would be refundable if the commercial offer is accepted and followed through as recommended in the audit report. The cost of technology conversion is difficult to estimate as it depends on how MONSAM operates, and particularly on the quality of its sterilization techniques. A ballpark figure of between \$200,000 and \$500,000 was provided by Star Syringe for a factory that was already producing syringes to GMP/ISO standards.

If MONSAM were to suffer liquidity problems, loan assistance from the Government or a partner²⁷ could mobilize funds to cover the initial cost of upgrading the production line. Local budgets may need additional support, to cushion the impact of an increase in the price per syringe.

Figure 7 shows the substantial difference in costs among the three syringe options: disposable syringes, locally produced AD syringes, and imported AD syringes. It is assumed that internal (Government) resources will be used to purchase all syringes; prices therefore include VAT. Introducing local AD syringes would cost 12 percent more per year, while imported AD syringes would cost another 140 percent.

A more complete approach to safe injection practices, including the routine use of safety boxes and the introduction of high-temperature incinerators in both aimags and soums, would cost about \$90,000 per year (assuming the capital costs of incinerators are phased

Figure 7: Syringe Prices (Primary Series of Vaccinations), 2002–2006



Note: Based on current local prices for disposable syringes and UNICEF contract prices for imported AD syringes. Technology transfer prices are based on Star Syringe quotes. Prices include VAT.

²⁶ Quoted by Star Syringe.

²⁷ The Program for Appropriate Technology in Health (PATH) has provided loan support for technology transfers to developing-country manufacturers.

in), or just under \$500,000 dollars over five years (see Table 15). These figures do not include the installation of incinerators, training in their use, the implementation of behavioral change strategies, and waste disposal in Ulaan Baatar. Safety boxes are not manufactured in Mongolia and will need to be purchased abroad. Donors have so far provided safety boxes; without donor support, local budgets would be significantly affected. Centralized procurement and exemption from VAT would lower costs.

Table 15: **Safe Injection Costs, 2002–2006** (US\$)

Item	2002	2003	2004	2005	2006	Total
Disposable syringes	24,208	24,546	24,841	25,139	25,441	124,175
AD syringes, local	27,196	27,577	27,908	28,243	28,582	139,505
Safety box	4,678	4,743	4,800	4,858	4,916	23,995
Subtotal	31,874	32,320	32,708	33,100	33,498	163,500
Incinerator						
Capital costs						
Aimag	6,300	6,300	6,300	6,300	6,300	31,500
Soum	27,760	27,760	27,760	27,760	27,760	138,800
Operating costs						
Aimag	4,827	4,827	4,827	4,827	4,827	24,133
Soum	15,951	15,951	15,951	15,951	15,951	79,754
Total, disposable syringes	83,723	84,127	84,478	84,834	85,194	422,356
Total, AD syringes	86,711	87,157	87,545	87,938	88,335	437,686

Note: Waste management costs assume the purchase of Montford incinerators (at \$1,500) for aimags and small incinerators (at \$400) for soums. Incinerator operating costs include fuel, salaries for managers, and storage. Syringes and safety boxes include VAT.

A more comprehensive study would have to be made to estimate the total cost of implementing a safe injection plan for the immunization program, which in any case should be part of a plan for the entire health system.

Introduction of new vaccines

Disease burden, vaccine and implementation costs, program impact, cost-effectiveness relative to other program priorities, and the likelihood of sustainable financing must all be considered when deciding on the feasibility of introducing new vaccines. In addition, services must have the capacity, and be sufficiently robust, to absorb the new vaccines.

Pneumococcal and Haemophilus influenzae type B (Hib) vaccines

Acute respiratory infection (ARI) is the primary cause of death among Mongolian children. The Government has therefore made the introduction of pneumococcal and Hib vaccines a priority.

The burden of pneumococcal or Hib disease in Mongolia is not known. A WHO-designed rapid-assessment tool for Hib disease burden uses existing data, including laboratory test results. But even this information is severely limited. The National Microbiology Labora-

tory has no tests for Hib, and the number of Hib specimens tested each year is not known.²⁸ While ARI is clearly a serious problem, the effectiveness of Hib vaccine may be limited. Studies in other Asian countries indicate that the vaccine is unlikely to have a major impact.

Costs and financing

Pneumococcal vaccine. Three doses of pneumococcal vaccine are required for immunization. At \$44 per dose, the vaccine would be an extremely expensive addition to the routine program. There are no data on the disease burden or information on the efficacy of pneumococcal vaccine in Mongolia. The Government therefore proposes a trial introduction (for one year) in two aimags. For this trial the vaccine alone would cost over \$3 million, as shown in Table 16.

Table 16: Cost of Trial Introduction of Pneumococcal Vaccine Among 2- to 5-Year-Olds in Two Districts, 2000

Cohort	17,258
Doses (3)	51,774
Wastage (%)	1.3
Total Doses	67,306
Price per Dose (US\$)	44.25
Total Price (US\$)	2,978,299
Transport (8%) (US\$)	238,264
Subtotal (US\$)	3,216,563
VAT (15%)	446,745
Total (US\$)	3,663,308

Note: Based on CDC (Atlanta) prices. Assumes full coverage of trial cohort and 25% wastage.

Full introduction of the vaccine in the routine program will cost about \$9 million per year in vaccines, or \$48 million over five years, as shown in Table 18. Locally manufactured AD syringes and safety boxes would cost an additional \$50,000. Other associated program costs such as storage, waste disposal, and training must also be considered.

Table 17: Cost of Routine Introduction of Pneumococcal Vaccine (Conjugate), 2002–2006

Year	Cohort	Coverage	Doses (3)	Wastage	Total Doses	Price per Dose (US\$)	Total Price (US\$)	Transport (8%)	Subtotal (US\$)	VAT (15%)	Total (US\$)
2002	49,500	44,550	133,650	1.3	173,745	44.25	7,688,216	615,057	8,303,274	1,153,232	9,456,506
2003	50,193	45,174	135,521	1.3	176,177	44.25	7,795,851	623,668	8,419,519	1,169,378	9,588,897
2004	50,795	45,716	137,147	1.3	178,292	44.25	7,889,401	631,152	8,520,554	1,183,410	9,703,964
2005	51,405	46,264	138,793	1.3	180,431	44.25	7,984,074	638,726	8,622,800	1,197,611	9,820,411
2006	52,022	46,820	140,459	1.3	182,596	44.25	8,079,883	646,391	8,726,274	1,211,982	9,938,256
Total									42,592,421	5,915,614	48,508,035

²⁸ Shapiro (2001)

The cost of even a pneumococcal vaccine trial significantly overwhelms existing routine program expenditure. From the perspective of available financial resources and ongoing financial sustainability, the introduction of this vaccine cannot be justified. Donors would find it difficult to justify such support, particularly when there are other pressing program issues. In any case, no donor has been identified and the likelihood of finding one or of mobilizing internal resources would be minimal.

Tables 18 and 19 show the cost of introducing Hib vaccine in Mongolia, using two different strategies: broad introduction (full coverage), and targeted introduction for those at high risk (20 percent coverage). The cost in the first year, excluding supplies, would be about \$600,000 for broad introduction and \$121,000 for targeted introduction, at the UNICEF price of \$3 per dose. MOH prefers the targeted strategy, which is more financially pragmatic. No funding source has been identified, although Mongolia would qualify for assistance from the Global Alliance on Vaccines and Immunization (GAVI) if the introduction of the vaccine is considered appropriate. GAVI may also fund a study on the disease burden.

Table 18: Cost of Broad Introduction of Hib Vaccine, 2002–2006

Year	Cohort	Coverage	Doses (3)	Wastage	Total Doses	Price per Dose (US\$)	Total Price (US\$)	Transport (8%)	Handling (6%)	Subtotal (US\$)	VAT (15%)	Total (US\$)
2002	49,500	44,550	148,500	1.2	178,200	3	534,600	42,768	32,076	609,444	80,190	689,634
2003	50,193	45,174	150,579	1.2	180,695	3	542,084	43,367	32,525	617,976	81,313	699,289
2004	50,795	45,716	152,386	1.2	182,863	3	548,589	43,887	32,915	625,392	82,288	707,680
2005	51,405	46,264	154,215	1.2	185,057	3	555,172	44,414	33,310	632,897	83,276	716,173
2006	52,022	46,820	156,065	1.2	187,278	3	561,835	44,947	33,710	640,491	84,275	724,767
Total								219,382	164,537	3,126,200	411,342	3,537,542

Table 19: Cost of Targeted Introduction of Hib Vaccine, 2002–2006

Year	Cohort	Coverage	Doses (3)	Wastage	Total Doses	Price per Dose (US\$)	Total Price (US\$)	Transport (8%)	Handling (6%)	Subtotal (US\$)	VAT (15%)	Total (US\$)
2002	49,500	9,900	29,700	1.2	35,640	3	106,920	8,554	6,415	121,889	16,038	137,927
2003	50,193	10,039	30,116	1.2	36,139	3	108,417	8,673	6,505	123,595	16,263	139,858
2004	50,795	10,159	30,477	1.2	36,573	3	109,718	8,777	6,583	125,078	16,458	141,536
2005	51,405	10,281	30,843	1.2	37,011	3	111,034	8,883	6,662	126,579	16,655	143,235
2006	52,022	10,404	31,213	1.2	37,456	3	112,367	8,989	6,742	128,098	16,855	144,953
Total								43,876	32,907	625,240	82,268	707,508

Hepatitis A

Mongolia reports high rates of viral hepatitis, and although diagnosis is primarily clinically based (less than 25 percent of cases are laboratory-confirmed), the most common form appears to be Hepatitis A. The Government has therefore made the introduction of Hepatitis A vaccine, aside from the above vaccines, a program priority.

Costs and financing

During the winter disaster, rates of Hepatitis A increased significantly in those aimags that were most affected. UNICEF launched an emergency appeal and received \$300,000 from the Canadian and Irish Governments for a Hepatitis A vaccination campaign. MOH proposes to undertake such a campaign in three aimags (for children between 2 and 4 years). It would cost about \$240,000 in vaccines (Table 20), and \$1,500 in AD syringes and safety boxes. MOH foresees the need for a further \$16,000 for a survey and \$450 for training. As the emergency appeal is directly linked to the winter disaster, these funds must be spent by the end of 2001. However, given WHO recommendations (below), the effectiveness of such a campaign may be limited.

Table 20: Cost of Hepatitis A Vaccination in Three Aimags (2- to 4-Year-Olds), 2002

Cohort	10,000
Coverage	10,000
Doses (3)	20,000
Wastage	1.1
Total Doses	22,000
Price per Dose (US\$)	10
Total Price (US\$)	220,000
Transport (8%)	17,600
Subtotal (US\$)	237,600
VAT (15%)	33,000
Total (US\$)	270,600

As shown in Table 21, it would cost \$1.4 million per year to introduce Hepatitis A vaccine into the routine program. No source of funds for this has been identified.

Table 21: Cost of Routine Introduction of Hepatitis A Vaccine, 2002–2006

Year	Cohort	Coverage	Doses (3)	Wastage	Total Doses	Price per Dose (US\$)	Total Price (US\$)	Transport (8%)	Subtotal (US\$)	VAT (15%)	Total (US\$)
2002	49,500	44,550	99,000	1.3	128,700	10	1,287,000	102,960	1,389,960	193,050	1,583,010
2003	50,193	45,174	100,386	1.3	130,502	10	1,305,018	104,401	1,409,419	195,753	1,605,172
2004	50,795	45,716	101,591	1.3	132,068	10	1,320,678	105,654	1,426,332	198,102	1,624,434
2005	51,405	46,264	102,810	1.3	133,653	10	1,336,526	106,922	1,443,448	200,479	1,643,927
2006	52,022	46,820	104,043	1.3	135,256	10	1,352,565	108,205	1,460,770	202,885	1,663,655
Total									1,460,770	202,885	1,663,655

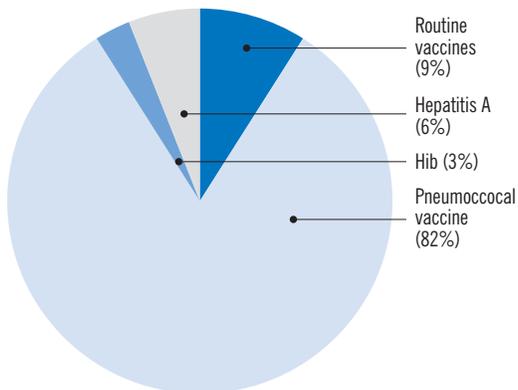
Hepatitis A vaccination can be very effective in preventing and controlling outbreaks among young children in highly endemic areas, notes WHO, which cautions, however, that the vaccination should not be done only once, as “maintaining high levels among children is necessary to prevent future outbreaks.”²⁹ When children contract Hepatitis A,

²⁹ Quotes and broader comments drawn from Shapiro (2001).

they usually recover completely and develop lifelong immunity. Most cases of Hepatitis A in Mongolia occur in children below 5 years, limiting overall morbidity. The cost-effectiveness of routine use of Hepatitis A vaccine is therefore questionable. Moreover, introducing the vaccine into the routine program would cost more than the program itself. Hence, ongoing financial support is not likely to be secured.

Overall

Figure 8: Relative Costs of New Vaccines



Introducing new vaccines into the national immunization program presents enormous financial challenges. The cost of the vaccines is prohibitive and completely overshadows the current routine program. The total additional cost for limited introduction (pneumococcal vaccine trial equivalent to 35 percent coverage, targeted Hib introduction equivalent to 20 percent coverage, and a targeted campaign for Hepatitis A equivalent to 20 percent coverage) would amount to \$4 million per year. Injection supplies and safety boxes would add another \$37,000. Figure 8 shows the cost of each vaccine relative to the total cost of routine EPI vaccines, including Hepatitis B.

As the Government now depends fully on donors for basic EPI vaccines, internal resource mobilization is highly unlikely (if not impossible). Likewise, no external funding sources have been identified. If external resources could be found in the short term, it would be irresponsible of partners to provide support for the introduction of these vaccines without a commitment from the Government to ensuring sustainability. At the very least, a *long-term* financing agreement would be required. In any case, any investment must be preceded by a more in-depth study to determine the disease burden and cost-effectiveness.

Disease control initiatives

Maximizing the advantages of a program that provides high coverage presents an opportunity to eradicate measles. This is an objective of the program, and a preliminary action plan includes a campaign in 2004, more vaccinations in rural areas with low coverage of measles vaccine, stricter surveillance, and a strengthened measles laboratory.

Costs and financing

Data from the measles campaign in October 2000 were used in estimating the cost of a campaign for 2004 (\$375,000).³⁰ Other elements of the plan are included in the financing sections above.

Financial planning

Sufficient, timely, and reliable financial resources are critical to program continuity and integrity. A coherent and comprehensive approach to (and analysis of) financial require-

³⁰ To be confirmed.

ments, available resources, and financing gaps is an important aspect of medium-term planning. Financial planning supports program sustainability by facilitating the targeting of resources based on needs and priorities, highlighting inefficiencies, and identifying risks in funding continuity. In particular, risk identification and management can reduce “crisis management,” which can not only skew program priorities but is an inefficient use of management resources.

Some key principles of financial planning are:

- Understanding program costs and expenditures accurately and in detail; expenditure records must therefore be transparent and accessible
- Basing financial projections on a detailed multiyear plan, from which an annual work plan is derived
- Using the budget as a management tool by maintaining it as a working document and reporting against it
- Prioritizing areas for funding, and planning with partners on the basis of these priorities
- Managing risk, which involves identifying risks to funding continuity and developing strategies to mitigate these
- Developing, where required, a financial sustainability plan that identifies funding sources (meeting quantity, consistency, and sustainability criteria), cost reduction and efficiency measures (ensuring a balance between cost cutting and equity), and resource mobilization strategies

Financial planning supports program sustainability by facilitating the targeting of resources based on needs and priorities, highlighting inefficiencies, and identifying risks in funding continuity

Strategic planning and performance reporting are difficult in the Mongolian healthcare system because of (i) a shortage of financial data, (ii) separation between financial and health policy reporting, and (iii) decentralization.

Reporting is not done along functional lines and EPI finances are not systematically monitored, such that financial planning for the program is complicated and time-consuming, and takes a back seat to other pressing program issues. As a result, while the EPI draft program plan (1999) includes a budget for some elements of the program, and the draft revised version will have a more complete (although basic) framework, neither version identifies future financial sources, gaps, or priority funding areas. Moreover, there has been no reporting against the 1999 budget.

At the same time, the EPI staff has a relatively useful amount of financial data and a good understanding of financing gaps in the program. During the data collection stage of this report, the EPI team made clear their interest in improving efficiency, understanding costing methodology, and undertaking financial planning. Further assessments of the efficiency of the program as well as training and technical assistance in financial policy, budgeting, and planning would be worthwhile and well received.

Financing Needs, Sources, and Gaps

The following analysis is only at the national level. There are not enough data to examine financing gaps at the aimag level, which absorbs the majority of operating costs, including personnel, supplies, transport, and maintenance costs. Particularly in

aimags with limited resources, such gaps may affect both the equity and the quality of services provided.

Projected costs: Basic EPI program

The minimum cost of maintaining the national immunization program over the next five years is projected in Table 22. Vaccine needs are based on forecast population growth and wastage rates provided by the EPI team, but do not take current stock levels into account. No capital investment costs are included. The basic operating cost of the program is just under \$1 million for 2002 and about \$4.9 million over the next five years. On average, vaccines account for 35 percent of the total cost.

Table 22: Projected Minimum Costs of Standard Immunization Program, 2002–2006 (US\$)

Operating expenses	2002	2003	2004	2005	2006	Total	%
Vaccines							
Primary series	300,624	304,833	308,491	312,193	315,939	1,542,080	31.0
Booster series	42,715	43,067	43,407	43,752	44,104	217,046	4.4
Injection supplies							
Primary series	24,208	24,546	24,841	25,139	25,441	124,175	2.5
Booster series	9,024	9,049	9,075	9,102	9,130	45,380	0.9
Cold storage	2,857	2,857	2,857	2,857	2,857	14,286	0.3
Transport							
Vaccine distribution	82,852	82,852	82,852	82,852	82,852	414,261	8.4
Mobile services	119,412	119,412	119,412	119,412	119,412	597,058	12.0
Surveillance							
Laboratory	27,230	28,121	28,131	29,389	31,504	144,375	2.9
Reporting/ Investigation	5,000	5,000	2,000	2,000	2,000	16,000	0.3
TB Center	8,120	8,120	8,120	8,120	8,120	40,600	0.8
Personnel							
National level	10,262	10,262	10,262	10,262	10,262	51,312	1.0
Subnational level	264,092	264,092	264,092	264,092	264,092	1,320,462	27.0
Training							
General	20,000	17,000	15,000	15,000	15,000	82,000	1.7
Specific (BCG)	3,980	3,845	3,560	3,560		14,945	0.3
Social mobilization	25,304	25,304	25,304	25,304	25,304	126,520	2.6
IEC and advocacy	21,722	21,722	21,722	21,722	21,722	108,610	2.2
Monitoring							
Surveys	8,070	7,800	5,400	5,400	5,400	32,070	0.7
Implementation monitoring	4,000		5,000		6,000	15,000	0.3
Supplies (office)	500	500	500	500	500	2,500	0.1
Total	979,972	978,384	980,027	980,657	989,640	4,908,679	100.0

Note: Based on above cost and financing tables, and budgets estimates provided by EPI team

Projected costs: Strengthened/Expanded program

Table 23 summarizes the projected costs of the following: a trial pneumococcal vaccination, a targeted Hepatitis A campaign, limited introduction of Hib vaccine, a measles

campaign, improved injection practices, strengthened laboratory capacity, strengthened national-level management, and regular replacement of cold-chain and transport equipment. The table does not include the marginal operating costs of introducing new vaccines. The measles cost is a lump-sum amount that covers vaccines and all associated costs. Operating costs for surveillance, transport, and training reflect a 10 percent premium allowing for strengthening and consolidation. The amount for national-level personnel represents two additional staff (cold-chain technical officer and training officer).

Table 23: Costs of a Strengthened and Expanded EPI, 2002–2006 (US\$)

Item	2002	2003	2004	2005	2006	Total	% of All Costs
Operating Costs							
Standard program	979,972	978,384	980,027	980,657	989,640	4,908,679	
Savings from changes in the vaccination schedule	(39,284)	(39,761)	(40,201)	(40,647)	(41,099)	(200,993)	
Subtotal	940,687	938,623	939,826	940,010	948,541	4,707,687	41.0
New vaccines							
Pneumococcal	3,216,563					3,216,563	28.0
Hepatitis A	237,600					237,600	2.0
Hib	121,889	123,595	125,078	126,579	128,098	625,240	5.0
Injection supplies	38,534	34,297	34,708	35,125	35,546	178,209	2.0
Measles campaign			375,000			375,000	3.0
Safe injection							
Additional cost of local AD syringes	2,989	3,030	3,067	3,104	3,141	15,330	0.1
Safety boxes	4,678	4,743	4,800	4,858	4,916	23,995	0.2
Waste management	20,777	20,777	20,777	20,777	20,777	103,886	1.0
Surveillance							
Laboratory	2,723	2,812	2,813	2,939	3,150	14,438	0.1
Transport	11,941	11,941	11,941	11,941	11,941	59,706	1.0
Personnel							
National level	1,800	1,800	1,800	1,800	1,800	9,000	0.1
Training							
General	2,000	1,700	1,500	1,500	1,500	8,200	0.1
Cold chain and transport	5,000	5,000	5,000	5,000	5,000	25,000	0.2
Stock, wastage management	50,000					50,000	0.4
Maintenance (including spare parts)							
Cold chain	48,902	48,902	48,902	48,902	48,902	244,511	2.0
Transport	36,587	36,587	36,587	36,587	36,587	182,937	2.0
Subtotal, Operating Costs	4,742,670	1,233,809	1,611,801	1,239,122	1,249,900	10,077,302	88.0
Capital Costs							
Cold chain							
Upgrade	141,874					141,874	
Replacement		123,704	123,704	123,704	123,704	494,815	4.0
Laboratory							
CIIDR strengthening	54,000					54,000	0.5
NCL strengthening	82,000					82,000	1.0
Transport							
Replacement	81,498	81,498	81,498	81,498	81,498	407,490	4.0
Waste management							
Incinerator installation	34,060	34,060	34,060	34,060	34,060	170,300	1.0
Subtotal, Capital Costs	393,432	239,262	239,262	239,262	239,262	1,350,479	12.0
Total	5,136,103	1,473,071	1,851,062	1,478,384	1,489,162	11,427,782	100.0

Excluding the pneumococcal vaccine trial, improvements in the first year will cost almost double the basic program. Of this increase the majority (47 percent) is due to the Hepatitis A campaign and the limited introduction of Hib, and 30 percent is the cost of capital equipment replacement and incinerators (to be introduced). In the third year operational costs will rise as a result of the measles campaign. Decreases in the fourth and fifth year reflect a more stable cost (\$1.5 million per year) of the program, assuming Hib, but not pneumococcal vaccine, is introduced. In total, operating costs account for 89 percent of program costs, including the purchase of routine vaccines (42 percent of operating costs). The cost of vaccine for the pneumococcal trial would equal 342 percent of the basic program.

Excluding all new vaccines, the above improvements would add 70 percent more, or about \$460,000, to the cost of the basic program.

Projected funding sources and gaps

The Japanese Government (including JICA), WHO, and UNICEF have so far been the primary donors. Although JICA technical assistance will end in September 2002, the Japanese Government may provide continuing support for vaccine purchases (on a year-to-year basis). For 2002–2003, WHO estimates it will contribute about \$100,000, a significant proportion of which may fund the services of a full-time international expert in laboratory surveillance. UNICEF still has to finalize its budget for 2002–2006 but is expected to maintain its current level of contributions of between \$25,000 and \$30,000 a year. This amount will be used to develop safe injection practices, introduce new vaccines, and undertake continuing social mobilization.

In 2002–2003 ADRA will provide about \$100,000 (excluding international technical assistance) to support training for immunization workers in the soums (through workshops in each aimag) (\$24,000), cold-chain equipment (\$15,000), public awareness campaigns, and assessments of immunization coverage in remote areas.

Table 24 shows the gap in funding for an improved EPI program over the next five years. It assumes the Government of Mongolia will:

- Maintain current funding levels for operating costs
- Begin contributing to the cost of routine vaccines, starting at 5 percent in 2003 and increasing by 5 percent yearly to 20 percent in 2006

No capital costs are included in Government expenditure, as fiscal constraints make this unlikely. Five-year forecasts for WHO and UNICEF assistance are based on current levels of support.

Figure 9 gives the overall funding gap for the national program over the five years 2002–2006. Of the total gap of \$7.3 million, 15 percent is for routine vaccines, 55 percent for new vaccines, and 13 percent for capital equipment replacement. After the first year, the gap is constant, reflecting a discrepancy between recurrent capital and operating costs and identified resources.

Figure 9: Overall Funding Gap for Improved EPI, 2002–2006

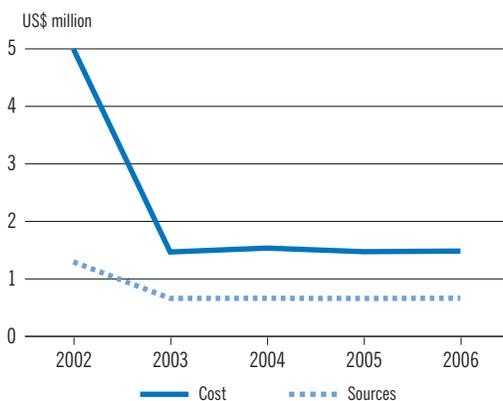


Table 24: Funding Gap for Improved EPI, 2002–2006 (amounts in US\$)

	Cost	% of Total Cost	Sources	Gap	% of Total Gap
Operating Costs					
Basic program	4,908,679				
Less savings from schedule changes	(200,993)				
Subtotal	4,707,687	41.0	3,646,523	1,061,164	15.0
New vaccines					
Pneumococcal	3,216,563	28.0		3,216,563	44.0
Hepatitis A	237,600	2.0	237,600		
Hib	625,240	5.0		625,240	9.0
Injection supplies	178,209	2.0		178,209	2.0
Measles campaign	375,000	3.0		375,000	5.0
Safe injection					
Additional cost of local AD syringes	15,330	0.1		15,330	0.0
Safety boxes	23,995	0.2		23,995	0.0
Waste management	103,886	1.0		103,886	1.0
Surveillance					
Laboratory	14,438	0.1		14,438	0.0
Transport	59,706	1.0		59,706	1.0
Personnel					
National level	9,000	0.1		9,000	0.0
Training					
General	8,200	0.1		8,200	0.0
Cold chain, transport	25,000	0.2		25,000	0.0
Stock, wastage mgmt	50,000	0.4		50,000	1.0
Maintenance (including spare parts)					
Cold chain	244,511	2.0		244,511	3.0
Transport	182,937	2.0		182,937	3.0
Subtotal, Operating Costs	10,077,302	88.0		6,193,180	85.0
Capital Costs					
Cold chain					
Upgrade	141,874		141,874		
Replacement	494,815	4.0		494,815	7.0
Laboratory					
CIIDR strengthening	54,000	0.5		54,000	1.0
NCL strengthening	82,000	1.0		82,000	1.0
Transport					
Replacement	407,490	4.0		407,490	6.0
Waste management					
Incinerator installation	170,300	1.0		170,300	2.0
Subtotal, Capital Costs	1,350,479	12.0		1,208,605	17.0
Unallocated			125,000	125,000	(2.0)
Total	11,427,782	100.0	4,150,997	7,276,785	100.0

Policy and Financing Options

Funding gaps at the national level must be addressed to strengthen the immunization program. Over the next five years these gaps will primarily affect the purchase of basic EPI vaccines, the cold chain, transport capacity, laboratory capacity, injection safety, and coverage. Failure to address these issues may erode the gains of the past 20 years. Closing these gaps will require ongoing support from external partners, Government policies that can lead to cost savings, and careful (and appropriate) use of the Immunization Fund. The introduction of new vaccines presents significant financial challenges, not least of which is finding a balance between expanding the program with limited funds, and consolidating and strengthening it.

Any discussion of immunization financing must consider the broader reforms now taking place in the health sector, including financial management reforms.

Until now the Government has depended fully on donors to fund EPI vaccine procurement. However, funding uncertainties dictate that it should either fund all vaccine purchases or *at least* (if donor support is confirmed) contribute an increasing proportion of the cost of purchase

Policy Options

The Government can improve the financial sustainability of the program (through cost savings), increase efficiency, and reduce uncertainty by implementing policy decisions in the following areas:

- Vaccine procurement
- Management of wastage and stocks
- Management of equipment
- Safe injection practices
- Local government budgets
- Government charges
- New vaccines
- Financing structure
- Immunization Fund

Vaccine procurement

Until now the Government has depended fully on donors to fund EPI vaccine procurement. However, funding uncertainties dictate that it should either fund all vaccine purchases or *at least* (if donor support is confirmed) contribute an increasing proportion of the cost of purchase. Fiscal constraints may limit Government support but cannot justify withholding such support. In addition, a dedicated line for EPI specific vaccine purchases in both the national budget chart of accounts and the MOH specific chart of accounts should be created. Doing this presents two clear *advantages*:

- *Easier sustainability*. Unless the Government guarantees a certain level of funding for ongoing EPI vaccine purchase, the program may not be sustainable. Relying year after year on donors complicates medium-term forecasting and potentially compromises program continuity.

- *Improved accountability and transparency.* A budget line must be reported against at the end of each financial year, with the reporting unit taking responsibility for correct (and complete) use of funds. A specific EPI vaccine line would therefore reduce the risk of funds being diverted to other expenditure areas (including nonroutine vaccines).

Self-sufficiency also includes technical and logistical self-reliance. To prepare itself for independent procurement (through open-bid tender, as prescribed by Government policy), the Government should invest in strengthening its *procurement* and *quality assurance* capacity, and seek technical assistance in this area. Until it acquires adequate capacity, it should continue procuring vaccines through UNICEF.

The need for sufficient capacity will increase if new vaccines are purchased, as there are no WHO-prequalified suppliers and no UNICEF procurement service for pneumococcal or Hepatitis A vaccine.

Wastage and stock management

Wastage rates are a useful financial management tool. Although wastage rates appear acceptable at the national level, an in-depth analysis at aimag level will highlight regional discrepancies. Where possible, appropriate reduction strategies and a system of regular monitoring, reporting, and feedback can then be implemented. As good wastage management facilitates accurate forecasting, procurement and distribution costs may also be reduced. Certainly, areas where wastage rates are of concern will need to be addressed before new (and very expensive) vaccines are introduced.

Good stock management is also an important tool for cost control. Systems developed for routine vaccines should be applied as well to nonroutine (or emergency) vaccines, as wastage (due to expiry) of these stocks, and therefore financial loss, has been known to occur.

Management of equipment

Implementing a national immunization program requires significant resources, which should be managed well to reduce costs. The cold chain, laboratory equipment, and vehicles should all be inventoried and their functional status, performance, and maintenance schedule monitored for optimal efficiency and longevity. A national (centralized) inventory and monitoring system will facilitate needs-based planning and make resource mobilization more efficient. More importantly, it will identify where (limited) resources are most needed and can be most effectively deployed.

An important element of good monitoring is responsiveness. Breakdowns in the cold chain, for example, should be addressed as quickly as possible. To do this requires technical capacity in repairs and a budget for transport and training. Additional resources at the national level to provide this service are justifiable.

Any investment in capital equipment should support the establishment of an effective and responsive monitoring system, and include provisions for supplies and training.

The need for sufficient capacity will increase if new vaccines are purchased, as there are no WHO-prequalified suppliers and no UNICEF procurement service for pneumococcal or Hepatitis A vaccine

Local governments account for the vast majority of Government expenditure. It is clear that any increase in operating cost elements caused by policies designed to strengthen the program will primarily fall to local budgets

Safe injection practices

The upcoming WHO assessment of safe injection practices will determine the urgency of changing to AD syringes, not only for the immunization program but also within the broader health system. Should the Government endorse a change, the most feasible policy (and financing) option would be to require MONSAM to upgrade its production facilities from disposable syringes to AD syringes. MONSAM may need financial support for this, and the Government should be prepared to assist the company either by providing its own funds or by helping to mobilize external resources.

Upgrading to AD syringes would increase the cost to the buyer, as a result of cost recovery for the upgrade and royalties on each syringe. The impact on local budgets will need to be monitored to ensure this does not have adverse consequences. The central Government may have to provide subsidies equal to the increase, or MONSAM may have to resort to alternative methods of cost recovery (possibly through increased export prices).

Local government budgets

Local governments account for the vast majority of Government expenditure. It is clear that any increase in operating cost elements³¹ caused by policies designed to strengthen the program will primarily fall to local budgets. In aimags and soums with limited local (human and financial) resources, this may heavily affect the extent and quality, and therefore the equity, of services provided to the local population. To prevent existing and possible future inequities the following policy options should be considered:

- A discretionary budget at central level to supplement, not substitute for, local budgets for transport costs, particularly in areas of low coverage
- Centralized procurement and financing of syringes (as provided for in the Immunization Law)
- Removal of VAT on safe injection equipment

Government charges

At present, VAT (15 percent) is levied on all purchases, including those made by the Government for immunization. Donor purchases are excluded. This tax adds a significant amount to the cost of the program, and will have a greater impact when the Government begins funding routine vaccines. To maximize the effectiveness of the (limited) immunization budget, immunization supplies, particularly vaccines, should be VAT-exempt. In addition, the removal of clearance charges (11 percent) for cold-chain equipment entering the country by rail will also result in cost savings, allowing funds to be used more strategically and effectively.

³¹ Such as transport, personnel, syringes, safety boxes, and incinerators.

Where Government funds are so limited and donors for routine vaccines are yet to be found, and where other programmatic issues such as coverage and laboratory surveillance are identified weaknesses of the program, introducing these new vaccines appears unrealistic

New vaccines

The clear financial priority of the Government is the introduction of pneumococcal and Hepatitis A vaccine. The cost of these vaccines (even for a limited target population) totally overwhelms current expenditure, and presents two fundamental policy considerations. Firstly, while the Government continues to rely on donor funding for basic EPI vaccines, the issue of resource mobilization and subsequent financial sustainability is of great concern; at best, it is highly questionable. Secondly, if resources can be mobilized, other public health priorities, including consolidating the program, must be considered when assessing the *cost-effectiveness* of such an enormous investment. Where Government funds are so limited and donors for routine vaccines are yet to be found, and where other programmatic issues such as coverage and laboratory surveillance are identified weaknesses of the program, introducing these new vaccines appears unrealistic.

Financing structure

As highlighted by the financing gap analysis, to strengthen basic immunization services resources need to be mobilized, and a reliable medium-term financing structure established. There are five possible financing sources, each of which must be considered in terms of equity, reliability, and consistency. These sources are:

1. *Central Government budget.* The central Government now contributes about 4 percent of program costs and 8 percent of the total Government contribution, mainly in personnel and capital costs. Increasing and *maintaining* the proportion of this contribution, particularly in key areas such as vaccine procurement, and cold-chain and laboratory equipment, would improve both self-sufficiency and sustainability. Moreover, the reliability of this funding facilitates strategic forward planning and the efficient use of resources.
2. *Local government budget.* Local governments now support almost 50 percent of program costs, mostly for personnel, transport, and injection supplies—all vital to high coverage and delivery of safe vaccination services. Local budgets have limited capacity to absorb further costs, particularly in areas of low economic status (and consequently low income to Government). To demand increased contributions would be unreasonable, and could be inequitable. Indeed, rather than expecting to mobilize resources from this area, the central Government may have to provide supplementary support to some aimags or soums.
3. *Health Insurance Fund.* Under the ADB project the Government has agreed to increase the percentage of Government health expenditure on primary healthcare, possibly based on a defined “essential package of services.”³² As availability of Government funds to increase expenditure is limited, and it may take time to realize cost savings from rationalizing the healthcare system, one option is to allocate more funds from the Health Insurance Fund. Ensuring immunization is included in the definition of an “essential package” may be one way of mobilizing more funds for the program.

³² The essential package is in the process of being defined, and it is not known whether it will include immunization.

The Immunization Fund is still in its infancy and its future role in immunization financing is still being defined. The extent to which it will be used as a revolving or trust fund is unclear

4. *Donors.* Support from donors will undoubtedly continue in the future, but although the level of assistance is not clear, it is likely to decrease over time. Grant assistance (especially for vaccines) may not be consistent or reliable, and to reduce the negative impact of this, supplementary assistance is preferable. Loan assistance, however, may provide continuity and offer the Government an alternative contribution mechanism to upfront financing.

5. *Immunization Fund.* Depending on its structure (see below), the Immunization Fund may be able to raise some funds (for example, through service charges). A small amount of income will come from user fees charged for voluntary vaccinations, although this will not be significant, and may only be cost-neutral. Income should not be generated at the expense of budgets already paying for immunization services. Rather, it should only result from savings or efficiencies the comparative advantage of the Fund can provide.

The existence of the Fund itself can be used to mobilize donor resources, as it not only demonstrates the commitment of the Government to immunization, but also offers a transparent mechanism (based in law) to manage both donor and internal finances. The sustainability advantages that the Fund provides should be promoted and used to attract support.

The Government will need to assess the costs, benefits, and risks of each of these sources, particularly as they affect program sustainability, and plan accordingly for the medium to long term. It may be helpful to divide costs into recurrent and capital, and target resource mobilization correspondingly.

Immunization Fund

The Immunization Fund is still in its infancy and its future role in immunization financing is still being defined. The extent to which it will be used as a revolving or trust fund is unclear. The Immunization Law and Fund regulations will require further work to finalize the Fund's operating mechanisms. Discussions and negotiations should be held with potential donors regarding the form most likely to generate external funds. The Fund needs to be careful that it does not merely shift costs (from central to local government budgets) in an attempt to generate funds for its own sustainability; it is not a profit center.

There are strong arguments for developing the Fund into an internal revolving fund, which can provide supplementary and emergency support through short-term credit to both central and local governments. At the central level, critical shortages in supplies have in the past compromised program integrity, and urgent donor funding has been sought. Delays in donor financing can lead to gaps and a short-term credit facility could prevent these from causing damage to the program. At the local level, health administrators often struggle to meet immunization costs, particularly for outreach or mobile services. Anecdotal evidence suggests constant borrowing of funds and use of private resources to ensure vaccination targets are met. Again, the safety net of a revolving fund would alleviate short-term budget shortfalls and minimize disruptions in the program.

In addition, the Fund could provide strategic financial support to local budgets when necessary, particularly for transport and syringe needs. The central Government would have to allocate and transfer *upfront* a minimum level of funds to the Fund at the start of each year (as part of the formal budget process).

Further analysis would be required to determine the extent to which the Fund could be self-sustaining (through service fees, for example) or would require replenishment. And, as the Fund will play a pivotal role in future immunization financing, a practical and appropriate finance and administration system will have to be established and implemented. Technical assistance in the form of advice and training in international best practices is well justified.

If the Fund were to become a trust fund, support could be sought either through grant financing or loan assistance. In either case, it would probably be conditional upon a matched Government grant, which may not be possible under the current fiscal circumstances.

Financing Options

The size of the funding gaps identified in this report is merely indicative. In some cases, more comprehensive assessments must be made to provide accurate information.

Vaccines

The Japanese Government may fund the purchase of routine vaccines in 2003, but is not certain to provide funding after that. Hence, there will be a financing gap of \$936,000 between 2004 and 2006 for the primary series of vaccinations. Mobilizing these funds externally would be risky and would take up valuable management time. Therefore, for reasons of stability and future self-sufficiency, any donor funding should be contingent upon (i) a minimum contribution by the Government, and (ii) the development of a medium-term procurement and financing strategy.

Costs can be reduced by rationalizing the national schedule.

A financial package is required to provide technical assistance for both an assessment of the State Health Inspectorate (including the NCL) and subsequent strengthening. Donor support is well justified. The Government must plan to provide adequate financing to the NCL for supplies.

Vaccine management and the cold chain

Investment in technical assistance for an analysis of wastage rates, the introduction of appropriate reduction strategies, and the establishment of an ongoing wastage monitoring system in the aimags is also well justified.

As the Fund will play a pivotal role in future immunization financing, a practical and appropriate finance and administration system will have to be established and implemented

The Government can control costs by establishing a national inventory and monitoring system for equipment, and a management and maintenance system for vehicles. Any assistance provided in these areas must be either a condition of, or part of, any package

Recurrent capital costs to strengthen and maintain the cold chain and vehicles are based on a replacement schedule of 10 percent, not on a systematic needs assessment. Moreover, no comprehensive evaluation of the cold chain has taken place recently. Such an assessment may yield management and policy concerns requiring further investment.

On the basis of current estimates, a capital investment funding gap of \$500,000 for the cold chain and \$400,000 for vehicles exists over the next five years. This does not include spare parts costs of about \$50,000 per year, and repair and maintenance costs of about \$37,000 per year. No source of funds has been identified. Any investment in the cold chain should be preceded by in-depth assessment and include sufficient spare parts and training in use and maintenance.

The Government can control costs by establishing a national inventory and monitoring system for equipment, and a management and maintenance system for vehicles. Any assistance provided in these areas must be either a condition of, or part of, any package. The additional cost of technical cold-chain and transport officers at central level and district-level training for cold-chain officers, about \$2,000 per year, represents a prudent Government investment.

Fuel supplies and costs in remote areas are a major concern, greatly affecting coverage. Advocacy at both local and central levels, for increased and supplementary funding is required. Funding for this essential service should be considered a priority.

Laboratory surveillance

Operating costs for laboratory surveillance amount to \$30,000 per year, and at just over 3 percent of the basic program expenditure are a relatively minor proportion of overall costs. Critical supply shortages in some laboratories show this to be a priority area requiring sufficient planning and allocation of resources from the central budget. Investment in capital equipment to strengthen regional laboratories has been estimated at \$54,000. However, a national needs assessment of equipment, including (and especially) the Central Microbiological Laboratory, is needed. Any investment should be (i) accompanied by adequate training in use and maintenance and (ii) be contingent on the establishment of a national monitoring system (for equipment and supplies).

Injection safety

A firm costing for improving safe injection practices depends on the Government's medium-term policy decision whether or not to use AD syringes. Introducing AD syringes through technology transfer would add only 12 percent to operational costs and seems to be a feasible way of upgrading from disposable syringes. The barrier to such a transfer would be the capital cost, which could amount to \$500,000. Imported AD syringes would cost about \$300,000 over five years (at the current price). Safety boxes and incinerators would add at least \$60,000 more to the cost each year for five years, and donor support would be required. For sustainability reasons the Government should finance all syringe costs.

Cost-reduction savings in the Mongolian immunization program may take place in five areas: rationalization of the national schedule, reduction of wastage rates in aimags and soums, use of wastage rates in planning, improved stock management, and exemption of immunization supplies from clearance charges and VAT

Introduction of new vaccines

Given the unknown disease burden of pneumococcal and hepatitis A, the unknown cost-effectiveness of the vaccines, and the high cost, donor funding is unlikely. At the same time, with current fiscal constraints and many competing priorities, internal resources cannot be mobilized. Hence, the funding options for these vaccines appear negligible.

Summary

Cost-reduction savings in the Mongolian immunization program may take place in five areas: rationalization of the national schedule, reduction of wastage rates in aimags and soums, use of wastage rates in planning, improved stock management, and exemption of immunization supplies from clearance charges and VAT.

Additional funding is required to *strengthen* the program in five areas: laboratory surveillance; the national control laboratory; transport; the cold chain; and injection safety.

Extra funding would be required to *expand* the program in two areas: new vaccine introduction and measles eradication.

The structure of program financing will affect program sustainability. Financing sources include: central Government funds, local government funds, the Health Insurance Fund, donors, and the Immunization Fund. Each source has its advantages and disadvantages, and issues of reliability, consistency, and self-sufficiency should be considered when developing a financial sustainability strategy.

Recommendations

To maintain, strengthen, and expand the Mongolian national immunization program in a rational manner a number of policy issues must be addressed, cost reduction strategies introduced, and resources mobilized. Considering the fiscal and economic situation of Mongolia and the need to consolidate the substantial gains achieved in coverage and disease control, it is recommended that the Government:

1. Improve sustainable financing and accountability by:

- Developing a *financial sustainability* plan, including:
 - Cost reduction and efficiency strategies
 - A medium-term resource mobilization strategy, which seeks to balance funding sources according to equity, efficiency, accountability, continuity, and reliability
- Advocating for the inclusion of immunization in the HIF “essential health package.” Any income generated through this package must be additional to, and not displace, existing Government contributions.
- Financing the purchase of routine EPI vaccines after 2002, either entirely or in a co-financing arrangement (which includes an increasing share from the Government)
- Creating and maintaining a budget line for EPI specific vaccines in:
 - MOFE (national) budget and chart of accounts
 - MOH budget, chart of accounts, and financial database
- Clearly defining the financing role of the Immunization Fund. The benefits of a revolving-fund mechanism (with central budget support) should be considered. Processes must be in place to ensure the Fund does not become self-sustaining at the expense of current immunization budgets.
- Seeking technical assistance for financial planning, and advice on international best practice for fund management
- Minimizing the impact of cost increases on local budgets by exploring alternative financing strategies (e.g., centralized financing for injection supplies) where necessary
- Ensuring funding priorities are consistent with financial resources and program needs
- Continuing to purchase vaccines through UNICEF until the Government develops sufficient capacity to procure vaccines and ensure their quality on its own

2. Reduce cost (and improve financial sustainability) by:

- Rationalizing the national schedule
- Seeking technical assistance to improve vaccine forecasting, wastage calculations, and stock management. Such assistance should cover:
 - Analyzing wastage rates in aimags
 - Implementing a national system for monitoring aimag wastage rates
 - Developing and implementing strategies and policies for reducing wastage
 - Using stock levels when forecasting vaccine needs
- Applying the foregoing strategies to nonroutine vaccines
- Establishing a national inventory and monitoring system for cold-chain, transport, and laboratory equipment and supplies
- Hiring a technical officer at the central level for cold-chain repairs, and providing a budget for ongoing training in repairs and maintenance at the subnational level

To maintain, strengthen, and expand the Mongolian national immunization program in a rational manner a number of policy issues must be addressed, cost reduction strategies introduced, and resources mobilized

- Removing import clearance charges on cold-chain and transport equipment
 - Exempting immunization supplies from VAT
3. Mobilize resources (internally or externally) to address gaps in funding for the following:
- *Strengthening the cold chain.* It is further recommended that:
 - Any investment be preceded by a comprehensive assessment of the cold chain
 - (Subject to the foregoing assessment) Funding be based on an annual replacement schedule of 10 percent per year
 - A funding package include a budget for spare parts, a central level training officer and ongoing subnational training
 - External funding be contingent on (or include a budget for) a national inventory and monitoring system (as recommended above).
 - *Strengthening transport infrastructure.* It is further recommended that:
 - Funding be based on an annual replacement schedule of 10 percent per year
 - The associated operating costs be covered as well by any investment
 - External funding be contingent on (or include a budget for) an national inventory and monitoring system (as recommended above)
 - *Strengthening laboratory capacity,* through investments in equipment and supplies. It is further recommended that:
 - Investment in the Microbiological Laboratory be preceded by an in-depth assessment
 - Funding be contingent on (or include a budget for) a national inventory and monitoring system, and the provision of adequate spare parts and training in the use of equipment and its maintenance
 - *Strengthening the SHI and the NCL* through investments in equipment, supplies, and training
 - *Improving safe injection practices* , including supplies and waste disposal requirements. It is further recommended that:
 - Investment be guided by a comprehensive strategy addressing all aspects of injection safety, including behavior change. If necessary, the cost of developing the strategy should be incorporated in the funding proposal.
 - MONSAM be encouraged to upgrade production to AD syringes through incentives (or disincentives, if necessary), including assistance in mobilizing resources for the upgrade
 - The impact of syringe price increases on local budgets be monitored to ensure that injection safety is not adversely affected. If necessary, financing of syringes should be centralized (as provided for in the Immunization Law).
 - Safety boxes be centrally financed, or adequate compensation be made to local budgets to cushion the budget impact
 - Incinerators be financed centrally
 - *Introducing new vaccines* that are determined to be cost-effective
4. Immunization partners show commitment to a sustainable immunization program by:
- Investing only if the Government commits over the long term to fund all core operational EPI costs including, and especially, vaccines and safe injection needs
 - Ensuring that identifiable cost savings generated through the above strategies are used for immunization

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