



ADB

ASIAN VACCINATION INITIATIVE

Azerbaijan National Immunization Program

FINANCING ASSESSMENT

Asian Development Bank

ASIAN VACCINATION INITIATIVE

Azerbaijan National Immunization Program

FINANCING ASSESSMENT

© 2002 Asian Development Bank
All rights reserved

The findings, interpretations, and conclusions expressed in this publication do not necessarily represent the views of the Asian Development Bank or those of its member governments. The Bank does not guarantee the accuracy of the data included in this publication and accepts no responsibility for any consequences of their use.

Asian Development Bank
P.O. Box 789
0980 Manila, Philippines
Tel: (63-2) 632-4444
Fax: (63-2) 636-2444
Website: <http://www.adb.org>

ISBN 971-561-418-3
Publication Stock No. 010502

Contents

<i>Illustrations and Tables</i>	<i>iv</i>
<i>Acknowledgments</i>	<i>v</i>
<i>Abbreviations</i>	<i>vi</i>
<i>Executive Summary</i>	<i>vii</i>
Introduction	1
Purpose	1
Methodology	1
Background	3
Socioeconomic Situation	3
Demographic and Health Indicators	4
Health System	7
National Immunization Program	11
Five-Year Strategic Plan	11
Organization Structure	12
Coverage	12
Financial Structure	13
Past and Current Financing	13
Future Financing	15
Key Issues	15
Financing Needs, Sources, and Gaps	21
Policy and Financing Options	27
Policy Options	27
Financing Options	29
Summary	30
<i>Annex</i>	<i>31</i>
<i>References</i>	<i>36</i>

Illustrations and Tables

Figures

1	Organization of the Healthcare System	7
2	Organization of the Immunization Program	12

Tables

1	Socioeconomic Indicators, 1992–1999	4
2	Demographic Indicators, 1995–1999	4
3	Projected Population, 2000–2006 ¹	5
4	Health Indicators, 1995–1999	5
5	Incidence of EPI Target Diseases, 1991–1999	6
6	Government Health Budget, 1995–2000 ³	8
7	Extrabudgetary Funds for Health, 1995–1998	9
8	Donor Support for the Health Sector, 1995–1999	9
9	National Immunization Schedule	11
10	Reported Immunization Coverage, 1996–1999	13
11	Expenditures for the Routine Immunization Program, 2000	14
12	NIP Vaccine and Syringe Requirements, 2001–2004	16
13	Cost of Research Studies and Reviews, 2002–2006	20
14	National Immunization Program: Cost of Vaccines, Syringes, and Safety Boxes, 2002	22
15	National Immunization Program: Cost of Vaccines, Syringes, and Safety Boxes, 2002–2006	22
16	Summary of Estimated Costs, 2002–2006	23
17	Office Equipment Purchase Costs, 2002–2006	24
18	Cold-Chain Equipment Purchase Costs, 2002–2006	24
19a	Transport Equipment Purchase Costs, 2002–2006	25
19b	Operating Costs of Transport Purchased in 2002–2006	25
20	Social Mobilization Costs, 2002–2006	25
21	Proposed Training Budget, 2002–2006	26
22	Financing Gap, 2002–2006	26

Acknowledgments

This report was prepared in July 2001 by Dr. Rehan Abdul Hafiz for the Agriculture and Social Sectors Department (West) of the Asian Development Bank. The study was supervised by Indu Bhushan, Senior Project Economist, under the overall guidance of Edward M. Haugh, Manager, Education, Health, and Population Division (West), ADB. Camille Contreras and Elena Roces of ADB provided production support.

The author wishes to thank the staffs of the Ministry of Health and Ministry of Finance of Baku, the UNICEF Resident Mission, and the country offices of the International Monetary Fund and the World Bank for their help and cooperation in the preparation of this report.

Abbreviations

AD	auto-disable
AEFI	adverse effects following immunization
BCG	anti-TB vaccine
CDC	Centers for Disease Control and Prevention, Atlanta (United States)
DPT or DTP	diphtheria and tetanus toxoids and pertussis vaccine
DT	diphtheria and tetanus vaccine
EPI	Expanded Program on Immunization
EPI Unit	Epidemiological Unit
FAP	feldsher-midwifery post
GAVI	Global Alliance on Vaccines and Immunization
HIB	Haemophilus influenzae type B
MCH	Maternal and Child Health Unit
MOH	Ministry of Health
MR	measles rubella vaccine
NID	National Immunization Day
NGO	nongovernment organization
OPV	oral polio vaccine
RCHE	Republican Center for Hygiene and Epidemiology
SNID	Subnational Immunization Day
TB	tuberculosis
Td	diphtheria (reduced component) and tetanus vaccine
TT	tetanus toxoid
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
WHO	World Health Organization

The organization of health services in Azerbaijan has not changed significantly since independence and still follows the traditional Soviet model, where the Ministry of Health is responsible for certain central specialist institutions, and the regions and cities are responsible for all other services

Executive Summary

This financing assessment of the national immunization program of the Republic of Azerbaijan was carried out under the Asian Vaccination Initiative and in collaboration with the Government of Azerbaijan and the United Nations Children's Fund (UNICEF).

The assessment was made to:

- Estimate the current and future requirements of the program, including the cost of strengthening and expanding services
- Determine financing gaps and identify sustainable funding sources
- Recommend finance and policy measures to ensure the long-term sustainability of the program

The findings of this assessment will provide a framework within which the Government of Azerbaijan can seek support to strengthen and sustain the immunization services.

Azerbaijan, like other newly independent republics in the Commonwealth of Independent States (CIS), has shifted gradually from a predominantly State-driven economy to one that is market-controlled, with substantial contribution from the private sector. The economy and the healthcare system, as a result, are still in transition.

The organization of health services has not changed significantly since independence and still follows the traditional Soviet model, where the Ministry of Health is responsible for certain central specialist institutions, and the regions and cities are responsible for all other services. Healthcare reform has taken place mainly in the field of financing; administration is still vertical.

The total cost of delivering immunization services is difficult to ascertain because district-level funding is not yet well defined. However, with planned reforms, the contribution of district-level governments is expected to play a larger role in healthcare delivery in Azerbaijan.

Routine immunization is provided at more than 2,000 facilities throughout the country, and other campaigns such as National Immunization Days for polio and measles vaccination are held for high-risk and hard-to-reach children. Reported immunization coverage is high (more than 93 percent) for all Expanded Program on Immunization (EPI) vaccines, but the numbers vaccinated may actually be lower. A UNICEF-supported evaluation in 1999 indicated a validated coverage of only around 72 percent for DPT3. Reported immunization coverage may actually be higher than that measured through surveys and assessments.

The burden of disease from measles appears to be high: there were more than 2,800 cases in 1998 and more than 1,000 in 1999. High numbers of mumps cases have also been reported, with more than 3,300 cases in 1998 and more than 4,200 in 1999.

The most recent comprehensive assessment of the national immunization program was made in 1999 for a UNICEF-sponsored study. A review of the status of the cold chain was made starting in October 2000, with support from UNICEF (see report in Annex).

EPI target diseases can be controlled more effectively with adequate and sustainable funding for EPI, better surveillance and disease reporting, targeting of special populations, and consistent quality of vaccines through a sustained cold chain

The Ministry of Health has prepared a national immunization plan for 2000–2005 with support from the Centers for Disease Control and Prevention (CDC) in the United States and UNICEF Azerbaijan's application to the Global Alliance on Vaccines and Immunization (GAVI) for new and underutilized vaccines was based on this plan, which will be implemented under the guidance of the Interagency Coordinating Committee. The immunization plan has the following major objectives:

- Maintain better than 98 percent coverage for EPI vaccines through routine immunization at the republic and district levels
- Achieve certification of poliomyelitis eradication by 2000
- Undertake a measles control strategy to eliminate the disease by 2007
- Ensure safe injection practices
- Ensure an adequate supply of all EPI vaccines and syringes
- Integrate hepatitis B immunization by 2001
- Consider including other vaccines in EPI

EPI target diseases can be controlled more effectively with adequate and sustainable funding for EPI, better surveillance and disease reporting, targeting of special populations, and consistent quality of vaccines through a sustained cold chain. Vital to the success of these strategies, in the Government's view, is an active and effective Interagency Coordinating Committee (ICC).

Since independence, the immunization program has been supported entirely by UNICEF. In 2001, UNICEF donated about \$262,690 to cover the costs of routine vaccines and syringes. No other donors have given additional support. The Government of Azerbaijan contributed 10 percent of vaccine costs in 2000.

For 2002–2006, routine immunization costs and infrastructure support for the immunization program are estimated at \$12,036 million. Of this amount, \$9,378 million, or 77.91 percent, still has to be sourced.

It is therefore recommended that the Government of Azerbaijan:

- Ensure the sustainability of the national immunization program. Though functional, it remains fragile and at risk without long-term financial viability.
- Improve the procurement, storage, and delivery of vaccines by centralizing procurement, strengthening cold-room provisions to increase storage capacity, and ensuring the availability of adequate transport for vaccine delivery. Until the Government can develop an effective national control authority for biologicals, it should continue to procure vaccines through UNICEF's procurement services.
- Strengthen laboratory capacity and surveillance of all diseases, especially acute flaccid paralysis (AFP) surveillance of polio to complete the polio-free certification process.

Introduction

Purpose

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

The assessment sought to address the following issues:

- Outline the financial status and financing gaps of the national immunization program.
- Identify sustainable financial options for strengthening the program, particularly the cold chain, surveillance, and injection safety.
- Identify future funding requirements for a routine or expanded program.
- Identify potential areas for new investment in the program, such as the introduction of new vaccines or the implementation of disease control initiatives.
- Identify funding sources, expected as well as potential.
- Where possible, analyze the cost-effectiveness of current or planned immunization activities.

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

Methodology

The data used in this report were collected during a field visit to Azerbaijan in July 2001. The data are mostly at the national level and were obtained from documents and interviews with key implementers of the national immunization program.

The cost and financing analyses are based on data provided by the Ministry of Health (MOH) and the United Nations Children's Fund (UNICEF) office in Azerbaijan. The data include the national immunization plan for 2000–2005, an assessment of the cold chain, reports of previous consultants, and Azerbaijan's application to the Global Alliance on Vaccines and Immunization (GAVI) for support for new and underutilized vaccines (GAVI Window 1).

Estimates of immunization coverage and population are based on MOH information and UNICEF country data.

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

Background

Socioeconomic Situation

Before independence, most of the people had access to free health care and social protection under the old Soviet system. Political and social conflicts that occurred after the breakup of the former Soviet Union led to the collapse of many structures and worsening demographic indicators

The Republic of Azerbaijan, in the southern part of the Caucasus Mountains and west of the Caspian Sea, shares borders with Russia, Georgia, Turkey, Armenia, and Iran. Its political system is based on a parliamentary democracy and strong presidential rule. The president, who heads the executive branch, is appointed for a term of five years. He appoints the prime minister, other government officials, and the heads of local government bodies in the cities and the 65 administrative districts (rayons). (Besides the districts, there are three cities with separate administrations: Baku, Ganja, and Sumgayit.) These appointments must be approved by the legislature, the 50-member Milli Mejlis. The Supreme Court, the highest judicial body, is separate. The ministries in the social sector, such as health, education, and social protection, report directly to the prime minister. The Government is actively pursuing reforms in all sectors.

The country has witnessed dramatic changes in the last decade, following independence in 1991. Before independence, although average productivity may have been low, most of the people had access to free health care and social protection under the old Soviet system. Political and social conflicts that occurred after the breakup of the former Soviet Union led to the collapse of many structures and worsening demographic indicators. The private sector and nongovernment organizations (NGOs) were expected to assume some of the functions that used to be held by the State. In Azerbaijan, however, this was not possible. Between 1990 and 1995 the country's gross domestic product (GDP) fell by 58 percent and real wages dropped by more than 80 percent.

GDP has increased steadily since 1995. In 1999, it grew by 7.4 percent, somewhat less than the growth of 10 percent recorded a year earlier. Despite the growth, however, real GDP per capita dropped from \$537 in 1998 to \$509 in 1999, mostly because of verified demographic data. In 2000, GDP per capita was \$609.0, as reported by the European Commission in its economic trends fact sheet. Much of the growth has come from the private sector, whose share in GDP went up from 11.7 percent in 1996 to 21 percent in 1997. That share has stood at 11–12 percent in recent years. Both industry and agriculture have contributed to the growth in GDP, although their share has increased more slowly than the share of transportation, communication, and construction.

Human poverty in Azerbaijan remains extensive. According to a study made by the World Bank, the economic collapse between 1990 and 1995 pushed nearly 70 percent of the population below the poverty line. The decline has been severe and, despite a higher rate of economic growth and an increase in foreign investments, GDP has remained below that in many other countries of the Commonwealth of Independent States (CIS). Birth rates also declined dramatically between 1990 and 1999, perhaps reflecting the growing poverty of the population.

The country's HDI value fell from 0.718 to 0.692 between 1992 and 1995 but has gradually improved since 1996. (See Table 1.)

Table 1: Socioeconomic Indicators, 1992–1999

Indicator	1992	1993	1994	1995	1996	1997	1998	1999
HDI	0.718	0.707	0.696	0.692	0.697	0.706	0.712	0.719
Life expectancy index	0.745	0.742	0.743	0.735	0.753	0.770	0.772	0.777
Education index	0.870	0.880	0.880	0.880	0.868	0.871	0.878	0.865
GDP index	0.540	0.498	0.464	0.462	0.470	0.477	0.487	0.515
GDP per capita (US\$)	2,540	1,980	1,610	1,590	1,675	1,740	1,850	2,187

Source: UNDP (2000)

Allocation of health resources

The Government, which considers public sector reform a major precondition for economic success and social development, put in place a tight fiscal policy in 1995. The ratio of fiscal revenue to GDP that year was 17.6 percent (compared with over 50 percent in 1992) and has stayed at that level since then. Public expenditures have borne the brunt of the fiscal adjustment.

Healthcare funding has markedly dropped over the past decade. At the start of the 1990s, public health expenditure for health was about 3 percent of GDP. This figure rose to 3.3 percent in 1993 but then fell to 1.1 percent in 2000. Real public expenditure for health in 1999 was only about 23 percent of the 1992 level. The slump in public funding for health has created medical supply shortages in clinics and hospitals, adversely affecting the reach and quality of health care.

According to a study made by the World Bank, the economic collapse between 1990 and 1995 pushed nearly 70 percent of the population below the poverty line

Demographic and Health Indicators

The country has a population of 7,748,163 (July 2000 estimate). Thirty percent of this is below 15 years of age, 63 percent 15–64 years, and 7 percent over 65 years and over. There are about 18.1 births per 1,000 population.

Azerbaijan has undergone a demographic transition from a very high population growth rate of 3.4 percent per year during the 1960s to a low rate of 1.2 percent during the 1990s and less than 1 percent at present. This shift is largely attributable to changes in attitudes and practices and greater economic difficulties. As a consequence, the fertility rate has also fallen, from 3.25 children per woman in 1980 to 2.29 in 1990 and 2.0 in 1998, and the number of marriages each year has dropped, from 10.6 per 1,000 in 1991 to 5.2 in 1998. (See Tables 2 and 3.)

Table 2: Demographic Indicators, 1995–1999

Indicator	1995	1996	1997	1998	1999
Population (millions)	7,643.5	7,726.2	7,799.8	7,876.7	7,953.4
Fertility rate	19.1	17.4	17.4	15.7	–

Table 3: Projected Population, 2000–2006¹

Indicator	2000	2001	2002	2003	2004	2005	2006
Total population	7,748,163	7,825,645	7,903,901	7,982,940	8,062,769	8,143,379	8,224,831
Births	140,242	141,644	143,061	144,491	145,936	147,395	148,869
Infant deaths	2,314	2,337	2,361	2,384	2,408	2,432	2,456
Surviving infants, 0–11 months old	137,928	139,307	140,700	142,107	143,528	144,963	146,413
Population, 0–5 years old	774,816	780,686	788,493	796,378	804,342	812,385	820,509
Population, below 15 years	2,324,449	2,347,693	2,371,170	2,394,882	2,418,831	2,443,019	2,467,449
Population, child-bearing age	2,092,004	2,083,969	2,104,809	2,125,857	2,147,116	2,168,587	2,190,273

Table 4 gives the health indicators for 1995 to 1999.

Table 4: Health Indicators, 1995–1999

Indicator	1995	1996	1997	1998	1999
Infant mortality rate (per 1,000 live births)	23.5	19.9	19.6	16.6	16.5
Under-five mortality rate (per 1,000 live births)	43.2	39.3	37.5	33.2	32.1
Maternal mortality rate (per 100,000 live births)	37.0	44.1	31.0	41.1	43.4

Source: UNICEF ICDC 1999

Vaccine-preventable diseases

The national immunization program targets six vaccine-preventable diseases: tuberculosis, diphtheria, tetanus, pertussis, poliomyelitis, and measles. Routine immunization services are delivered in over 2,000 facilities throughout the country, and additional campaigns such as National Immunization Days for polio and measles vaccination are targeted to reach high-risk and hard-to-reach children. Azerbaijan held National Immunization Days for measles among refugee populations in 1998 and 1999, vaccinating 562 children. Whereas reported immunization coverage rates are high (more than 93 percent) for all Expanded Program on Immunization (EPI) vaccines, these figures may not truly reflect the actual numbers vaccinated. A UNICEF-supported evaluation in 1999 indicated a validated coverage of only around 72 percent for DPT3. Similarly, immunization coverage for measles is reported to be greater than 98 percent but has been assessed to be only 67 percent.

¹ The calculations are based on the following statistics:

Indicator	Units	Multiplying Factor
Population growth rate	1 per 100	0.01
Crude birth rate	18.1 per 1,000 persons	0.0181
Infant mortality rate	16.5 per 1,000 live births	0.0165
Population, 0–5 years old	10 per 100	0.1
Population, under 15 years old	30 per 100	0.3
Population, child-bearing age	27 per 100	0.27

Note: 0–5 years = 9.976%; under 15 years = 0.3%; CBA = 26.632%; pregnant woman population = 2.069%.

In the 1990s immunization services were disrupted by the dissolution of the Soviet Union and an influx of refugees and internally displaced persons (IDPs) fleeing the conflict with Armenia and ethnic Armenians in the Nagorno-Karabakh region.² While there have been outbreaks of poliomyelitis, diphtheria, and measles, no cases of disease due to wild strains of polio virus have been detected in Azerbaijan since 1996.

Reported cases of vaccine-preventable diseases from 1991 to 1999 are shown in Table 5.

Table 5: Incidence of EPI Target Diseases, 1991–1999

Disease	1991	1992	1993	1994	1995	1996	1997	1998	1999
Diphtheria	66	72	170	841	867	146	38	19	22
Measles	6,122	535	1,321	6,478	432	1,824	1,906	2,890	1,081
Mumps	–	–	–	–	–	4,096	5,415	3,308	4,265
Rubella	–	–	–	624	109	75	1,372	3,376	504
Pertussis	150	89	417	104	–	15	52	43	–
Polio	21	22	69	16	5	0	0	0	0
Tetanus	11	11	11	20	–	5	5	3	–

Source: UNICEF (1999); WHO office in Europe

There were 2,303 reported cases of tuberculosis in 1997, 2,515 in 1998, and 2,766 in 1999. Immunization against rubella and mumps is not currently part of EPI, but Azerbaijan has collected information on their incidence as indicated in Table 4. Azerbaijan has no established surveillance for invasive disease due to *Haemophilus influenzae* type B (Hib).

The burden of disease from measles appears to be high, as does that from mumps. The Ministry of Health plans to introduce a single antigen measles dose for 6-year-olds and has shown interest in administering measles-mumps-rubella (MMR) vaccine to infants at 12 months. However, MMR is currently not supported by EPI and its introduction will depend on donor support. No donor has as yet been identified.

Health System

The organization of health services has not significantly changed since independence and still follows the traditional Soviet model. The Ministry of Health supervises certain central specialist institutions, and the regions and cities take charge of all other services. Unlike other smaller CIS republics, Azerbaijan has no oblast tier and has a strong central health policy unit in the office of the prime minister. Accountability is rather complex, as the district health administrators answer to the Ministry of Health in some matters but get their funds from the district.

² Simmering ethnic conflicts have kept up a steady flow of IDPs and refugees into Azerbaijan since 1998. In mid-2000 there were about 789,832 of these. Children constitute about 49.5 percent. Most IDPs live in tents and public premises. Only 2.9 percent have their own houses. About 40 percent have settled in urban areas. Both refugees and IDPs have limited access to medical services, generally far below the national average.

Health planning is done by the MOH and the Ministry of Finance and Capital Planning. This planning is still mostly concerned with the development of specialized healthcare facilities.

Structure and reform

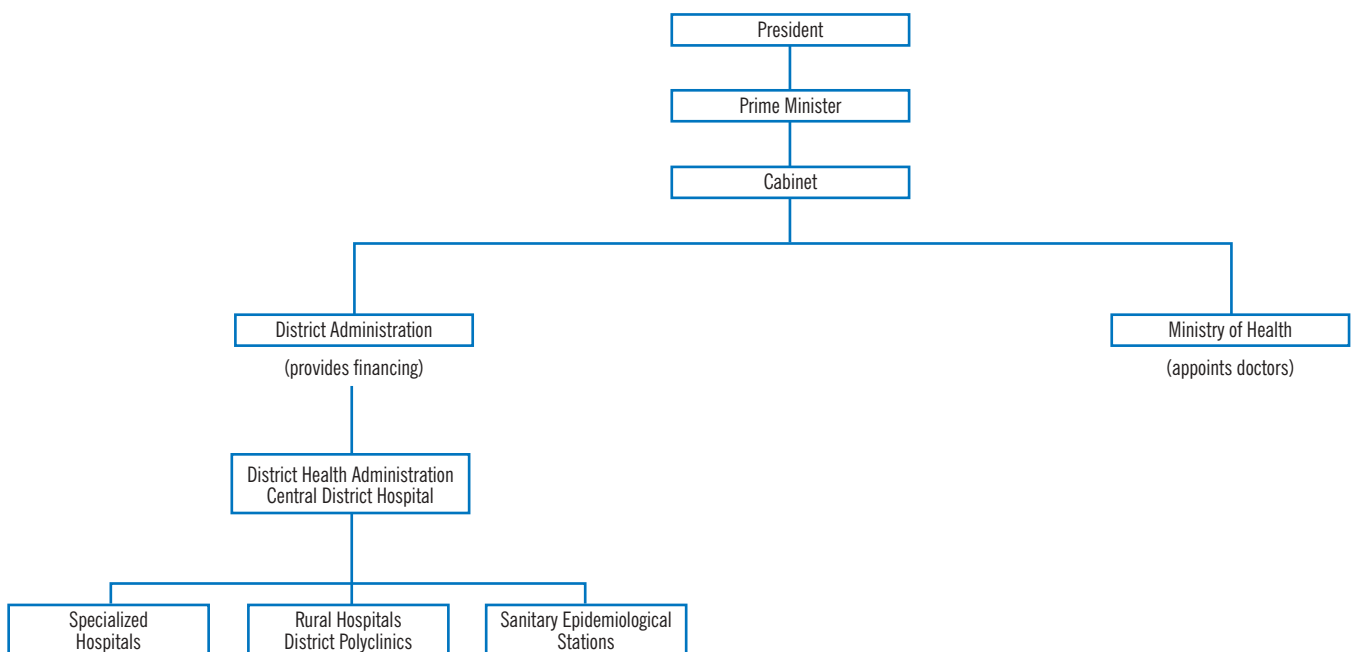
A presidential decree in 1998 marked a major step toward reorganizing and reforming the healthcare system to achieve the following:

- Make services more cost-effective by consolidating facilities, shifting to outpatient care, strengthening prevention, and introducing a policy for essential drugs
- Give priority to mother and child care
- Involve communities in health system management and financing
- Promote health awareness through enhanced social mobilization
- Eventually introduce insurance

However, changes have occurred mainly in financing; the management system is still mostly vertical. (See Figure 1.) MOH still appoints district health doctors and monitors district-level services. Sanitary epidemiological stations (which are responsible for EPI programs) are directly under it. MOH plans to delegate more responsibility to the districts but will retain control of national programs, including the immunization program.

A major task of public health reform is defining State obligations and creating conditions for the development of paid medical care, through voluntary as well as obligatory medical insurance.

Figure 1: Organization of the Healthcare System



Finance

Requests for budget allocations, based on “norms” set by the requesting ministry, are submitted to the Ministry of Finance, which makes the allocations according to priority. Hence, if the MOH does not prioritize the National Immunization Program (NIP), there may be no funds for it. The system is not ideal: there are no clear budget ceilings and having to allocate funds yearly makes planning difficult. (The financial year in Azerbaijan coincides with the calendar year.) However, with the intervention of the World Bank and the International Monetary Fund (IMF), a Medium-Term Expenditure Framework (MTF), which will allow planning for three-year periods, is being formalized.

State funding for health services is allocated to:

- MOH and institutions directly under it
- District and city health departments. These are under local control but are technically under MOH. They are funded both from local revenue and centrally from the Ministry of Finance.
- Health departments of ministries that are not under MOH

Official financing through budgetary allocation (from taxes and other government revenues such as from the export of natural resources) accounts for over 99 percent of the health budget. (See Table 6.) Less than 1 percent is self-financed.

Table 6: Government Health Budget, 1995–1999³

Year	Amount (billion manat)
1995	148.3
1996	202.8
1997	193.8
1998	155.4
1999	186.2

Note: Weighted exchange rate (2000): \$1 = 4373.0 manat.

Extrabudgetary funding for health services is also being developed. Fees paid for services provided are deposited in the national treasury for redistribution (but not to MOH). Table 7 gives the total amount collected for 1995 to 1998, the last year for which figures are available.

³ The consumer price indices of goods and services for 1995–1999 are given below:

Year	Index Value
1995	511.8
1996	119.9
1997	103.7
1998	99.2
1999	91.5

Extrabudgetary funding for health services is also being developed. Fees paid for services provided are deposited in the national treasury for redistribution

MOH itself does not purchase pharmaceutical products; it only regulates and licenses them. A pharmaceutical company owned by the MOH produces about 70 items, but not cost-effectively. The Government may have to consider measures to protect local manufacturing

Table 7: Extrabudgetary Funds for Health, 1995–1998

Year	Amount (billion manat)
1995	5.6 ^a
1996	20.0 ^b
1997	40.0 ^c
1998	37.2 ^d

^aUS\$1 = 4,417.50 manat

^bUS\$1 = 3,986.80 manat

^cUS\$1 = 3,868.80 manat

^dUS\$1 = 4,373.00 manat

Hard-currency convertibility

Foreign exchange needed for the purchase of pharmaceutical products abroad is available from the central bank, with restrictions. There is a lower limit on purchases that are not made through national banks than on those made through the banks. MOH itself does not purchase pharmaceutical products; it only regulates and licenses them. A pharmaceutical company owned by the MOH produces about 70 items, but not cost-effectively. The Government may need to take a more pragmatic approach to pharmaceutical production by the public sector to ensure cost-effectiveness. Public-private partnerships may be worth considering.

There are two modes of procurement—through conventional tendering, led by the procuring ministry, and through UNICEF. The Government proposes to create a State Procurement Agency to ensure transparent and competitive procurement. A law on public procurement is being drafted and will be adopted soon, as required for an IMF loan.

Donor support

Donor support for health has largely been channeled through UNICEF. Table 8 shows the extent of this support from 1995 to 1999.

Table 8: Donor Support for the Health Sector, 1995–1999

Year	General Resources (US\$ thousand)	Special Funds ^a (US\$ thousand)
1995	400	
1996	328	62.0
1997	358	37.7
1998	342	502.6
1999	364	1,253.3
Total	1,792	1,855.6

Source: Government of Azerbaijan/UNICEF Master Plan of Operations 2000–2004

^aExtra resources were provided by the Governments of UK, US, and Finland. Some contributions came from national and international oil companies operating in Azerbaijan.

National Immunization Program

To improve control of EPI target diseases Azerbaijan should ensure adequate and sustainable funding for EPI, improve surveillance and disease reporting, target special populations, and ensure consistent quality of vaccines through a sustained cold-chain system

The most recent comprehensive assessment of the national immunization program was made in 1999 for a UNICEF-sponsored study. A review of the status of the cold chain was begun in October 2000 with support from UNICEF and is now being completed. The study has now been completed (see Annex), but it does not define accurately the requirements for cold-chain expansion. An extensive study is still required.

Five-Year Strategic Plan

MOH has finalized a national immunization plan for 2000–2005 with support from the Centers for Disease Control and Prevention (Atlanta, US) and UNICEF Azerbaijan's application to GAVI for new and underused vaccines is based on this plan, which will be implemented with the support and guidance of the Interagency Coordinating Committee (ICC).⁴ The plan has the following major objectives:

- Maintain better than 98 percent coverage of EPI vaccines through routine immunization at the republic and district levels.
- Achieve certification of poliomyelitis eradication by 2000.
- Undertake a measles control strategy that will lead to elimination by 2007.
- Ensure safe injection practices.
- Ensure an adequate supply of all EPI vaccines and syringes.
- Integrate hepatitis B immunization by 2001.
- Consider including other vaccines in the EPI program.

To improve control of EPI target diseases Azerbaijan should ensure adequate and sustainable funding for EPI, improve surveillance and disease reporting, target special populations, and ensure consistent quality of vaccines through a sustained cold-chain system. Vital to the success of the strategies, in the Government's view, is an active and effective ICC.

The national immunization schedule is shown in Table 9. Vaccine is provided free of charge by the Government.

Table 9: National Immunization Schedule

Age of Child	Visit No.		Traditional Antigens		New Vaccine: Hepatitis B Monovalent Formulation ^a
0–24 hours	0 ^b				Hepatitis B1
4–7 days	0 ^b	BCG	OPV0		
2 months	1		OPV1	DTP1	Hepatitis B2
3 months	2		OPV2	DTP2	
4 months	3		OPV3	DTP3	Hepatitis B3
12 months	4			Measles	
18 months	5		OPV4	DTP4	
6 years	6			DT Measles	

^a If the birth dose is missed, the three doses of hepatitis B vaccine can be given along with DTP1, DTP2, and DTP3 according to the current schedule.

^b For infants born in a hospital, the first dose of hepatitis B vaccine (hepatitis B1) should be given during the first 24 hours after birth. For infants born elsewhere, hepatitis B1 should be given as soon as possible after birth.

⁴ An Interagency Coordinating Committee (ICC) for EPI was established in September 2000 to coordinate EPI inputs and resources within and outside the country. This committee, which plans to meet quarterly, is made up of representatives of government agencies, WHO, the United Nations High Commission for Refugees (UNHCR), UNICEF, and the World Bank.

Organization Structure

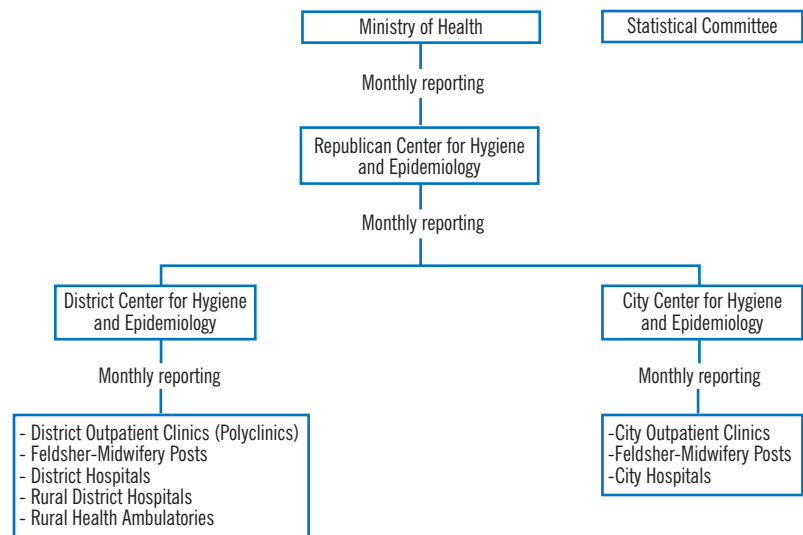
MOH plans, manages, and regulates health services in Azerbaijan. Administratively the country is divided into 59 districts (rayon), 11 cities (saharlar), and one autonomous republic (Naxcivan Muxtar Respublikasi). Five of the 59 districts are occupied. The districts have a variable number of hospitals and maternal, child, rural, and urban outpatient clinics. Routine immunization is delivered through 2,000 facilities throughout the country; in addition, for high-risk and difficult-to-reach populations there are polio vaccinations on National Immunization Days, as well as campaigns against measles and other diseases. MOH monitors immunization services at the republic level. There is no delivery of immunization services in the private sector apart from a unit in the Center for Hygiene and Epidemiology in Baku, run by a multinational vaccine manufacturer that supplies antigens not available in the national program.

The Republican Center for Hygiene and Epidemiology (RCHE) stores the vaccines at the central level and sees to their transportation, storage, and distribution.

A national network of bacteriology, parasitology, and other special laboratories aims to detect infectious diseases early.

Figure 2 shows how the immunization program is organized.

Figure 2: Organization of the Immunization Program



MOH monitors immunization services at the republic level. There is no delivery of immunization services in the private sector apart from a unit in the Center for Hygiene and Epidemiology in Baku

Coverage

The total target population for 2001 is 139,307 children below 1 year old; this figure was 137,928 in 2000 and 120,000 in 1999. Another 5,000 to 6,000 children are vaccinated through nonhealth departments. Reported immunization coverage rates (see Table 10) are high, but their accuracy may be questionable. Instead of reporting immunization by

Following independence and until 1995, Azerbaijan received all vaccines and syringes through funds provided to UNICEF by USAID. Since 1995 UNICEF has supplied all vaccines, syringes, and cold-chain equipment

1 year of age, as recommended by the World Health Organization (WHO), the Government calculates coverage by birth cohort (by year of birth), as is common in other former Soviet bloc countries. Each quarter, clinics offering immunization services calculate immunization coverage from immunization registers, which are organized by the surname of children. Immunization coverage levels validated by a UNICEF-sponsored survey in 1999 were significantly lower than those in published reports from the Government census that year. DTP3 coverage was officially reported to be more than 98 percent but according to the UNICEF-funded survey was only about 72 percent. Similarly, the reported coverage for measles immunization was more than 98 percent, versus the 67 percent validated by the survey. National Immunization Days held in 1996–1999 to immunize children up to 4 years old against polio had higher than 98 percent coverage at birth according to RCHE but have not been externally validated. It would be appropriate to propose that the Government follow WHO-recommended guidelines in reporting coverage rates, that is, report DTP3, OPV3, and BCG vaccination by 1 year of age and measles vaccination coverage by 12–18 months.

Table 10: Reported Immunization Coverage, 1996–1999

Item	1996 (%)	1997 (%)	1998 (%)	1999 (%)
BCG	90.0	93.6	96.4	92.0
OPV3	97.1	97.6	98.1	78.3
DTP3	96.0	96.9	97.4	72.0
Measles	98.5	96.6	97.7	66.9

Financial Structure

Funds for immunization services are provided by MOF through MOH. MOH develops a plan of action defining its budget requirements and submits it to MOF for financial release. This plan is in addition to plans developed at the district level. Budget allocations are generally not enough to meet the needs.

Funds flow into the program in two tiers. Funds flow from MOF to MOH, and from MOF to the municipal governments for distribution to the district level. The ratio of local to State funds is 20:80. Since the role of municipal governments has not yet been fully defined, fund release to the district level has not been streamlined. Only about 40 percent of actual fund requirements are met, leaving wide gaps in health service provision.

Past and Current Financing

Vaccine costs

Following independence and until 1995, Azerbaijan received all vaccines and syringes through funds provided to UNICEF by USAID. Since 1995 UNICEF has supplied all vaccines, syringes, and cold-chain equipment. It incurred total costs of \$286,000 in 2000 and expects to incur \$262,690 in 2001. No funding is available at present.

All national and local operating costs are borne by MOH. These include the salaries of healthcare workers who provide vaccination services, training, cold-chain maintenance, surveillance, and the distribution of vaccines and logistics

The Government provides 10 percent of vaccine costs and is expected to contribute 20 percent by 2003. It now pays for BCG vaccine, which it procures directly and not through UNICEF, unlike all other vaccines. Less than full compliance with the WHO open-vial policy, which the Government professes to support, may waste more vaccine than necessary.

Nonvaccine costs

All national and local operating costs are borne by MOH. These include the salaries of healthcare workers who provide vaccination services, training, cold-chain maintenance, surveillance, and the distribution of vaccines and logistics. There are, however, concerns about the regular and adequate flow of funds.

Budget allocations have not yet been made to cover an additional requirement of \$35,181 worth of syringes for 2001.

WHO provides \$20,000 each year for EPI-related training.

Overall

UNICEF has been the primary donor and has supported the program from the start. In 1995–1999 UNICEF contributed \$3.65 million from general resources and special funds. NIP support was a major component. Table 11 shows details of expenditure for routine immunization activities for 2000.

Table 11: Expenditures for the Routine Immunization Program, 2000

Item	Central Government (US\$)	UNICEF (2000) (US\$)
Vaccines		
BCG	–	–
OPV	–	21,260
Measles	–	35,354
DPT, DT	–	135,766
Equipment and training costs	–	94,000
Total	–	286,000

Future Financing

Key Issues

Major issues need to be addressed to maximize the effectiveness of the national immunization program of Azerbaijan and make it sustainable. Among these issues are: increasing national support for immunization financing, ensuring an effective cold chain, and implementing safe injection practices. The surveillance system, particularly for acute flaccid paralysis (AFP), must be strengthened and expanded.

The Government of Azerbaijan has established a State Oil Fund and will use foreign expertise in dealing with issues relating to accumulation of oil revenues, which should be substantial. But it has yet to develop an appropriate mechanism for managing the revenues through the oil fund. Social development funds are expected to be used mainly to ensure an equitable distribution of benefits across the population.

Vaccine self-sufficiency is a key to achieving a sustainable immunization program. A country is vaccine-self-sufficient if it is able to purchase all the routine EPI vaccines it needs

Vaccine supply: Quality and financial sustainability

Vaccine self-sufficiency is a key to achieving a sustainable immunization program. A country is vaccine-self-sufficient if it is able to purchase all the routine EPI vaccines it needs. A critical component of self-sufficiency is good-quality vaccines. Azerbaijan does not produce vaccines locally. But since UNICEF prequalifies almost all of the vaccines for EPI, lot inspection or assessment by a national control authority is not an issue.

No EPI vaccines are imported through the private sector. The Government purchased all of its BCG requirements for 2001 through a tender awarded to Aventis-Pasteur-Mérieux, whose vaccines are registered in Azerbaijan. Given the reputation of the manufacturer, there is no concern about the quality of the vaccine it supplied.

The Government should create a National Control Authority of Biologics (NCAB) to qualify vaccines imported through sources other than UNICEF. This will become more essential as the Government funds a greater share of vaccine costs. At present there is an authority that deals primarily with general pharmaceuticals and inspects UNICEF-purchased vaccines.

Discussions with the immunization team brought out the need to use the polio vaccine supplied through UNICEF within six hours after the vial is opened. Some confusion regarding the WHO open-vial policy has resulted. UNICEF should take up this matter with the manufacturers. All OPV is, however, supplied with vaccine vial monitors (VVMs).

Costs and financing

The projected requirements for EPI vaccines and syringes are given in Table 12.

Anti-rabies vaccine and tuberculin are purchased from Russia. No concerns over their quality have been expressed.

Table 12: NIP Vaccine and Syringe Requirements, 2001–2004

Vaccine	2001 (US\$)	2002 (US\$)	2003 (US\$)	2004 (US\$)
BCG	250,000	250,000	250,000	250,000
DPT	600,000	600,000	600,000	600,000
DT	140,000	140,000	140,000	140,000
Polio	750,000	750,000	750,000	750,000
Measles	500,000	500,000	500,000	500,000
Syringes, BCG	180,000	180,000	180,000	180,000
Syringes, 0.5 ml	800,000	800,000	800,000	800,000

Note: Based on applications submitted to and approved by GAVI for new and underused vaccines.

By conservative estimates, it will cost \$3.048 million over 2002–2006 to replace and strengthen cold-chain equipment, and provide transport vehicles and generators

Cold-chain and vaccine management

Good management of vaccine and a well-functioning cold chain increase vaccine effectiveness and promote sustainability.

Preliminary data from an ongoing UNICEF-supported assessment points out the following:

- All town and district centers have been provided with UNICEF-funded cold-chain equipment to allow them to store and distribute vaccines supplied from RCHE.
- All freezers in the Center for Hygiene and Epidemiology in Baku are in working order, but refrigerators in two districts and one autonomous republic are not functional.
- All health centers have vaccine carriers for vaccine delivery but are not using these for lack of vehicles.
- There are generators in 18 towns and districts, but these are not operating because of difficulties in purchasing fuel. The Center for Hygiene and Epidemiology in Nakhchivan Republic has one generator; the other six districts of the autonomous republic have none. Given the frequent power breakdowns in the districts, functional generators must be made available.
- With UNICEF support, subcenters for the storage of vaccines were developed at the Centers for Hygiene and Epidemiology in Ganja, Shaki, Barda, Lankaran, and Beylagan to ensure the availability of vaccine. However, because of the lack of vehicles to transport the vaccine, these centers still do not operate.
- The lack of a proper functional vehicle at RCHE hampers vaccine delivery.
- Refrigerators in most of the maternity hospitals assessed are not in working order and vaccines are not kept under optimal conditions.
- Each district has one pediatric polyclinic. Refrigerators in 28 of these clinics are not in working condition. Fifty refrigerators are obsolete and do not maintain the required temperatures.
- Districts have from one to 16 rural hospitals, depending on their area and population. Of the total, 192 hospitals (about 50 percent) do not have refrigerators. Hospitals without refrigerators receive and administer vaccine on a fixed day each month.

Open vials of DPT vaccine are kept for six days. To help reduce wastage, the Government should revise this policy to reflect the open-vial policy of WHO—a move that will become even more useful once vaccine vial monitors become available

- Only 88 (23.2 percent) of 380 rural outpatient clinics in the Nakchivan Autonomous Republic and 27 districts have refrigerators.
- Power failures are frequent in all districts. In district centers electric power is supplied at fixed times in the morning and evening; other settlements have power after working hours when health personnel are no longer on duty.

There are serious problems with transport at the national level and with refrigeration at the district (rayon) and clinic levels. The national storage facility is in Baku, and vaccine is distributed monthly to the 60 district facilities. Each facility serves up to 40–50 distribution sites. The 12 main district (rayon) health centers have refrigerators and generators, and ten also have freezers. Vaccines are transported in cold boxes and private automobiles from the storage facilities of the 12 districts to outlying clinics for the monthly vaccination day.

Republic EPI staff feel that the cold chain cannot be sustained beyond its present capacity and major inputs are required, especially with the introduction of hepatitis B in September 2001. In addition, only one six-year-old vehicle is available to transport vaccines from the central storage facility in Baku to the 12 main districts where vaccines are stored.

No inventory of the cold chain is available. But the UNICEF assessment of the cold chain, now ongoing, should produce more comprehensive data. Visits to various centers in Baku and other regions revealed inadequate cold-chain capacity and maintenance at centers outside the central depository. The centers also lacked knowledge of the use of VVMs for polio vaccine. In one center the entire stock of polio vaccine VVMs was dark in color and had to be disposed of.

By conservative estimates, it will cost \$3.05 million over 2002–2006 to replace and strengthen cold-chain equipment, and provide transport vehicles and generators.

Vaccine wastage

The evaluation made by UNICEF in 1999 assumed 30 percent vaccine wastage, without giving the basis for this assumption. EPI staff believe wastage to be lower. But wastage does not appear to be calculated routinely and has not been formally assessed. Current baseline vaccine wastage and its causes should have been assessed before the introduction of hepatitis B vaccine. But since this was not done, the Government should consider making such an assessment well in advance of the submission of the GAVI inception report in September 2002. Wastage reduction targets of 25 percent in the first year of vaccine introduction to 15 percent by the third year have been set.

Open vials of DPT vaccine are kept for six days. To help reduce wastage, the Government should revise this policy to reflect the open-vial policy of WHO—a move that will become even more useful once vaccine vial monitors become available. Staff must be trained before a vaccine is introduced. Vaccine ordering and distribution must also be carefully planned, and authorities must concern themselves with ensuring vaccine security. As new and more expensive vaccines are introduced prudent use will become more critical.

Injection safety has not yet been assessed. The Government should consider seeking technical assistance in this regard, particularly in developing a national injection safety plan that also includes therapeutic injections

Projections of needs are now based on estimates. More comprehensive management tools should be introduced and their use encouraged through training. Similarly, accountability for vaccines and cold-chain equipment, at times lacking on the periphery, should be strengthened.

Safety of injections

A 1998 government decree, "Achieving Safe Immunization Practices," provides for adverse event reporting, proper vaccine handling, and safe injections including waste disposal. Adverse effects following immunization are to be reported monthly, and the names of patients with adverse effects to be recorded by physicians and health district staff, using several types of forms. The decree should be reviewed and updated to conform to WHO guidelines. Auto-disable syringes are currently used for all EPI vaccines. Safety boxes and areas for appropriate disposal by burning are reportedly adequate. District and local health staff in 25 districts were trained in safe immunization practices in 1998 and 1999. This training must be expanded to include all 60 districts, perhaps in coordination with training in preparation for the introduction of hepatitis B vaccine.

Injection safety has not yet been assessed. The Government should consider seeking technical assistance in this regard, particularly in developing a national injection safety plan that also includes therapeutic injections, according to the guidelines in the WHO Injection Safety Aide-Mémoire. The Safe Injection Global Network (SIGN) Secretariat at WHO could assist in identifying technical consultants for the development of such a plan.

Syringes are not produced locally. Although adequate quantities of EPI vaccines are supplied, almost all centers visited had a shortage of BCG syringes.

Cases of syringe reuse have been reported, especially when the country was in a financial crisis. Now, however, adequate syringes are provided and inexpensive syringes are available on the market. Knowledge of the use of auto-disable syringes is sufficient at the central level and on the periphery.

There are enough safety boxes for the safe disposal of used syringes. The UNICEF cold-chain assessment (see Annex) and observations made during the mission indicate that proper use and disposal procedures are being followed. But there are no complete reports on use outside the immunization program. A strict and supervised waste management policy and technical assistance and training are necessary to ensure safe syringe disposal.

Cost and financing

Syringes for all routine vaccination for the next five years will cost \$2.2 million. This figure excludes syringes supplied by GAVI for special hepatitis B campaigns.

Surveillance and disease control

Rural clinics, polyclinic, feldsher-midwifery posts (FAPs), and physicians in each district (rayon) report cases of disease to district health centers, which in turn submit reports to

MOH. Poliomyelitis and diphtheria cases are reported as they occur, on an urgent case reporting form. Each clinic reports cases of measles, mumps, tetanus, pertussis, and rubella to the district each month and the data are forwarded to MOH in Baku.

Laboratory capacity must be strengthened. The country does not have adequate laboratory capacity to test for poliomyelitis, measles, and hepatitis, and will not be able to assess the disease burden of *Haemophilus influenzae* type B, rubella, and mumps if the vaccines against these diseases are included in the EPI program.

Introduction of new vaccines

Hepatitis B

According to limited data, there is 4–7 percent prevalence of chronic infection with hepatitis B virus (hepatitis B surface antigen positive) in the general population of Azerbaijan. This indicates intermediate endemicity for the disease. Conservative estimates for the prevalence of serologic markers of hepatitis B virus infection place the total number of lifetime infections in a birth cohort at about 35,000, including about 4,800 chronic infections and about 700 deaths.

With support from GAVI, hepatitis B vaccine, monovalent formulation, is being introduced nationwide. Hepatitis B vaccine and syringes have arrived in the country. GAVI will provide 203,219 doses of hepatitis B in 10-dose vials in 2001; by the year 2005 this will increase to 338,360 doses. GAVI support includes auto-disable syringes and safety boxes.

The first dose of hepatitis B vaccine should be given within 24 hours of birth, the second dose given with DPT1 at 2 months, and the third dose given with DPT3 at 4 months.

Because hepatitis B vaccine is relatively expensive, efforts should be made to reduce vaccine wastage through the open-vial policy and other measures.

Information, education, and communication activities should be organized for healthcare providers, parents, the general public, community groups, and key decision makers to increase support for and participation in the immunization program. Assistance in carrying out these activities as soon as possible should be sought. Despite the imminent launch of hepatitis B vaccination, only limited training seems to have been provided so far.

Continuity of support for hepatitis B vaccination will depend on successful implementation; hence, its introduction must be effectively monitored and the coverage assessed. The evaluation of the progress of hepatitis B vaccination and other GAVI activities will depend on the availability of accurate reports on routine vaccination coverage and on regular coverage surveys, if possible every two to three years. More accurate reporting on coverage would lessen the need for frequent formal surveys.

Haemophilus influenzae type B (Hib)

MOH has shown a lack of interest in assessing the disease burden from *Haemophilus influenzae* type B (Hib) invasive disease before it applies to GAVI for the inclusion of Hib

Because hepatitis B vaccine is relatively expensive, efforts should be made to reduce vaccine wastage through the open-vial policy and other measures

vaccination in EPI. MOH should seek outside help in assessing the disease burden from Hib, begin surveillance of cases, and draft a plan for including Hib vaccination in EPI, if required. GAVI support for the introduction of Hib vaccination will be available to countries receiving GAVI support.

Cost and financing

Table 13 shows the cost of studying the disease burden from Hib, as well as other diseases.

Table 13: Cost of Research Studies and Reviews, 2002–2006

Research Study/Review	Unit Cost (US\$)	2002		2003		2004		2005		2006		Total	
		Cost No.	Cost (US\$)	Cost No.	Cost (US\$)	Cost No.	Cost (US\$)	Cost No.	Cost (US\$)	Cost No.	Cost (US\$)	Cost No.	Cost (US\$)
Assesment of injection practices (including technical assistance)	30,000	–	–	1	30,000	–	–	–	–	–	–	1	30,000
EPI review (including technical assistance)	40,000	–	–	–	–	1	40,000	–	–	–	–	1	40,000
EPI coverage survey													
National level (including technical assistance)	20,000	1	20,000	–	–	–	–	–	–	–	–	1	20,000
District level	2,000	20	40,000	20	40,000	20	40,000	20	40,000	20	40,000	100	200,000
Disease burden study													
Hepatitis B (including technical assistance)	30,000	1	30,000	–	–	–	–	–	–	–	–	1	30,000
Measles (including technical assistance)	30,000	–	–	–	–	1	30,000	–	–	–	–	1	30,000
Hib (including technical assistance)	40,000	–	–	–	–	–	–	1	40,000	–	–	1	40,000
Rapid assesment of injection practices	1,000	–	–	–	–	2	2,000	2	2,000	2	2,000	6	6,000
Miscellaneous studies	20,000	–	–	1	20,000	1	20,000	1	20,000	1	20,000	4	80,000
Subtotal	–	–	90,000	–	90,000	–	132,000	–	102,000	–	62,000	–	476,000
Contingency (10 %)	–	–	9,000	–	9,000	–	13,200	–	10,200	–	6,200	–	47,600
Total Cost	–	–	99,000	–	99,000	–	145,200	–	112,200	–	68,200	–	523,600

Disease control initiatives

Polio

MOH has submitted documentation to have the country certified as free of poliomyelitis. Although no polio cases have been reported since 1996, the Republic may not yet be ready for certification, as suggested by the results of two AFP surveillance evaluations (in June 1999 and June 2000) and official reports to WHO on AFP surveillance indicators. Annualized nonpolio AFP rates among children below 15 years have not yet exceeded 1/100,000, and stool specimens are not always collected on time for all AFP cases.

Besides, WHO has not yet certified the national laboratory; this will affect the quality of AFP surveillance even after certification, as well as laboratory-based surveillance critical for other vaccine-preventable diseases now targeted or to be targeted later by EPI. Health centers showed an understanding of the mechanisms of AFP reporting but little concern with meeting national AFP targets. Still, Azerbaijan unofficially considers itself to be polio-free since 1996.

The absence of immunization services for refugee populations, mainly those from Afghanistan, Chechnya, and Iran, gives cause for concern. The Government does not provide immunization coverage, and neither does UNHCR provide support. Special efforts need to be made to provide immunization services for these dispersed communities. Otherwise, given the low level of annualized nonpolio AFP rates among children below 15 years, the discovery of wild strains of polio virus could have serious national, regional, and global implications.

The absence of immunization services for refugee populations, gives cause for concern. Special efforts need to be made to provide immunization services for these dispersed communities

Measles

The burden of disease from measles appears to be high. There were more than 2,800 cases in 1998 and more than 1,000 in 1999. High numbers of mumps cases have also been reported: more than 3,300 cases in 1998 and more than 4,200 in 1999. Accordingly, MOH plans to introduce a single antigen measles dose for 6-year-olds and is interested in administering MMR vaccine to infants 12 months old. However, implementation requires outside funding, and so far no donor has been identified.

Financing Needs, Sources, and Gaps

This analysis at the national level is based on data provided by UNICEF, WHO, and MOH.

Projected costs: Routine program

Tables 14 and 15 show estimates of the basic operational costs of the national immunization program (excluding transport, social mobilization, and other costs), for 2002 and over the five-year period from 2002 to 2006. The estimates of vaccine needs are based on annual population growth and actual wastage rates. The basic cost of the program would be \$1.3 million for 2002, and \$5.8 million for the five years from 2002 to 2006.

Table 16 gives a summary of all the program costs from 2002 to 2006.

The cost of improving the cold chain and laboratory infrastructure, implementing a measles eradication campaign, and securing polio-free certification are projected and summarized in Tables 17–21. All these fall within the objectives of the Government's five-year plan. Not included is the salary cost of health personnel related to the introduction of hepatitis B vaccine starting in late 2001 and for the measles campaign. The cost of Hib vaccine is also not included in the analysis since the vaccine is unlikely to be introduced in the medium term.

Table 14: National Immunization Program: Cost of Vaccines, Syringes, and Safety Boxes, 2002

Item	BCG	Hepatitis B	DPT	Measles (routine)	Measles (booster)
Target age group	0-11 m	0-11m	0-11m	0-11m	6 years
Target population	140,700	140,700	140,700	140,700	158,078
Expected % coverage	90	90	90	90	90
Vaccines					
No. of doses/target	1	3	4	1	1
Total doses	126,630	379,890	506,520	126,630	142,270
Wastage multiplier	2	1.333	1.333	1.67	1.67
Doses needed	253,260	506,393	675,191	211,472	237,591
Doses/vial	20	20	20	10	10
Total no. of vials	12,663	25,320	33,760	21,147	23,759
Cost/vial (US\$)	1.14	8	1.16	1.22	1.22
Total cost, including 15% contingency and transport charges (US\$)	15,879	222,813	43,077	28,380	31,885
Syringes					
No. of AD syringes needed	133,341	400,024	533,366	133,341	149,811
Unit cost of AD syringe (US\$)	0.068	0.068	0.068	0.068	0.068
No. of disposable syringes for reconstitution	13,334		0	22,268	25,018
Unit cost of disposable syringes for reconstitution (US\$)	0.042		0.042	0.042	0.042
Total cost, including 15% contingency and transport charges (US\$)	11,071	31,282	41,709	11,503	12,924
Safety Boxes					
No. needed	133,475	400,024	533,366	133,564	150,061
Unit cost (US\$)	0.02	0.02	0.02	0.02	0.02
Total cost, including 15% contingency and transport charges (US\$)	3,070	9,201	12,267	3,072	3,451
Total cost, including 15% contingency and transport charges (US\$)	30,020	263,296	97,053	42,955	48,260

Table 15: National Immunization Program: Cost of Vaccines, Syringes, and Safety Boxes, 2002–2006

Item	2002 (US\$)	2003 (US\$)	2004 (US\$)	2005 (US\$)	2006 (US\$)	Total (US\$)
Vaccines						
Routine						
BCG	15,879	16,673	17,507	18,382	19,302	87,744
DPT	43,077	45,231	47,493	49,867	52,361	238,029
OPV	86,103	90,409	94,929	99,675	104,659	475,776
Hepatitis B	222,813	233,954	245,651	257,934	270,831	1,231,183
DT	31,885	33,479	35,153	36,911	38,756	176,183
Measles	28,380	29,799	31,288	32,853	34,496	156,815
Total	428,137	449,544	472,021	495,623	520,404	2,365,729
Measles campaign		364,035	-	-	-	364,035
Syringes						
Hepatitis B	31,282	32,846	34,488	36,213	38,023	172,852
Other than Hepatitis B	400,208	420,218	441,229	463,291	486,455	2,211,401
Measles campaign		205,202	215,462	226,235	237,547	
Safety Boxes						
Hepatitis B	9,201	9,661	10,144	10,651	11,183	50,839
Other than Hepatitis B	116,511	122,337	128,454	134,876	141,620	643,799
Measles campaign		56,362	59,180	62,139	65,246	
Total	985,339	1,660,205	1,301,799	1,366,889	1,435,233	5,808,656

Note: Yearly estimates based on annual increase of 5% over the base cost for 2002.

DT	TT (routine)	OPV (routine)	OPV (outbreak response/mopping up)	Total	2003 Measles Campaign
6 years	CBA	0-11/18m	0-5 years	–	0-15 years
158,078	2,092,004	140,700	774,816	–	2,324,449
90	90	90	10	–	100
1	2	5	2	–	1
142,270	3,765,607	633,150	154,963	–	2,324,449
1.67	1.333	1.333	1.2	–	1.167
237,591	5,019,554	843,989	185,956	–	2,712,632
10	10	20	20	–	10
23,759	501,955	42,199	9,298	–	271,263
1.22	0.51	1.52	1.52	–	1.22
31,885	281,597	70,557	15,546	741,619	364,035
149,811	3,965,184	0	0	–	2,447,645
0.068	0.068	–	–	–	0.068
25,018	0	–	–	–	285,640
0.042	0.042	–	–	–	0.042
12,924	310,077	0	0	431,490	205,202
150,061	3,965,184	–	–	–	2,450,501
0.02	0.02	–	–	–	0.02
3,451	91,199	0	0	125,712	56,362
48,260	682,873	70,557	15,546	1,298,821	625,599

Table 16: Summary of Estimated Costs, 2002–2006

Item	2002 (US\$)	2003 (US\$)	2004 (US\$)	2005 (US\$)	2006 (US\$)	Total (US\$)
Vaccines	428,137	813,579	472,021	495,623	520,404	2,729,764
Syringes and safety boxes	557,202	846,626	614,315	645,031	677,282	3,340,455
Cold chain	424,270	248,270	352,770	248,270	248,270	1,521,850
Transport	344,300	234,300	234,300	344,300	234,300	1,391,500
Transport operating cost	33,605	22,605	22,605	33,605	22,605	135,025
Institutional strengthening	64,240	100,430	59,840	53,240	63,800	341,550
Training	88,000	66,000	126,500	88,000	126,500	495,000
Review and research studies	99,000	77,000	145,200	110,000	68,200	499,400
Printing of manuals, registers, etc.	50,000	50,000	35,000	35,000	35,000	205,000
Surveillance	150,000	150,000	150,000	150,000	150,000	750,000
Social mobilization	67,100	67,100	78,100	82,500	82,500	377,300
Miscellaneous	50,000	50,000	50,000	50,000	50,000	250,000
Total	2,355,854	2,725,910	2,340,651	2,335,568	2,278,861	12,036,844

Table 17: Office Equipment Purchase Costs, 2002–2006

Description	Unit Cost (US\$)	2002		2003		2004		2005		2006		Total	
		No.	Cost (US\$)	No.	Cost (US\$)	No.	Cost (US\$)	No.	Cost (US\$)	No.	Cost (US\$)	No.	Cost (US\$)
National EPI Cell													
Desktop computers	1,200	2	2,400	2	2,400	–	–	–	–	2	2,400	6	7,200
Laptop computers	3,000	–	–	2	6,000	–	–	–	–	1	3,000	3	9,000
Printers	800	2	1,600	2	1,600	–	–	–	–	2	1,600	6	4,800
UPS	200	2	400	2	400	–	–	–	–	2	400	6	1,200
Photocopier	3,000	–	–	1	3,000	–	–	–	–	–	–	1	3,000
Overhead projectors	250	–	–	2	500	–	–	–	–	–	–	2	500
Multimedia projectors	3,000	–	–	1	3,000	–	–	–	–	–	–	1	3,000
Field Offices													
Desktop computers	1,200	12	14,400	12	14,400	12	14,400	12	14,400	12	14,400	60	72,000
Printers	800	12	9,600	12	9,600	12	9,600	12	9,600	12	9,600	60	48,000
UPS	200	12	2,400	12	2,400	12	2,400	12	2,400	12	2,400	60	12,000
Photocopier	3,000	–	–	2	6,000	2	6,000	–	–	–	–	4	12,000
National EPI Laboratory													
Desktop computers	1,200	4	4,800	–	–	–	–	–	–	1	1,200	5	6,000
Printers	800	2	1,600	–	–	–	–	–	–	1	800	3	2,400
UPS	200	4	800	–	–	–	–	–	–	1	200	5	1,000
Equipment (lump sum)	20,000	1	20,000	2	40,000	1	20,000	1	20,000	1	20,000	6	120,000
Consumables (lump sum)	2,000	1	2,000	1	2,000	1	2,000	1	2,000	1	2,000	5	10,000
Subtotal			60,000		91,300		54,400		48,400		58,000		312,100
Contingency (10%)			6,000		9,130		5,440		4,840		5,800		31,210
Grand Total			66,000		100,430		59,840		53,240		63,800		343,310

Table 18: Cold-Chain Equipment Purchase Costs, 2002–2006

Description	Unit Cost (US\$)	2002		2003		2004		2005		2006		Total	
		No.	Cost (US\$)	No.	Cost (US\$)	No.	Cost (US\$)	No.	Cost (US\$)	No.	Cost (US\$)	No.	Cost (US\$)
Cold rooms (2–8° C) 30 CFt	45,000	2	90,000	–	–	2	90,000	–	–	–	–	4	180,000
Cold rooms (20° C) 30 CFt	30,000	2	60,000	–	–	–	–	–	–	–	–	2	60,000
Electric refrigerators	500	200	100,000	200	100,000	200	100,000	200	100,000	200	100,000	1,000	500,000
Freezers	450	50	22,500	50	22,500	50	22,500	50	22,500	50	22,500	250	112,500
Voltage regulators	250	250	62,500	250	62,500	250	62,500	250	62,500	250	62,500	1,250	312,500
Cold boxes	325	100	32,500	100	32,500	100	32,500	100	32,500	100	32,500	500	162,500
Vaccine carriers	18	400	7,200	400	7,200	400	7,200	400	7,200	400	7,200	2,000	36,000
EPI thermometers	5	200	1,000	200	1,000	200	1,000	200	1,000	200	1,000	1,000	5,000
Generators	2,500	4	10,000	–	–	2	5,000	–	–	–	–	6	15,000
Subtotal			385,700		225,700		320,700		225,700		225,700		1,383,500
Contingency (10%)			38,570		22,570		32,070		22,570		22,570		138,350
Total			424,270		248,270		352,770		248,270		248,270		1,521,850

Note: Assumes the following: 2,000 health facilities; over the five years, one new refrigerator for half of the facilities and one new freezer for 12.5% of the facilities.

Table 19a: Transport Equipment Purchase Costs, 2002–2006

Item	Unit Cost (US\$)	2002		2003		2004		2005		2006		Total	
		No.	Total Cost (US\$)	No.	Total Cost (US\$)	No.	Total Cost (US\$)	No.	Total Cost (US\$)	No.	Total Cost (US\$)	No.	Total Cost (US\$)
Refrigerated vans	50,000	2	100,000	–	–	–	–	2	100,000	–	–	4	200,000
Supervisory vehicles (double cabin, 4X4)	18,000	6	108,000	6	108,000	6	108,000	6	108,000	6	108,000	30	540,000
Motorbikes	1,800	50	90,000	50	90,000	50	90,000	50	90,000	50	90,000	250	450,000
Bicycles	75	200	15,000	200	15,000	200	15,000	200	15,000	200	15,000	1,000	75,000
Subtotal			313,000		213,000		213,000		313,000		213,000		1,265,000
Contingency (10%)			31,300		21,300		21,300		31,300		21,300		126,500
Total			344,300		234,300		234,300		344,300		234,300		1,391,500

Table 19b: Operating Cost^a of Transport Purchased in 2002–2006

Item	Annual Operating Cost (US\$)	2002		2003		2004		2005		2006		Total	
		No.	Total Cost (US\$)	No.	Total Cost (US\$)	No.	Total Cost (US\$)	No.	Total Cost (US\$)	No.	Total Cost (US\$)	No.	Total Cost (US\$)
Refrigerated vans	5,000	2	10,000	–	–	–	–	2	10,000	–	–	4	20,000
Supervisory vehicles (double cabin, 4X4)	1,800	6	10,800	6	10,800	6	10,800	6	10,800	6	10,800	30	54,000
Motorbikes	180	50	9,000	50	9,000	50	9,000	50	9,000	50	9,000	250	45,000
Bicycles	3.75	200	750	200	750	200	750	200	750	200	750	1,000	3,750
Subtotal			30,550		20,550		20,550		30,550		20,550		122,750
Contingency (10%)			3,055		2,055		2,055		3,055		2,055		12,275
Total			33,605		22,605		22,605		33,605		22,605		135,025

^a Estimated at 10% of capital cost, except for bicycles for which operating costs are estimated at 5% of capital cost.

Table 20: Social Mobilization Costs, 2002–2006

Item	2002 (US\$)	2003 (US\$)	2004 (US\$)	2005 (US\$)	2006 (US\$)	Total (US\$)
Radio and TV spots	20,000	20,000	25,000	25,000	25,000	115,000
Print media	15,000	15,000	15,000	15,000	15,000	75,000
Publicity materials	15,000	15,000	20,000	20,000	20,000	90,000
Information booklets	5,000	5,000	5,000	7,000	7,000	29,000
Seminars	6,000	6,000	6,000	8,000	8,000	8,000
Subtotal	61,000	61,000	71,000	75,000	75,000	343,000
Contingency (10%)	6,100	6,100	7,100	7,500	7,500	34,300
Total	67,100	67,100	78,100	82,500	82,500	377,300

Table 21: Proposed Training Budget, 2002–2006

Area of Training	2002 (US\$)	2003 (US\$)	2004 (US\$)	2005 (US\$)	2006 (US\$)	Total (US\$)
Training of Master Trainers ^a	10,000	15,000	15,000	10,000	–	50,000
Study Tours	30,000	–	35,000	–	35,000	100,000
Regular Training ^a	40,000	45,000	45,000	45,000	50,000	225,000
Refresher Training ^b	–	–	20,000	25,000	30,000	75,000
Subtotal	80,000	60,000	115,000	80,000	115,000	450,000
Contingency (10%)	8,000	6,000	11,500	8,000	11,500	45,000
Total	88,000	66,000	126,500	88,000	126,500	495,000

^a In injection safety, surveillance, vaccine wastage reduction, cold-chain management, data management, new vaccines and techniques, supervision and management, social mobilization, and related topics.

^b Up to three years after regular training.

Projected sources and funding gap

For the current year (2001) and for the short term, UNICEF is the only available source of funding for the NIP. There are no commitments from any other donors.

Table 22 shows the EPI financing gap for 2002–2006, based on the current level of expenditure and the available resources (UNICEF). This analysis shows that \$9.38 million more is needed to improve the immunization program over that time.

Table 22: Financing Gap, 2002–2006

Item	2002	2003	2004	2005	2006	Total
Total expense ^a (US\$)	2,355,854	2,725,910	2,340,651	2,335,568	2,278,861	12,036,844
Sponsored by GAVI ^b (US\$)	263,296	276,460	290,283	304,797	320,037	1,454,874
Minimum Government contribution (US\$)	235,585	272,591	234,065	233,557	227,886	1,203,684
Unmet needs (US\$)	1,856,973	2,176,859	1,816,303	1,797,214	1,730,937	9,378,286
Unmet needs as % of total expense	78.82	79.86	77.6	76.95	75.96	77.91

^a Excluding human resource and routine operational costs.

^b Cost of hepatitis B vaccine and AD syringes, and safety boxes for hepatitis B vaccine.

Policy and Financing Options

This analysis is limited to the national level. There are not enough data to determine financing gaps at the district (rayon) level, although there is concern that deficiencies could exist at that level and could be responsible for the inadequate delivery of immunization services. Financing gaps at the national and subnational levels would affect the quality of immunization services in Azerbaijan, primarily the cold chain, surveillance, injection safety, and measles control. Major steps must be taken as soon as possible to overcome these inhibiting factors.

Financing gaps at the national and subnational levels would affect the quality of immunization services in Azerbaijan, primarily the cold chain, surveillance, injection safety, and measles control. Major steps must be taken as soon as possible to overcome these inhibiting factors

Policy Options

At the policy level, the Government must effectively implement policy decisions that will lead to program sustainability over the medium to long term, and provide effective access to immunization services.

Budget line

The Government has fulfilled its commitment to provide 10 percent of the vaccine costs for 2001, and has procured through its own system all BCG requirements for the current year. The Government also continues to demonstrate through presidential decrees its commitment to improve health delivery and immunization services in general. However, the availability of resources for at least five years should be ensured through a budget line in the national budget. Resources will also have to be made available at the district (rayon) level to fund service delivery. These steps will give the following clear advantages:

- Ensure sustainability. Medium-term planning and medium-term commitment from donors will obviate the need for yearly planning. Delays caused by the latter can cause supply shortages and interrupt immunization services. The development of longer-term plans also signals commitment on the part of the Government and makes partner and donor commitments more accessible, measurable, and meaningful.
- Set in motion a process of accountability. The Government can thus be ensured of improved coverage and accountability for coverage data, and avoid the current discrepancies between reported and assessed coverage rates.

Centralized procurement

Good-quality vaccines, syringes, and cold-chain equipment can be obtained more quickly and at lower cost through centralized procurement. Distribution also becomes smoother and more equitable.

Without a National Control Authority for Biologicals, it becomes increasingly important to make sure that good-quality vaccines are procured. Partners and donors are particularly sensitive to this issue. Given the strong relationship between UNICEF and

HHealth services in Azerbaijan are in transition. With the Government moving toward defining in more emphatic terms its commitments and appropriate health delivery mechanisms, financing decisions must be made as soon as possible

the Government, the latter could very well continue to entrust the procurement function to UNICEF if donor funds are made available for strengthening NIP services in Azerbaijan. In such a case, UNICEF should be given financial responsibility as executing agency. In discussions, the Deputy Health Minister, while appreciating the support of UNICEF, expressed the wish that it would also assume financial responsibility for funds being provided under GAVI Window I, as well as other future donor funding. Various donors have routed funds for purchases of supplies and equipment through UNICEF. In a current restructuring project for the country's health sector, UNICEF in Azerbaijan is acting as executing agency on behalf of the World Bank. The project is worth about \$3 million. The World Bank is providing \$3 million for health sector infrastructure support, and has designated the UNICEF office in Azerbaijan as the executing agency for the purchase of commodities and supplies.

Capacity building for service delivery, cold-chain maintenance training, strengthening of surveillance capability, development of effective national monitoring tools—these are some of the areas in which UNICEF should be encouraged to increase its participation. In addition, there is a need to improve social mobilization, and this is a strong point of UNICEF.

Medium- to long-term donor commitments will free up the UNICEF country budget for the foregoing activities.

Hard-currency convertibility and import duties

These are not stipulated since the Government itself does not import its NIP requirements. Such restrictions would further delay the availability of the necessary supplies and equipment.

Financial information systems

Funds for immunization services are not clearly defined in the present structure and are merely seen as part of the greater health system. Developing financial information systems will help set in motion a process of tracking and appropriate fund use, facilitating comparison and analysis.

Summary

Health services in Azerbaijan are in transition. With the Government moving toward defining in more emphatic terms its commitments and appropriate health delivery mechanisms, financing decisions must be made as soon as possible. It would seem appropriate for donors to begin negotiations that would allow financial mechanisms to be in place before the start of the new financial year in 2002.

Further decentralization, with greater horizontal line management, is expected. The Government also plans to introduce principles of sustainability and cost-effectiveness into the health system. Some decentralization of the healthcare system has been achieved mainly in the field of financing. On the management side the vertical system still dominates.

The Government should see to it that resources are available over the long term. If extended commitments cannot be made, the Government must negotiate with donors to preserve the continuity of NIP services

The Government has sought to revitalize the healthcare system through proposals that aim to link areas of public sector health care with community involvement. These proposals are based on:

- System rationalization, with districts having leaner, more cost-effective, and sustainable structures, fewer hospital beds, and more outpatient rather than inpatient care
- Consolidation of facilities, with specialized clinics merging with central hospitals
- A strong public sector forming the basis of the service and working with a private medical initiative supervised by the community
- The State and the communities sharing health costs

The public role in co-financing will include:

- Adopting service fees
- Establishing funds for the procurement of drugs
- Raising capital funds

These inputs, if successful and universal, will provide much-needed impetus to the healthcare system. But the effects on health care are difficult to determine at this stage.

Financing Options

Routine vaccines

The Government should see to it that resources are available over the long term. If extended commitments cannot be made, the Government must negotiate with donors to preserve the continuity of NIP services. Azerbaijan's immunization program remains fragile, and would suffer if its continuity were threatened.

Nonroutine vaccines

There is no evidence to suggest that non-EPI vaccine quality is being compromised. MOH imports (mainly from Russia) are in sufficient quantity and there have been no complaints about quality. However, a National Control Authority for Biologicals would provide adequate protection.

Vaccine management system, including cold-chain equipment

Vaccine management, cold-chain equipment, and vaccine transport must be improved. Without a detailed inventory, and given the need to enhance immunization services in a timely manner, an empirical plan with requirements for existing and planned vaccination sites could be developed.

Transport equipment for delivery of immunization supplies either does not exist or is not functional. This results in short deliveries or inappropriate storage of supplies, wasting large amounts of vaccine. Support for vaccine transport is therefore essential. A detailed study on vaccine wastage and proposals for minimizing wastage must be done in 2002 before the deadline for the submission of the 2002 GAVI inception report.

UNICEF is committed to supplying the country with its vaccine and syringe needs, but as a consequence is reducing its inputs in more traditional areas such as training, supervision, and capacity building of immunization services

Safe injection practices

Adequate groundwork appears to have been laid for the adoption of safe injection practices. Auto-disable syringes and safety boxes are already being used. But future support must ensure continued use. Training must build knowledge of safe injection practices. Right now, procedures for the safe disposal of used vaccines and safety boxes are not entirely clear to all immunization services staff.

Surveillance

An effective and sustained surveillance system is critical for both the short- and long-term needs of the immunization program. Effective AFP surveillance will not only pave the way for polio-free certification but can also be built upon to include other EPI antigens. Improved surveillance will enhance epidemiological intelligence and provide a better understanding of disease patterns. Immunization will thus become more cost-effective.

Introduction of new vaccines

With the introduction of hepatitis B starting in September 2001, effective measures should be taken to improve the capacity and quality of cold-chain storage. GAVI will provide continued support only if the effects of interventions are measurable. Systematic, phased introduction might therefore be the answer. The Government may wish to consider introducing hepatitis B vaccine in phases instead of nationwide all at one time. It could seek infrastructure support under GAVI Window II applications toward the end of 2001 to improve immunization facilities.

Summary

Areas that require funding are vaccine and syringes, measles campaigns, cold-chain equipment, transport, and surveillance.

Areas that need training and support are injection safety, cold-chain equipment, and vaccine management.

Measles eradication is an area that the Government is keen to promote through immunization campaigns. It must decide on the target groups, draw up plans, and seek support.

To mobilize financing, the Government has the following options available: use its own resources, increase donor commitment, or borrow soft loans. UNICEF is committed to supplying the country with its vaccine and syringe needs, but as a consequence is reducing its inputs in more traditional areas such as training, supervision, and capacity building of immunization services.

Cold Chain and Vaccine Storage Assessment

Contents

Objectives	1
1. Cold chain and vaccines in various levels of Health system	1
1.1. Town and district Centers for Hygiene and Epidemiology	1
1.2. Maternity Hospitals	2
1.3. Town and District Pediatrician Polyclinics	2
1.4. Rural Hospitals	2
1.5. Rural Outpatient Clinics	3
1.6. Feldsher-Obstetrics Posts	3
2. Electric power supply of villages and towns	3
3. The Awareness of Health Personnel on Safe Immunization Practices	3
Recommendations	3

According to the National EPI, and with support of UNICEF, the monitoring of cold chain and vaccines storage as well as of AFP surveillance was conducted during October 2000 - March 2001.

The monitoring was carried out by the specialists from RCHE and National Polio Lab, and one independent expert in 27 districts, 4 towns, and in Naxcivan Autonomous Republic.

Objectives

1. To assess cold chain system, vaccines storage, and safe immunization practices.
2. To assess AFP surveillance in silent territories through taking samples from health children and wastewater, with analysis of those samples in the National Polio Lab for identification of current enteroviruses variety in the country.
3. To develop relevant recommendations based on the outcomes of the monitoring.

1. The cold chain state and vaccines storage at different levels of health system

1.1. Town and district Centers of Hygiene and Epidemiology (CHE)

Town and district CHEs ensure the delivery of vaccine supplies from RCHE, their storage and distribution, as well as supervise vaccination in local health care facilities.

All the centers have been provided with cold chain equipment (by UNICEF); moreover, the refrigerators and freezers are of high quality in terms of their technical specifications. During the fall-winter period, when the electricity is supplied only for 10-14 hours a day, they ensure necessary temperature regime for the vaccines storage.

All the freezers in CHEs are in order. Most refrigerators are also in working condition, except for 5 which require certain repair: in Zardab, Lenkaran, and Xanlar 1 each, and 2 refrigerators in Naxcivan AR. The heads of the above centers have already requested assistance for repairs from the Republican Supply Center.

Naxcivan received 12 "Sibir" refrigerators from Amoco; all of them are out of order currently.

In each CHE, there is a specially trained person in charge of cold chain equipment.

Each CHE is provided with large coldbox for vaccine transportation from the RCHE, however they are not used due to the absence of the transport means.

21 out of 32 towns and districts, or 66%, are fully equipped with small vaccine carriers. To fully cover the needs of health centers implementing vaccination, 236 carriers are required for the remaining 11 districts, and 160 are necessary for Naxcivan.

There are generators in 18 towns and districts, however they are not used because of problems with fuel provision. In Naxcivan, there is only 1 generator in the CHE, while there is none in 6 districts of the Autonomous Republic.

Given the fact that only town and district CHEs are able to ensure proper and continuous storage of vaccine supplies under unfavorable climate conditions and interrupted electricity supply (spring-

summer-fall), availability of generators in all districts and their use is desirable. Another important factor in cold chain management is frequency of receipt and transportation of vaccines to remote towns and districts, which are located up to 500 km away from Baku, especially summer time.

To target this problem, an establishment of regional centers was planned in Gence, Sheki, Berde, Lenkeran, Beylagan, and CHEs in these districts have been provided with sufficient amount of cold chain equipment. However, due to absence of transportation means in the above CHEs prevents their use as regional centers.

Moreover, absence of vehicle in the Republican Supply Center does not allow to practice centralized distribution of vaccines, as it used to be previously and proved to be successful, especially during National Immunization Days. Existing in the Republican Supply Center vehicle is absolutely out of order and is to be replaced.

1.2. Maternity

Maternity houses are functioning in all towns and district centers; maternity beds are available in rural hospitals.

Maternities of 24 districts and town are equipped with refrigerators, they are located in vaccination rooms. Vaccination nurses in maternities are responsible for refrigerators, too.

There are no refrigerators in maternities of 5 districts: Astara, Gedebey, Agdash, Bilasuvar and Shamaxi. In Mingachevir, Qax, and Sabirabad maternities, refrigerators are frequently repaired. This does not allow for proper vaccines storage, and therefore refrigerators should be replaced. In Naxcivan, each of 8 maternities is equipped by a refrigerator, although only 2 of them are in order.

1.3. Town and District Children's Outpatient Departments

There is one Children's Outpatient department (OPD) in each district, 2 in Ali-Bayramli, 5 in Sumqayit, 5 in Gence, 1 in Naxcivan City, and 2 in Mingacevir.

Refrigerators in 28 OPDs are in working conditions. There are no refrigerators in Astara and Gedebey, in 1 OPD on Gence, and in 1 OPD in Sumqayit. In Naxcivan AR, only 3 out of 8 children's OPDs have refrigerators in working condition.

In more than 50% of children's OPDs, refrigerators are obsolete, and therefore hardly ensure safety of vaccines.

There is trained personnel in all children's OPDs in charge of refrigerators.

1.4. Rural Hospitals

The number of rural hospitals can range from 1 to 16 in various districts depending on the number of population and distance from the district center. 97 out of 192 rural hospitals (50%) do not have refrigerators. Because of absence of refrigerators, The rural hospitals, which do not have refrigerators, receive and administer vaccines in the fixed day once a month.

1.5. Rural Outpatient Clinics

Only 88 (23,2%) of 380 rural outpatient clinics located in Nakhchivan Autonomous Republic and 27 districts have refrigerators.

1.6. Feldsher-Obstetrics Posts

Only 20 (2,1%) of 971 feldsher-obstetrics posts have refrigerators. The distance from district centers to feldsher-obstetrics posts varies from 5km to 80 km. Safety are available at all FOPs, and the boxes are properly incinerated.

2. Electric power supply in towns and districts

In all districts as well as in Naxcivan AR and Gence city, there are breaks in electric power supply. In district centers, electric power is supplied in the mornings and in the evenings at fixed time; while in other settlements it is supplied after the working hours, in the evening, when there is no health personnel in the health facilities. Among the towns where monitoring was held Sumgayit and Mingachevir are fully supplied with electric power.

3. The Awareness of Health Personnel on Safe Immunization Practices

Chiefs of health system in towns and districts, chief pediatricians, chiefs of epidemiological departments are functioning according to EPI-related Orders, Instructions, reporting documents of the Ministry of Health.

Those doctors who have gone through training on EPI and AFP surveillance, were provided all relevant teaching materials.

Other health personnel receive information on EPI and AFP surveillance during health meetings. However, trained specialists do not consequently train their colleagues. Neither seminars are conducted for the lower health personnel, who are directly providing immunization services. The only opportunity for vaccinating nurses to receive new information is from the epidemiologists who monitor their activities.

Most of the monitored districts have been provided with posters, booklets on various infectious diseases, vaccination calendars and immunization cards.

Recommendations

1. To consider town and district Centers for Hygiene and Epidemiology the only health facilities where vaccines can be stored, until the supply of electric power is normalized. To find ways to ensure proper operation of generators in the districts, as well as provide generators to the districts which have none. The main responsibility of each Center for Hygiene and Epidemiology is to ensure necessary temperature regime for vaccines storage.

2. To continue efforts for strengthening cold chain management in maternities, rural and urban child polyclinics, rural hospitals and rural ambulatories.
3. To suggest that responsibilities of vaccine provision of FAPs vaccination control and training of vaccinators is responsibility of rural hospitals and ambulatories in catchment area of which the FAPs are located, given the fact that each Feldsher-Obstetrics Post (FAP) is rendering services to extremely small number of children. Preferably, to provide all FAPs with vaccine carriers.
4. To continue trainings for doctors at all levels, while adjusting vaccination calendar to introduction of new vaccines into the national EPI.
5. To pay particular attention to the capacity building of vaccinators, as well as their certification, while introducing safe immunization practices at all levels of health system.
6. For strengthening social mobilization of population, Chief doctors to provide vaccination rooms in all facilities with relevant IEC materials, and to provide necessary technical assistance to those rooms to function as centers working directly with the population.



References

ASSC 1995

ASSC 1995–2000

United Nations Children's Fund (UNICEF). 1999. ICDC.

United Nations Development Program (UNDP). 2000. *Human Development Report: Azerbaijan*.



ISBN 971-561-418-3
Publication Stock No. 010502

ISBN 971-561-418-3



9 789715 614184