

**Government of
Republic of Moldova**

**Comprehensive Multi-Year Plan
for Immunization Programme
2011-2015**

May 2010 (Revised in May 2011)

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EXECUTIVE SUMMARY

The Republic of Moldova is a small, landlocked country in Eastern Europe, established as an independent state in 1991, following the collapse of the Soviet Union, with a population of 4.1 million. It had an armed conflict in 1992 in its eastern region called Transnistria, which has not yet been resolved. Since 1991 Moldova faced serious economic challenges, losing 66% of its GDP in first decade of independence, followed by sustainable growth starting 2000 and being challenged again by the 2008-2009 global economic crisis.

The Republic of Moldova has a double epidemiological burden as rates of communicable diseases have increased since independence due TB, which is responsible for 81% of deaths, at the same time as non-communicable diseases, such as cardiovascular diseases and cancers, have also increased as a cause of premature mortality. Moldova has an ageing population, with average life expectancy at birth of 69.4 years and children under one accounting for 1.1% of total population.

Moldova National Immunization Programme represents an integrated effort, involving national, regional and local authorities, different sectors, a range of institutions and services of the health sector, including public health service and primary health care. Starting 1994, three 5-year National Programmes for Immunization have been issued by the Government defining goals, objectives and targets in the area of preventing diseases by concerted immunization activities and commitments of the National Government sectors and institutions, local authorities, civil society, and international partners. The National Immunization Program for 2006-2010 guarantees immunizations free of charge against ten infectious diseases: poliomyelitis, diphtheria, tetanus, whooping cough, hepatitis B, measles, mumps, rubella, tuberculosis, and hemophilus influenza type B.

Child immunization levels have recovered since 1995, keeping vaccination coverage over 90% and expanding to new antigens as hepatitis B, rubella, mumps, haemophilus influenza type B. Moldova is free of polio and neonatal tetanus, reached elimination of diphtheria, measles and rubella, recorded significant achievements in control of hepatitis B, pertussis and mumps by implementing routine immunization, vaccination campaigns and catch-up immunization activities.

Moldova NIP benefited of international donors support for providing traditional and new vaccines, strengthening cold chain and logistics improving programme management and enhancing surveillance. The Government of Moldova showed sustainable gradual increase of its financial commitment toward NIP and covers currently all programme antigens with except of GAVI co-financed Hib vaccine.

Introduction of health insurance in 2004 has improved financing of the health system, access to services and financial protection of population. Human resources those, remain a problem of the Moldova health system - the number of family doctors in Moldova decreased by 3 percent over the past several years and almost 30 percent of rural primary care facilities have no doctors.

The National Health Policy, issued by the Government in 2007 and the Health System Development Strategy for the period 2007-2016 define the framework of the efforts made by the Government and civil society, aimed at improving population's health by ensuring access and quality of preventive services.

The MYP 2011-2015 is aligned with national health and development policies and addresses the GIVS strategic areas toward protecting more people, introducing new vaccines and technologies, further integrating immunization, other linked health interventions and surveillance in the health systems context and exploring partnership opportunities to strengthen reliably financing, supply of vaccines and delivery of immunizations. It explores costing and financing scenarios and highlights the role of GAVI co-financing support to introduce rotavirus vaccine starting 2012 and pneumococcal vaccine starting 2013 and government's commitment to secure additional funds to fill the funding gap.

1. BACKGROUND

1.1. GENERAL INFORMATION

Geographical situation

1.1. Country general information

The Republic of Moldova is a small, landlocked country in Eastern Europe. It has a surface area of 33,700 square kilometers and shares a border with Romania and Ukraine. The capital of Moldova is Chisinau.

The territory of the Republic of Moldova is divided into administrative-territorial units. There are 2 municipalities, 32 districts (raions) and two territorial units to which special terms of autonomy are attributed: the autonomous territory of Gagauz (is divided into 3 raions), and the territory of Transnistria located on the east side of the Dniester River (including 2 towns and 5 raions). Total numbers of administrative-territorial units is 44.

The climate of the Republic of Moldova is moderately continental. It is characterized by a lengthy frost-free period, short mild winters, lengthy hot summers, modest precipitation, and long dry periods in the south. The average annual temperature increases southward from around 8-9°C in the north to around 10-11°C in the south. The average annual precipitation varies between 600-650 mm in the north and the center and 500-550 mm in the south and the southeast.

The 2004 population census conducted in Moldova provides a population count of 3.4 million, excluding region of Transnistria. Moldova's population has decreased by approximately 274,000 people compared with 1989 census estimates. The greater number of deaths than live births, as well as a surplus of emigrants over immigrants results in a negative population growth estimated to be about -0.5 percent. An aging population is a consequence of a declining population; since 1989, there has been a decrease in the proportion of young people under age 15 and a simultaneous increase in the proportion of working-age and elderly people age 60 and older. The average life expectancy at birth was 69.4 years in 2008.

Large-scale labor emigration of both young male and female has a substantial negative impact on the population growth, on the social and economic structure of society and contributed to worsening the living arrangements of children: only about two-thirds of children under age 15 live with both parents in Moldova.

Population and demographic indicators

Moldova's official population count registered in the population census of October 5, 2004, excluding the districts in the region of Transnistria, was 3.4 million. According to the National Statistics Bureau, in 2009 population of the Republic of Moldova, comprised 3.565 thousand people (without Transnistria region). According to the local health statistics data, population in Transnistria for the year 2009 comprised 525 thousand people. Moldova has the highest population density of any of the former Soviet Republics; on average, there are about 111 people per square kilometer, and about 1,255 people per square kilometer in Chisinau. Compared with the population count in the 1989 census, Moldova's population has decreased by approximately 274,000 people. The rate of population decline, determined both by a greater number of deaths than live births, as well as a surplus of



emigrants over immigrants, results in a negative population growth estimated to be about -0.5 percent. An aging population is a consequence of a declining population; since 1989, there has been a decrease in the proportion of young people under age 15 and a simultaneous increase in the proportion of working-age and elderly people age 60 and older. The average age registered in the 2004 census was 35.3 years, compared with 32 years in the 1989 census data. The average life expectancy at birth was 69.4 years in 2008. The life expectancy is also higher in urban areas than rural areas—both men and women in urban areas live approximately 3 years longer than those in rural areas. The main demographic indicators is presentation in table 1.

Table 1. Demographic indicators for Republic of Moldova 2000-2006

Indicator	2003	2004	2005	2006	2007	2008	2009
Population (millions)*	4.2	4.2	4.2	4.2	4.1	4.1	4.1
Live births*	40,600	43,000	42,400	42,400	42,955	44,033	46,195
Infant mortality rate**	14.3	12.1	12.4	11.8	11.3	12.1	12.0
Fertility rate **	1.22	1.26	1.27	1.2	1.3	1.3	NA
Population growth (%)**	-0.34	-0.32	-0.29	-0.28	-0.23	-0.19	-0.13
Life expectancy at birth**	67.91	68.3	67.9	68.4	68.95	69.4	NA
Live-births / 1000**	10.1	10.6	10.5	10.5	10.6	10.9	11.4
Deaths / 1000**	11.9	11.6	12.4	12.0	12.0	11.8	NA

* Data are presented for the country including Transnistria area

** Data are presented for the country, excluding Transnistria area

The ethnic composition of Moldova as registered in the 2004 census reveals that the majority of the population is ethnic Moldovan (76 percent), followed by Ukrainian (8 percent), Russian (6 percent), Gagauz (4 percent), Romanian (2 percent) and Bulgarian (2 percent). Other ethnic groups make up about 1 percent of the population. The overwhelming majority of Moldovans are affiliated with the Orthodox religion.

Education

Moldova's education system, until independence in 1991, followed the same structure as the Soviet educational system. In the past 15 years, however, the system has undergone several reforms, making the analysis of education data across a wide range of ages challenging. Basically, Moldova's primary and secondary educational system has three components. The first component is primary school and comprises grades 1-4 (usually children age 8 to 11, but some children start younger). The second component is secondary school and comprises grades 5-9 (usually children age 12 to 16, but some children start younger), or grades 5-12. Students who have completed a total of at least 9 grades are considered to have fully completed compulsory education. The third component is secondary special education. Secondary special education is an alternative for students who have completed a total of at least 9 years of schooling; at this stage, a student may opt to follow secondary special education that is specialized technical training in a specific field such as nursing, agriculture, construction, etc. Secondary special education usually lasts 2-3 years and, when successfully completed, the student is considered qualified to work in that specific field. Students who have successfully completed a total of 12 years of schooling (primary and secondary education), or who have completed primary schooling plus a secondary special education, are qualified to attend university.

Only a tiny fraction population age 7 and older have no education. Furthermore, by age group 15-19, virtually all females and all males have attended or completed secondary or secondary special

education. In the oldest age groups, age 65 and above, about one-third have attended or completed only primary education.

Overall, relatively more people have opted to pursue secondary education (65 percent of males and 56 percent of females) versus secondary special education (10 percent of males and 15 percent of females). This is especially the case for the age group 15-19, where, for both sexes, 86 percent have reached secondary school versus only about 5 percent who have attended secondary special school.

In terms of the highest level of education, women are slightly more likely than men to attend university. Overall, 13 percent of males and 15 percent of females have at least some university education. This difference is largest in younger generations; for example, for the age group 20-24, 40 percent of women versus 30 percent of men have at least some higher education.

Exposure to Mass Media

Access to information is essential in increasing people's knowledge and awareness of what is taking place around them, and may eventually affect their perceptions and behavior. In the survey, exposure to media was assessed by asking respondents how often they read a newspaper, watched television, or listened to the radio. Knowing the types of persons who are more or less likely to be reached by the media is important for purposes of planning programs intended to spread information about health or other issues related to the general welfare of the population.

About 95 percent of women and men in Moldova have exposure to media at least once a week. Television is the most popular media source and more than 90 percent of women and men watch it at least weekly. About an equal share of women and men listen to the radio, which is the second most popular media source (76 and 79 percent, respectively). Women, however, are more likely than men to read a newspaper once a week (56 and 41 percent, respectively). Overall, women have more exposure to media: 46 percent access all three sources at least once a week, versus 35 percent of men.

1.2. POLITICAL AND SOCIO-ECONOMIC TRENDS

Political situation

The Republic of Moldova was established as an independent state in 1991, following the collapse of the Soviet Union. It is governed by a constitution that was approved in 1994, replacing the old Soviet constitution of 1979. It became a parliamentary republic in 2001. The head of state is the president, chosen by the parliament once every four years. The prime minister is nominated by the president and approved by the parliament, and is the head of government. The parliament is unicameral and has 101 seats. Members of parliament are elected by a popular vote for four-year terms of office. Following independence, the country was ruled by the Agrarian Party, with Mircea Snegur as President until 1996. From 1996 to 2001, the Alliance of Centrist Democrats was in power, with the Moldovan Communist Party winning 70% of parliamentary seats in 2001 and holding a reduced majority of 56% in the 2005 parliamentary elections (Way 2002, Way 2005). Vladimir Voronin, leader of the Moldovan Communist Party, was elected to the presidency in February 2001 and was reelected for this position in 2005.

On August 8, 2009, four Moldovan parties – Liberal Democratic Party, Liberal Party, Democratic Party, and Our Moldova Alliance – agreed to create a governing coalition that pushed the Communist party into opposition. On August 28, 2009, Moldova's pro-Western coalition has chosen a new parliament speaker (namely Mihai Ghimpu) in a vote that was boycotted by Communist legislators.

As Moldova is a parliamentary republic, presidential powers are limited by parliament, while the powers of both parliament and the president are constrained by the independent Constitutional Court.

Until 1998, Moldova was divided into 40 districts and 10 towns for administrative purposes. In 1999, the administrative arrangements were reorganized. Twelve administrative regions were established (10 counties (judets), the metropolitan area of Chisinau and the Territorial Autonomous Unit of Gagauzia), each with a regional administration and civil servants.

Special autonomy status was granted to the Gagauz region in 1994, and the Territorial Autonomous Unit of Gagauzia now has power over its own political, economic and cultural affairs. However, with the passing of the Law Regarding the Local Public Administration (No. 123-XV) in March 2003, Moldova was reorganized once more, this time into 32 local districts (rayons), three municipalities and two territorial autonomous units. Local governments have tax-raising powers, but the funding of health services has been recentralized through the National Health Insurance Company (NHIC). Laws relating to health care are enacted both by primary legislation after parliamentary discussion and by decree, but the process is negotiated between parliament and the Ministry of Health (MOH). The other key interest groups integrated into the health policy process are the various international partners active in the Moldovan health sector.

Moldova joined the CIS in 1991, and has been a member of the United Nations since 1992. Moldova was one of the first post-Soviet states to join the Council of Europe and the Organization for Security and Cooperation in Europe; it is also in the World Trade Organization and the Stability Pact for South Eastern Europe. The Moldovan Government has expressed interest in joining the North Atlantic Treaty Organization (NATO) and the EU, but formal accession discussions have not taken place. Moldova has been proclaimed a permanently neutral country that will not permit the stationing of foreign military troops on its territory. Moldova is signatory to various international treaties that have an impact on health including the United Nations Convention on the Rights of the Child (1993) and the European Convention on Human Rights (1995). Compliance with the United Nations Convention on Rights of the Child has been positive in terms of the legislative framework in place, but the key barriers to successful realization of the convention include the high rates of poverty and emigration, which have a great impact on the well-being of children.

The European integration represents the priority of the foreign and domestic policy of the Republic of Moldova. The Partnership and Cooperation Agreement between Republic of Moldova and European Union signed on 28 November 1994 set the basis of collaboration with EU in the political, commercial, economic, juridical, cultural and scientific sectors. Republic of Moldova signed on 22 February 2005 the Action Plan Moldova-EU and has obtained significant progresses in the process of fulfilling the Action Plan objectives in all its domains.

Amongst the most valuable achievements of the Moldovan diplomacy in the area of European Integration are the deepening of the bilateral dialogue with the EU within the European Neighbourhood Policy; the signing of the European Union – Republic of Moldova Action Plan in Brussels on 22 February 2005; the establishment of the Mission of the Republic of Moldova to the European Community (in May 2005); the creation of the Office of the Delegation of the European Commission to the Republic of Moldova (in October 2005); the appointment of a Special EU Representative to the Republic of Moldova and the enlargement of the (“five plus two side”) format for carrying out of negotiations for the settlement of the conflict in Transnistria with the inclusion of the EU and the USA.

The new Government of the Republic of Moldova defined five pillar reform priorities: European integration, economic recovery, rule of law, administrative and fiscal decentralization and reunification of the country. This vision draws from several strategic planning frameworks: the Economic Stabilisation and Recovery Programme, the National Development Strategy, the EUMoldova Action Plan, the Eastern Partnership and the Partnership and Cooperation Agreement between Moldova and the European Union.

The Joint Statement of the EU - Republic of Moldova Cooperation Council of 21 December 2009 set the tone for an intensified dialogue. On 12 January 2010 Moldova and the EU launched negotiations on an Association Agreement which will raise the bilateral relationship to a new level.

This Agreement is a framework to bring Moldova closer to the EU through political association and economic integration. Both the EU and Moldova have reaffirmed their desire to start talks on the creation of a Deep and Comprehensive Free Trade Area. In addition, the two parties have agreed to establish dialogue on visa liberalization for the citizens of Moldova.

Conflict affected areas

Since Moldova claimed independence, there has been civil strife in its eastern region situated on the left bank of the river Nistru, so called Transnistria, which sought to maintain its links with the Soviet Union and declared independence from Moldova shortly after the country seceded from the Union. In 1992, there was armed conflict in Transnistria between the Moldovan army and Soviet army troops based there. This conflict has not yet been resolved, and although the self-proclaimed Transnistrian Moldovan Republic has never been recognized internally or internationally as an independent state, it currently has its own parliament, president, constitution, economic system and currency. The region remains effectively outside central government control, and its status is still being negotiated. Basic health and demographic data for the region are not available, but it would seem that the region has maintained a largely unreformed Semashko style health system for the local population of approximately 0.6 million inhabitants.

One of the areas where the information exchange was successful over the time is prevention and control of infectious diseases and the national immunization program, where regular reports are received from the Transnistria region. The external assistance provided to Moldova and distributed equitable to Transnistria too was one of the contributing factors to maintain cooperation and reporting in those areas.

Economy

Agriculture and food processing dominate the Moldova economy and the country is dependent on imports for its energy needs. The private sector currently contributes over 60 percent of the GDP and the market is functioning with commercial banks, stock exchanges, free economic zones, etc.

Moldova's industry is concentrated mainly on processing agricultural raw materials, in particular, the production of wine and cigarettes and the processing of tobacco. This activity is complemented by light industries such as chemical industry, wood processing, machine building, and the manufacturing of some equipment. Heavy industry such as cement works and metallurgy is concentrated in the Transnistria region and has a market in Russia.

The sharp decline of economic activity in the first decade after independence led to an acute growth of poverty in the 1990s—Moldova went from a country with an overall medium income level to one with an overall low income level. The GDP reached only 34 percent of the 1990 level and over 70 percent of the country's population was considered poor. In 2003, UNDP's human development indicators ranked Moldova only 117th out of a total of 177 countries.

Starting 2000, the economy started to manifest a sustainable growth, the real GDP grew on average by 5.9 per year during 2000-2006, with a cumulative growth of 49.5% versus 1999.

The 2004 population census revealed that over 357,000 Moldovans (approximately one-quarter of the total labor force) currently work abroad. Migrant workers' remittances have increased disposable income and fueled a rapid increase in final consumption and construction expenditures. In 2008, Moldovan workers sent home about US\$ 1.9 billion (31 percent of GDP). As a result, Moldova has weathered a number of economic shocks over the last few years. In spite of severe terms of trade shocks (in the form of substantially higher energy prices), export bans on its main export (wine), and a significant drought that devastated the agriculture sector, economic growth has still averaged more than 6 percent per year from 2000 to 2008.

The global economic crisis had a major and abrupt impact on the economy of the Republic of Moldova. After registering double digit growth rates for most of the decade, in 2009 remittances fell

27%, reflecting plunging economic activity in countries with large numbers of temporary Moldovan workers. Foreign Direct Investment fell abruptly to 2% of GDP from a pre-crisis level of 11.4%. Exports of goods and services decreased by a hefty 22%, although the decrease of imports was even higher – 35%, meaning no overall negative impact on GDP performance.

The combination of these factors brought a decline in GDP performance of 9% in real terms. At the end of the fourth quarter of 2009 the number of unemployed reached 73,900, almost double the comparable period in 2008. Reduced disposable incomes, especially for the 40% of Moldovans living in households that receive remittances, as well as an overall decrease in consumer confidence resulted in deflationary pressures. The CPI at the end of 2009 was only 0.4% after several months of deflation. Deposits held with domestic banks decreased by 3.7% in comparison with the end of 2008, while credit to the real economy shrunk by 4.9% in the same period. Lending conditions also worsened in real terms despite expansionary monetary policy followed by the National Bank of Moldova (NBM).

A substantial response was proposed by the current Government through its Economic Stabilization and Recovery Programme for 2009-2011. The Programme, recently backed by the IMF, focuses on public expenditure rationalization, enhancement and targeting of safety nets, and liberalization of the highly regulated economy.

1.3. HEALTH STATUS OF POPULATION

Following independence, there was a sharp fall in all health indicators in the Republic of Moldova and average life expectancy fell from 69.0 in 1989 to 65.9 in 1995, however the situation has since improved and life expectancy in 2006, reached 69.4 years in 2008 with improvements more expressed in women comparing to men.

The infant mortality rate rose in the early 1990s, from a low of 18.3 per 1000 live births in 1992 to 22.9 in 1994. A downward trend has been following since, and in 2007 it reached 11.3, however in 2008 the infant mortality rate registered a raised back to 12.1. Similarly, the highest maternal mortality rate of 52.9 deaths per 100000 live births was in 1993, it gradually decreased to the lowest level in 2006 at 16.0, but in 2008 it returned to a level of 43.6.

The Republic of Moldova has a double epidemiological burden as rates of communicable diseases have increased since independence due TB, which is responsible for 81% of deaths, at the same time as non-communicable diseases, such as cardiovascular diseases and cancers, have also increased as a cause of premature mortality. Poverty, alcohol and tobacco are the key health determinants for most Moldovans and mortality and morbidity from these factors account for a sizeable burden on society. The main causes of death in the Republic of Moldova are diseases of the circulatory system followed by cancer, diseases of the digestive system and injury and poisoning.

Child immunization levels have recovered since 1995, keeping vaccination coverage over 90% and expanding to new antigens as hepatitis B, rubella, haemophilus influenza type B. Moldova is free of polio and neonatal tetanus, eliminated indigenous malaria, brucellosis, epidemic typhus.

Diphtheria and measles outbreaks were successfully controlled by supplementary immunization. Cases of deaths by acute diarrhea were reduced since 1995 by more than 80%. Sexually transmitted infections also sharply increased following independence, with syphilis showing one of the biggest increases.

The key challenges in communicable disease control in the Republic of Moldova are TB and HIV/AIDS. The incidence and mortality of TB has been rising since 1990, accompanied by a ten fold increase of the prevalence of multi-drug resistant tuberculosis. By 2004 the HIV/AIDS epidemic had become generalized in Moldova. Proportion of new cases acquired through sexual contact increasing from 20% in 2001 to 75% in 2008, when incidence of HIV/AIDS reached 19.3 cases per 100000 inhabitants.

According to MDHS2005, in Moldova 8% of children under age five are stunted, about 4% are wasted, and 4% are underweight. Iron deficient anemia is present in 28% of women and 40 percent of

pregnant women, and about one-third of children age 6-59 months have mild or moderate anemia. Disorders induced by dietary iodine deficiency constitute a major nutritional problem. Sixty percent of households currently use adequately iodized salt. Ninety percent of households in Moldova have access to safe sources of drinking water and 77% have adequate means of sanitary disposal of excreta with important variation by rural/urban areas.

1.4. HEALTH CARE SYSTEM

1.4.1. Health Sector Organization

The MOH has overall responsibility for the population's health, but the financing of most services has been recentralized to the NHIC and the organization of primary and secondary care is now devolved to the rayon/municipal level. Tertiary services, highly specialized hospitals and public health institutes are the responsibility of the MOH, but only public health institutes and the blood service are funded directly from the MOH budget.

A Parliamentary Committee on Health and Welfare develops the national health policy framework, monitors the activity of the Ministry of Health and inter-ministerial coordination in the field of health services. Public health research is coordinated by the Medical Section of the National Academy of Science through the specific 3 to 5 year financed projects. The Ministry of Health coordinates a number of national health policies, programmes and strategies for priority public health issues such as health promotion, immunization, blood transfusion, mental health, prevention and control of HIV/AIDS and sexually transmitted diseases, tuberculosis, viral hepatitis, diarrhea disease and cholera, anti-rabies, bronchial asthma, diabetes, iodine-deficiency disorders, cancer, etc.

The main public health facilities in the Republic of Moldova maintain a vertical organizational structure and are accountable directly to the MOH. The National Centre of Health Management collects national health data and analyses it for use in strategic health planning. The National Scientific Practical Centre of Preventive Medicine and a network of 36 territorial branches is responsible for developing norms and guidelines, conducting research on health related issues, providing training and quality control, enforcing the implementation of sanitary norms in all public and private facilities (including health care facilities), environmental health monitoring, surveillance of communicable disease, occupational health, food safety, health promotion.

State University of Medicine and Pharmacy and a number of national research institutes (TB, Cardiology, Oncology, Mother and Child Health, Neurology) and national centers (Dermatovenerology, Narchology, Oral health, Reproductive health and genetic disorders, Emergency health, recovery and rehabilitation facilities) that are based on tertiary hospitals conduct research provide expertise and guidance on specific health issues they do approach.

One of the basic chains in the provision of public health services to communities is represented by the Primary health care, which converge and integrate at the district/community level messages of most of the vertical programmes, targeting individuals. Many of those activities are covered by the health insurance package and benchmarks and incentives are established for high performance (TB diagnosis and treatment, vaccination coverage, antenatal examination etc.).

Moldova embarked on a health sector reform at the end of the 1990s. At that time, health sector indicators were deteriorating and public financing of the health sector accounted for only 2.9 percent of GDP. The reforms focused on extending and strengthening the primary health care (PHC) network. Health infrastructure was consolidated to increase efficiency; health insurance was introduced to make health care more affordable for the population; and hospitals became autonomous institutions. By 2008, public health expenditures recovered to 5.6 percent of GDP. Average per capita health spending at 1833 lei has reached the highest levels since independence. Key improvements in health indicators have also been realized.

Introduction of health insurance has improved access and financial protection, but there are gaps in coverage. Health insurance now covers 74.2 percent of the population and state budget contributions account for nearly 60 percent of total National Health Insurance Company revenues. However, Access to quality health care services remains skewed in favor of the largely better-off urban and insured population. At the primary care level, a network of 1,917 family physicians delivers basic services, and 89 percent of the population visits a family physician. However, coverage rates vary from around 99 percent in Chisinau to less than 65 percent in some of the districts. Furthermore, a significant number of primary care centers, especially in rural areas, lack standard medical equipment. The number of family doctors in Moldova decreased by 3 percent over the past several years and almost 30 percent of rural primary care facilities have no doctors. The average age of family physicians is about 47 and few young physicians are entering family practice. As a result, urban families visit doctors 80 percent more often than rural families.

Table 2. The main indicators of financial allocations to health care system in the Republic of Moldova

Indicator	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total health expenditure as % of GDP	6.1	6.1	6.4	6.8	7.4	7.6	NA	NA	NA
Total government health expenditure as % of public expenditure	8.7	10.0	9.6	10.5	12.1	11.3	NA	NA	NA
Private sector spending on health as % of total health expenditure	51.5	51.3	48.2	49.0	43.2	43.8	NA	NA	NA

In august 2007 the Government issued the National Health Policy, defining it as a priority in the framework of the efforts made by the Government and civil society, aimed at continuous strengthening of the population's health and improvement of the economic and social situation in the country.

The general objectives of the National Health Policy are as follows:

- a) increase in life expectancy at birth and lengthening the healthy life;
- b) ensuring life quality and diminishing the differences in terms of health for all social groups;
- c) strengthening the intersector partnership in order to improve the population's health;
- d) increase in the individual's responsibility for one's own health.

The specific objectives of the National Health Policy are as follows:

- a) ensuring the economic and social security of population;
- b) promotion of health and disease prevention;
- c) ensuring a healthy start in life;
- d) maintenance of health of the young generation;
- e) strengthening the health of the elderly;
- f) combating noncontagious chronic diseases;
- g) creating a healthy and safe environment;
- h) rational nutrition and increased physical activity;

- i) modeling a society free of tobacco, alcohol and drugs;
- j) guaranteeing a life free of violence and traumas;
- k) ensuring the prerequisites for the improvement of mental health;
- l) combating contagious diseases;
- m) achieving new performances in the health protection system.

Immunizations were defined as one of the basic tools to be sustained and promoted in order to achieve diseases prevention and control.

Following the National health Policy, the Health System Development Strategy for the period 2007-2016 has been developed with the goal to improve people's health, upgrading the financial protection and degree of satisfaction of the public through adequate enhancement of the Health system performance.

1.4.2 Specific Health Care Services

Public Health Service

The State Service for Public Health Surveillance has been established by Law no. 10 of 03 February 2009 following the reform of the previous Sanitary Epidemiologic Service that was traditionally oriented towards communicable disease prevention and control, regulation over exposure to risk factors, surveillance and law enforcement;

The State Service for Public Health Surveillance comprises the National Public Health Center, two municipal Public Health Centers (Chisinau and Balti), and 34 district Public Health Centers.

The reform is oriented to align national legislation and institutional structure and capacity to international and European community norms, International Health Regulations (2005), to respond to new challenges that affect the population's health status, strengthen surveillance, prevention and control over communicable and non communicable diseases, health promotion, information and health education, and assessment of the social determinants of health. The main proposed actions include a) rehabilitation and modernization of diagnostic and laboratory services; (b) strengthening implementation capacity for public health programmes, disease prevention and control; (c) mainstreaming ICT into the provision and management of healthcare to extend its reach, to improve health outcomes, and enhance efficiency; (d) health promotion and training of specialists involved in public health; and (e) promotion of gender sensitive preventive, biomedical, behavioural, epidemiological and healthservice research, including the testing of new and emerging drugs and medical technologies, benefiting women and men equally.

Management of the National Immunization Programme remains one of the leading areas of work of the State Service for Public Health Surveillance.

Primary Health Care Service. The main objectives of primary health services are to promote health and wellness, protect maternal and child health, improve health care coverage in rural areas, develop professional and technological capacity, prevent and control transmissible diseases, and implement a family planning program. Primary health care services are provided by 37 district and 12 municipality level Family Doctor Centers, 332 Health Centers, 577 Family Doctor Offices and 362 Health Offices. The number of family doctors in 2009 was 1917.

Emergency Health Care. The National Scientific and Practical Emergency Medicine Center oversees emergency health care in Moldova. Emergency services are administered through 4 regional nodes located in the North, Center, South, and Autonomous Territory of Gagauzia, as well as 43 sub-units and 74 emergency health care posts in rural settlements. Altogether, 497 doctors, 907 paramedical personnel, and 303 ambulance fleets attend to medical emergencies.

Hospital and Specialized Out-patient Health Care. Hospital and specialized out-patient health care, including dental care, is provided by specialized consulting sections of district hospitals. A review of hospitals in rural areas concluded that the average number of beds in rural hospitals was too high and thus inefficient from an economic and medical standpoint; Moldova, therefore, worked to streamline the number of beds in hospitals. Overall, the absolute number of beds dropped from 45,665 in 1998 to 20,457 in 2005, due mainly to the liquidation of hospitals in rural settlements that had a capacity of 50-100 beds each. In the same period, the number of hospitals was reduced from 245 to 65. Improvements in hospital indicators have since been observed, for example, the average duration of hospitalization decreased from 17.5 days in 1998 to 9.8 days in 2005, and the use of beds increased from 251 days per year in 2000 to 265 days in 2005.

Further hospital reorganization was identified as a health system priority and is stipulated within the national policy and strategic planning documents including the National Development Strategy for 2008-2011, the National Health Policy for 2007-2021 and the Health System Development Strategy for 2008-2017.

1.4.3 Human Resources

Human resources provision and their geographical distribution is inadequate and consequently there is an excess of professionals in certain disciplines and in urban areas, while there is a shortage of epidemiologists and public health laboratories staff as well as of family doctors in rural communities. In 2009 in public medical institutions worked 34% less physicians and 49% less nurses comparing to 1990.

That poses a major challenge for the health system including the public health. There have been changes to the salary model: to address the lack of coverage in rural compared with urban areas, higher remuneration rates now reflect higher demand. However, wages are still relatively low.

Health staff is trained at one of five state-certified medical colleges and at the State Medical University. The training and accreditation of doctors through the official state medical university is strictly regulated. Doctors must also undertake continuing professional development at five-year intervals. All doctors must pass state medical exams before doing the residency and further training. However, in recent years, there have been concerns about the standards in basic medical and public health training. Improvements have been made, however, in postgraduate training in health management and family practice.

Following recent reforms, the training of family doctors and health care managers have received particular attention and training programmes have developed considerably. The Faculty of Family Medicine was established at the State Medical University in 1998 and the first Chair on Training on Management and Public Health was subsequently created in 2000.

Training in public health, health system administration and management is an increasingly significant need as there is also a lack of capacity in this area. The training of health care managers began in 2003 in the School of Public Health, at the State Medical University. In addition, since 2005, a Master's Programme and short courses for health professionals has been provided.

In 2005, the average age of family physicians was 47 years. With very few of the young residents entering family medicine, the prevailing attrition rate and the looming retirement of the existing cadre of doctors there is likely to be a substantial shortage of family physicians to meet needs. An analysis undertaken during the evaluation of the World Bank Health Investment Fund Project, which estimated the annual attrition rate of family physicians to be 5.5%, projected that the health system needs would only be met around 2050 if the current intake of doctors to family medicine residency programmes continues.

Almost all employees in Moldova's health system—including 10,761 doctors and 23,141 paramedical personnel—are state employees. Approximately 36 doctors per 10,000 persons serve population in urban areas, while about 12 doctors per 10,000 persons serve rural inhabitants. The coverage of paramedical personnel is better and constitutes 66 paramedics per 10,000 people. The average ratio of paramedical personnel per doctor is 2.2.

Low salaries for medical personnel continue to be a widespread and persistent problem in Moldova's health care system although the average monthly salary has increased since implementation of health insurance from 125 USD for doctors and 70 USD for nurses to \$385 and \$220 accordingly.

1.5. IMMUNIZATION SERVICES WITHIN THE HEALTH CARE SYSTEM

National Immunization Program. Prevention of vaccine preventable diseases is among the most important and cost-effective investments in public health. Timely immunization fosters health and reduces the medical, social, and economic setbacks caused by certain preventable diseases.

The first National Immunization Program was approved in Moldova for the years 1994-2000. Its implementation allowed to eliminate poliomyelitis, stop diphtheria and mumps epidemics, and to achieve a substantial reduction of the incidence of viral hepatitis B, measles, and whooping cough.

The second National Immunization Program, for 2001-2005, has strengthened achievements of high vaccination coverage, guaranteed the timely supply of vaccines, improved the quality of immunization services, and has helped Moldova maintain the status of a polio-free country. In addition, the elimination of indigenous cases of diphtheria, measles, rubella and neonatal tetanus has been achieved, the incidence of hepatitis B, whooping cough, and mumps has diminished significantly, and the incidence of tetanus in adults has been reduced to very few cases.

These successes were possible thanks to a committed activity of medical employees, provision of international assistance by entities such as UNICEF, WHO, the governments of the United States and Japan, the Global Alliance for Vaccines and Immunization, and the systematic increase of financial support granted by the Government of Moldova.

The National Immunization Program for 2006-2010 guarantees children, and others at risk, immunizations free of charge against ten infectious diseases: poliomyelitis, diphtheria, tetanus, whooping cough, hepatitis B, measles, mumps, rubella, tuberculosis, and hemophilus influenza type B. The Program pursues the following objectives:

- Ensuring over 95 percent vaccination coverage, at the national level and at the level of each district and municipality;
- Maintaining Moldova as a poliomyelitis-free country, and a country free of cases of tetanus in newborns and congenital rubella;
- Continued progress towards eliminating cases of measles, rubella, and diphtheria;
- Reducing the incidence of: tetanus to less than 0.05 cases per 100,000 population; hepatitis B in children to less than 2 cases per 100,000 population; whooping cough to less than 1.5 cases per 100,000 population; and mumps to less than 6 cases per 100,000 population;
- Limiting the cases of child tuberculosis to isolated cases; and
- Reducing morbidity and mortality from septic meningitis and pneumonia caused by Hib infection in children under age three.

The Ministry of Health is developing now a new National Immunization Program for 2011-2015 following the WHO Global Immunization Vision and Strategy and aiming to:

- Protect more people in a changing world

- Introduce new vaccines and technologies
- Integrate immunization, other linked health interventions and surveillance in the health systems context
- Immunize in the context of global interdependence

The National Immunization Program for 2011-2015 targets the introduction of universal immunization against rotavirus and *Streptococcus pneumoniae* and will provide more room for provision of additional antigens requested by specific populations at risk, by engaging both public and private sectors in performing immunizations.

Management of the NIP

At the national level:

The coordination of activities of the National Immunization Program (NIP) is performed by the Ministry of Health, which brings together and coordinates institutions, resources and actions for the reduction of morbidity, disability and mortality from vaccine-preventable diseases and ensure inter-sector cooperation. MoH ensure the National Immunization Programme is integrated into the national health policy and other sector-wide policy initiatives, including health insurance and minimal package of health services.

The National Center of Public Health is authorized by the MOH to perform overall management of the NIP, and to ensure links to other departments within the sector. It performs the following functions:

- development of the National Immunization Policy and long-term plans on immunization service, including financial planning;
- development of regulations, governing the functioning of the immunization service and its interaction with other areas of the health system;
- scientific and operation research in support of the national immunization system;
- development of a long-term strategy and annual plans for immunization;
- purchasing, storing, distribution and release of vaccines and injection supplies to district centers of preventive medicine;
- maintenance and development of the cold chain;
- conduct monitoring of the vaccination coverage, of quality of immunization services, of Advers Events Following Immunization
- Surveillance of vaccine preventable diseases, including laboratory surveillance
- Serological studies of the herd immunity of population against vaccine preventable diseases
- training (gradual and post-gradual) of staff involved in provision of immunization services;
- general functions, including social mobilization, sanitary and epidemiological monitoring and surveillance, research and development, program management, as well as administering immunization and related health care

At the city and district levels

The national Immunization Programme is managed by the city/district Center of Public Health (CPH) in close cooperation with the primary health care services.

District CPH include amongst others an epidemiology department, a microbiological laboratory, the district vaccine store, transportation means. An epidemiologist and one assistant are assigned in charge of management of the immunization programe at district level. The CPH performs:

- immunization process management and oversight;
- insure links to local public administrations;

- methodological guidance and supervision on immunization services;
- training of primary health care workers;
- coordination of microplanning of vaccinations by primary health units;
- vaccine provision;
- monitoring and maintenance of the cold chain;
- epidemiological surveillance;
- monitoring of vaccination coverage;
- supervision of immunization practices;
- monitoring and investigation of AEFI;
- social mobilization;
- laboratory investigation of samples from suspect cases of infectious diseases

Primary healthcare services are represented at district and local levels by the district primary health administration, primary health care centers and offices of family doctors.

Managers of primary healthcare facilities are in charge for organization of the provision of immunization services to the population living in the catchment area of the institution.

The main functions of the primary health care workers are as follows:

- keeping updated lists of population living in the service area to be covered by services;
- perform micro-planning of immunization services;
- insure links to local public administrations, schools, other institutions and organizations;
- establish appropriate conditions for conducting immunizations;
- conduct monthly screening of population to identify eligibles for specific immunization doses;
- perform medical examinations before immunization
- inform patients on benefits of vaccination as well as on the possible AEFI for each specific dose of vaccine;
- conduct immunization;
- receive vaccine and injection supplies from the district CPH
- ensure appropriate storage of vaccines and supplies;
- monitoring and maintenance of the cold chain;
- training of primary health care workers;
- detection and notification of cases of disease and of AEFI to the district CPH;
- ambulatory treatment and/or referral of patients to the next level of care;
- taking samples from patients for laboratory diagnosis and send samples to the CPH;
- monitoring of vaccination coverage;
- social mobilization etc;

Each country administrative unit prepares territorial immunization programmes and designate managers at all levels of PHC in order to allow appropriate micro-planning, monitoring and supervision of the programme.

Once a year the progress of the national immunization programme is reviewed at a joint meeting of preventive medicine services, primary health care and local public administrations.

Immunization programme's major partners and their contributions

Effective implementation of the NIP is based on intense cooperation and interaction between many organizations, services and institutions under the overall leadership of the Ministry of Health as follows:

- Public Health service;
- Primary health care units

- Local public administration;
- Institutions of the Ministry of Education, Youth and Sport;
- International and non-governmental organizations.

They are engaged in the NIP implementation with a variety of expertise and functions at local, intermediate (rayon) and national levels.

A. The main institutions involved with NIP at the local level there are:

1. Institutions of primary medical health care do perform:

- Planning, organization and rendering immunization services to the population;
- Coordinate this activity with interested local and regional agencies and structures;
- Provide integration of immunization services within framework of primary medical health care;
- Provide availability of free- of charge services and access of the population to such services;
- Provide quality of immunization service activity, including training of medical staff and compliance with conditions for transportation, storage and use of vaccines;
- Organize recording system of immunization activities and selection of persons eligible to vaccination (on a monthly basis);
- Provide timely order, delivery of required amount of materials and consumables necessary for immunization of the population and keep record of the materials received;
- Execute continuous monitoring of immunization coverage, implementation of the cold chain, vaccine consumption, cases of vaccine preventable diseases and other evidence of activity on the corresponding territory, presenting reports to the superior instances and in accordance with the applicable procedure;
- Inform the population about advantages of immunization and immunization schedule.

2. Agencies of local public administrations:

- Provide direct assistance in creating conditions for immunization, which includes maintaining facilities, providing equipment for vaccine storage, telephone communication; safe disposal of sharp and piercing medical disposals once immunization services are performed, provide support to medical staff in mobilization of the population.

3. Institutions of the Ministry of Education, Youth and Sport:

- Provide support for immunization of preschool children, pupils and students;
- Help informing the population on effectiveness and need for immunization;
- Cooperate with medical institutions on access to subordinate institutions only of persons vaccinated under requirements of the Program, with exception for rare occurrence of true medical contraindications, confirmed by the family doctor.

B. At administrative-territorial level (rayon, city):

1. Public Health Centres:

- Together with leadership of public medical-sanitary institutions is responsible for drawing up regional immunization programs and monitoring of their introduction;
- Draws up territorial immunization plans, timely receives and distributes vaccines and other consumables needed for immunization;
- Executes monitoring of the Program tasks and other indices on administrative territory and in medical institutions;
- Cooperates with agencies of local public government on aspects of introduction of the Program;

- Participates in accreditation of medical personnel, and in authorization of institutions, offering immunization services;
- Participates in instructing medical personnel on safe immunization practices;
- Organizes control of institutions of primary medical aid and provides necessary methodological and practical aid;
- Carries out epidemiologic surveillance, organizes and holds disease control activities, in regard to vaccine preventable diseases;
- Organizes and holds activities on information of the population and advocacy activities on immunization advantage.

2. Primary health care services:

- In cooperation with preventive medicine service, is responsible for development of rayonal immunization programs and monitoring their introduction;
- Provides primary health care institutions with qualified personnel, ensuring access for the population to immunization services;
- Cooperates with local public authorities on aspect of introduction of the Program;
- Executes organization, planning, and carries out monitoring and estimation of implementation of the Program;
- Organizes and participates in training of medical staff on methods of safe immunization practices, evaluation of knowledge and skills of the personnel, carrying out immunization; and executes accreditation of the personnel;
- Carries out quality control of immunization provided at primary medical aid institutions, provides necessary methodical and practical aid;
- Ensures creating conditions, providing necessary equipment and consumables for implementation of immunization;
- Annually determines need, provides centralized application of statistic vaccination record forms and records on immunization implementation;
- Ensures awareness of the population about effectiveness of vaccination and its importance for health.

C. At the national level:

1. The Ministry of Health

- Approves regulatory documents and recommendations on implementation of the Program;
- Plans annually, within the limits of funding envisaged for public health service, allocations for funding procurement of vaccines, syringes, equipment for safe elimination of immunization wastages, cold chain equipment, and other types of equipment and consumables, required for implementation of the Program;
- Issues annual orders on vaccination planning and approves annual vaccination plans for the country;
- Executes annual evaluation of implementation of the Program at Collegium Sessions of the Ministry of Health;
- Together with participation of the Council for Coordination of the Immunization Program Development and Funding for the period 2006-2010, the National Center of Public Health, the Scientific Research Institute for Mother and Child Health Care, Institute of

Phtiziopneumology, Scientific Practical Centre of Management in Health, the “T. Ciorba” Republican Clinical Hospital for Infectious Diseases, the “Nicolae Testemitanu” Medical and Pharmacy State University, the National Medical Insurance Company, ensures coordination of the Program.

2. The Council for Coordination of the Immunization Program Development and Funding for the period 2006-2010 (hereinafter referred to as “the Council”)

The Council is a consultative body, acting on a voluntary basis and its objectives comprise consolidation and assistance to implementation of the Program.

The Council consists of representatives of the Ministry of Health, national medical-sanitary institutions, responsible for coordination and implementation of the Program, as well as non-governmental and international organizations, carrying out their activity in the field of health care.

Activity of the Council has the following objectives:

- Providing assistance in estimation and planning of short- and long-term activities;
- Support and assistance realization of priority areas of the Program;
- Creation of reliable partnership links through coordination of activity of national and foreign resources for their ultimate increase in order to increase efficiency of the Program;
- Rendering assistance in mobilizing internal and external resources for implementation of the Program;
- Support in ensuring transparency of the Program and use of existing funds and resources;
- Encouragement of circulation of information among national and foreign partners;
- Support in implementation of new tasks, included in the Program
- Decisions of the Council are taken at the meetings and are of consultative character.
- Meetings are convoked at least 4 times a year and decisions taken at the meetings are recorded in a proceedings report.

3. The National Center of Public Health is responsible for:

- Development, reasoning and promotion of immunization policy;
- Development and improvement of regulatory and methodical basis in the field of immunization and epidemic surveillance over vaccine preventable diseases;
- Cooperation with national and international institutions, ministries and other central administrative agencies;
- Development of the national vaccination plan, supply with vaccines, syringes and other consumables, required for implementation of the vaccination;
- Control, monitoring and evaluation of Program implementation;
- Monitoring and providing operation of the cold chain, in compliance with requirements of the World Health Organization and the European Union;
- Implementation of epidemiologic control and specific diagnosis of infectious vaccine preventable diseases;
- Organization and implementation of anti-epidemic activities in case of infectious vaccine preventable diseases reported;
- Organization and supervision over the accreditation and training of medical staff in immunization practice with development and approval of the corresponding training programs and training materials;
- Conducting scientific and scientific-practical researches;
- Ensuring awareness among the population and promoting immunization.

3. Scientific Practical Centre of Management in Health should provide:

- Annual approval of statistical report forms on immunization;

- Publishing immunization coverage data and information on infectious diseases morbidity in statistical yearly periodicals;
- Preparation of annual information about death cases from infectious diseases stipulated in the Program, for regions and age groups.

4. The N. Testemitanu Medical and Pharmacy State University, the Scientific Research Institute for Mother and Child Health Care, Institute of Ftziopneumology, the “T. Ciorba” Republican Clinical Hospital of Infectious Diseases ensures:

- University and post-university training of medical staff in immunoprophylaxis, diagnosis and treatment of vaccine preventable diseases;
- Modification of training programs in compliance with requirements of the present Program and regulative basis on its introduction, approval by the Ministry of Health ;
- Participation in expert group activities on development of normative basis for introduction of the Program and assessment of specific epidemiologically important subjects;
- Inclusion of investigations in the Program – development of questions, related to immunoprophylaxis, diagnosis and treatment of vaccine preventable diseases.

5. The Medicine Agency

- Fulfill the functions of the NRA for vaccines and drugs
- Organizes national tenders for procurements of vaccines and supplies related to immunization
- Organize all contracting procedures for procurements of vaccines and supplies related to immunization.

6. The National Health Insurance Company

- Provide financing for operation of primary health care services;
- Assesses the fulfillment of the unic package of services (quality indicators including immunization coverage) by the primary health care services.

7. WHO, UNICEF, GAVI and other international partners

- Provide technical advice and guidance for the NIP components
- Identify and provide alternative financing sources and programmes to strengthen and expand the NIP;
- Supply vaccines and immunization related equipment for implementation of new vaccines;
- Provide support on implementation of the NIP action plan activities.

Delivery of Immunization Services

Moldova immunization programmes were initiated in early 60th and country has remarkable achievements in control of vaccine-preventable diseases. Hepatitis b vaccine was firstly introduced for newborns at risk in 1989 and then, expanded to all newborns since 1995. Starting 2002, 2-dose schedule of measles, mumps rubella (MMR) combined vaccine was implemented countrywide. Large immunization campaigns were conducted against diphtheria (1995-1996), polio (1996), measles and rubella (2002), mumps (2008), pandemic flu (2010). Approval by the Government of the NIP budget for 5-year term allowed sustainable and timely funding from the national budget that covers all antigens for routine vaccination of the population, with exception of new vaccines co-financed by GAVI. Assessments of Hib burden and cost-efficiency of immunization conducted with the support of WHO, as well as the national statistics data reveal that septic meningitis and pneumonia represent important health issues and cause a significant number of diseases and deaths. A sentinel surveillance for rotavirus infection established in Moldova with WHO Euro support revealed a high burden of rotavirus in children under five. The co-financing policy offered by GAVI for implementing new vaccines represents an

important opportunity to further expand to implementation of rotavirus and pneumococcal vaccination in Moldova in a sustainable manner.

Urban population in the Western part of the country is served by Family Doctor (FDs), which are located at Health Centers. Each HC has an immunization office, served by a nurse. Children are immunized after clinical check-up performed by their FDs. Rural population in the Western part is served by Family Doctor, which are situated in a Health Centers (HC), Family Doctor Offices (FDOs), and Health Offices (HO).

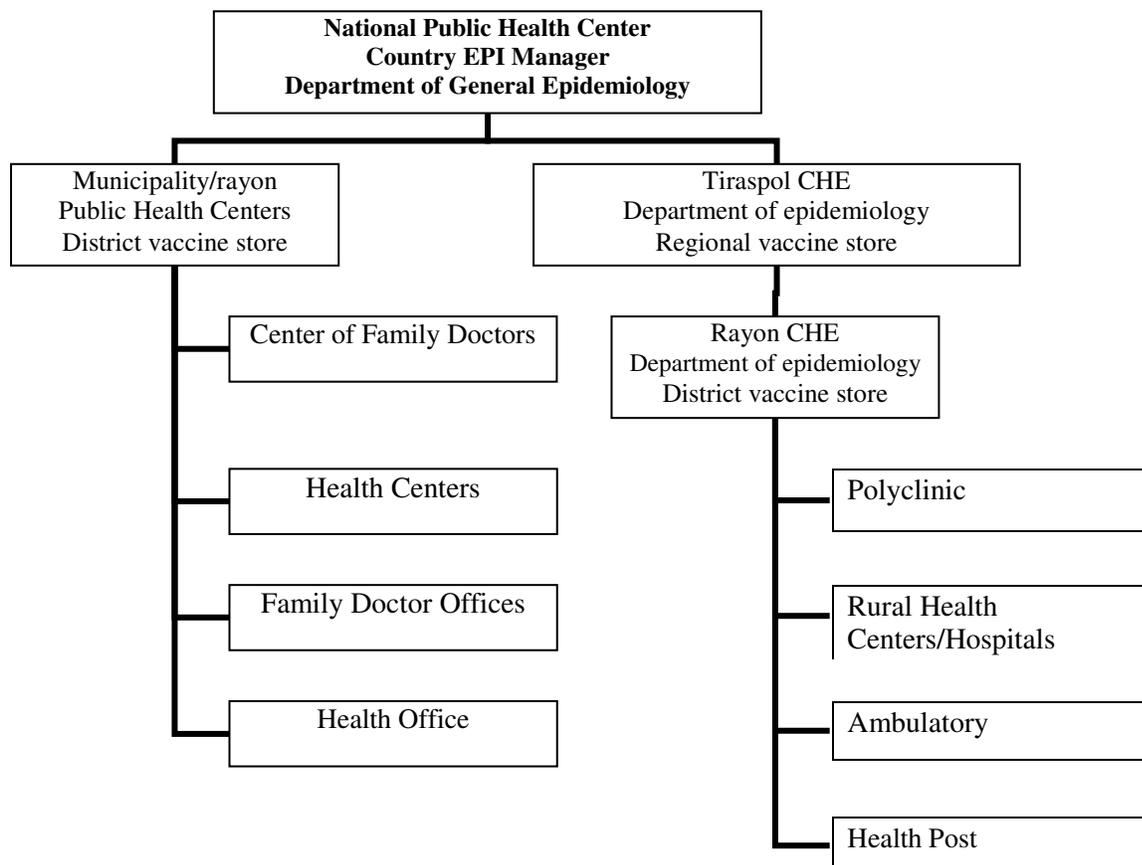
Planning and reporting of immunization is down up, from vaccine providers to PHC, and from the latter to NPHC (Figure 2). Both vaccine planning and estimates of immunization coverage are based on population data, which are up-dated at least once a year by family doctors and nurses.

Recording and reporting documents are approved by the National Office of Statistics. Standardized documents are used countrywide. Similarly to the West part's PHCs, the East part Center of Hygiene and Epidemiology (TCHE) report to the NSPH immunization coverage rates on monthly base.

According to the National legislation, children not timely vaccinated for any reason (temporary contraindications, shortage of vaccine etc) are vaccinated irrespectively of their age. Immunization coverage data for the last 15 age cohorts are up-dated and analyzed at the end of each year with the aim to identify and eliminate any immunization gaps.

Moldova has worked on improving its immunization coverage reporting. New reports have been designed, tested and implemented since 2001. The new reports give possibility for monitoring timeliness of immunization, dropout rates, vaccine wastage rates and vaccine stocks.

Figure 2. Organization chart of planning and monitoring vaccinations



Financing of the immunization programme,

The MOH is in charge for planning and execution of the state budget in the health sector. No separate vertical immunization system exists in the Republic of Moldova. Immunization Program, represents a service integrated with primary health care (family medicine) and public health services and, consequently, receives funding from different sources.

Procurement of immunization supplies (vaccines, syringes, safety boxes) is funded from the centralized state budget managed by the Ministry of Health. The Budget estimates for immunization supplies are approved by the Governmental Decree for a period of 5 years while approving the National Immunization Program. The last NIP was approved for the period 2006-2010 and envisages allocation of sufficient funds for procurement of routine vaccines, including MMR vaccine, hepatitis B vaccine and co-financing for Hib vaccine for the period 2008-2010.

The NPHC defines each year resource requirements for the next fiscal year by the end of May and submits the budget proposal and immunization supplies needs to the MOH. The MOH drafts and approves the consolidated budget for entire health sector including the budget of the NHIC and submits it to the Ministry of Finance.

The Government submits the state budget to the Parliament for review and approval. The bill contains aggregated public expenditure budget lines. The main discussion in the Parliament could be around the share of health sector in the overall state budget.

As soon as the Parliament approves the state budget, the MOH becomes responsible for the execution of the state budget in health sector. It means that the MOH receives its share of budgeted funds from the Ministry of Finance and manages these funds on its own in accordance with provisions of national health programs. The MOH can reallocate the flow of resources between different national health programs based on the priority or emerging needs.

Table 3. The State budget scheduled and issued funding for NIP vaccine procurement 2006-2010 (MDL)

	2006	2007	2008	2009	2010
Scheduled by NIP	6,196,300	6,657,600	7,176,400	7,761,000	8,420,900
Issued	7,000,000	7,100,400	7,176,400	8,451,000	10,438,500
Executed	6,526,613	7,099,888	6,799,400	8,076,617	NA

As it can be seen from the table above, over the last 5-year program the Government issued adequate funding, according to the scheduled budget of the NIP and in 2009-2010 the issued funding exceeded the scheduled funding by 109% and 124%. It is worth mentioning that happened during the economic crisis that severely affected the Moldova economy and the overall health budget, which was cut by 20%. The Government commitment to provide adequate financing to the NIP reflects its recognition as a priority public health program in the Republic of Moldova.

Procurement of vaccines and supplies is executed by means of public tenders called for by the Medicine Agency. Public Health Service, which is responsible for acquisition, storage, distribution of vaccines and syringes, surveillance over vaccination, investigation of adverse reactions, surveillance over infectious diseases, case investigation, lab-based confirmation, implementation of preventive and disease control measures is funded from the state budget. The system approved for planning and managing of funds does not foresee separate articles for various activities carried out in the framework of immunization. Funding is provided within existing limits and usually is not sufficient for procurement of equipment and consumables for acting laboratories, transportation vehicles and special refrigeration equipment. All operational activity, which primary medicine carries for immunization, is funded from the Health Insurance Fund, including expenses for immunization activities, regular expenses for maintaining facilities, equipment, transport etc. Calculation of expenses is done as per one citizen who benefits from the services. Costs for construction works, full repair of facilities, procurement of equipment more expensive than MDL 3000 is funded from the founder's account – local public administration.

2. DISEASE TRENDS AND VACCINATION COVERAGE

2.1 MORBIDITY AND MORTALITY TRENDS FOR VACCINE PREVENTABLE DISEASES

The NIP for 2006-2010 targeted 10 VPDs: Viral Hepatitis B, Tuberculosis, Poliomyelitis, Diphtheria, Tetanus, Pertussis, Haemophilus influenzae type b, Measles, Mumps, Rubella infections. Reported number of cases and Incidence Rate (# of cases per 100,000 pop.) of major VPDs, Targeted by the NIP is present in table 4.

Table 4. Reported number of cases and Incidence Rate (# of cases per 100,000 pop.) of major VPDs, Targeted by the NIP

	Diphtheria		Pertussis		Measles		Mumps		Rubella		Hepatitis B	
	No	% ₀₀₀	No	% ₀₀₀	No	% ₀₀₀	No	% ₀₀₀	No	% ₀₀₀	No	% ₀₀₀
2000	10	0.23	169	3.96	681	15.94	1943	45.5	2803	65.6	749	17.5
2001	5	0.12	210	4.92	457	10.72	2556	59.9	4508	105.7	678	15.9
2002	1	0.02	5	0.12	4928	115.7	1582	37.1	7316	171.7	614	14.4
2003	0	0.0	31	0.73	87	2.05	519	12.2	508	11.95	483	11.4
2004	0	0.0	105	2.5	4	0.09	414	9.8	170	4.03	451	10.7
2005	0	0.0	24	0.57	6	0.14	368	8.7	32	0.78	411	9.75
2006	0	0.0	44	1.05	34	0.81	296	7.05	14	0.33	300	7.15
2007	0	0.0	36	0.88	10	0.24	1757	42.7	3	0.07	263	6.39
2008	0	0.0	30	0.73	0	0.0	29783	726.3	1	0.02	194	4.73
2009	1	0.02	48	1.17	0	0.0	292	7.14	1	0.02	152	3.72

2.1.1. Poliomyelitis

WHO certified Moldova as a polio-free country in 2000 (last paralytic case due to wild poliovirus in 1991). Zero weekly Polio/AFP reporting was introduced in 1999 and timeliness and completeness of reporting are regularly analyzed by the NPHC. The incidence rate of non-Polio AFP (cases/100,000 pop. under 15 years) during the last 5 years is as follows: 2005 – 0.99, 2006 – 0.81, 2007 – 2.0, 2008 – 1.24, 2009 – 1.1. Active surveillance of AFP was introduced in 1999. Epidemiologists visit monthly Pediatric, Neurological, Traumatology and other hospital wards where there is a probability an AFP case to be treated.

Despite the overall satisfactory surveillance system performance some rayons (20%) do not provide on time weekly zero reports, there are some silent areas where AFP were not reported for many years. That could be determined by lack of full understanding of non-polio AFP surveillance and eradication among health staff, reluctance for reporting, lack of epidemiologist in some rayons to manage the Programme, insufficient supervision to districts, insufficient quality of active surveillance, insufficient frequency of feedback.

2.1.2. Tetanus

The last case of neonatal tetanus (NT) was registered in 1966. Since the late 2000s the annual number of adult tetanus cases varies from 0 to 1. Most of tetanus cases occur among not immunized individuals over 50 years of age. Serological studies, carried out at 5-year intervals since 1986 do not show significant differences in population immunity to Tetanus. In the last 9-year period (2001-2009) 97.3±1.0% of both children and adults had antitoxin titers equal or over 0.1 IU/ml.

2.1.3. Pertussis

Since the introduction of mass immunization with DPT in the early 1960s pertussis has been well controlled. In the 1980s and 1990s pertussis morbidity decreased by 98% as compared with the pre-vaccination period. Nevertheless, small cyclic rises continued to occur. During the last 5-year period incidence rate of pertussis was in the range from 0.57 to 1.17/100,000.

Nearly 73% of reported pertussis cases in 2009 were children from 0 to 2 years old, 93% of whom were not immunized, but 57% from them were 0-5 months old, i.e. not eligible for received DPT3 according the National Immunization Schedule.

A big proportion of pertussis cases are reported from urban regions where attempts for bacteriological confirmation of cases with convulsive coughing are more systematically done.

2.1.4. Diphtheria

After a 25-year period of low diphtheria morbidity (an average of 0.5/100,000) Moldova experienced a 3-year epidemic (1994-1996) with an average incidence rate of 4.5/100,000. The case fatality ratio was 5.2% (out of 888 cases 46 had a fatal outcome). During the period 2003-2008 diphtheria cases were not registered in the country. One case of diphtheria was reported in 2009.

Diphtheria epidemic was due to interruption of routine immunization against diphtheria in the early 1990s, decrease of population immunity (waning immunity in adults, using of low immunogenicity vaccine in the 1980s), increased population migration and repeated importation of toxigenic *C.diphtheriae* strains from neighbors countries.

Effect of large-scale supplementary immunization of children and adults in 1995-1997 on population immunity to diphtheria was visualized by several serological studies. In 2007 – 2009 99% of the individuals tested had protective antitoxin titers (>0.03 IU/ml) as compared to 89% in 1991-1995.

2.1.5. Measles

Last fatal cases of measles were reported as far as in the year 2000.

Last epidemic outbreak of measles morbidity started in the year 2001 with 457 cases of illness (10.7 cases per 100 thousands of the population). In the year 2002, the epidemic spread to the whole country. 4928 cases of measles were registered (I.R. - 115.6 cases per 100 thousands of the population). The epidemic was marked with outbursts of measles in schools, high educational institutions, colleges and other types of educational institutions. Thus, 56% out of all cases were registered in schools, for children aged 7-14 years and approximately 31% of cases – for young people aged 15- 25 years. The infection had been imported into families, which caused infected of more than 160 children under 12 months, who had not reached vaccination age by that time. Among patient who developed measles, proportion of previously vaccinated against the disease was 85%.

In order to stop the measles epidemic, the Republic of Moldova, supported by international organizations and donors (WHO, UNICEF, USAID, CDC, March of Dimes, JICA) organized and conducted in November-December the National Vaccination Campaign. Within the campaign, 766.728 children aged 8-19 years (98,3% of the overall number of children eligible to vaccination) and 73.594 young people aged 20-23 years from educational institutions, militaries and other types of community (98,8% from the overall number eligible to vaccination) had been administered supplementary dose of vaccine against measles and rubella. Besides, two dose schedule of MMR combined vaccine was implemented for routine vaccination against measles, in the year 2002 – one dose at the age of 12 months and another – at the age of 7 years.

Undertaken measures allowed to stop the measles epidemic. Maintaining high coverage with MMR vaccine, which exceeds 96% for the age of 24 months and more than 97% for the age of 7 years in 2003-2006, has led to significant decrease in measles morbidity – 4 cases in 2004 and 6 cases in 2005.

The aforementioned activities, helped to prevent measles epidemic outbreak in 2006,

influenced by measles epidemic situations in neighboring countries – Ukraine (incidence rate 96.3‰) and Romania (9.5‰). In the year 2006, only 34 measles cases were recorded in the Republic of Moldova, which comprises incidence 0.81‰. From all cases recorded in 2006, 11 were imported (10 from Ukraine and 1 from Russian Federation); 9 secondary measles cases following contact with imported cases. There were registered 3 outbreaks with 2 cases and 3 outbreaks with 3 cases of measles. Laboratory analysis confirmed the diagnosis for 31 from 34 ill persons, and 27 persons were hospitalized. Out of the total number of those who developed measles, 5 persons had not been vaccinated, for 19 adults vaccination data could not be established, 6 had been received only 1 dose of measles vaccine and 4 persons – 2 doses. Two persons were of age under 12 months, 18 – older than 18 years; gypsies – 12, travelers and homeless persons – 6, medical staff - 2.

In 2007 in the country was registered 10 cases of measles, incidence rate was 0.24‰. During the period 2008 – 2009 measles cases were not registered in the country.

Serological surveys conducted in 2007-2008, revealed 95.6% of the populations possess protective antibody titer against measles, while in 2005, for women of childbearing age this figures comprised – 93%.

2.1.6. Rubella

Prior to the year 2002, rubella was spreading out following its natural patterns, developing more intense epidemics each 3-5 years (1986 – 239,3/100,000, 1989 – 175,9/100,000, 1994 – 116,4/100,000, 1999 – 150,6/100,000, 2002 – 171,7/100,000) and minimum incidence recorded for period 1980-2001 - 20,4/100,000 in 1997. Over 80% of cases registered until year 2000 were reported for urban areas. The most vulnerable groups were children aged 3-6 years, for which approximately 51% cases were recorded. This group was followed in 1980-1996 by children under 2 years, among which approximately 27% of cases were recorded with annual incidence comprising 538/100,000. Starting with 1997, second place was occupied by school age children of 7-14 years, among which approximately 50% of rubella cases had been recorded annually, with annual media incidence rate 331/100,000.

The National Vaccination Campaign against measles/rubella implemented in the year 2002, under which 98.3% children aged 8-19 years and 98.8% adults aged 20-23 from communities had been administered with combined MR vaccine; vaccination performed in 2002-2003 against rubella and which covered 97% women aged 20-30 living in the country at that moment, as well as use of 2 doses of MMR combined vaccine for routine vaccination made it possible to take rubella under control. Morbidity rate had decreased significantly from 171,7/100,000 in 2002 to 0,33/100,000 in 2006. Starting 2005, laboratory-based confirmation for all rubella cases have been performed, which has been carried out in majority rayons of the country, with exception for the Transnistria region. 10 out of 14 rubella cases reported in the country in 2006 belong to Transnistria; however, these cases had not been laboratory confirmed. In 2007 there were registered 3 laboratory confirmed cases of rubella, in 2008 and 2009 – only one case per year.

Serological surveys conducted in 2007-2008, had demonstrated 94.6% of children and 98% of adults possess protective antibody titer against rubella.

Reporting system for all congenital rubella cases was introduced in the country as far as in 1991. Not a single case of congenital rubella has been established and reported during these years. According to a retrospective study, executed by NPHC in 2005-2006, probability of the congenital rubella syndrome (CRS) during the pre-vaccination stage equals to 1 : 1.000.000 population per year.

The main problems that need to be addressed in order to strengthen measles-rubella surveillance are related to improving laboratory confirmation of cases. Investigation of the measles and rubella rate per 100,000 populations is low and amounted to 2.3 in 2006; 1.4 in 2007; 0.8 in 2008 and 1.4 in 2009.

High incidence of measles and rubella in neighboring countries over the last years contributed

to increase of the importation of cases.

2.1.7. Mumps

Achieving high immunization coverage with mumps vaccine resulted in a significant decrease of incidence rates of the disease in the late 1980s and the early 1990s. Severe shortage of vaccine and practical discontinuing of immunization since 1993 was followed by an intensive epidemic countrywide (1996-1998). A total of 28,845 cases were reported. The incidence rate of 222.7/100,000 was close to levels observed in the pre-immunization period.

The situation started to improve in the year 2000, when coverage with vaccine increased and exceeded 93%, and in particular, after the year 2002 following implementation of the second dose of MMR vaccine at the age of 7 years. By 2007, incidence rate had decreased to 7,05/100,000, in comparison to 59,94/100,000 in 2001. During 2004-2006, average proportion of mumps among schoolchildren (7-17 years of age) comprised 45% and among adults - 25%. 68.6% cases of mumps were registered in urban areas with average incidence comprising 13.4/100,000, which exceeded by 2.7 times figures recorded for rural areas – 4.85/100,000 correspondingly.

A significant change in the epidemiology of mumps occurred in October 2007, when the number of mumps cases began to increase dramatically, getting an epidemic spreading in the centre of the country with further expansion. Between 1st October 2007 and 25th May 2008, a total of 30,683 mumps cases was reported in Moldova. Case numbers peaked in week 14/2008 with 2,351 cases. The monthly incidence increased from <1/100,000 in the months preceding the outbreak (January -September 2007) to 25/100,000 in December 2007 and 202/100,000 in March 2008. By the end of February, all regions of Moldova were affected by the mumps outbreak. A total of 29,801 cases were reported between the introduction of weekly case reporting in week 51/2007 and week 21/2008. Of these, 41% were 15-17 years old and the majority (n=23,799 - 80%) was 15-24 years old. From week 51/2007 until the end of week 10/2008, when a supplementary vaccination campaign started, vaccination status was available for 10,257 of 15,480 cases (66%). The vast majority (96%) of cases with known vaccination status were in individuals vaccinated against mumps. Of vaccinated cases, 96% had received one dose of mumps vaccine and 4% had received two doses. The supplementary vaccination campaign began in week 10/2008 targeting individuals in all settings born between 1989 and 1994; students and postgraduate students in all educational institutions; teaching staff born between 1984 and 1988; army, police, and border troops. As of 25 May 2008, a total of 329,842 persons were vaccinated. The supplementary vaccination campaign implementation led to a steady decline of cases from week 15/2008. In June 2008 the epidemic of mumps was stopped. In the following period of time the incidence of mumps returned to the preepidemic period and in 2009 was 7.14‰.

The main problems that need to be addressed in order to strengthen mumps surveillance are related to improving early laboratory confirmation of suspect cases.

2.1.8. Viral Hepatitis B

Until recently, Moldova was among the European countries with the highest incidence rate of acute VHB. Its average annual incidence rate in the late eighties was 68.4/100,000 (2875 cases). A permanent downward trend has been observed since the early 1990s (48‰ in 1991-1994, 32‰ in 1995-1997, 19‰ in 1998-2000, 12.4‰ in 2001-2005, and 5.5‰ in 2006-2009).

This downward trend is a result of a number of factors such as increased implementation of single-use syringes and improved sterilization of reusable in health facilities, better control of donated blood, and creation of immune generations since the fall of 1995.

In the pre-immunization period, morbidity from acute VHB was highest in young children (Table 5).

Screening of pregnant women was introduced at the end of 1989 and for a period of 2 years

(1990-1992) children born from HBsAg positive mothers were immunized. Selective immunization and introduction of single-use syringes in immunization practices contributed to prevention of vertical and early horizontal transmission of HBV infection in infants. Incidence rate in children from 0 to 2 years dropped by 42%.

Universal infant immunization resulted in further decrease of incidence rates in this age-group. In 1996-1997, when hepB3 coverage rate was about 85%, incidence rate fell to 19‰ and in 1998-1999 (hepB3 93.5%) to 16‰. Data on age specific Incidence Rates (cases/100,000 pop) of Acute VHB are provided in table 5.

A substantial reduction of VHB incidence rates among children 3-6 years of age has been observed since 1998, when the first immunized birth cohort reached the age of 3 years. In 2000 (6 birth cohorts immunized), incidence of acute VHB in children from 3 to 6 is almost equal to that of children 0 to 2.

In 2009, children from 0 to 18 years of age are responsible for only 0.66% of acute VHB cases.

The aforementioned achievements have become possible due to the assistance provided by Governments of Japan and USA as well as due to the GAVI assistance on providing hepatitis B vaccine support during 2002-2008.

Table 5. Age specific Incidence and Incidence Rates (cases/100,000 pop) of Acute VHB in R. Moldova in Selected Time-Periods

Year	0-2 years			3-6 years			7-14* years			Adults		
	#	%	‰	#	%	‰	#	%	‰	#	%	‰
1989	296	10,43	124,27	355	12,51	106,13	351	12,37	56,13	1836	64,69	58,27
1990	244	9,71	109,07	342	13,61	99,53	357	14,21	56,26	1569	62,46	49,32
1991	136	6,58	62,62	241	11,65	69,51	292	14,12	45,93	1399	67,65	44,30
1992	130	6,24	63,82	284	13,64	86,85	343	16,47	51,35	1325	63,64	41,95
1993	122	5,91	62,09	217	10,51	69,57	300	14,53	43,66	1426	69,06	45,19
1994	119	5,49	61,06	226	10,43	73,07	337	15,56	49,70	1484	68,51	46,84
1995	70	3,95	39,35	168	9,49	58,72	261	14,75	36,76	1271	71,81	40,05
1996	37	2,84	22,59	107	8,21	39,45	208	15,95	29,73	952	73,01	29,82
1997	23	2,09	14,70	57	5,17	21,49	157	14,25	23,11	865	78,49	26,91
1998	15	1,53	10,29	42	4,27	16,67	162	16,48	24,39	764	77,72	23,58
1999	8	1,01	5,75	19	2,40	7,93	100	12,63	15,05	665	83,96	20,43
2000	4	0,53	3,09	10	1,33	4,59	71	9,45	11,20	666	88,68	20,23
2001	2	0,29	1,62	9	1,33	4,49	56	8,26	9,25	611	90,12	18,32
2002	5	0,81	4,18	5	0,81	2,69	57	9,28	10,29	547	89,09	16,08
2003	2	0,41	1,72	2	0,41	1,17	37	7,66	7,63	442	91,51	12,74
2004	1	0,22	0,85	0	-	0,00	64*	14,19	9,03	386	85,59	11,97
2005	2	0,49	1,69	3	0,73	1,82	28*	6,80	4,04	379	91,99	11,70
2006	2	0,67	1,67	0	-	0,00	13*	4,33	2,01	285	95,00	8,71
2007	4	1,52	3,31	0	0	0	15*	5,70	2,47	244	92,78	7,56
2008	1	0,52	0,82	0	0	0	28*	1,03	0,33	191	98,45	5,96
2009	0	0	0	0	0	0	1*	0,66	0,17	151	99,34	4,70

* Starting 2004 the age cohort changed to 7-17 years

Along with the routine vaccination of newly born children, during 2000-2003 vaccination against hepatitis B had been performed for medical staff, children born in 1993-1995 who had not received vaccine prior to that. In 2005 – 2006, having received the World Bank support for delivery of vaccine, a catch-up campaign of vaccination of children born in 1988-1992 was conducted. Up to date,

99% of the population of the Republic of Moldova less than 21 years is protected with vaccine against viral hepatitis B.

The risk of viral hepatitis B vertical transmission remains high in the Republic of Moldova. Proportion of pregnant women who are HBs-antigen carriers, according to NCPH data, in 2008-2009, comprised about 4.4% (North geographical regions - 1.8%, Central - 2.4% and South - 7.4%). Women of age group 20-32 years give approximately 92% of births in the country. The population aged 20-30 years old currently recorded about 57% cases of acute VHB cases. Vaccination of children at birth has significantly reduced prevalence of HB-antigen carriers (to about 1%) in vaccinated cohorts; however, only 14 generations of children have benefited from vaccination starting the first day after birth. Among those vaccinated at the age of 10-12 years or being teenagers, proportion of HB-antigen carriers remained at the pre-vaccination level (7%).

Analysis of surveillance data of acute hepatitis B cases in children under 2 years of age revealed continuous presence of perinatal transmission of infection. From 14 cases registered during 2004-2008, 12 infants and children were born from HBsAg seropositive mothers. Of them 10 infants, although have received one or two doses of hepatitis B vaccine, have developed the disease during first 2-6 month of life.

Despite a very high coverage of newborns with the birth HepB vaccine dose (>98%), one percent of vaccinated children develop chronic hepatitis B infection associated with presence of HBsAg and two percent show presence of AntiHBcor as a indication of breakthrough infection. Although that represent a significant reduction of prevalence of HB virus infection in children comparing to the situation before immunization has began (presence of AntiHBcor - 17% and of HBsAg- 7%) the Ministry of Health is looking to strengthen activities to prevent perinatal transmission of infection.

2.1.9. Tuberculosis

A significant increase in incidence, prevalence and mortality from Tuberculosis (TB) has been observed in Moldova in the last decade. Incidence rate (all forms) rose from 67.0 in 1998 to 132,5 cases per 100,000 population in 2006 (Table 6) and the mortality, from 9.2 to 19.3/100,000. The increase is mostly due to pulmonary TB, including destructive forms and permanent upward trend of smear-positive pulmonary forms are of special concern.

Table 6. Main TB indicators of Tuberculosis in Republic of Moldova

Indicators	2001	2002	2003	2004	2005	2006	2007	2008	2009
1 No. TB cases	3820	4142	4579	5154	5632	5471	5325	4940	4747
2 TB Incidence rate/100.000	89,4	97,1	108,3	121,7	133,9	132,5	128,4	120,5	115,8
3 TB mortality rate/100.000	15,5	17,3	16,9	17,1	19,1	19,3	20,2	17,4	17,9
4 Incidence rate/100.000 TB destructive forms	28,9	31,6	31,6	35,6	43,2	41,2	39,1	39,6	36,1
5 Incidence rate/100.000 TB of smear-positive pulmonary forms	27,6	29,5	30,1	37,3	42,3	44,3	48,3	47,0	41,4
6 TB Incidence rate/100.000 in children	12,7	13,2	30,7	33,2	31,2	32,2	30,8	25,4	26,0
7 No of TB meningitis	x	4	5	1	3	3	2	3	4
8 No of TB meningitis in children	x	1	2	1	1	1	1	0	0

TB morbidity is higher in urban than in areas rural of Moldova. The present reversed situation, due to well-known socio-economic factors like migration, crowded habitats, deficient nutrition etc, needs further investigation.

An important increase of TB incidence in children was observed since 2003. A total of 25 cases

of TB meningitis have been reported in 2002-2009, 7 cases of them were in children. TB meningitis in children has not increased significantly. However, the growing pool of destructive pulmonary TB forms in the community constitutes permanent risk for children and underlines the necessity of sustaining high coverage with BCG at birth.

2.1.10. Haemophilus influenzae type b and Streptococcus pneumoniae invasive disease

Septic meningitis and pneumonia are important public health problems in Moldova. During 2005-2009 the average number of suspected cases of septic meningitis was 165, representing an incidence rate of 4.03%000. Respiratory diseases there were the 3d main cause of death in children under 5, produced an average disease specific mortality rate of 2,14%0, and were responsible for 13% of deaths. The leading cause of death Among cases of child deaths from respiratory diseases, 93% were caused by acute pneumonia. High mortality rate of pneumonia in children <5 (CU5) also suggests a potential role of H.influenzae type b and Streptococcus pneumoniae.

Bacteriological diagnosis of H.influenzae type b and Streptococcus pneumoniae infections is still largely deficient in R. Moldova due to the lack of laboratory supplies. Among laboratory confirmed septic meningitis cases in 2005-2009. H.influenzae type b was identified as the causative agent in 1.5% and Streptococcus pneumoniae – in 21.1% of samples. Bacteriologists from PMCs and CHEs passed training in performing H.influenzae and Streptococcus pneumoniae lab diagnosis and all bacteriological laboratories were supplied with methodological guidelines and protocols. However, the shortage of laboratory supplies and low awareness of clinicians on etiological role of H.influenzae and Streptococcus pneumoniae on invasive diseases in children makes the laboratory diagnosis of this microorganisms is still deficient.

In order to overpass that shortcoming in assessing the burden of the invasive a H.influenzae type b and Streptococcus pneumoniae diseases, Republic of Moldova is using estimated data produced by WHO studies.

In August 2007 WHO has finished systematized activities on estimation of number of caused by severe cases and deaths caused by Haemophilus influenzae, type b and Streptococcus pneumoniae for children older than 1 month and under five years. Mathematical calculations allowed to obtain figures regarding spread of Hib and Streptococcus pneumoniae infection in the Republic of Moldova, which is shown in Table 7 and Table 8.

Three separate studies, performed by the international experts using WHO recommended methods, testify intense circulation of the Hib infection among children in the Republic of Moldova. Implementation of the Hib vaccination would prevent an average of 20 cases of bacterial meningitis and 1273 cases of pneumonia, saving annually approximately 48 children's lives.

Republic of Moldova started implementation of immunization against Haemophilus influenza type b in January 2009, using combined tetravalent vaccine DTP-Hib. Until end April 2010, 51,397 children were provided with the first dose of DTP-Hib, 42,297 received the second dose and 35,452 received the 3d dose of the vaccine. Due to the short life of the supplied vaccine, and to avoid wasting vaccine due to expiry date, a catch up single dose of DTP-Hib was provided to 23,587 children at the age 22-24 months. Starting May 2010, primary vaccination with DTP-Hib is temporarily cancelled, because of the lack of the vaccine caused by postponing by UNICEF SD the scheduled for April 2010 shipment of the vaccine.

Table 7. Estimation of severe cases and deaths causes by *Haemophilus influenzae*, type b (Hib), in the Republic of Moldova for children older than 1 month and under five years.

	Estimation	Uncertainty range	
		Lower limit	Higher limit
TOTAL			
Cases	1301	1030	1833
Total deaths	49	33	71
• Total deaths on HIV +	0	0	1
• Total deaths on HIV -	49	33	71
Pneumonia			
Incidence Rate*	513.07	405.84	726.28
No. of cases	1273	1008	1803
Fatality rate	3.34	2.23	4.49
No. of deaths	43	28	65
- No of death on HIV +	0	0	1
- No of death on HIV -	43	28	65
Meningitides			
Incidence Rate *	8.11	6.28	8.75
No. of cases	20	16	22
Fatality rate	23.17	23.01	23.26
No. of deaths	5	4	5
- No of death on HIV +	0	0	0
- No of death on HIV -	5	4	5
Other non-invasive diseases, besides pneumonia and meningitis			
Incidence Rate *	3.05	2.37	3.30
No. of cases	8	6	8
Fatality rate	3.32	3.29	3.33
No. of deaths	1	1	1
- No of death on HIV +	0	0	0
- No of death on HIV -	1	1	1

* No vaccination against Hib

Taking into consideration the high burden and severe health outcomes caused by *Streptococcus pneumoniae* (annual average number of 1997 cases and 102 deaths among children under 5 years of age), that are almost two-fold higher than health outcomes of Hib infection (1302 cases and 49 deaths per year), the Republic of Moldova plans to apply for GAVI co-financing support toward implementation of universal vaccination with pneumococcal vaccine starting 2013.

Table 8. Estimation of severe cases and deaths causes by *Streptococcus pneumoniae*, in the Republic of Moldova for children older than 1 month and under five years.

	Estimation	Uncertainty range	
		Lower limit	Higher limit
TOTAL			
Cases	1997	1496	2603
Total deaths	102	72	111
• Total deaths on HIV +	7	5	7
• Total deaths on HIV -	95	67	104
Pneumonia			
Incidence Rate*	760.33	585.74	990.97
No. of cases	1888	1454	2460
Fatality rate	4.68	3.88	6.56
No. of deaths	95	70	102
- No of death on HIV +	7	5	7
- No of death on HIV -	88	65	95
Meningitides			
Incidence Rate *	5.14	1.99	6.73
No. of cases	13	5	17
Fatality rate	29.70	28.22	31.28
No. of deaths	4	1	5
- No of death on HIV +	0	0	0
- No of death on HIV -	4	1	5
Other non-invasive diseases, besides pneumonia and meningitis			
Incidence Rate *	38.64	14.96	50.61
No. of cases	96	37	126
Fatality rate	16.52	15.69	17.39
No. of deaths	3	1	4
- No of death on HIV +	0	0	0
- No of death on HIV -	3	1	4

* No vaccination against *St. pneumoniae*

2.1.11. Rotavirus infection

Surveillance of rotavirus infection was deficient in the Republic of Moldova for many years. Laboratory diagnosis of rotavirus infection and notification of cases to the surveillance system was initiated in the Republic of Moldova in 1991. Passive hemo-agglutination testing were implemented and performed in a few number of laboratories from main cities and few rayons. During 1992-1999 an average number of 52 cases of rotavirus infection per year, with a maximum of 102 cases in 1995 have been reported. During 2000-2007 the laboratory diagnosis of rotavirus infection was not performed at all. Following a WHO mission in November 2007, a sentinel site surveillance project for rotavirus infection was agreed on and, following the provision of equipment, supplies and conducted training, in June 2008 ELISA testing for rotavirus has started in children under 5 years of age with acute diarrhea, hospitalized in the infectious diseases hospital for children from Chisinau. In 2008 583 children were fully investigated and in 2009-1160 children. Rates of positive results for rotavirus was 27.1% in 2008 and 32.3% in 2009. Age specific rates were almost equal among children aged from 1-5 years (30.7%), and only 10.5% were positive for rotavirus in those with age up to six months. None of the patients with confirmed diagnosis of rotavirus infection has died.

Rotavirus infection in the given context of high burden represents a public health problem for the Republic of Moldova and it plans to apply for GAVI support toward implementation of vaccination against rotavirus infection starting 2012.

2.2 VACCINATION SCHEDULE

The second National Immunization Program (NIP) adopted by Government of Moldova on 28.05.2001 (Decree No 369) had been successfully implemented during a five-year time period 2001-2005. Under that Program, starting 2002, Republic of Moldova has implemented immunization of children with 2-dose MMR vaccine, has performed national immunization campaigns for children and young people against measles and rubella (including women under 30 years), and catch-up immunization of for teenagers against viral hepatitis B. The NIP has obtained long-term funding from budget sources: Moldova has been procuring necessary annual amounts of vaccine for routine vaccination of the population, with exception for vaccine against hepatitis B, which has been granted by GAVI. Country has achieved and still maintains objectives of coverage exceeding 95% for children's vaccination against diphtheria, tetanus, poliomyelitis, pertussis, measles and rubella, and coverage more than 98% against tuberculosis and viral hepatitis B. Maintaining a high level of vaccine coverage allowed achieving stated in the NIP 2001-2005 objectives toward reducing morbidity: maintain polio free status of the Republic of Moldova, zero cases of maternal and neonatal tetanus (MNT); maintain diphtheria incidence under 0.1/100,000; pertussis incidence under 2/100,000; tetanus incidence under 0.1/100,000; viral hepatitis B incidence for vaccinated children - under 2/100,000; measles and rubella incidence - under 1/100,000; mumps – under 10/100,000. Financial problems did not allow implementing vaccination against Hib infection, although it had been envisaged by the NIP for the years 2001-2005.

The third NIP for the years 2006-2010 was approved by the Government Decree No523/16 of May 2006. Immunization schedule envisaged by the NIP for the period 2006-2010 is represented in Table 9 and provides for immunization against 10 infections: Hepatitis B, tuberculosis, diphtheria, tetanus, pertussis, poliomyelitis, measles, mumps, rubella and *Haemophilus influenzae* type b.

Table 9. Republic of Moldova Immunization Schedule for 2006 – 2010.

	Visits		Antigens			Remarks
In 24 hours after birth	1	HepB1				
2nd day of life	1	BCG1				
1 month	2	HepB2				
2 months	3		Hib1	OPV1	DTP1	Simultaneously
4 months	4		Hib2	OPV2	DPT2	Simultaneously
6 months	5	HepB3*	Hib3	OPV3	DPT3	Simultaneously
12 months	6					MMR1
22-24 months	7			OPV4	DPT4	Simultaneously, 16-18 month after OPV3/DPT3
6-7 years	8	BCG2		OPV5	DT	MMR2 OPV5/DT- simultaneously in the spring before school entry BCG/MMR2 in the autumn before school entry
14-15 years					Td	
Adults old 20, 25, 30, 35, 40, 50, 60 years					Td	

* Infants at increased risk of HBV perinatal infection should get HepB3 1 month after HepB2

Funds, allocated by the Government for the years 2008-2010, are sufficient to perform immunization against 9 infections with exception for Hib. In this context, the Republic of Moldova appealed to GAVI for obtaining assistance on procurement of Hib vaccine. After receiving GAVI approval of support for implementation of Hib vaccine based on co-financing policy, Republic of Moldova has initiated immunization against Hib infection starting January 2009, using DTP+Hib vaccine.

On May 2010 the Ministry of Health Conceal has reviewed preparatory process, objectives and targets of the 4th NIP for years 2011-2015. The vaccination schedule to be followed according to the

2011-2015NIP is displayed in the table 10.

Table 10. Republic of Moldova Immunization Schedule for 2011 – 2015.

	Visits		Antigens						Remarks
First 24 hours after birth	1		HepB0						
2nd day of life	1	BCG1							
2 months	2		HepB1	DTP1	Hib1	OPV1	Rota1	Pneumo1	Simultaneously. HepB, DTP, Hib in one doze 0,5 ml of pentavalent vaccine
4 months	3		HepB2	DTP2	Hib2	OPV2	Rota2	Pneumo2	
6 months	4		HepB3	DTP3	Hib3	OPV3	Rota3	Pneumo3	
12 months	5								MMR1
22-24 months	6		DTP4		OPV4				
6-7 years	7	BCG2	DT		OPV5		MMR2		
									Simultaneously, 16-18 month after OPV3/DPT3
									OPV5/DT- simultaneously in the spring before school entry
									BCG/MMR2 in the autumn before school entry
14-15 years	8		Td						
Adults old 20, 25, 30, 35, 40, 50, 60 years			Td						

According to the proposed Immunization Schedule for 2011 – 2015, two new vaccination antigens will be implemented – against Rotavirus infection and against Streptococcus pneumoniae.

2.3 VACCINATION COVERAGE

Administrative reported vaccination coverage

Reported vaccination coverage with traditional EPI antigens has been equal or higher 95% for the last 7 years (Table 11)

Table 11. Reported Immunization Coverage with the NIP antigens

#	Antigens	Reported coverage %								
		2001	2002	2003	2004	2005	2006	2007	2008	2009
1	BCG1	98.6	99.1	97.5	96.2	97.4	99.0	98.8	98.6	98.7
2	Hep. B3	94.4	98.8	98.9	98.8	98.8	98.8	97.8	97.6	97.1
3	OPV3	98.1	98.3	98.4	98.2	98.5	98.2	97.1	97.7	95.9
4	DTP3	97.1	97.	97.7	97.5	97.6	97.2	96.0	95.4	93.9
5	Measles 1	94,1	94,3	X	x	x	x	x	x	x
6	Mumps 1	93,8	93,9	X	x	x	x	x	x	x
7	Rubella 1	x	91,3	X	x	x	x	x	x	x
8	MMR 1	x	x	95,7	96,3	96,9	96,9	94,7	94,4	91,3
9	OPV4	98.3	98.5	98.7	98.7	98.7	98.5	98.4	98.3	97.4
10	DTP4	97.4	97.8	97.4	98.3	98,5	98.2	97.7	97.5	96.1
11	BCG2	84.9	70.1	89.6	91.1	90,4	91.2	89.3	90.7	87.4
12	OPV5	98.4	95.0	98.0	99.8	99.3	99.2	98.6	98.5	98.4
13	DT	96.3	80.6	97.0	98.6	99.2	99.1	98.2	98.5	97.9
14	MMR2	x	68.9	95.7	97.8	97.9	98.4	96.0	97.5	96.5

Reported data testify a decreasing trend of the vaccine coverage with VHB3, OPV3, DTP3 and MMR1 in last several years.

Survey results,

The data on immunization Coverage were assessed during the demographic and health survey (DHS) conducted in the Republic of Moldova in 2005.

Next assessment of vaccination coverage is going to take place in 2011, when a Multiple Indicator Cluster based Survey is scheduled with support from UNICEF and other donors.

According to the immunization schedule, all vaccines should be administered within the first year of life, except MMR which is administered at the age of 12 months. Taking into account this country-specific vaccination schedule, the Moldova DHS examines full coverage of immunizations for the cohort of children age 15-26 months, thus allowing for a reasonable three-month interval for children to receive their MMR vaccine.

Information on children's vaccination coverage was obtained for all children under five years. In Moldova, child-specific information about the vaccines they received are registered in the Child's Medical Development Card (Fișa medicală de dezvoltare a copilului [Form 112/e]), or on an immunization card, or in a log (Forms 063/e or 063-1/e)—any of which can usually be found at the child's family doctor in the local primary health facility. In addition, an "immunization certificate" has come into use since distribution began in 2002. It has a record of vaccinations and is kept by the child's parent or caregiver.

The MDHS collected vaccination data from both sources—from the forms kept at the local health facility and from the immunization certificate kept by the parents or caregiver—as well as from the mother's verbal report. All mothers of children under age five were asked to show to the interviewer the immunization certificate or any other written record of the child's vaccines. If the immunization certificate or another medical record were available, the interviewer copied the date that each vaccine was received into the questionnaire. Then, the interviewer asked the mother if the child had received any of the following vaccines: polio, DTP, BCG, measles, mumps and/or rubella, and how many doses of each vaccine were administered. After completing the household interview, when information about the local health facility's address was noted, an interviewer visited that health facility to obtain vaccine information from that source.

Table 12. Vaccinations by source of information

Percentage of children age 15-26 months who received specific vaccines at any time before the survey, by source of information (vaccination card at home or at the health facility, or mother's report), and percentage vaccinated by 15 months of age (or by 24 months of age for measles, mumps and rubella), Moldova 2005

	Percentage of children who received:															
	BCG	Hepatitis B			Diphtheria-pertussis-tetanus			Polio			MMR ¹			Fully vaccinated ²	No vaccinations	Number of children
		B1	B2	B3	1	2	3	1	2	3	Measles	Mumps	Rubella			
Vaccinated at any time before survey																
Vaccination card	89.7	89.3	89.0	87.8	88.7	87.7	86.4	89.3	88.6	87.7	84.9	83.0	82.8	81.6	0.0	295
Mother's report	10.1	8.4	7.9	6.7	9.5	9.2	7.1	9.8	9.4	7.1	5.7	6.4	5.9	3.7	0.0	34
Either source	99.7	97.7	96.9	94.5	98.3	96.9	93.5	99.1	98.1	94.8	90.6	89.4	88.7	85.3	0.0	329
Vaccinated by 15 months of age³	99.7	97.7	96.5	92.8	96.9	95.3	89.9	98.5	96.8	92.7	89.5	88.8	87.9	81.6	0.5	329

¹ Children under five years of age who received this vaccine by 24 months of age

² Including one dose of BCG, three doses of HepB, three doses of DPT, three doses of polio, and one dose of measles, mumps and rubella.

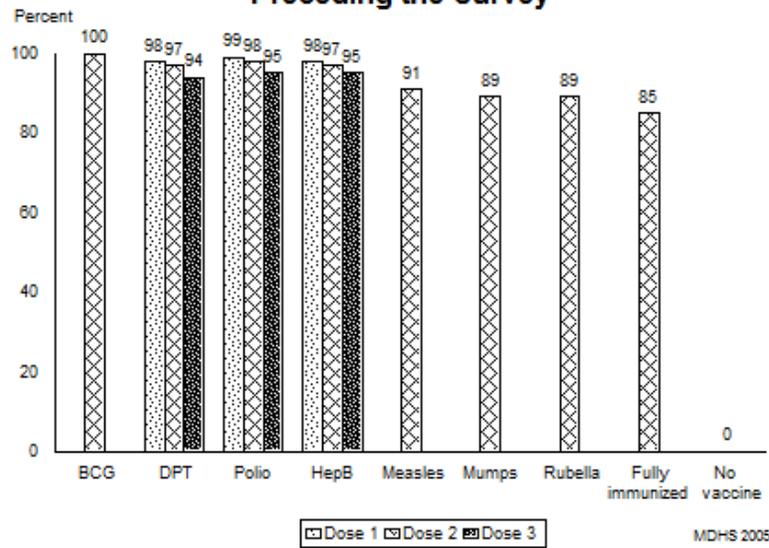
³ For children whose information was based on the mother's report, the percentage of vaccinations given during the first 14 months of life (or during the first 23 months of life for measles, mumps and rubella) was assumed to be the same as for children with a written record of vaccination.

Table 12 shows results of vaccination coverage for children age 15-26 months, including the vaccination coverage for each of the nine preventable childhood infections. The estimates are based on information from written sources (at the home or/and the local health facility), and in cases where written sources were not available, data were completed with information reported verbally by the mother. The upper part of Table 12 shows the percentages of children age 15-26 months vaccinated any time before the survey. The bottom line of the table shows the percentage children vaccinated in the first year of life. For children not having an available written source of vaccination dates, the proportion of those vaccinated before the first birthday (or before the age of 15 months for measles, mumps and rubella) was considered identical to that of children with an immunization document.

Overall, 85 percent of children age 15-26 months are fully immunized with the 9 antigens stipulated by the National Immunization Program. No children were identified as not having received any vaccine. The highest rate of specific immunization coverage (over 99 percent) was identified for the BCG vaccine. More than 98 percent of children were vaccinated with the first doses of HepB, DTP, and polio, confirming the high access of children to immunization services in the Moldova. The coverage with subsequent doses is slightly less, however, with 95 percent of children receiving the three recommended doses of HepB and polio and 94 percent receiving the three recommended doses of DTP vaccine. The decrease in coverage with subsequent doses reflects immunization drop out rates. Drop out rates represent the proportion of children who received the first dose of vaccine but who do not follow through with receiving the third dose. The drop out rates are 5 percent for DTP, 4 percent for polio and 3 percent for HepB. The proportion of children vaccinated against measles is 91 percent and the proportion of those vaccinated against mumps and rubella is 89 percent (Figure 3).

Timely and complete immunization coverage of children in the first year of life is important to provide protection before they might become exposed to diseases. Overall, 76 percent of children were immunized against the nine infections in the first year of life (or before age 15 months for measles, mumps, and rubella). While the data on the timely coverage for BCG, MMR, and the first doses of HepB, polio and DTP do not vary significantly from rates of vaccination at any time before the survey, complete coverage including the third doses of HepB, polio, and DTP within the first year of life is less: 91 percent versus 95 percent for HepB, 89 percent versus 95 percent for polio, and 87 percent versus 94 percent for the DTP vaccines.

Figure 3 Percentage of Children Age 15-26 Months Vaccinated Against Childhood Diseases at Any Time Preceding the Survey



Comparing results on the immunization coverage from the 2000 Multiple Indicator Cluster Survey (MICS 2000), excluding Transnistria, similar coverage rates are observed for the same age group (age 15-26 months) vaccinated any time before the survey. Moreover, there has been a significant effort to increase the prevalence of fully immunized children before their first birthday, including all antigens stipulated by the National Immunization Program. It is also notable that since 2000, there has been a reduction to under 1 percent of children who have not received any of the recommended vaccines, as well as the successful implementation of immunization against rubella (Figure 4).

Figure 4 Proportion of Children Age 15-26 Months Who Have Received Recommended Vaccines Before Their First Birthday

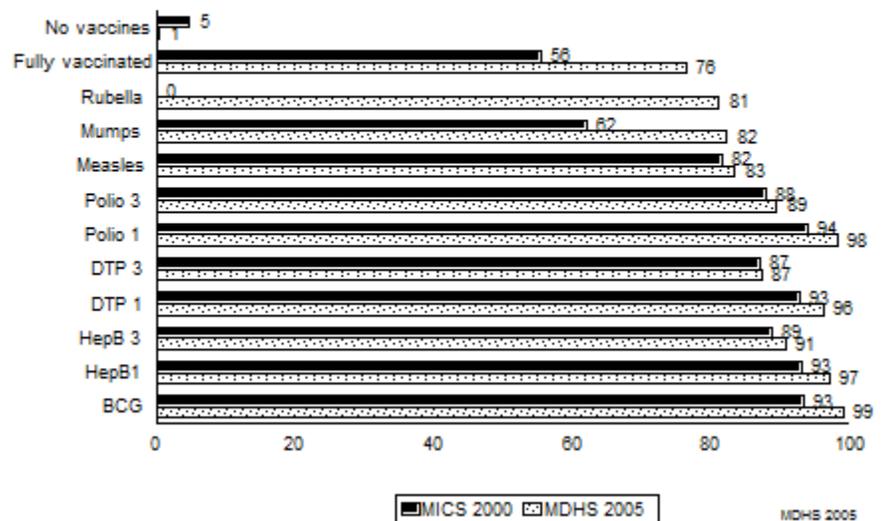


Table 12 presents vaccination coverage results for children from age one to five years, by one-year age groups (12-23 months, 24-35 months, 36-47 months, and 48-59 months). The results show vaccine-specific coverage in the first year of life, except for vaccines against measles, rubella, and mumps for which coverage is estimated in the first 15 months of life. Estimates in the table do not show significant variations in immunization coverage among age groups. The low immunization coverage for rubella, at 52 percent among children age 48-59 months, is due to the fact that not all children in this age group had the chance to be vaccinated because the rubella immunization was only implemented since January 2002.

Table 12. Vaccinations in first 15 months of life

Percentage of children under five years of age at the time of the survey who received specific vaccines by 15 months of age (or by 24 months for measles, mumps and rubella), and percentage with a vaccination card, by current age of child, Moldova 2005

Current age of child in months	Percentage of children who received:													Fully vaccinated ²	No vaccinations	Percentage with a vaccination card at home or health facility	Number of children
	BCG	Hepatitis B			Diphtheria-pertussis-tetanus			Polio			MMR ¹						
		B1	B2	B3	1	2	3	1	2	3	Measles	Mumps	Rubella				
12-23	99.8	97.9	96.3	92.8	98.0	95.6	89.9	99.1	97.3	93.2	84.7	83.6	82.7	77.9	0.0	89.6	355
24-35	98.8	97.9	96.5	93.3	96.8	95.5	91.8	97.5	96.5	92.0	92.3	89.1	88.7	81.7	1.2	93.1	328
36-47	99.0	96.9	95.8	90.7	97.0	95.3	90.3	97.3	96.9	92.2	93.6	92.3	91.3	83.2	0.8	94.2	299
48-59	98.9	96.4	95.6	93.2	96.4	95.4	88.7	97.4	96.4	92.3	90.8	90.2	60.4	51.9	0.5	90.2	273
Total	99.1	97.3	96.1	92.5	97.1	95.4	90.2	97.9	96.8	92.4	90.1	88.5	81.4	74.3	0.6	91.7	1,255

Note: Information was obtained from the vaccination card at home or at the health facility, or if there was no written record, then from the mother's report. For children whose information was based on the mother's report, the percentage of

vaccinations given during the first year of life is assumed to be the same as for children with a written record of vaccinations.

¹ Children under five years of age who received this vaccine by 24 months of age

² Including one dose of BCG, three doses of HepB, three doses of DPT, three doses of polio, and one dose of measles, mumps and rubella.

Both survey and administrative reported vaccination coverage data reveal that more than 90 percent of children receive their immunization doses during the first year of life (15 months for MMR vaccine). Still the administrative reported figures tend to be higher comparing to survey estimates. The difference is more obvious for MMR vaccine and 3d doses of DTP, OPV, HepB. One of the possible explanations for that could be relate to very high migration of population in- and out of the country. That also would explain some differences in measles-mumps-rubella coverage in the situation when Moldova gives only combined MMR vaccine since January 2002. In order to ensure high vaccination coverage country uses a comprehensive vaccination coverage monitoring and evaluation system.

Generally, high vaccine coverage (> 90%) is reported in the majority of the rayons and there were no districts with coverage less than 80% for many years. Permanent problems remain in the Transnistrian regions where vaccination for certain antigens and target groups is implemented with delays, especially in city of Tiraspol where timely vaccination coverage does not exceed 90%. Even in that case children still do get their doses with some delays.

Detailed figures and information about underperforming districts are provided in tables 13-14).

Situation in Transnistria lacks any stability and depends much on allocation of funding for vaccine procurement from local authorities. Transnistrian regions do not receive funds from the national budget of the country due to separatist authorities do not contribute to the national budget. Consequently they have to finance purchase of vaccines using their own sources. Unfortunately, central government and central medical authorities cannot influence the situation in short time because of lack of cooperation expressed by Transnistrian authorities. Still, the national authorities supply to the region free of charge all vaccines and supplies received as humanitarian aid (including those offered by GAVI) as well as supply all other vaccines procured by the country at their cost.

Table 13. Reported vaccination coverage at national and sub-national levels (%), Republic of Moldova, 2008.

	BCG	Hep. B	OPV	DT/Td	DTP	MMR
Age	12-23 months	12-23 months	12-23 months	X	12-23 months	12-23 months
National level	98.6	97.6	96.9	X	95.4	94.4
Western Part	99.1	98.4	97.7	X	96.8	96.0
Transnistria	94.9	91.4	91.0	X	85.6	82.8
	<i>Grigoriopol - 90.6</i>	<i>Tiraspol - 93.8</i>	<i>Tiraspol - 83.8</i>	X	<i>Tiraspol - 73.8</i>	<i>Tiraspol - 71.7</i>
	<i>Tiraspol - 93.8</i>	<i>Bender - 92.2</i>	<i>Bender - 89.2</i>	X	<i>Bender - 84.4</i>	<i>Bender - 77.1</i>
	<i>Slobozia - 93.8</i>	<i>Ribnita - 91.9</i>		X	<i>Dubasari - 90.6</i>	<i>Ribnita - 84.8</i>
Age	X	X	3 years	X	3 years	X
National level	X	X	98.3	X	97.5	X
Western Part	X	X	98.8	X	98.4	X
Transnistria	X	X	94.4	X	90.7	X
	X	X		X	<i>Tiraspol - 86.2</i>	X
	X	X		X	<i>Bender - 88.8</i>	X
Age	7 years	X	7 years	7 years	X	7 years
National level	90.7	X	99.3	98.5	X	97.5
Western Part	96.2	X	99.4	98.8	X	98.2
Transnistria	48.7	X	97.9	95.7	X	91.8
	<i>Ribnita - 30.1</i>	X		<i>Tiraspol - 91.5</i>	X	<i>Tiraspol - 85.2</i>
	<i>Bender - 43.4</i>	X			X	<i>Dubasari - 89.2</i>
	<i>Tiraspol - 46.4</i>	X			X	
	<i>Dubasari - 46.5</i>	X			X	
	<i>Camenca - 52.8</i>	X			X	
	<i>Slobozia - 55.4</i>	X			X	
Age	X	X	X	15 years	X	X
National level	X	X	X	99.0	X	X
Western Part	X	X	X	99.1	X	X
Transnistria	X	X	X	98.7	X	X

Table 14. Reporting vaccination coverage at national and sub-national levels, Republic of Moldova, 2009.

	BCG	Hep. B	VPO	DT/Td	DTP	MMR
Age	12-23 months	12-23 months	12-23 months	X	12-23 months	12-23 months
National level	98.7	97.1	95.9	X	93.9	91.3
Western Part	99.0	97.6	96.9	X	96.0	94.1
Transnistria	96.3	92.9	88.5	X	78.5	71.3
	<i>Vulcanesti – 94.2</i>	<i>Slobozia – 89.0</i>	<i>Tiraspol – 84.6</i>	X	<i>Tiraspol – 78.5</i>	<i>Tiraspol – 62.5</i>
		<i>Tiraspol – 90.7</i>	<i>Bender – 86.3</i>	X	<i>Bender – 72.0</i>	<i>Bender – 66.5</i>
		<i>Vulcanesti – 90.6</i>	<i>Slobozia – 84.2</i>	X	<i>Grigoriopol – 86.0</i>	<i>Dubasari SN – 73.4</i>
		<i>Donduseni – 92.3</i>	<i>Grigoriopol – 92.0</i>	X	<i>Slobozia – 76.4</i>	<i>Grigoriopol – 84.0</i>
		<i>Bender – 93.6</i>	<i>Dubasari SN – 93.0</i>	X		<i>Ribnita – 84.8</i>
		<i>Dubasari SN – 94.9</i>	<i>Donduseni – 92.3</i>	X		<i>Slobozia – 73.6</i>
			<i>Chisinau – 93.5</i>	X		<i>Chisinau – 87.8</i>
						<i>Cahul – 88.9</i>
National level	X	X	3 years – 97.4	X	3 years – 96.1	X
Western Part	X	X	98.3	X	7.7	X
Transnistria	X	X	91.3	X	84.3	X
	X	X	<i>Tiraspol – 89.1</i>	X	<i>Tiraspol – 89.1</i>	X
	X	X	<i>Bender – 84.5</i>	X	<i>Bender - 93,2</i>	X
	X	X	<i>Ribnita – 90.6</i>	X	<i>Grigoriopol – 92.0</i>	X
	X	X		X	<i>Ribnita – 90.6</i>	X
National level	7 years – 87.4	X	7 years – 98.4	7 years – 97.9	X	7 years – 96.5
Western Part	93.9	X	98.7	98.7	X	97.7
Transnistria	40.5	X	95.8	92.5	X	88.2
	<i>Ribnita - 23.6</i>	X	<i>Tiraspol – 94.2</i>	<i>Tiraspol – 91.2</i>	X	<i>Tiraspol – 80.2</i>
	<i>Bender - 33.3</i>	X	<i>Bender – 90.8</i>	<i>Bender – 80.8</i>	X	<i>Bender – 88.7</i>
	<i>Tiraspol - 41.1</i>	X			X	<i>Ribnita – 86.9</i>
	<i>Dubasari – 55.7</i>	X			X	<i>Slobozia – 94.0</i>
	<i>Camenca – 00.0</i>	X			X	<i>Ciadir-Lunga – 92.0</i>
	<i>Slobozia – 50.8</i>	X			X	

**3. IMMUNIZATION PROGRAMME CHARACTERISTICS
(ACHIEVEMENTS, PROBLEMS AND OBJECTIVES)**

3.1 SERVICE DELIVERY

Accelerated disease control

The main objectives of the program are to ensure vaccination coverage > 95% at national and district level; maintaining the status of the country free of polio neonatal tetanus and congenital rubella, sustainable elimination of local measles, rubella and diphtheria cases, reducing the incidence rate of tetanus cases under 0,05 cases per 100000 population, of acute viral hepatitis B in children - under 1 case per 100,000 children, of pertussis - under 1,5 cases per 100000 population, and of mumps – under 6 cases per 100000 population; reduce morbidity and mortality caused by septic meningitis and pneumonia following Hib and St. pneumonia infection in children under 3 years; reduce morbidity of acute diarrhea diseases caused by rotavirus in children under 3 years of age.

POLIOMYELITIS:

Achievements

WHO certified Moldova as a polio-free country in 2000 (last paralytic case due to wild poliovirus in 1991). Active surveillance and zero weekly Polio/AFP reporting was introduced in 1999 and timeliness and completeness of reporting are regularly monitored by the NPHC. National polio laboratory certified by WHO. Environmental surveillance of poliovirus circulation performed.

Problems

Despite the overall satisfactory surveillance system performance, some rayons (20%) do not provide on time weekly zero reports, there are some silent areas where AFP were not reported for many years. Competing health priorities pose pressure on time dedicated to non-polio AFP surveillance and eradication among health staff, lack of epidemiologist in some rayons to manage the Programme, insufficient supervision to districts, insufficient quality of active surveillance, insufficient frequency of feedback.

Objectives

- Maintaining polio free status

Strategies

- Improving non-polio AFP surveillance performance
- Providing additional vaccination opportunity to children at increased risk
- Maintaining high coverage with OPV vaccines through routine vaccination
- Strengthen research on population immunity and poliovirus circulation

MEASLES & RUBELLA ELIMINATION AND CONGENITAL RUBELLA SYNDROME (CRS) CONTROL PROGRAMME

Achievements

Last fatal cases of measles were reported as far as in the year 2000.

Last epidemic outbreak of measles and rubella took place in 2001-2002. A National Vaccination Campaign against measles and rubella was conducted in 2002 covering with combined measles-rubella vaccine 98 percent of children 8-19 years of age and students aged 20-23 years, and with monovalent rubella vaccine - 97 percent of women 20-30 years of age.

The trivalent measles-mumps-rubella (MMR) vaccine was implemented since January 2002 for primary routine vaccination at 12 months of age. The second routine dose of MMR has been initiated the same year at the age of 7 years (in school children).

Starting 2005, laboratory-based confirmation for all measles and rubella cases has been initiated. The National laboratory for measles&rubella diagnosis is certified on annual base by WHO.

After registering 10 cases of measles in 2007, Moldova reached the elimination of measles. During the period 2008 – 2009 measles cases were not registered in the country.

Serological surveys conducted in 2007-2008, revealed 95.6% of the populations possess protective antibody titer against measles.

Rubella morbidity rate had decreased significantly from 171,7/100,000 in 2002 to 3 laboratory confirmed cases in 2007 and single cases registered in 2008 and 2009.

Serological surveys conducted in 2007-2008, had demonstrated 94.6% of children and 98% of adults possess protective antibody titer against rubella.

Investigation of the measles and rubella rate per 100,000 populations is low and amounted to 2.3 in 2006; 1.4 in 2007; 0.8 in 2008 and 1.4 in 2009.

High incidence of measles and rubella in neighboring countries over the last years contributed to increase of the importation of cases.

Problems

No lab based confirmation of all suspected cases, difficulty in collecting blood samples from all suspected cases, refusal for specimen collection and hospitalization, difficulty and delay in delivering samples from remote districts, some districts not reporting, high risk for importing measles and rubella from neighbouring countries, inadequate hospitalization of suspect cases, inadequate investigation for rubella of children with congenital malformations

Objectives

- Maintain elimination of measles, rubella and congenital rubella infection by 2015

Strategies

- Improving MR and CRS surveillance
- Improve clinical management of suspected measles, rubella and CRS
- Providing additional vaccination opportunity to individuals at increased risk and/or lacking immunity
- Maintaining high coverage with 2 doses of MMR vaccines through routine immunization;
- Continue systematic research of the immune status of population against measles and rubella.

ELIMINATION OF MATERNAL AND NEONATAL TETANUS (MNT)

Achievements

The last case of neonatal tetanus (NT) was registered in 1966. Since the late 2000s the annual number of adult tetanus cases varies from 0 to 1. 98% of both children and adults have antitoxin titers equal or over 0.1 IU/ml.

Serological studies performed during 2001-2009 reveal 97.3±1.0% of both children and adults have antitoxin titers equal or over 0.1 IU/ml.

Problems

- No specific problems

Objectives

- Maintaining eliminated status of MNT

Strategies

- Maintaining MNT surveillance
- Maintaining high coverage with T containing vaccines through routine immunization (primary series and booster doses)

ACCELERATED CONTROL OF DIPHTHERIA**Achievements**

After a 25-year period of low diphtheria morbidity and due to interruption of routine immunization against diphtheria in the early 1990s, Moldova experienced during 1994-1996 a 3-year epidemic with an average incidence rate of 4.5/100,000 and a case fatality ratio of 5.2%. A large-scale supplementary immunization campaign of children and adults in 1995-1997 led to reduction and elimination of cases.

During the period 2003-2008 diphtheria cases were not registered in the country. One case of diphtheria was reported in 2009.

Serological studies conducted during 2007 – 2009 revealed 99% of the individuals tested had protective antitoxin titers (>0.03 IU/ml).

Problems

- No specific problems

Objectives

- Maintaining elimination status of diphtheria

Strategies

- Maintaining diphtheria surveillance
- Maintaining high coverage with D containing vaccines through routine immunization (primary series and booster doses)

CONTROL OF HEPATITIS B**Achievements**

Moldova was among the European countries with the highest burden of hepatitis B virus. Its average annual incidence rate of acute hepatitis B in the late eighties was 68.4/100,000.

Implementation of single-use syringes and improved sterilization in health facilities, better control of donated blood, implementation of universal infant immunization since 1995 and vaccination of high risk groups contributed to a significant decrease incidence of acute cases to of acute cases in 2009. Perinatal transmission has been significantly reduced - presence of AntiHBcor dropped among children from 17% to 3% and presence of HBsAg dropped from 7% to 1%.

Up to date, 99% of the population of the Republic of Moldova less than 19 years of age have received the vaccine against viral hepatitis B.

Problems

The risk of viral hepatitis B vertical transmission remains high in the Republic of Moldova. Proportion of pregnant women who are HBs-antigen carriers comprises about 8-12%. Analysis of surveillance data of acute hepatitis B cases in children under 2 years of age revealed continuous presence of perinatal transmission of infection. Despite a very high coverage of newborns with the birth HepB vaccine dose (>98%), one percent of vaccinated children continue to develop chronic hepatitis B infection associated with presence of HBsAg and two percent show presence of AntiHBcor as an indication of breakthrough infection. The highest age specific incidence rates of acute hepatitis B are registered among young adults 20-29 years of age.

Objectives

- Further reduce VHB incidence rate, specially perinatal transmission and transmission in youths and young adults

Strategies

- Strengthening HepB surveillance
- Maintaining high coverage with HepB vaccines through routine vaccination
- Strengthen research toward reducing perinatal hepatitis B transmission
- Reduce transmission of hepatitis B virus in youths, young adults and other groups under risk

ROUTINE IMMUNIZATION SERVICES AND IMMUNIZATION COVERAGE

Achievements

Immunization services are provided through the various health care facilities over 1551 primary health care facilities and maternity wards by variety of health staff: medical nurses, family doctors. Immunization services are provided by FDs in the Western and by pediatricians in the Eastern part of the country. They are equally accessible for both urban and rural population. Ninety-seven per cent of the population in the Western part live in less than 5 km from the immunization provider as compared to 94% in the Eastern part. Ninety-six per cent of children from the Western part and 90% of these in the Eastern part need less than 1 hour to reach their vaccine provider. Immunization services are delivered mainly using fixed and outreach services. Children are immunized after clinical check-up from their FDs done immediately before that. Proportion of deliveries at maternity ward is over 98% and represent an important opportunity toward providing the birth hepatitis B dose and BCG vaccine.

Both survey and administrative reported vaccination coverage data reveal that more than 90 percent of children receive their immunization doses during the first year of life (15 months for MMR vaccine).

Generally, high vaccine coverage (> 90%) is reported in the majority of the rayons and there were no districts with coverage less than 80% for many years. Drop-out rates are very low for reported coverage figures (1-2%) but higher based on survey estimates (5 percent for DTP, 4 percent for polio and 3 percent for HepB).

Problems

- Lack of staff in some remote health facilities, inadequate resources for ensuring transportation of staff and vaccines down to the service area;
- Lack of epidemiologists in some districts, migration and lack of motivation, the high turnover of staff is seen in many areas;
- Unmet needs for additional and systematic training and training tools on vaccine management;
- Weak supportive supervision due to inadequate supervision tools, insufficient capacity and lack

- of resources;
- Extensive contraindications and unreliable vaccine supply, specially in the eastern region Transnistria;
- Problems in timely registering of children under one with primary health care, especially in urban areas: consequently denominator problems arise leading to overestimating administrative vaccination coverage figures.
- Very high migration of population in- and out of the country affects timely vaccination coverage;
- Permanent problems remain in the Transnistrian rayons where vaccination for certain antigens and target groups is implemented with significant delays;
- Limited resources and capacity for developing and promoting social mobilization tools and activities;
- An increasing trend of resistance of population toward receiving vaccines is observed.

Objectives

- Achieving at least 90% coverage for all NIP antigens in all districts by 2012

Strategies

- Ensure universal access of population to immunization services and reach everybody targeted for immunization;
- Strengthen vaccine-management and improve vaccine, immunization and injection quality and safety;
- Increase demand for immunization services;

NEW AND UNDERUSED VACCINES INTRODUCTION

Achievements

Moldova immunization programmes were initiated in early 60th and country has remarkable achievements in control of vaccine-preventable diseases. Hepatitis B vaccine was firstly introduced for newborns at risk in 1989 and then, expanded to all newborns since 1995. Starting 2002, 2-dose schedule of measles, mumps rubella (MMR) combined vaccine was implemented countrywide. Vaccination against Hib was initiated in 2009 using a combined DTP-Hib vaccine with the GAVI support. Large immunization campaigns were conducted against diphtheria (1995-1996), polio (1996), measles and rubella (2002), mumps (2008). Through the adaptation of NIP long-term funding from budget sources was achieved that covers all antigens for routine vaccination of the population, with exception for vaccine against hepatitis B, which has been granted by the GAVI. Conducted with the support from WHO assessments of burden of rotavirus infection and of infections caused by *Str. Pneumoniae* revealed their significant role in causing illness and death. GAVI co-financing policy of assistance represents an important opportunity to implement rotavirus and pneumococcal vaccination in Moldova in a sustainable manner.

Republic of Moldova started implementation of immunization against *Haemophilus influenzae* type b in January 2009, using combined tetravalent vaccine DTP-Hib. Until end April 2010, 51,397 children were provided with the first dose of DTP-Hib, 42,297 received the second dose and 35,452 received the 3rd dose of the vaccine. Due to the short life of the supplied vaccine, and to avoid wasting vaccine due to expiry date, a catch up single dose of DTP-Hib was provided to 23,587 children at the age 22-24 months. Starting May 2010, primary vaccination with DTP-Hib is temporarily cancelled, because of the lack of the vaccine caused by postponing by UNICEF SD the scheduled for April 2010 shipment of the vaccine.

Problems

- High vaccine cost,
- Insufficient disease burden data and limited surveillance capacity;
- Unreliable supply of DTP-Hib vaccine during 2008-2010.

Objectives

- Expand national immunization programme through introduction of new and underused vaccines

Strategies

- Strengthen surveillance of Hib, Str. pneumoniae and Rotavirus and collect evidence for decision-making for introduction of new and underused vaccines;
- Reliable supply of Hib containing vaccine;
- Introduction of rotavirus and pneumococcal vaccination through GAVI New and Underused Vaccines (NUV) support;

3.2 ADVOCACY AND COMMUNICATION

Achievements

Adoption of the NIP through a Governmental Decree gives the programme a status of a governmental initiative. It provides a good opportunity to keep the NIP high on the agenda of both central and local authorities, as well as of the community members.

However, advocacy, awareness and high level commitment for immunization is still lacking, as social mobilisation for routine activities is one of the most neglected components of the programme. Moldova NIP has developed a set of messages to population on importance and safety of immunizations, however the main problem relates to financial support to promote those messages.

During 2007-2009 the Republic of Moldova joined to the EURO WHO appeal to conduct the European Immunization Week. There was created a working group which planned and coordinated implementation of the activity.

Building professional capacity on social mobilization and developing a system of good information and communication methods and tools for immunizations is recognized as an important mean to increase timely vaccination coverage.

One of the important mechanism to advocate for NIP is the established Council for Coordination of the Immunization Program Development and Funding, which is a consultative body, consisting of representatives of the Ministry of Health, national medical-sanitary institutions, responsible for coordination and implementation of the Program, as well as non-governmental and international organizations, carrying out their activity in the field of health care.

The general public opinion is generally favorable to vaccinations, there are no ethnic, political or social movements against immunizations. However, a raising trend of resistance to immunization is followed over the last couple of years fuelled by some confessional believes as well as concerns raised following pandemic flu vaccination.

The vaccination coverage is high and percentage of refusals is low. Still country faces important socio-demographic problems related to high migration of population in – and out of the country, including children. In urban areas a late subscription with primary health care is observed that may lead to late vaccination of children. All that factors might affect the timely vaccination coverage and create pockets of unvaccinated children. Therefore a systematic and continuous advocacy support and communication activities are required in order to increase the demand for timely vaccination.

Problems

- The ICC does not include in its composition Civil Society Organizations (CSOs)
- Immunization program is not receiving sufficient financial support for conducting communication and social mobilization activities.
- The NIP lacks designated and trained staff capacity to efficiently develop and promote information and communication on benefits of vaccination
- A national resource place with information and communication materials on immunization needs to be established
- High migration and conflict in Transnistria region affects timely vaccination rates
- Some confessions express negative attitude toward vaccination

Objectives

- Increasing support and commitment for NIP through better dissemination of information and community involvement

Strategies

- Enhance the National Inter-agency Coordination Committee advocacy and communication of the NIP
- Strengthen political support and commitment to the Programme through planned advocacy activities;
- Strengthen the national capacity for communication and information;
- Increase community demand for immunization services through enhanced communication and information dissemination

3.3 SURVEILLANCE

Achievements

Surveillance of VPDs in Moldova is integrated with the general surveillance system of infectious diseases. Surveillance data on most VPDs are available for tenths of years. Evaluation of the national surveillance system has been performed with the support from WHO, identifying strengths and weaknesses of the system. Prioritization of diseases for surveillance was performed involving a variety of professionals from different areas and levels of the system. Case definitions have been established in 2007 for 78 communicable diseases and conditions, following WHO recommendations and EU legislation. The VPDs surveillance documentation is reflecting WHO standards.

Until now, the reporting system continue to be paper-based and almost entirely manual, with the exception of few programmes (i.e. Vaccine Preventable Diseases) that have introduced computer-based reporting from the rayonal to the national level, although not officially recognized by the Ministry of Health.

For the reporting cases of infectious diseases, health care establishments and facilities (namely, Health Posts (HP), Family Doctors Offices (FDO), Health Centres (HC), GP's Centres (GPC) and hospitals) have to fill in the form 058 on individual cases, that is sent within 24 hours to the rayon/municipality Centre of Preventive Medicine (CPM). Each outpatient case, as well as severe cases admitted to the hospitals, has to be notified first by telephone (Figure 5).

During epidemic outbreaks, aggregated notification of communicable disease cases is accepted instead of individual notification on forms 058. Data provided by form 058 are recorded at the level of the rayon/municipality Centre of Preventive Care in form 060, and if the laboratory result is positive, the case is being registered as a confirmed one.

On a monthly basis, the statistician from the rayon/municipality CPM aggregates data on all

confirmed cases of infectious diseases, fill in the monthly aggregate reporting form 2, that is further forwarded to the national level, that is NSPCPC. All rayon/municipality level CPMs are submitting their reports by both electronic mail and ordinary land mail.

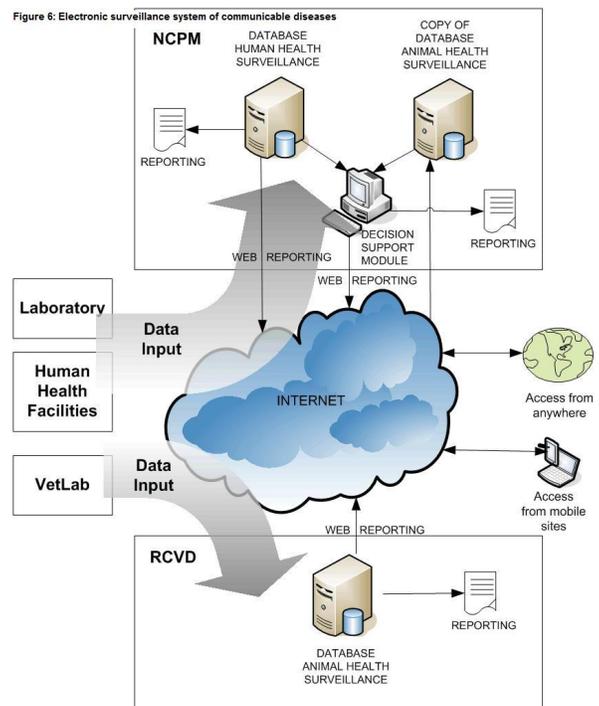
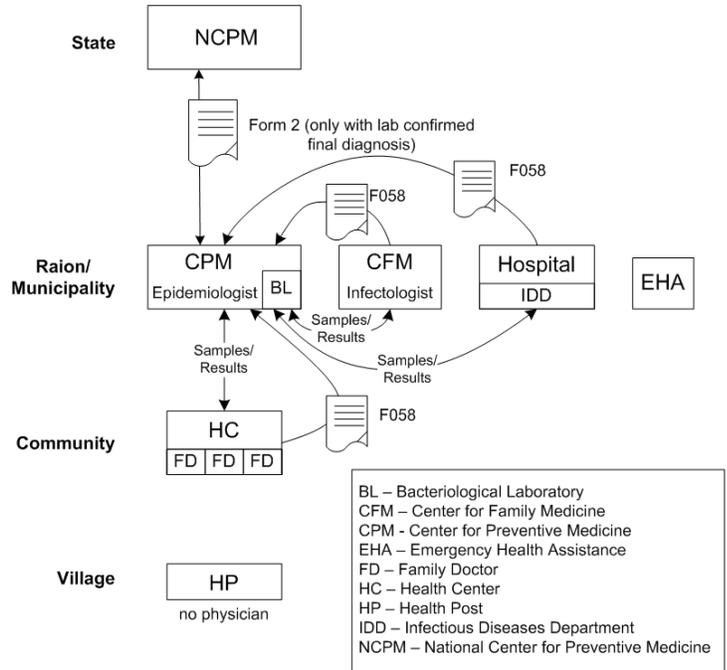
Figure 5. Flow of notification of communicable diseases under the current surveillance system

At the national level all monthly reports are processed, rates and trends are estimated and feed-back is provided.

If case investigation is decided, the epidemiologist will use form 357, that is a generic form, and not disease- or outbreak-specific. For VPDs cases the NSPCPM collects at the national level case based information using disease-specific case investigation forms.

In 2009 a “Improved surveillance system project” was initiated with the support from World Bank under the framework of a wider avian flu prevention and control project. The new system aims to bring together case based data on infectious diseases and aggregate data on outbreaks, collected and provided by the reporting physicians, epidemiologists and laboratories, and make them available instantly to decision makers at all levels of the health system. The main features of the system are:

- at least daily update/reporting period;
- on-line data entry and reporting;
- support for different data input scenarios - possibility of data entry in PHC and at the point of data creation (primary health care facilities, hospitals, PHC, laboratories) - in first phases only partially on levels;
- detection and reporting on both suspected and confirmed cases;
- flexible data sets (ability for adding new diseases, locations and similar) without changing the software;
- flexible reporting (ability to generate user defined reports)
- reporting on geographical attributes;
- various types of report (table, graph, map);
- various media of reporting (screen, paper, standard forms, world wide web)



- decision support module;
The system is scheduled to be fully functional by end 2010.

All rayon/municipality PHCs have bacteriological laboratories, which are involved in laboratory surveillance of communicable diseases and etiological confirmation of cases. But these bacteriological laboratories are not well-equipped.

Active laboratory surveillance of diphtheria, based on standard case definition has been carried out countrywide. Throat smears from healthy individuals are also examined laboratory with the aim to monitor spread of *C. diphtheriae* toxigenic (tox+) strains and carry our supplementary immunization activities if needed. Fage-typing of strains is routinely done.

Bacteriologists from PHCs and CHEs were recently trained in performing *H.influenzae* lab diagnosis and all bacteriological laboratories were supplied with methodological guidelines on the microbe 's diagnosis. However, due to shortage of diagnostic media and low awareness of clinicians on etiological role of *H.influenzae* for invasive diseases in children, laboratory diagnosis of this microorganism is still deficient.

AFP surveillance was established in 1995 and comprasis active surveillance and weekly zero reporting.

Laboratory diagnosis of viral infections is done mainly by the NSPCPM. Serological diagnosis of viral hepatitis (B and C) is routinely done in most of the PHCs and is also available in major hospitals in both the Western and the Eastern part of the country.

Case based information for measles cases is collected at the national level starting 1996. Starting 2004, laboratory investigation of samples from suspect rubella and measles cases is performed. In 2006 was initiated case based reporting to the national level for all suspect rubella cases.

National Measles and the national Polio laboratories are functional and both of them were certified by WHO.

Serological studies on population immunity to VPDs are performed systematically.

AEFI cases are subject to reporting and investigation following the same flow as for infectious diaseases. All suspect cases are reported based on specific reporting forms to the national level. All cases are investigated by rayon/municipality epidemiologists and severe cases are investigated with involvement of teams of experts from the national level. Aggregate monthly reporting of confirmed cases is performed as well.

Problems

Case definitions are not systematically applied, capacity for appropriate use of surveillance data management tools is weak, electronical surveillance system not yet fully functional, limited lab capacity for analysis of pertusis, mumps, rotavirus, bacterial meningitis, severe pneumonia, limited supervision capacity, tools and regular visits to district and health facility level, lack of adequate operational funds/support for case investigation, transportation of specimens to reference laboratories. Some districts, specially from Transnistria region are late in providing timely reporting.

Objectives

- Strengthen surveillance of VPD
- Strengthen laboratory capacity for detection of VPDs
- Strengthen vaccination coverage monitoring

Strategies

- Developing the national surveillance system of VPDs
- Improving quality of VPDs surveillance through capacity building activities
- Improving lab capacity for detection of VPDs
- Improving timeliness and completeness of reporting and monitoring coverage at district and facility levels

3.4 VACCINE SUPPLY, QUALITY AND LOGISTICS (IMMUNIZATION QUALITY AND SAFETY)

National Regulatory Authority (or its functions),

Moldova does not have a local production of vaccines. The Medicine Agency acts as the National Regulatory Authority in the Republic of Moldova. It is in charge for registration of medical drugs and biologicals for human use, including the vaccines. The National Public Health Center (NPHC) provides expertise during the process of vaccine registration. Due to absence of possibility for laboratory investigation of vaccine quality and safety, only vaccine from producers prequalified by the WHO for international deliveries, is admitted to national registration and procurement.

Vaccine procurement (including; vaccine quality and vaccine need forecasting)

Vaccine procurement is executed by means of public tenders. The NPHC staff, which is responsible for the Immunization Program conduct forecasting of quantities of required vaccines, establish the schedule of supply, develop technical requirements for vaccines, syringes, safety boxes and submit the requirements to the Medicine Agency, which, in its turn, initiate public tenders through the National Agency for Public Tenders. Tender conditions specify that only vaccines from WHO prequalified producers can be subject to tender offers. During the last 3 years, vaccines and syringes have been procured from the following producers:

- DTP, DT, Td, MMR and Hep. B – Serum Institute of India; GlaxoSmithKline Belgium
- BCG – Japan BCG Laboratory;
- OPV – Sanofi Pasteur, France and GlaxoSmithKline Belgium;
- Hep. B - LG Live Sciences, Republica Coreia;
- Hep. B – Shantha Biotechnics Private, India;
- Syringes BCG and AD 0,5 ml – Becton Dickinson.

Three parties conclude vaccine procurement contracts: Seller, Medicine Agency and the National Public Health Center acting as beneficiary of goods. Payment for goods is done in two stages - 30% prepayment and the rest within 30 days upon the delivery.

Vaccine management and delivery

Vaccines are delivered from the vaccine producer by air. Upon their arrival at the Chisinau airport, within 3 hours at the very latest, are delivered in producer's packing to the National Vaccine Store at NPHC. The store staff verifies the documents for the goods, state of vaccines, execution of the cold chain conditions, expiry date, quality, integrity of the product, etc. A vaccine arrival report is filled in for each supply. Vaccines are taken out from the package and are kept in corresponding conditions of the cold chain - OPV in freezers at 20-22°C below zero, and other vaccines – in refrigerators at +2-+8°C.

Rayon/municipality PHCs are responsible for picking up vaccines and injections supplies from the central level. Vaccine is distributed and delivered to rayon/municipality PHCs once in 3 months according to their requirements, based on vaccine planning. Vaccine is delivered by means of ordinary transportation vehicles in special cold boxes with ice packs used for polio vaccine and with packs of cold water used for other types of vaccines.

Maximum time of transportation does not exceed 6 hours to the most distant localities. The

schedule is done in a way that avoid transporting vaccines in months with the lowest and the highest temperature, which may present risk to vaccines.

Primary health care facilities receive vaccines from rayon/municipality PHCs by traveling to the district once per months, mostly at the end of each month. For vaccine transportation all of them are equipped with vaccine carriers and cool water packs. Almost all facilities are equipped with functional refrigerators. In case of failure of the refrigerator, vaccines are kept at the health center and are brought for outreach immunization sessions by family doctor, according to the scheduled.

Cold Chain and logistics

The national vaccine cold store has been established and equipped in 1994. Moldova immunization programme follows WHO recommendations in storage temperatures. All vaccines except OPV are kept in +2°C to +8°C cold rooms. OPV is kept in 4 units of Vestfrost model HF506 with net storage capacity of 1,852 liters. Cold room net storage capacity is measured as 4596 liters in chiller 1 and 4114 liters in chiller 2. The volume calculations in order to check availability of sufficient storage capacity are done with the assumption of total amount of vaccines of annual needs arriving once a year and on the same day. Even with this assumption, only 89% of the available storage capacity in +2°C to +8°C and 23% of the -15°C to -25°C will be occupied. Vaccine storage volume calculations by type of vaccine and storage temperature are shown in Table 15.

Table 15. Vaccine storage volume calculations for Chisinau primary vaccine store (EVSM, Dec. 2004)

Temperature	Type of vaccine	Annual needs in doses including safety stock	Total volume required in litres	Available storage volume in litres
+2°C to +8°C	BCG	280,408	337	8,990
	MMR	107,479	2,042	
	DTP	202,210	607	
	DT	66,218	199	
	Td	753,477	2,260	
	HepB	133,199	2,331	
	Subtotal for +2°C to +8°C		7,776	
-15°C to -25°C	OPV	288,728	433	1,852

*Assumptions: All vaccines arrive once a year and on the same day.
MMR is in mono-dose and HepB is in 2 dose vials
The measured net capacity of the two rooms assumes 80% utilization of available shelf volume.*

The net storage capacity of cold rooms was increased from 8,708 liters up to 8,990 liters with additional installed wooden crates (282 liters total for 2 cold rooms) under the wall mounted units.

As for campaigns a separate +2°C to +8°C cold room which is located in the same compound but in another building in the basement with approximately 82,000 liters capacity is used. This volume is way beyond the any campaign that has been conducted in Moldova.

In 2011 Moldova plans to install at the national vaccine store an additional cold room of 24m³ in order to expand capacity for rotavirus and pneumococcal vaccine introduction in 2012-2013.

Based on the current schedule, vaccine storage capacity at the national level exceeds the requested capacity. Provision of Hib component using 1 dose pentavalent (DTP-HepB-Hib) or 10 dose tetravalent (DTP-Hib) vaccines requires a storage volume per child from 99 to 103cm³. Implementation of rotavirus vaccine and pneumococcal vaccine would increase the required storage capacity per child to 397cm³. With the above mentioned upgrade the national store will feet comfortably new vaccines, provided the maximum annual vaccine stock is supplied in two shipments or the 82m³ cold room from

the basement is used for temporary storage.

During period of time 1994-2002 more than 1,160 refrigerators and freezers have been supplied to the rayon and primary health care levels in order to strengthen the cold chain. A cold chain inventory is kept both at the national and the municipal/rayon level which is updated annually.

Refrigerators are now available down to the village level (about 2/3 are “ice-lined”). Cold boxes, vaccine carriers, thermometers, icepacks and freeze-watch indicators were supplied to each health facility providing immunization services.

All PHCs have freezers in addition to refrigerators. They normally store vaccine for not more than 5 months. FDCs/FDOs and polyclinics are not permitted to keep vaccine stores for more than one month. According to the actual status, only vaccine stores from Chisinau, Cantemir and Ungheni require additional capacity to fit rotavirus and pneumococcal vaccines. In 2011 cold chain equipment at PHC level will be upgraded by supplying 30 refrigerators of 700 liters and 15 refrigerators of 500 liters. Thus, the storage capacity will be adequate to the present needs, including for using Hib component vaccines such as pentavalent DTP-HepB-Hib or tetravalent DTP-Hib + HepB, as well as for introducing rotavirus and pneumococcal vaccines. For details see table 16.

At the primary health care level there are 1551 health facilities providing vaccinations. The average number of children under one covered by one facility is 30. 87% of facilities are equipped with refrigerators with useful volumes varying from 20 to 100 liters that is far beyond the needs for storage of the monthly quantity of vaccine. The estimated existing storage capacity at operational level is over 55,700 liters while the required monthly capacity, including 50% reserve is about 800 liters. All health units covering more than 400 population are equipped with refrigerators. Those who are not equipped with refrigerators represent very small health units covering up to 400 population (4 children under one year of age). Outreach vaccination sessions are conducted there by family doctors from health centers that cover those small areas. All primary health care facilities are equipped with vaccine carriers and ice packs to ensure transportation of the vaccine and temporary storage during outreach activities.

Table 16. Cold chain storage capacity at rayon/municipality vaccine store level

DTP-HepB+Hib, Lyoph, 1 dose/vial + Rota + Pneumo

								0.3972
Required annual storage capacity/child (Lt) at T+4								
Required annual storage capacity/child (Lt) at T-20								0.0156
Nr.	Rayon/municipality d/o level vaccine store	Target population 2015	Existing storage Capacity (Lt) T+4	Existing storage Capacity (Lt) T-20	Required storage capacity for 1 quarter + 50% (Lt) T+4	Required storage capacity for 1 quarter + 50% (Lt) T-20	Excess (+) or Deficit (-) of Storage Capacity (Lt) T+4	Excess (+) or Deficit (-) of Storage Capacity (Lt) T-20
1	CMP mun. Chişinău	9624	585	376	1433	56	-848	320
2	CMP mun. Bălţi	1766	414	188	263	10	151	178
3	CMP Anenii Noi	996	198	188	148	6	50	182
4	CMP Basarabasca	309	108	188	46	2	62	186
5	CMP Briceni	821	173	188	122	5	51	183
6	CMP Cahul	1469	364	188	219	9	145	179
7	CMP Cantemir	802	108	188	119	5	-11	183
8	CMP Calaraş	891	173	188	133	5	40	183
9	CMP Căuşeni	1131	346	376	168	7	178	369
10	CMP Cimişlia	588	108	188	88	3	20	185
11	CMP Criuleni	1339	371	188	199	8	172	180

12	CMP Dondușeni	423	153	188	63	2	90	186
13	CMP Drochia	914	281	188	136	5	145	183
14	CMP Edineț	894	216	188	133	5	83	183
15	CMP Fălești	1067	216	188	159	6	57	182
16	CMP Florești	1009	236	188	150	6	86	182
17	CMP Glodeni	678	216	188	101	4	115	184
18	CMP Hincești	1431	306	188	213	8	93	180
19	CMP Ialoveni	1386	351	188	206	8	145	180
20	CMP Leova	610	108	188	91	4	17	184
21	CMP Nisporeni	833	128	188	124	5	4	183
22	CMP Ocnîța	472	108	188	70	3	38	185
23	CMP Orhei	1508	459	188	225	9	234	179
24	CMP Rezina	600	153	188	89	4	64	184
25	CMP Rîșcani	730	236	188	109	4	127	184
26	CMP Sîngerei	1082	261	188	161	6	100	182
27	CMP Soroca	1024	216	376	153	6	63	370
28	CMP Strășeni	1179	198	188	176	7	22	181
29	CMP Șoldănești	511	108	188	76	3	32	185
30	CMP Ștefan Vodă	861	153	188	128	5	25	183
31	CMP Taraclia	471	108	188	70	3	38	185
32	CMP Telenești	908	153	188	135	5	18	183
33	CMP Ungheni	1543	216	188	230	9	-14	179
34	CMP Comrat	951	281	188	142	6	139	182
35	CMP Ciadîr Lunga	841	128	188	125	5	3	183
36	CMP Vulcănești	276	198	188	41	2	157	186
37	CIE Tiraspol	1629	441	188	243	10	198	178
38	CIE Bender	878	216	188	131	5	85	183
39	CIE Camenca	218	45	188	32	1	13	187
40	CIE Dubasari	385	153	188	57	2	96	186
41	CIE Grigoriopol	472	198	188	70	3	128	185
42	CIE Rîbnița	803	198	188	120	5	78	183
43	CIE Slobozia	957	261	188	143	6	118	182
Total		47,280	9,647	8,648	7,042	277	2,605	8,371

Special guidelines on maintaining the cold chain were issued in Moldovian and Russian language and distributed to the vaccine stores and all immunization-providing sites. A special emphasis is placed on temperature regime (VVMs, freeze indicators etc). A reporting system for each case of violation of safe temperature range, documented by freeze indicators has been established in 2004.

A plan for gradual replacement of aging cold chain equipment is incorporated into the cMYP. It should be noted that it addresses requirements for additional capacity in case of both further new vaccines introduction and/or adding large scales supplementary immunization. Cost of cold chain maintenance and overheads will also be covered under the cMYP.

EVSM assessment

In July 2003 Moldova with assistance from WHO conducted its first primary vaccine store assessment for compliance to Effective Vaccine Store Management (EVSM) standards. By that time, Vaccine Arrival Report (VAR) was not in use. As a result, Moldova scored pretty low in the pre-shipment and arrival procedures (26%). Performance in other indicators ranged between 74 and 100%. Following the assessment recommendations, Moldova immunization programme has introduced a series of measures to improve the performance of the primary store and requested for an external assessment

which was performed through a WHO mission during 6-10 December 2004.

The assessment covers the process starting from procurement of vaccines up to its use according with the 10 criteria. The results of the assessment are shown in figures 7 and 8:

Figure 7: EVSM assessment, 2003

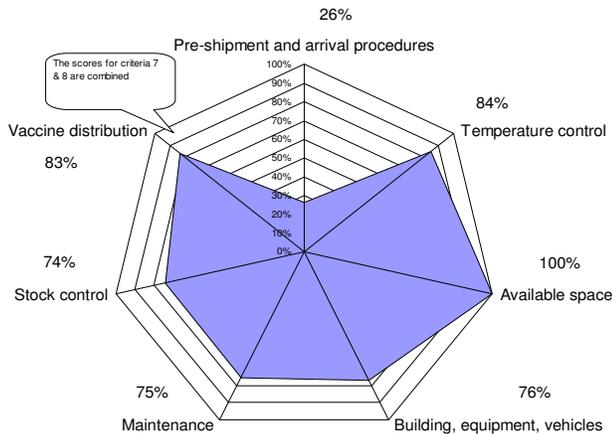
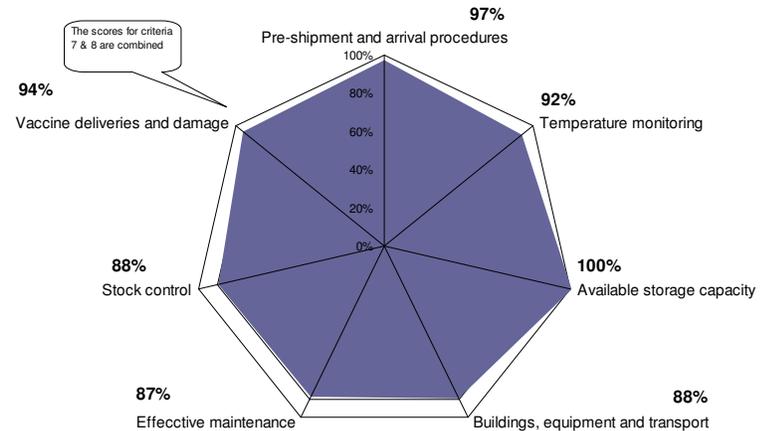


Figure 8: EVSM assessment, 2004



Recognition by WHO and UNICEF requires minimum 80% scoring in each and every indicator. Moldova primary vaccine store has proven to be managed effectively over the period of 12 months meeting the established global criteria and therefore Moldova primary vaccine store was awarded with a recognition certificate.

Safe administration of vaccine (injection safety),

The risk of spread of blood borne pathogens is supported by obvious overuse of injectable medicines in Moldova. Thus, from approximately 60-70 million syringes purchased annually only 1-2% are for routine immunization purposes. Since 1999 safe injection supplies have been fully introduced to the program.

The policy of the Ministry of Health of R. Moldova is that 100% of injections given in both the public and private health sectors for any purpose must be safe. It means that every injection must be given with a sterile single-use syringe and needle, which is then safely disposed of after use.

All injectable antigens provided by the national immunization programme (both primary series and boosters) should be given through only auto-disable syringes (ADs).

Only ADs should be used during supplemental immunization activities for both children and adults.

Since 2001 the Government of Moldova started to gradually increase its financial contribution for all required AD-syringes, reconstitution syringes. Moldova benefited of GAVI support for safety of injections that was channeled for strengthening injection safety implementation and was used to initiate local production of safety boxes. Starting 2007 the Government covered 100% of all syringes and safety boxes needs for NIP.

During 2006 all syringes for routine immunizations were procured with funds provided by the Government while GAVI injection safety funds were used for the procurement of Safety boxes.

A competition of local producers of safety boxes was accomplished, that allowed achieve a reasonable price per local produced safety box (0.6\$/box).

Alternative solutions, including recycling, melting etc. of used syringes, are also under consideration. A plan of procurement of electric needle destroyers for large health centers has been

incorporated into current MyP.

In order to monitor the use of safety boxes at the health facility level an indicator is included in the monthly vaccination reports (no. of used safety boxes per 100 of used syringes). The values of the indicator are provided in the table 17:

Table 17. No. of used safety boxes per 100 of used syringes, by year

Year	2002	2003	2004	2005	2006	2007	2008	2009
Safety box usage indicator	0.73	0.86	0.83	0.87	0.49	0.9	1.01	1.1

During 2003-2005 usage of safety boxes per 100 syringes was more than 0.83, that means almost all immunization syringes were collected properly into safety boxes. The value of the indicator (0.49) in 2006 reflects problems of supply of safety boxes due to delays registered with initiation of the local production of safety boxes. During 2007-2009 supply of safety boxes of local production covered all programme needs.

Waste management and disposal

According to the national policy, used injection equipment should be addressed within the context of the National regulation on medical waste disposal. It means that syringes and needles be collected immediately after use, in single-use sharps puncture resistant containers, which are color coded (yellow), labeled “Biological hazard” and are destructed together with their content. Up to date the achievements of Moldova regarding to the safe disposal of sharp waste produced by the immunization program are as follows:

- Disposable syringes and needles, including auto-disable and reconstitution syringes, are disposed of immediately following use in a designated safety box or sharps puncture-proof container;
- The needle is not recapped or removed from the syringe: the whole combination is inserted into the safety box directly after use;
- A system tracking stocks, the distribution and utilization of injection equipment and safety boxes is introduced countrywide and is integrated in monthly vaccination reports;
- Additional waste from injections (cap, syringe packaging) are disposed of as common waste;
- Full safety boxes are incinerated in small numbers by open burning in a pit or in iron vessels. These methods of destruction are particularly practiced by small producers of sharp waste (village health centres and posts, small family doctors centres);
- Residue from incineration (oxidized needles, vials, etc.) are buried in a common waste pit.

One of the main issues that still require an effective solution is identifying safe and environment friendly waste disposal solutions. The current practice of burning safety boxes is not considered environment friendly and is regarded as a temporary solution. Implementation of high temperature incineration is also questionable due to the need of huge investments, problems meeting environment regulations, ensuring sustainability of the process. The safe sharp waste disposal was subject of a number of meetings and workshops involving national and international organizations, NGOs. Possibilities for radical solution of medical waste destruction through building 1-3 plants were explored. That requires important investments and also raises issues related to sustainability of running those facilities. Other options include using autoclaves and shredders. Unfortunately, an agreement was not achieved yet regarding the most cost effective and sustainable solution.

Taking into consideration immunization services are integrated in Moldova with primary health care, safe disposal of immunization sharp waste is addressed in the context of disposal of all medical waste produced by health facilities, as it represent only a small fraction of that waste. Actually there is a need to solve the issue of disposal of all hazardous medical waste generated by health facilities.

Another issue that need to be addressed is further training of immunization staff on safe injection techniques, with special focus on proper injection site.

Open vial policy and vaccine wastage

Before 1994, practically all the vaccines used by the Moldova Immunization Programme were produced in the former USSR and were formulated in one - two dose ampoules (except BCG, which was produced in 20 doses ampoules). Little attention had been paid to vaccine wastage but due to the availability of low-dose ampoules it was probably insignificant.

Since 1994, a lot of the NIP antigens have been supplied in multi-dose vials. This practice generated managerial problems due to some demographic patterns of the Moldova population. Thus, as one birth cohort accounts for 1% of the total population and the average number of children from one birth cohort served by a medical facility is about 30, 25% of the country's health facilities serve birth cohorts smaller than 10 children. Using 10-20 doses vials under such conditions results in either high vaccine wastage or rare immunization sessions and delay of immunization.

Moldova adopted the Open Vial Policy in 1996. It allowed to lower vaccine wastage. Wastage rates for liquid vaccines (OPV, DTP, HepB, DT, Td) are now in the range of 2%-12%. The lowest wastage rate (2%) is observed with the HepB vaccine. That is mainly due to the implementation of a hepB mix (2-dose vials) supplied by GAVI.

The situation is different with the freeze-dried vaccines (BCG) where wastage rates is much higher than 60%. This is determined by the need to open BCG vial at least 3 times a week in order to immunize newborns at maternity ward. Due to low birth rates wastage of BCG vaccine is high. Low wastage rate for MMR vaccine is achieved by implementing a combined strategy of use of 1 dose and 5-10 dose vials, depending on the size of the immunization session. An increase of wastage rate was observed in 2008 for DTP vaccine due to replacing it with tetravalent DTP-Hib. During first year of implementation of DTP-Hib liquid vaccine in 10 dose vials, wastage rate was 17% and it is expected to be lower in subsequent years.

Wastage rates for syringes varied from 2 to 4 percent during the last three years (see table 18).

Table 18. Wastage rates for vaccines and syringes in the Republic of Moldova

Vaccine/Syringes	2005	2006	2007	2008	2009
BCG	62%	60%	61%	63%	64%
Hep. B	2%	2%	2%	2%	3%
OPV	9%	11%	18%	12%	10%
DTP	7%	7%	7%	28%	7%
DT	23%	12%	15%	16%	12%
Td	7%	6%	6%	7%	5%
MMR	6%	4%	5%	3%	7%
DTP+Hib	X	X	X	X	17%
BCG syringes	4%	3%	3%	4%	4%
AD 0,5 syringes	2%	3%	3%	4%	3%

Adverse events following immunization surveillance system

AEFI cases are subject to reporting and investigation following the same flow as for infectious diseases. All suspect cases are reported based on specific reporting forms to the national level. All cases are investigated by rayon/municipality epidemiologists and severe cases are investigated with involvement of teams of experts from the national level. Aggregate monthly reporting of confirmed cases

is performed as well.

Open vial policy was implemented countrywide in 1996 and after 10 years of its field use no major adverse events after immunization have been observed that would be associated to vaccine storage and handling. No single case of death associated with AEFI was reported during the above mentioned period.

Following the national reporting system, during the last three years there were registered each year from 54 to 70 cases of AEFI. The highest rate per 100 of administered doses is observed for BCG vaccine (0.043-0.08) followed by DTP vaccine (0.006-0.012). Following new DTP-Hib vaccine the rate of AEFI occurrence was 0.007. Sporadic cases of AEFI are observed after administration of DT, Td and MMR vaccine (see table no. 19).

In order to further strengthen knowledge on immunization safety a national guideline on Safe Immunization Practices was developed and field tested in two districts. It addresses in an integrated manner all activities related to safe delivery of immunization services.: (1) safe vaccine storage (temperature monitoring through thermometers, freeze indicators, VVM, checking of expiry dates); (2) safe vaccines handling and administration (safe injection - use of only auto-disable syringes for all NIP antigens administration, appropriate injection site and technique, open vial policy, reporting of adverse events following immunization - AEFI); (3) Safe waste disposal (collection of disposal in safety boxes, discarding of waste).

Table 19. Reported AEFI cases by antigens

Vaccine	2007			2008			2009		
	# doses administered	# AEFI	%	# doses administered	# AEFI	%	# doses administered	# AEFI	%
BCG	80005	34	0.043	78340	44	0.056	79094	60	0.08
Hep. B	139874	0	0	143979	1	0.0006	133521	0	0
Polio	205775	0	0	197327	0	0	197058	0	0
DTP	158282	16	0.01	157786	19	0.012	66120	4	0.006
DT	40983	0	0	39170	0	0	38224	0	0
Td	406586	2	0.0005	409161	0	0	385084	0	0
MMR	79190	2	0.003	435167	0	0	99937	0	0
DTPHib	X	X	X	X	X	X	88695	6	0.007

Objectives

- Ensuring safe administration of assured quality of vaccines and safe disposal

Strategies

- Improving self-reliance in quality assurance and regulatory oversight
- Ensure procurement of qualified vaccines that meet internationally recognized quality standards
- Improve and strengthen vaccine stock management and delivery systems at district level
- Ensure availability of adequate cold chain and logistics to maintain quality of vaccines
- Ensure implementation of safe injection practices
- Ensure proper management of (health care) waste and safe disposal
- Strengthen surveillance and response to adverse events following immunization (AEFI)

3.5 PROGRAMME MANAGEMENT

The National Immunization Program has organizational structures at national, rayon/municipality and local level. Immunization program has a long-term strategic plan covering a 5 year period of time. The NIPn is aligned with the national Health Policy issued by the Government of

Moldova on August 2007 defining immunization as a priority in the framework of the efforts made by the Government and civil society, aimed at continuous strengthening of the population's health and improvement of the economic and social situation in the country. The NIP addresses the WHO GIVS and meets MDG goals on mortality reduction.

Following the National health Policy, the Health System Development Strategy for the period 2007-2016 has been developed with the goal to improve people's health, upgrading the financial protection and degree of satisfaction of the public through adequate enhancement of the Health system performance. Besides strategic plan there are separate plans for certain program components, which are in line with WHO guidelines.

The cMYP is in line with those strategic plans but providing more detailed operational information regarding needs and required funds for the program. Annual work plans will be prepared for each coming year to address into details all specific activities.

Strategic planning function of the program is being strengthened with an Interagency Coordination Committee (ICC) in terms of coordination and partnership.

The composition of ICC is quite limited with major partners of the program during the cMYP period, strengthening of ICC participation is targeted in order to cover all potential stakeholders and partners.

Financial sustainability: Over the last five years the NIP benefited of sustainable increasing financing from the national budget, health insurance and international donors to ensure both procurement of routine NIP vaccines and syringes, as well as vaccines and injection safety supplies for new vaccines (seasonal influenza, hepatitis A) and for expanding protection of currently used vaccines to age groups beyond the NIP target population (MMR immunization campaign in youth and young adults). The Government of Moldova provided financing for vaccines and injection safety supplies for all routine EPI antigens, except Hib containing vaccine co-financed by GAVI. Health insurance company and international donors provided assistance for vaccines used in emergency settings, such as MMR campaign to take under control mumps epidemic, seasonal influenza, hepatitis A provided to population in flooded areas. The overall amount of funds dedicated to procurement of vaccines and injection safety supplies the program achieved the highest level in 2008 - \$8,619,469. Data on financing of NIP are provided in the table no. 20.

Table 20. Data on financing of NIP for vaccines and injection safety supplies

Financing sources	2002	2003	2004	2005	2006	2007	2008	2009
Gov. Moldova	\$ 165,465	\$ 219,629	\$ 456,616	\$ 412,595	\$ 498,217	\$ 568,125	\$ 754,228	\$ 680,247
Health In. Fund	0	0	0	0	0	\$ 1,389,264	\$ 2,236,671	0
GAVI	\$ 197,233	\$ 94,982	\$ 38,722	\$ 91,500	\$ 96,000	\$ 38,511	\$ 347,760	\$ 526,034
JICA	\$ 186,246	\$ 130,108	\$ 120,371	0	0	0	0	0
UNICEF	\$ 53,719	\$ 24,913	\$ 20,246	\$ 19,233	\$ 1,500	0	0	0
WHO	\$ 115,437	\$ 21,117	\$ 10,000*	\$ 10,000*	\$ 15,000*	0	0	0
CDC/M.of Dime	\$ 758,426	0	0	0	0	0	0	0
World Bank	0	0	\$ 330,295	0	0	\$ 148,080	\$ 114,713	0
Merk Sharp	0	0	0	0	0	0	\$ 4,440,540	0
Other	0	\$ 41,438	0	0	0	0	\$ 725,708	0
Total	\$ 1,476,233	\$ 532,187	\$ 976,250	\$ 533,328	\$ 610,717	\$ 2,152,978	\$ 8,619,469	\$ 1,206,281

*Estimates

Human resource and training: The human resources development issues were highlighted above and cover both primary health care and public health services. Although important steps were made to

strengthen the family doctors services, more efforts are required to cover with adequate training on immunization safety and management of NIP.

The last comprehensive assessment of quality of immunization services was done in 2001 and it is time now to conduct with the support from partners a new assessment of current knowledge, practice and attitudes of health professionals involved in management and implementation of immunization program in order to identify weak elements and capacity and develop appropriate strategies to improve the effective management and safety of services.

Regardless the availability of well defined specific plan it is envisaged to conduct training for mid level managers (district and oblast level) and central (national) level on the following training programs: “Immunization in Practice” , “MLM EPI course” and “Integrated Surveillance”.

Reporting of coverage: vaccination coverage is done on monthly basis from facility level to upper level used by standard form covering vaccines for all VPDs as well as AEFI.

Timeliness and completeness of reporting: reporting is performed generally on time and there are no systematic completeness problems with facilities reporting to district level. Timeliness and completeness of reporting from rayon/municipality level to the national level is appropriate. Quarterly feedback is available from national level to rayon/municipality level consisting of analysis performed at rayon/municipality level. Feedback system is not universally functional below rayon/municipality level. Actions taken based on analysis is quite limited with administrative measures and not supported with supportive supervision due to lack of operational resources and concept on performance development.

Available financing for control functions is very limited and insufficient for conducting effective management of the program.

Supportive supervision: Supportive supervision is one of the weakest functions of the program mainly due to lack of resources and mobility of the staff. If additional external resources will be available (through GAVI/HSS support), funding of supervision function at the rayon/municipality level should be a priority using those resources.

Objectives

- Improve national immunization programme management through better use of domestic and external resources within the context of country health system development process

Strategies

- Ensure adequate and sustainable financing of NIP through integration of cMYP into national budgetary and planning processes
- Strengthen country capacity to evaluate National Immunization Programme, determine and set NIP priorities and policies;
- Strengthen the National Immunization Programme within the context of the health system development
- Assess, develop and sustain the benefits of integrated interventions;
- Promote and develop research;
- Improve management of human resources;
- Improve communication and dissemination of information and increase community demand for immunization;
- Promote partnership, national and international collaboration, define and recognize the roles, responsibilities and accountability of partners.

4. IMMUNIZATION PROGRAMME STRATEGIES AND KEY ACTIVITIES

PROBLEMS IDENTIFIED	OBJECTIVES (LINKED WITH PROBLEMS)	STRATEGIES	KEY ACTIVITIES	TIMELINE (ACTIVITY)
1. Polio Eradication Programme				
Despite the overall satisfactory surveillance system performance, some rayons (20%) do not provide on time weekly zero reports, there are some silent areas where AFP were not reported for many years. Competing health priorities pose pressure on time dedicated to non-polio AFP surveillance and eradication among health staff, lack of epidemiologist in some rayons to manage the Programme, insufficient supervision to districts, insufficient quality of active surveillance, insufficient frequency of feedback	1. Maintaining polio free status	1. Improving non-polio AFP surveillance performance	1.1. Conduct regional trainings on AFP surveillance for health workers and rayon epidemiologists with a special focus to silent areas to improve reporting and active surveillance	2011-2012
			1.2. Strengthen monitoring of surveillance through enhanced regular supervision and support operational cost	2011-2015
			1.3. Advocate for importance of AFP surveillance at policy/decision-making level to mobilize more resources for the Programme (financial and human resources)	2011-2015
			1.4. Integrate the polio lab into the National virology laboratory to share common resources	2011
			1.5. Provide international training to the National virology laboratory staff on national polio diagnosis	2011-2012
			1.6. Coordinate with agencies which have better access to Transdnistria to improve cooperation	2011-2015
			1.7. Continue for providing reagents and kits for polio lab	2011-2015
		2. Providing additional vaccination opportunity to children at increased risk	2.1. Conduct annual assessments of the need for SIA	2011-2015
			2.2. Conduct SIA in high risk areas	2011-2015
		3. Maintaining high coverage with OPV vaccines through routine vaccination	3.1. Covered under routine immunization section	Refer to routine imm.
4. Strengthen research on population immunity and poliovirus circulation	4.1 Assess population immunity against polio among children, youths and young adults	2011, 2015		
	4.1 Evaluate poliovirus circulation in the environment	2011-2015		

2. Measles & rubella elimination and congenital rubella syndrome (CRS) control programme				
No lab based confirmation of all suspected cases, difficulty in collecting blood samples from all suspected cases, refusal for specimen collection and hospitalization, difficulty and delay in delivering samples from remote districts, some districts not reporting, high risk for importing measles and rubella from neighbouring countries, inadequate hospitalization of suspect cases, inadequate investigation for rubella of children with congenital malformations	2. Maintain elimination of measles, rubella and congenital rubella infection by 2015	2.1. Improving MR and CRS surveillance	2.1.1. Provide training for health facility and hospital staff on MR and CRS surveillance	2011, 2013
			2.1.2. Provide training for district epidemiologist on MR and CRS surveillance	2011, 2013
			2.1.3. Conduct lab based investigation and confirmation of all suspected cases	2011-2015
			2.1.4. Provide operational support to specimen transportation to the national measles lab	2011-2015
			2.1.5. Provide needed amount of reagents to national measles lab to conduct analysis for all suspected cases timely	2011-2015
			2.1.6. Develop and print a guide for the health staff on Counseling patients with measles rubella and explaining importance of specimen collection to minimize refusals	2011
			2.1.7. Conducting studies to assess M&R immunity levels by age groups to identify populations under risk	2012, 2015
			2.1.8. Continue conducting studies to assess feasibility of implementing alternative specimens	2012-2013
			2.1.9 Training of Lab staff on M&R virus isolation and PCR diagnostics techniques	2013
			2.1.10 Procurement of supplies and implementation of M&R virus isolation and PCR diagnostics techniques	2013-2014
			2.1.11 Systematic assessment of burden of M&R in neighboring countries and provide feed-back to districts and service level	2014-2015
		2.2 Improve clinical management of suspected measles, rubella and CRS	2.2.1 Review and update clinical protocol for clinical management of measles, rubella and CRS	2012-2013
			2.2.2 Conduct national and regional trainings on clinical management of measles, rubella and CRS	2013-2014
			2.2.3 Integrate protocols for clinical management of measles, rubella and CRS in university and postgraduate training curricula	2014-2015
		2.3 Providing additional vaccination opportunity to individuals at increased risk and/or lacking	2.3.1 Establish a reserve stock of vaccine and supplies for additional vaccination of individuals at increased risk	2013

		immunity		
			2.3.2 Update national M&R surveillance guidelines to incorporate policy on providing additional vaccination opportunity to individuals at increased risk and/or lacking immunity	2013
		2.4. Maintaining high coverage with 2 doses of MMR vaccines through routine immunization	2.4.1. Covered under routine immunization section	Refer to routine imm.
		2.5 Continue systematic research of the immune status of population against measles and rubella	2.5.1 Asses population immunity against M&R among children, youths and young adults	2011, 2015
			2.5.2 Study the need for implementation of a M&R booster dose for youths	2011, 2015

3. Elimination of maternal and neonatal tetanus (MNT)

No specific problem observed	3. Maintaining eliminated status of MNT	3.1. Maintaining MNT surveillance	3.1.1. Continue conducting studies to assess immunity levels among different age groups	2011, 2015
		3.2. Maintaining high coverage with T containing vaccines through routine immunization (primary series and booster doses)	3.2.1. Covered under routine immunization section	Refer to routine imm.
			3.2.2 Implement mandatory chek-up of immunization status against tetanus of pregnant women during first pregnancy visit, update pregnant health card to include tetanus immunization data	2011

4. Accelerated control of diphtheria

No specific problem observed	4. Maintaining elimination status of diphtheria	4.1. Maintaining diphtheria surveillance	4.1.1. Continue conducting search for diphtheria among suspect (tonsilitis) cases	2011-2015
			4.1.2. Continue conducting studies to assess immunity levels among different age groups	2011, 2015
			4.1.3. Review national guidelines in line with current disease epidemiology	2012
			4.1.4 Implement PCR techniques in laboratory diagnostics of diphtheria	2012

		4.2. Maintaining high coverage with D containing vaccines through routine immunization (primary series and booster doses)	4.2.1. Covered under routine immunization section	Refer to routine imm.
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5. Control of Hepatitis B

<p>1. High risk of viral hepatitis B vertical transmission remains due to proportion of pregnant women who are HBs-antigen carriers comprises 8-12%.</p> <p>2. Breakthrough VHB infection in vaccinated children was documented</p> <p>3. The highest age specific incidence rates of acute hepatitis B are registered among young adults 20-29 years of age</p>	Further reduce VHB incidence rate, specially perinatal transmission and transmission in youths and young adults	5.1. Strengthening HepB surveillance	5.1.1. Continue screening of pregnant women and other high risk groups	2011-2015		
			5.1.2. Continue conducting serosurveys to assess immunity levels and impact of hepatitis B vaccination	2011,2015		
			5.1.3. Review and update the National Program of viral hepatitis control in line with current disease epidemiology	2012-2012		
			5.1.4. Countrywide implementation of the diagnostics algorithm for all suspected acute hepatitis cases, including hepatitis B	2013		
			5.1.5. Continue checking donated blood	2011-2015		
				5.2. Maintaining high coverage with HepB vaccines through routine vaccination	5.2.1. Covered under routine immunization section	Refer to routine imm.
				5.3 Strengthen research toward reducing perinatal hepatitis B transmission	5.1.6. Research and implement management algorithms to reduce/prevent perinatal transmission	2012-2013
		5.4 Reduce transmission of hepatitis B virus in youths, young adults and other groups under risk	5.2. 1. Assess the high risk groups for acquiring hepatitis B infection, including youths, young adults and other groups under risk	2011-2012		
			5.4.1 Develop a national strategy for reducing transmission of hepatitis B virus in youths, young adults and other groups under risk	2012-2013		

6. Delivery of routine immunization services and immunization coverage

Lack of epidemiologists in some districts, lack of staff at health facility level, Unmet needs for additional and systematic training and training tools on vaccine	6. Achieving at least 90% coverage for all NIP antigens in all districts by 2012	6.1 Ensure universal access of population to immunization services and reach everybody targeted for immunization	6.1.1 Monitor provision of immunization services by each primary health care unit	2011-2015
			6.1.2 Prepare contingency plans for provision of immunizations to each community, addressing most common emergencies (lack of local health staff, electricity and cold chain equipment failure etc.)	2012

management, and high turnover, Weak supportive supervision, Extensive contraindications, denominators problems, limited resources and capacity for social mobilization		6.1.3 Ensure each remote community is provided with outreach services at least two times per month	2011-2015
		6.1.4 Increase frequency of immunization sessions through introduction of less dose vials	2011-2015
		6.1.5 Review contraindications in national guidelines to reduce false contraindications	2011
		9.1.6 Provide operational support to ensure provision of regular outreach services	2011-2015
	6.2. Strengthen vaccine-management and improve vaccine, immunization and injection quality and safety	6.2.1. Cooperate and provide guidance to training institutions to improve curriculum for family medicine doctors and nurses in line with NIP requirements	2012
		6.2.2. Cooperate and provide guidance to continuous medical education (CME) institutions to improve curriculum in line with NIP requirements	2012
		6.2.3. Advocate for impact of CME in improving quality of immunization services	2011-2015
		6.2.4. Review current immunization guidelines for family medicine doctors and nurses	2011
		6.2.5. Provide mid-level management (MLM) training for district epidemiologists in priority districts (also for training staff of undergraduate and CME training institutions)	2011-2012
		6.2.6. Provide immunization in practice (IIP) training for health facility staff in priority districts	2011-2012
6.2.7 Develop supportive supervision tools for district managers		2011	
6.2.8. Conduct regular supportive supervision to district and health facility levels		2011-2015	
	6.2.8. Provide operational support to supportive supervision activities	2011-2015	
	6.3. Increase demand for immunization services	6.3.1. Covered under advocacy & social mobilization section	Refer to advo.& com.

7. New and underused vaccines introduction				
High vaccine cost, Insufficient disease burden data and limited surveillance capacity; Unreliable supply of DTP-Hib vaccine during 2008-2010	7. Expand national immunization programme through introduction of new and underused vaccines	7.1. Strengthen surveillance of Hib, Str. pneumoniae and Rotavirus and collect evidence for decision-making for introduction of new and underused vaccines	7.1.1. Strengthen surveillance through introduction of latex test for Hib, Str. pneumoniae, N.meningitidis in public health laboratories	2011
			7.1.2. Expand the sentinel based surveillance system for rotavirus infection and integrate it with surveillance of acute diarrhea diseases	2011-2015
			7.1.3. Integrate surveillance for Hib, Str. Pneumonia, N.meningitidis with sentinel surveillance of influenza, ARI and LARI;	2011-2015
			7.1.4. Collect further evidence on effectiveness of pneumo vaccine introduction (circulating serotypes)	2011-2015
			7.1.5. Review national guidelines for surveillance and control of bacterial meningitis and severe pneumonia	2012-2013
			7.1.6. Implement surveillance of acute severe pneumonia and other invasive diseases;	2012-2015
	7.2. Achieve reliable supply of Hib containing vaccine		7.2.1. Assess and discuss implementation status of Hib containing vaccine (vaccine supply, vaccination coverage, vaccine wastage, financial sustainability) in Inter-Agency Coordinating Committee (ICC) meeting and inform GAVI, WHO and UNICEF SD through the APR	2011
			7.2.2. Improve communication with partners and assess reliable alternatives of supply of Hib containing vaccine, i.e. formulations, presentations and prepare a emergency PoA for replacing vaccines that are in short supply on the international market	2011
	7.3. Introduction of rota and pneumo vaccine through GAVI New and Underused Vaccines (NUV) support		7.3.1. Discuss introduction of rota and pneumo vaccine (cost-effectiveness and financial sustainability) through GAVI NUV support in Inter-Agency Coordinating Committee (ICC) meeting and obtaining commitment of Government and partners	2011
			7.3.2. Develop proposal for GAVI NUV support to introduce rota and pneumo vaccine	2011
			7.3.3. Introduce universal rotavirus vaccination	2012-2015

			7.3.4. Introduce universal pneumo vaccination	2013-2015
			7.3.5. Conduct activities that will be stated in new the vaccine implementation plan attached to the application	2011-2015

8. Advocacy, communication and social mobilization

<p>The ICC does not include in its composition Civil Society Organizations (CSOs); Immunization program is not receiving sufficient financial support for conducting; communication and social mobilization activities</p> <p>The NIP lacks designated and trained staff capacity on information and communication;</p> <p>Lack of a national resource place with information and communication materials on immunization;</p> <p>High migration and conflict in Transnistria region affects timely vaccination rates;</p> <p>Some confessions express negative attitude toward vaccination.</p>	<p>8. Increasing support and commitment for NIP through better dissemination of information and community involvement</p>	<p>8.1. Enhance the National Inter-agency Coordination Committee advocacy and communication of the NIP</p>	8.1.1. Advocate for expansion of ICC composition to involve representatives of; budgeting/financing, planning, family medicine, maternal and child health, health care reform units of Ministry of Health	2011	
			8.1.2. Regularly disseminate minutes of ICC meetings to all stakeholders	2011-2015	
			8.1.3. Conduct a meeting with the NGOs to discuss Participation in ICC	2011	
			8.1.4. Conduct a meeting with Transnistria authorities to discuss participation in ICC	2011	
		<p>8.2. Strengthen political support and commitment to the Programme through planned advocacy activities</p>		8.2.1. Prepare a national advocacy and communication plan for the current cMYP cycle, covering activities targeting politician/decision-makers, professionals (health care), partners, press (media) and parents	2011
				8.2.2. Plan and implement European Immunization Week activities at national and district levels every year	2011-2015
				8.2.3. Regularly produce press releases, situation analysis notes and feedback and conduct other planned advocacy activities to inform stakeholders on progress of routine immunization activities	2011-2015
				8.2.4. Prepare contingency plans to be used in case of media crisis and/or to manage opponents to NIP	2011
				8.2.5. Assess regularly level of support provided to NIP to identify impact of advocacy activities and to identify further actions needed	2011-2015
		<p>8.3 Strengthen the national capacity for communication and information;</p>		8.3.1. Designate/recrute staff responsible from advocacy, communication and information activities at national and district levels	2011-2015
8.3.2. Train designated staff on advocacy and communication skills	2011-2015				

		8.3.4 Identify specific needs on advocacy and communication by assessing knowledge/attitude toward NIP of policy makers and population	2013
		8.3.5 Engage health Insurance company in supporting NIP information and communication activities	2011-2015
	8.4. Increase community demand for immunization services through enhanced communication and information dissemination	8.4.1. Assess communication and information gaps that need to be addressed to increase community demand for immunization services	2011-2015
		8.4.2. Identify programme messages on benefits of immunization targeting parents	2011
		8.4.3. Develop information education and communication (IEC) materials on benefits of immunization	2011-2015
		8.4.4. Establish a public resource center with communication and information resources on immunization;	2012
		8.4.5. Contact with community leaders to improve public involvement and participation through increased awareness on immunization benefits	2011-2015
		8.4.6. Inform schoolchildren/students on benefits of immunization to communicate programme messages to families	2011-2015
		8.4.7 Conduct assessment of further involvement of non-governmental organizations (NGOs) in delivery of immunization services with special emphasis to low performing districts (considering available GAVI support in this field)	2011

9. Surveillance of vaccine preventable diseases (VPDs) and coverage monitoring				
Case definitions are not systematically applied, capacity for appropriate use of surveillance data processing tools is weak, electrical surveillance system not yet fully functional, limited lab capacity for analysis of pertussis, mumps, rotavirus, bacterial meningitis, severe pneumonia, limited supervision capacity, tools and regular visits, lack of adequate operational funds/support for case investigation, transportation of specimens to national level. Delay in timely reporting from some districts, concerns on accuracy of denominator	9. Strengthen surveillance of VPD	9.1. Developing the national surveillance system of VPDs	9.1.1. Conducting an integrated assessment of surveillance of VPDs (WHO)	2011
			9.1.2. Develop the National Guidelines on integrated surveillance of VPDs in line with WHO recommendations	2011-2012
			9.1.3. Review, update and print the revised case notification and case investigation forms	2011-2012
			9.1.4. Integrate surveillance of VPD within the national electronic surveillance system of communicable diseases	2011
			9.1.5. Shifting to electronic reporting of VPD	2011
			9.1.6. Integrate rotavirus surveillance with acute diarrhea surveillance	2012-2015
			9.1.7. Integrate Hib and pneumococcal surveillance with LARI/Influenza surveillance	2012-2015
			9.1.8. Implement surveillance of acute severe pneumonia and other invasive diseases;	2012-2015
			9.1.9. Improving data processing infrastructure (procurement of software and hardware)	2012-2013
		9.2. Improving quality of VPDs surveillance through capacity building activities	9.2.1. Conducting a training of trainers on integrated surveillance of VPDs (national level and selected district level staff) (WHO)	2012
			9.2.2. Conducting training for district epidemiologists on integrated surveillance of VPDs	2012
			9.2.3. Conducting training for health facility and related staff on integrated surveillance of VPDs	2012-2013
			9.2.4. Develop supportive supervision tools	2012
			9.2.5. Conducting regular supportive supervision to district level on surveillance of VPDs	2012-2015
			9.2.6. Provision of operational support for case investigation, transportation and specimens	2011-2015
			9.2.7. Conduct training of district and national epidemiologist on use of computerized data management systems for surveillance of VPD	2011-2012
		9.3. Strengthen laboratory capacity for detection of VPDs	9.3.1. Asses the national lab network for surveillance of VPD	2011
			9.3.2. Develop a national plan for developing Laboratory capacity for detection of VPD, defining levels, responsibilities and logistic requirements	2011

		9.3.3. Strengthen the system of transportation of samples from VPDs	2011-2015
		9.3.4. Strengthen laboratory detection capacity through introduction of latex test for Hib, Str. pneumoniae, N.meningitidis in public health laboratories	2011-2015
		9.3.5. Ensure financing and timely provision of laboratory reagents and consumables	2011-2015
		9.3.6. Implement PCR diagnostics for VPDs in the national laboratories of surveillance of VPDs	2011-2015
		Achieve/Maintain WHO accreditation status of the national laboratories of surveillance of VPDs	2011-2015
Strengthen vaccination coverage monitoring	9.4. Improving timeliness and completeness of reporting and monitoring coverage at district and facility levels	9.4.1. Improving accuracy of denominator through systematic exchange of data between birth registration offices, primary health care and local administrations	2011-2015
		9.4.2. Improve communication channels and documentation on newborns between maternity wards and primary health care	2011-2015
		9.4.3. Conducting training on reporting and coverage monitoring (Covered under MLM and IIP training activities)	2012-2013
		9.4.4. Improve information and communication to the population on the need to register with primary health services to receive immunizations (Covered under Advocacy, communication and social mobilization)	2011-2015

10. Immunization quality and safety				
Weak functions of NRA	10. Ensuring safe administration of assured quality of vaccines and safe disposal	10.1. Improving self-reliance in quality assurance and regulatory oversight	10.1.1. Conduct an immunization quality and safety assessment (if not, conduct separate assessments proposed under sub components of IQS)	2011
			10.1.2. Conduct national regulatory authority (NRA) assessment to identify needs (source of vaccines; UNICEF and Government procurement)	2012
			10.1.3. Provide international training for NRA staff to strengthen institutional capacity	2011-2012
			10.1.4. Increase functions of NRA through inclusion of lot release and laboratory access functions	2011-2012
		10.2. Ensure procurement of qualified vaccines that meet internationally recognized quality standards	10.2.1. Continue procuring vaccines through UNICEF Supply Division and/or through Government that meet internationally recognized quality standards	2011-2015
2. Need for upgrading temperature monitoring at district and health facility levels		10.3. Improve and strengthen vaccine stock management and delivery systems at district level	10.3.1. Update EVSM accreditation of the national vaccine store	2011
			10.3.2. Supervise and accredit/certify district level vaccine stores and management	2012-2015
			10.3.2. Conduct training for district level staff on vaccine management	2012
			10.3.3. Conduct training for health staff on vaccine management (Cover under IIP training)	2012-2013
			10.3.4. Upgrade temperature monitoring systems at district level (electronic thermometers, freeze-watches)	2011-2015
3. Need to maintain and upgrade cold chain infrastructure at national, and district levels		10.4. Ensure availability of adequate cold chain and logistics to maintain quality of vaccines	10.4.1. Conduct annual inventory of cold chain and vaccine storage capacity	2011-2015
			10.4.2. Upgrade cold chain infrastructure at national, and district levels to incorporate new vaccines	2011-2013
			10.4.3. Contracting maintenance of cold chain equipments with authorized services	2011-2015
			10.4.4. Update current guidelines for cold chain and contingency plans to be used in case of cold chain failures targeting district and health facility levels	2013

4. Improper injection sites, need to strengthen implementation of open vial policy		10.5. Ensure implementation of safe injection practices	10.5.1. Conduct training for health staff on administration of vaccines to proper injection sites and implementation of open vial policy (Cover under IIP training)	2012-2013
			10.5.2. Conduct injection safety assessment	2011-2012
5. Lack of environment friendly safe disposal policies and procedures		10.6. Ensure proper management of (health care) waste and safe disposal	10.6.1. Conduct assessment of waste management and safe disposal to identify country specific feasible waste management and safe disposal policies and strategies based on previous experiences	2012
			10.6.2 Implementation of environment friendly safe disposal technologies (electric needle destroyers, syringe melting devices etc.)	2011-2015
6. Hesitation to report all cases of AEFI, lack of permanent expert committee at national level for final evaluation, need to inform parents on AEFI		10.7. Strengthen surveillance and response to adverse events following immunization (AEFI)	10.7.1. Conduct assessment of AEFI surveillance system	2012
			10.7.2. Revise national guideline on AEFI surveillance and ensure its availability at all levels	2012-2013
			10.7.3. Incorporate AEFI surveillance training to integrated surveillance training to improve reporting	2012-2013
			10.7.4. Establish a permanent Expert Committee at national level to conduct final evaluation of severe cases	2011
			10.7.5. Develop and distribute posters on AEFI to all vaccination posts, targeting parents	2012-2013
			10.7.6. Develop and distribute Vaccine information sheets to be distributed by PHC to parents and caregivers	2011-2015
			10.7.7. Conduct systematic monitoring, analysis and feedback of AEFI	2011-2015

11. Programme management

1. Need for improved planning at operational level, need for further integration of NIP planning process to broader health sector plans	11. Improve national immunization programme management through better use of domestic and external resources within the context of country health system development process	11.1. Ensure adequate and sustainable financing of NIP through integration of cMYP into national budgetary and planning processes	11.1.1. Get approval by the Government of the NIP for 2011-2015, including approval for the annual budget	2010
			11.1.2. Discuss the cMYP with ministry of health and ministry of finance to ensure that it is part of the broader health sector plan	2010
			11.1.3. Disseminate cMYP to all district level and develop district/municipality immunization programmes, addressing local targets and specific activities	2011

	11.1.4. Review the cMYP and district/municipality immunization programmes annually when preparing the annual work plan for the next year	2011-2015
	11.1.5. Use cMYP as an advocacy tool in raising additional resources for NIP to fill the identified funding gap	2011-2015
	11.1.6. Prepare a new cMYP for the next planning cycle	2015
11.2. Evaluate and strengthen national immunization programme	11.2.1. Conduct annual national immunization program evaluations at national level with participation of major partners	2011-2015
	11.2.2. Conduct quarterly review of the national immunization program achievements and provide feedback to district health authorities, district administrations and local health facilities	2011-2015
	11.2.3. Conduct monthly monitoring of vaccination coverage, drop-outs, vaccine wastage and VPD incidence and provide regular feedback to relevant units	2011-2015
	11.2.4. Explore opportunity to incorporate vaccination coverage assessment module in complex household based survey, such as MICS, DHS etc.	2011-2015
	11.2.5. Conduct NIP management review with participation of national and international partners	2012
	11.2.6. Strengthen supervision and monitoring of NIP targets	2011-2015
	11.2.7. Strengthen the management, analysis, interpretation, use and exchange of data at all levels;	2011-2015
11.3. Strengthening NIP within the context of health sector development	11.3.1. Conduct a study to assess potential impact of current health reforms on immunization and identify further actions to strengthen NIP within the context of health sector development (WHO/EURO)	2011
	11.3.2. Ensure NIP managers are involved in working groups planning and assessing the health sector reform, to ensure that integration of activities takes place	2011-2015
	11.3.3. Informing and sensitizing NIP partners and local authorities on achievements, identified opportunities and threats for integration of immunization	2011-2015

	11.4. Assess, develop and sustain the benefits of integrated interventions	11.4.1. Continue implementing currently integrated activities of training, outreach and surveillance	2011-2015
		11.4.2. Involve managers of other relevant programmes to annual national immunization programme evaluations to assess and identify further integration opportunities	2011-2015
		11.4.3. Expand integration of NIP activities with other programme activities (i.e.; primary health care, supervision)	2011-2015
	11.5. Promote and develop research	11.5.1. Conduct systematic studies of population immunity	2011-2015
		11.5.2. Conduct laboratory research on circulating agents of VPD, their patterns and changes over the time	2011-2015
		11.5.3. Conduct research to identify NIP priorities, assess populations at risk and indentify NIP strategies and activities	2011-2015
	11.6. Improve human resources management	11.6.1. Make inventory of human resource needs (with regular revisions)	2011-2015
		11.6.2. Advocate for filling vacant epidemiologist positions in improving programme management capacity at district level	2011-2015
		11.6.3. Advocate for incentives and policies to reduce number of vacant positions at rural and remote health facilities in improving delivery of immunization services	2011-2015
11.7 Improve communication and dissemination of information and increase community demand for immunization	Covered under Advocacy, communication and social mobilization		
Promote partnership, national and international collaboration, define and recognize the roles, responsibilities and accountability of partners	Covered under Advocacy, communication and social mobilization		

5. IMMUNIZATION PROGRAMME COSTS AND FINANCING (CURRENT AND FUTURE)

5.1 OVERVIEW

Financing of the immunization services in Moldova is shared between central budget, Government Health Insurance Fund and sub-national budgets. Central Government is responsible for procurement of vaccines and injection supplies, cold chain, laboratory equipment – as part of the targeted national program; it also maintains all the facilities at the national level. Donor support is mainly targeting program activities such as training, programme management and disease surveillance. GAVI co-shares spending on vaccines and injection supplies.

After introduction in 2004 Mandatory Health Insurance in Moldova, current financing scheme includes Government Health Insurance Fund, which now covers all expenses on the maintenance and overheads of health care facilities at the sub-national level (rayon and municipal levels), including payroll, outreach vaccinations etc.

5.2 DETAILED INFORMATION ON PROGRAMME COST BY CATEGORIES

5.2.1 MACROECONOMIC INDICATORS

The major macroeconomic indicators such as GDP, Total Health Expenditures and Government Health Expenditures as percentage of Total Health Expenditures for 2009 are derived from various sources. Source of GDP baseline for 2009 was <http://devdata.worldbank.org/data-query/> (GDP in Moldova in 2008). For THE and GHE (as a % of THE) data was provided by the Ministry of Health. Indicators are presented in US Dollars (USD).

Currency exchange rate for 2010 at 12,1 MDL per 1 USD, obtained from the National bank, was used for 2011.

5.2.2 DEMOGRAPHIC INFORMATION

Data on demographic and health-related indicators is obtained from the National Bureau of Statistics (NBS) and Ministry of Health. Official NBS data on the population size does not include Transdnistria. In this case for total population estimates more precise data from health statistics was used. Estimations of the target groups were done by the National Scientific Center of Preventive Medicine (NSCPM) based on the obtained data.

5.2.3 VACCINES & INJECTION SUPPLIES

Table 1.3 Immunization schedule, Target population, Vaccine prices and other vaccine reference information

Vaccination schedule for 2010 includes BCG (2nd day and at the age of 7 years), OPV (at 2, 4 and 6 months, and at the age of 2 and 7 years), MMR (at the age of 1 and 7 years), DTP (at the age of 1 year), DT (at the age of 7 years), TD (at the age of 15, 20, 25, 30, 35, 40, 50, 60), Hep B (after birth and at the age of 2 and 6 months) and DTP-Hib (at the age of 2, 4 and 6 months).

Starting from 2011 Vaccination schedule will include DTP-HepB-Hib vaccine liquid which will replace 2nd and 3rd HepB vaccination (at the age of 2 and 6 months) as well as DTP-Hib. This transition is addressed in the Basic Scenario.

Introduction of the ROTA vaccine from 2012 and Pneumococcal vaccine from 2013 is addressed in Scenario A.

As stated in the national legislation, Government of Moldova procures most of the vaccines on the open tenders, administrated by Medicines Agency of the Republic of Moldova. Prices on vaccines and

other supplies differ from those offered by UNICEF. Procurement prices of 2009 were mainly used in the Basic Scenario.

UNICEF prices were used for the newly introduced vaccine (DTP-HepB-Hib). Vaccine prices and co-payment levels were revised in May 2011, according to recent UNICEF price projections and revised GAVI co-financing policies.

Table 1.1 Baseline expenditure on vaccines and injection supplies

Expenditures on vaccines and injection supplies as well as other supplies in 2009 were got from the NSCPM.

In 2009 expenditures on vaccines and injection supplies were covered by the government and GAVI (only DTP-Hib vaccine and injection supplies for it).

Table 0.1 Past and future DTP coverage and 1.4 Coverage and wastage

The data for this section was provided by the NSCPM.

5.2.4 PERSONNEL COST

Data on staff categories, gross monthly salary of the personnel involved in the immunization program at the National Level, regional and district levels was given by the NSCPM economist and partially obtained from the Economic Department of the Ministry of Health.

There are 2 types of health care facilities delivering immunization services: Primary Health Care Centers (1543 facilities of this type) and Maternity Hospitals/Departments (48 facilities of this type). The number of doctors and nurses at the primary health care level in each of types of the immunization points was calculated as following: Number of immunization points (Primary Health Care Centers and Maternity hospital/departments) was calculated and it was assumed, that 2 doctors and 6 nurses work at one Primary Health Care Center and 2 doctors and 4 nurses work at the Maternity Hospital/Department.

The percentage of the time spent on immunization activities for the personnel is diverse and depends on the position they occupy.

The routine immunization delivery in Moldova currently is based on fixed site strategy, no outreach activities are provided by the personnel.

Supervision activities are conducted by the personnel at the national level; per-diem per supervision visit is 205 MDL. No per-diem is foreseen for the regional level supervision activities.

5.2.5 VEHICLES AND TRANSPORT COST

Table 3.1 Average prices and utilization of vehicles.

The information regarding the vehicles was provided by the NSCPM.

There are three types of vehicles used by the immunization program: trucks, All-road vehicle 4X4 and cars for surveillance.

Information of the types (categories) of vehicles used by the immunization program, average unit price including all taxes for new vehicles in 2009, average number of kilometers traveled per year, average fuel consumption per 100 km for vehicles were entered in the table. Prices of the vehicles entered into the tool are assumed as of new vehicles, although majority of them were purchased during previous years.

Information on the prices on trucks, average number of kilometers traveled per year, average fuel consumption per 100 km was obtained from the previous costing exercise.

Current market prices were used for the All-road vehicles 4X4. For cars for surveillance were used 2009 prices – when the last procurement of these items happened.

Projections of additional vehicles needed in future were made by the immunization program manager.

Table 3.3 Other transport needs not elsewhere covered

Expenditures related to transportation of vaccine from district store to each immunization site are addressed here. The total amount of other transport costs including the transportation of vaccines and safe injection supply from the Central level to the regional level and from the regional to the rayon and immunization points level and transport maintenance cost are covered from the Government budget.

5.2.6 COLD CHAIN EQUIPMENT

Information on the types of the cold chain equipment, average unit prices for each type of cold chain equipment listed in the table was given by the NSCPM.

The average useful life year of cold chain equipment was defined as 10 years.

Equipment mentioned as a need in 2011 for the national (cold room) and regional level (Refrigerators 500l and 700l) is already in the process of procurement by the Government. Expected procurement prices for the abovementioned equipment were used in the costing. Cold chain equipment needs mentioned for the 3rd-5th years of the plan are to replace old equipment procured in 1994-1995. This is addressed in the financing section as a Government contribution. The mentioned equipment upgrade is a major cause of the increasing funding gap in 2013, as it is not covered from any funding source.

5.2.7 PROGRAM ACTIVITIES, OTHER RECURRENT COSTS AND SURVEILLANCE

Table 6.0 Total Spending and Future Needs for Program Activities

Program activities mentioned in the Table 6.0 come from national documents: ongoing National Immunization Plan (ends in 2010) and from draft of the new National Immunization Plan, which was discussed and approved at the Council of the Ministry of Health. Even though the list of activities and expected government financing is clarified in the national documents, volumes of funding from external sources (WHO, UNICEF, GAVI) for the mentioned activities are still under discussion. Expected donors' financial coverage is marked as Probable in the Financing section of the Tool.

5.2.8 OTHER EQUIPMENT NEEDS AND CAPITAL COSTS

Table 7.1 Average Prices of Other Equipment Needs

Information on the total number, types and average prices including all taxes of other equipment needs was taken from the NSCPM.

5.2.9 BUILDING AND BUILDING OVERHEAD

Information on the total number and type of building by administrative levels was provided by the NSCPM. Figures for the value of buildings were taken from the previous costing exercise (based on 2006 estimations) as well as allocation of space devoted to immunization activities. Building overheads were taken from the same source. NSCPM economist updated these figures by the 60% increase (compared to 2006). For all levels cost of entire building was calculated and the percentage of the space used for immunization was estimated and entered. All building overheads are paid by the central and local governments.

5.2.10 PAST COSTS BY CATEGORIES

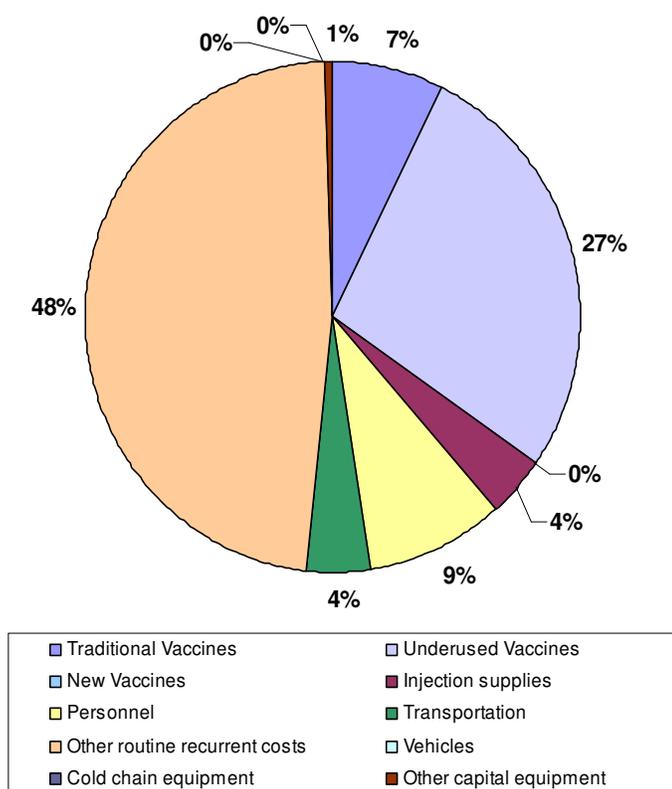
The total cost of the National Immunization Program in 2009 was \$ 3,137 million (*Figure*). Shared cost is not included into Total Immunization Expenditures for 2009. No campaigns were run in 2009 and the figures represent exclusively routine immunization.

Figure 1: Total Immunization Expenditure, 2009

Baseline Indicators	2009
Total Immunization Expenditures	\$3,175,292
Campaigns	\$0
Routine Immunization only	\$3,175,292
per capita	\$0.8
per DTP3 child	\$81.6
% Vaccines and supplies	38.7%
% Government funding	38.6%
% Total health expenditures	0.8%
% Gov. health expenditures	1.4%
% GDP	0.05%
TOTAL	\$3,175,292

The detailed cost profile for the total routine immunization expenditures (in Figure 2 below) shows that routine recurrent costs such as overheads and maintenance of buildings, cold chain and other capital equipment etc, represents the major portion of the actual spending. Cost of vaccines is the next biggest category – 35% of the overall spending in 2009 for routine immunization (mostly on the underused vaccines – Hepatitis B, MMR, DTP-Hib, DTP-HepB-Hib). Personnel cost represents 9% of the spending pie.

Figure 2: Baseline Cost Profile (Routine Only)



5.3 DETAILED INFORMATION ON PROGRAMME FINANCING

5.3.1 FINANCING SHEET

Financing of the national immunization activities come mainly from public sources. Vaccines, injection supplies, cold chain equipment, staff involved to the provision of the immunization services at the rayon and municipal levels, and other immunization-specific recurrent and capital costs are traditionally originating in the central (Government) budget. Health Insurance Fund secures spending on facilities' maintenance and overhead as well as vaccine distribution to the immunization sites.

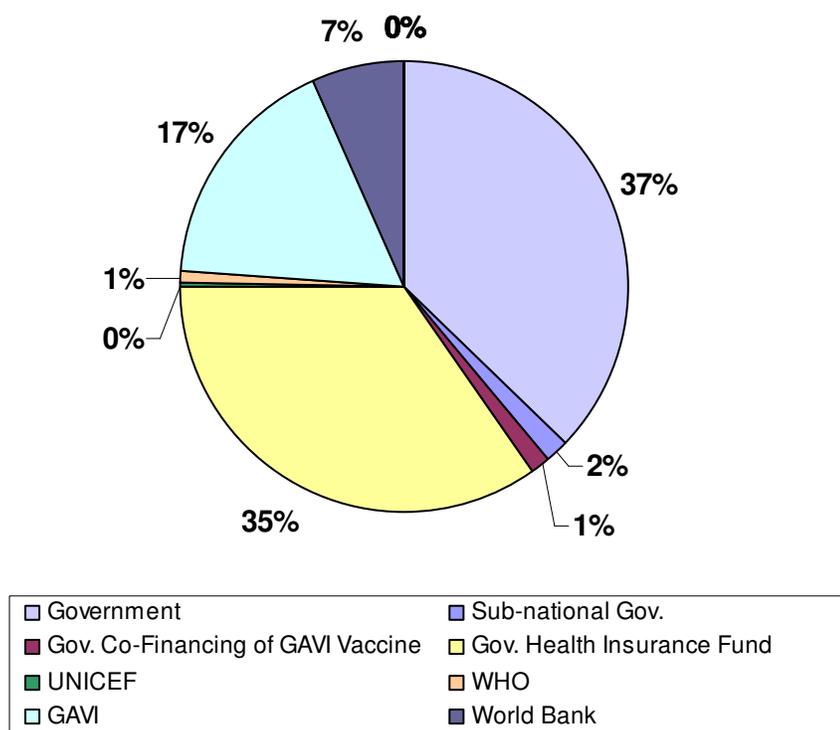
Financing of underused vaccines and injecting supplies is shared between Government of Moldova and GAVI. In the current immunization program GAVI provides DTP-Hib-HepB vaccine to the GoM.

Besides GAVI, providing vaccines, injecting equipment and training support, there are also World Bank, UNICEF and WHO, who contributes to the immunization program in Moldova, specifically supporting disease surveillance, implementation of program activities, IEC, social mobilization and training. Data on their current and expected spending was obtained during interviews and reviewing spending reports.

5.3.2 PAST FINANCING

Public sources – Government of Moldova and Government Health Insurance Fund – were the main players in 2009, contributing 75% of the total spending on the routine immunization in the Republic of Moldova. Over 0,7 mln USD from central budget was spent on vaccines and injection supplies in 2009. GAVI covered 65% of the expenditures on underused vaccines procured in 2009.

Figure 3: Baseline Financing Profile (Routine Only)



World Bank was one of the key international sources in 2009. Its contribution to the national routine immunization activities amounted 7% of total spending, mainly on disease surveillance and training. It should be noted, that World Bank is not represented as a financing source for the next years.

5.4 FUTURE RESOURCE REQUIREMENTS, FINANCING AND FUNDING GAP

5.4.1 FUTURE RESOURCE REQUIREMENTS

Estimated total resource requirements to implement routine immunization program in 2011-2015 amount over 40 mln USD, main part of which will be covering shared health system costs – 58% of total spending is required for this cost area.

Figure 4: Future Resource Requirements by Immunization System Components, in thousands USD

Programme components	2011	2012	2013	2014	2015	Total	%
Vaccine Supply and Logistics	1,555	1,500	1,691	1,649	1,725	8,121	20.1
Service Delivery	430	442	460	425	438	2,194	5.4
Advocacy and	24	36	39	25	26	151	0.4
Monitoring and Disease	43	54	61	39	43	239	0.6
Programme Management	1,234	1,266	1,291	1,321	1,337	6,450	16.0
Shared Health Systems Costs	4,468	4,558	4,649	4,742	4,837	23,253	57.5
Total	7,753	7,856	8,191	8,201	8,406	40,407	

20%, or nearly 8,1 million USD, of the overall requirement are foreseen for vaccine supply and logistics, 5% - for the service delivery, 16% - for program management. Advocacy and communication resource need take 0,4%, and 0,6% will be needed for monitoring and disease surveillance.

Figure 5 illustrates future resource requirement for the Basic scenario. In the baseline scenario the program only sustains current activities and does not imply any changes in the current immunization calendar.

Figure 5: Projection on Future Resource Requirements by cost categories

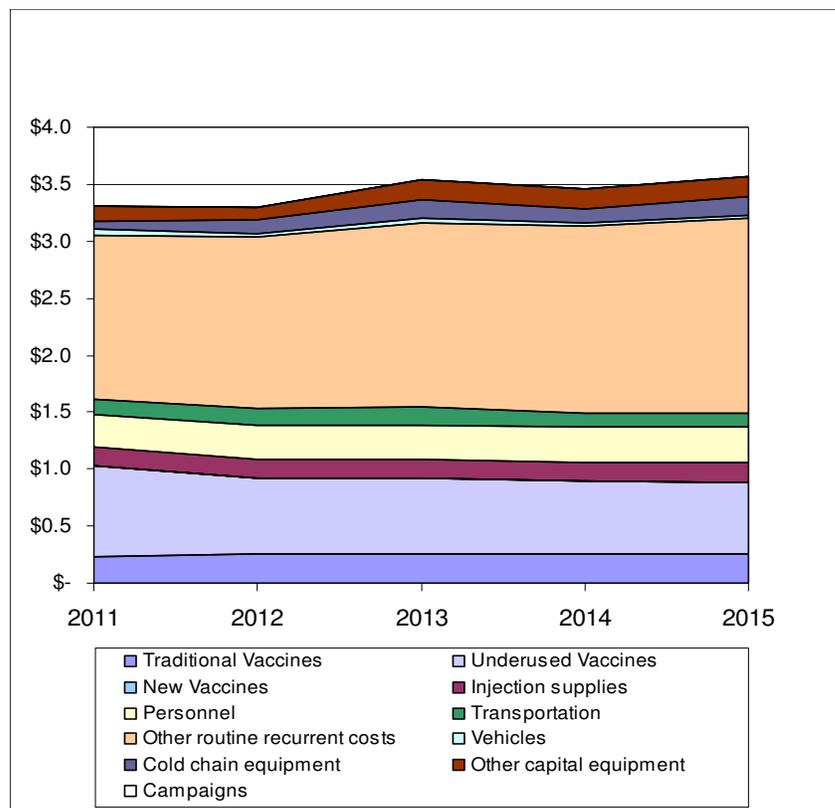


Figure 6 illustrates resource requirements by sources of financing and gaps. Shared costs are not included here.

Most of the funding for the implementation of this scenario is secured due to its Government origin. However, resources expected from GAVI are mentioned as secured. Although the areas of other donors' support if defined, financing amounts need to be confirmed each year. This financing is marked as Probable in the Financing worksheet.

The government intends to upgrade cold chain storage capacity in 2011 using GAVI NVS money received in the past for the introduction of DTP-HepB-Hib. The cold chain upgrade planned for 2013 is still not fully covered by the funds available.

Figure6: Resource Requirements, Financing and Gaps – Baseline Scenario (without shared costs) in thousands US\$

	2011	2012	2013	2014	2015	Total
Total Resource Requirements	3,285	3,298	3,542	3,459	3,569	17,154
Total Secured Financing	2,998	2,889	2,989	2,997	3,071	14,944
Government	1,230	1,302	1,378	1,432	1,492	6,857
Sub-national Gov.	56	60	67	73	81	337
Gov. Co-Financing of GAVI Vaccine	52	53	109	165	223	603
Gov. Health Insurance Fund	1,132	1,157	1,188	1,170	1,198	5,844
GAVI	527	317	248	156	77	1,325
Funding Gap	287	409	553	463	498	2,210
	8.7%	12.4%	15.6%	13.4%	14.0%	12.9%
Total Probable Financing	169	170	189	173	193	894
Government	54	50	61	60	70	295
Sub-national Gov.		5	8	3	3	19
Gov. Health Insurance Fund	9	10	10	10	10	49
UNICEF	10	10	10	10	10	50
WHO	95	95	100	90	100	480
Funding Gap	119	239	364	290	305	1,316
	3.6%	7.2%	10.3%	8.4%	8.6%	7.7%

All the secured funding from public sources covers 79% of total financial needs for 2011-2015 for routine immunization, which is also 91% of the overall secured funding for this program.

The composition of the funding gap with secure funds only is described in the Figure 7. Logistics (vehicles, cold chain and other equipment) is 67% of the overall gap. The biggest funding gap is expected in 2013. It is caused by the estimated need to renew some immunization-specific equipment, procure vehicles due to amortization of the old items.

Figure 7: Composition of the Funding Gap with secure funds – Baseline Scenario in thousands US\$

Immunization system components	2011	2012	2013	2014	2015	Total
Vaccines and injection equipment						
Personnel						
Transport						
Activities and other recurrent cost	119	155	166	135	132	707
Logistics (Vehicles, cold chain and other equipment)	169	254	387	327	366	1,503
Campaigns						
Total Funding Gap	287	409	553	463	498	2,210

Figure 8 clearly shows that there is no funding gap for vaccines and injection supplies, so the financial sustainability of the program in the future is not under a major risk considering only secure funding.

Figure 8: Composition of the Funding Gap with secure and probable funds – Baseline Scenario in thousands US\$

Immunization system components	2011	2012	2013	2014	2015	Total
Vaccines and injection equipment						
Personnel						
Transport						
Activities and other recurrent cost	0	37	43	22	9	112
Logistics (Vehicles, cold chain and other equipment)	119	202	320	267	296	1,205
Campaigns						
Total Funding Gap	119	239	364	290	305	1,316

The composition of the funding gap with both secure and probable funding does not change however a share of Logistics component increased dramatically (\$1.2 out of \$1.3 million). It means that even with probable funding the country is not able to meet needs for infrastructure upgrade.

5.5 IMPLICATION OF PROGRAMME STRATEGIES ON FUTURE RESOURCE REQUIREMENTS

Scenario A foresees introduction of Rota vaccine from 2012 (2 new doses in the vaccination calendar) and pneumococcal vaccine from 2013 (3 new doses in the vaccination schedule). Target cohort for both vaccines is “Surviving Infants”. Resources required for implementation of this Scenario are presented in Figure 9.

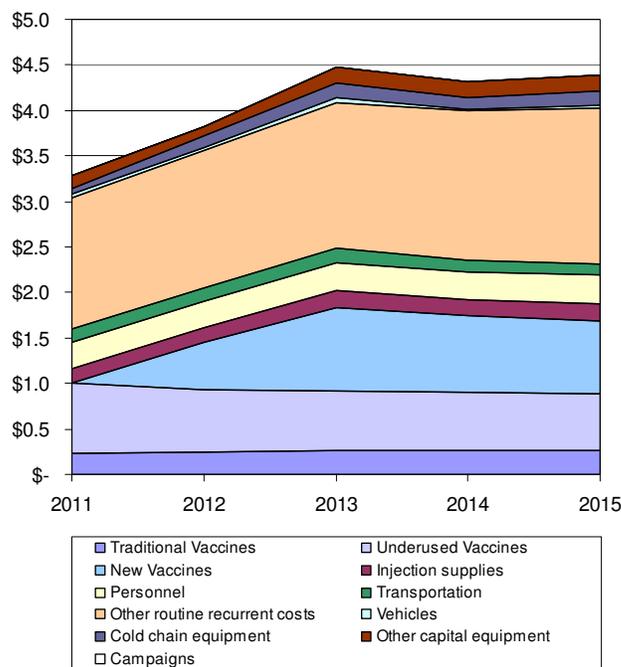
Figure 9: Future Resource Requirements for Scenario A without shared costs (in thousands US\$)

	2011	2012	2013	2014	2015	Total	%
Vaccine Supply and Logistics	1,555	2,022	2,627	2,512	2,551	11,267	25.9
Service Delivery	430	442	460	425	438	2,194	5.0
Advocacy and Communication	24	36	39	25	26	151	0.3
Monitoring and Disease Surveillance	43	54	61	39	43	239	0.5
Programme Management	1,234	1,266	1,291	1,321	1,337	6,450	14.8
Shared Health Systems Costs	4,468	4,558	4,649	4,742	4,839	23,253	53.4
TOTAL	7,753	8,378	9,126	9,064	9,232	43,553	100

Vaccine supply and logistics component increases its share in the total immunization program up to 26%, from 8,1 mln USD in Baseline Scenario to nearly 11,3 mln USD in Scenario A, due to new vaccines and additional cost for the logistics. After the revision of the vaccine prices the total cost of the vaccines for 2011-2015 was reduced on nearly 0,5 mln USD.

It is expected that most of the cost of the newly introduced vaccines will be paid by GAVI. GAVI and Government co-shared funding of the new vaccines are marked as probable in the Financing worksheet for this Scenario. Figure 10 illustrates how the introduction of these 2 vaccines causes the increase in the overall resource requirements.

Figure 10: Projection of Future Resource Requirement for Scenario A



The size of the funding gap and structure of financing by sources and types of funding are presented in Figure 11 below.

Figure 21: Resource Requirements, Financing and Gaps –Scenario A (without shared costs) in thousands US\$

	2011	2012	2013	2014	2015	Total
Total Resource Requirements	3,285	3,820	4,477	4,322	4,395	20,300
Total Secured Financing	2,998	3,511	4,024	3,859	3,897	18,290
Government	1,230	1,302	1,377	1,432	1,492	6,834
Sub-national Gov.	56	60	67	73	81	337
Gov. Co-Financing of GAVI Vaccine	52	116	336	561	785	1,850
Gov. Health Insurance Fund	1,132	1,157	1,188	1,170	1,198	5,844
GAVI	527	876	1,056	623	342	3,424
Funding Gap	287	309	453	463	498	2,010
	9%	8%	10%	10%	11%	10%
Total Probable Financing	169	170	189	173	193	894
Government	54	50	61	60	70	295
Sub-national Gov.		5	8	3	3	21
Gov. Health Insurance Fund	9	10	10	10	10	49
UNICEF	10	10	10	10	10	50
WHO	95	95	100	90	100	480
Funding Gap	119	139	264	290	305	1,116
	4%	4%	6%	7%	7%	5%

The funding gap with secure and probable funds remains at the level of 5% of the future resource requirements for the entire projection period and amounts to \$1.1 million.

It is noteworthy that the funding gap in Scenario A is slightly smaller than in Basic Scenario (\$1.1 vs. \$1.3 million correspondingly) due to the additional introduction grant from GAVI NVS (\$200K).

Comparison of the resource requirements of both Scenarios is presented in Figure 12.

Figure 32: Future resource requirements (without shared costs) - comparison of two Scenarios (in thousands USD)

	2011	2012	2013	2014	2015	Total
Scenario Basic (pentavalent)	3,285	3,298	3,542	3,459	3,569	17,154
Scenario A (+rota and pneumo)	3,285	3,820	4,477	4,322	4,395	20,300
Difference	0	522	935	863	826	3,146
	0%	16%	26%	25%	23%	18%

It shows that in average Scenario A requires 18% more resources than basic scenario.

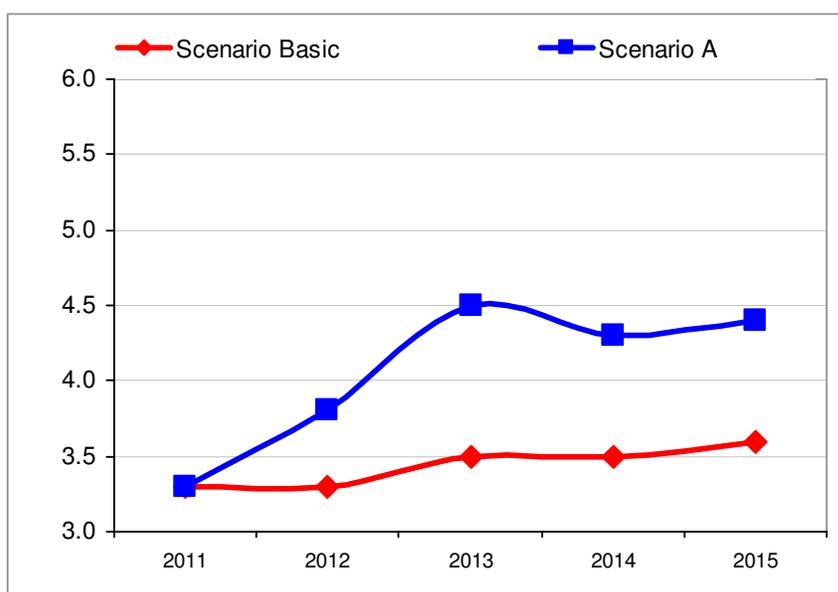
Figure 43: Comparison of future resource requirements between Scenarios (without shared costs)

Figure 13 above shows a sharp increase in resource requirements in 2012 and 2013 in scenario A with gradual increase of resource requirements for following years in both scenarios.

As to the funding gap structure (with secure and probable funding) there is no significant difference between scenarios either by years or components as shown in Figure 14 and 15 below.

[Error! Reference source not found.](#) Logistics (cold chain and vehicles) remain the major component of the funding gap in both scenarios because the Basic Scenario envisages already cold chain upgrade regardless of the introduction of new vaccines.

6. FINANCIAL SUSTAINABILITY

6.1.1 REVIEW OF MAJOR FINDINGS

6.1.1.1 BASIC SCENARIO

The costing exercise shows that immunization is an inexpensive program that only costs around 90 cents in per capita terms (including vaccines, injections, and operational costs).

If the government fully finances the immunization program (assuming no donor support) the total cost of the program will only represent approximately 1.4-1.7% of the government health budget and 0.8-0.9% of total health expenditures as shown in Figure 16.

Figure 56: Sustainability Analysis – Baseline Scenario

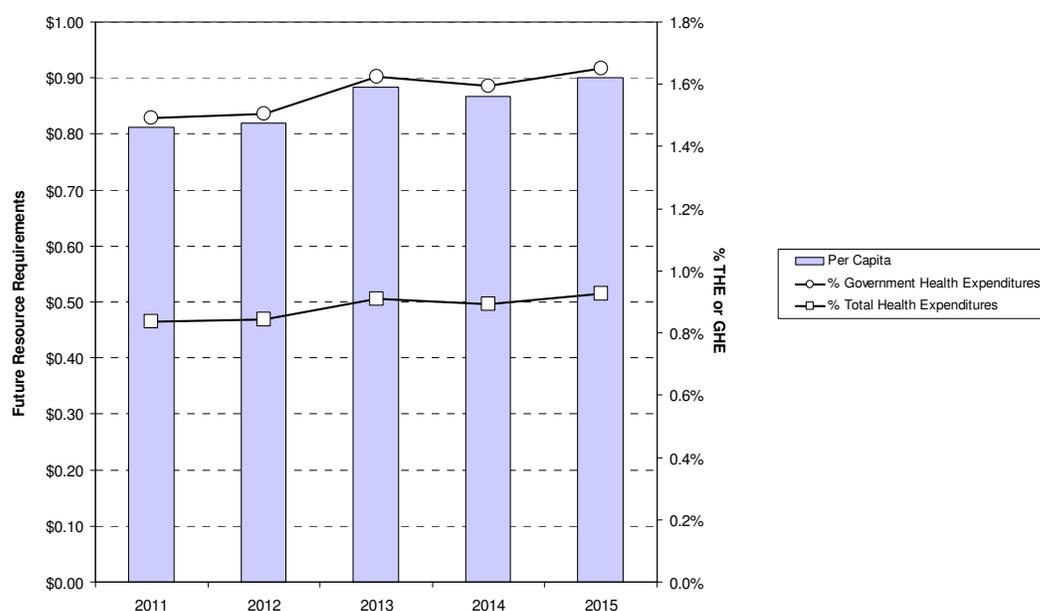


Figure 17 presents some macroeconomic and sustainability indicators regarding the financial requirements of the immunization program.

Figure 67: Macroeconomic and Sustainability indicators without shared costs – Baseline Scenario

Macroeconomic and Sustainability Indicators	2011	2012	2013	2014	2015
% Total Health Expenditures					
Resource Requirements for Immunization					
Routine and Campaigns	0.8%	0.8%	0.9%	0.9%	0.9%
Routine Only	0.8%	0.8%	0.9%	0.9%	0.9%
Funding Gap					
With Secure Funds Only	0.1%	0.1%	0.1%	0.1%	0.1%
With Secure and Probable Funds	0.0%	0.1%	0.1%	0.1%	0.1%
% Government Health Expenditures					
Resource Requirements for Immunization					
Routine and Campaigns	1.5%	1.5%	1.6%	1.6%	1.7%
Routine Only	1.5%	1.5%	1.6%	1.6%	1.7%
Funding Gap					
With Secure Funds Only	0.1%	0.2%	0.3%	0.2%	0.2%

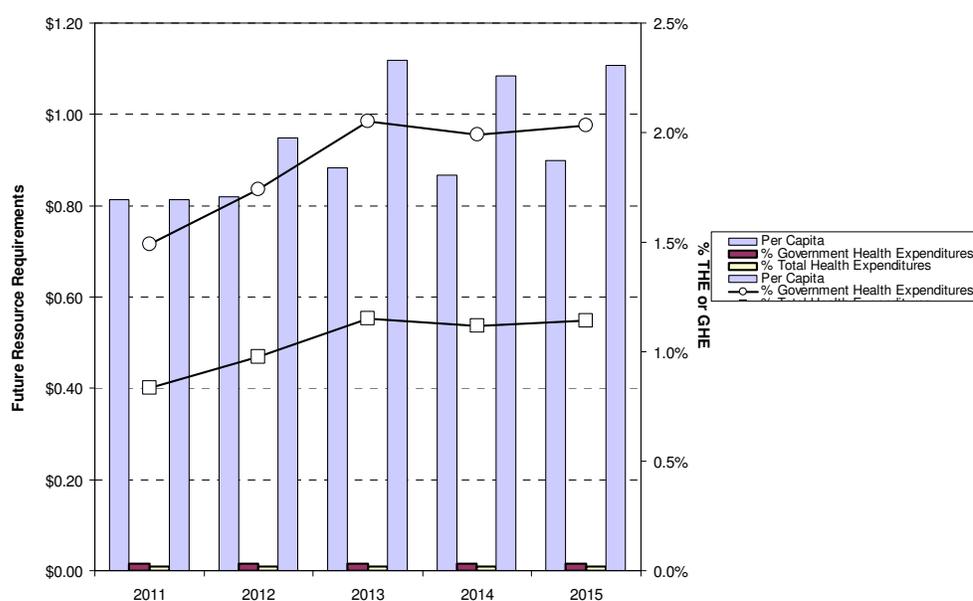
Macroeconomic and Sustainability Indicators	2011	2012	2013	2014	2015
With Secure and Probable Funds	0.1%	0.1%	0.2%	0.1%	0.1%
% GDP					
Resource Requirements for Immunization					
Routine and Campaigns	0.06%	0.05%	0.06%	0.05%	0.05%
Routine Only	0.06%	0.05%	0.06%	0.05%	0.05%
Per Capita					
Resource Requirements for Immunization					
Routine and Campaigns	\$0.81	\$0.82	\$0.88	\$0.87	\$0.90
Routine Only	\$0.81	\$0.82	\$0.88	\$0.87	\$0.90

If the above-mentioned macroeconomic situation does not change dramatically there is no threat to the financial sustainability of the NIP

6.1.1.2 SCENARIO A

Considering the evidence data in the Figure 18 below, the introduction of Rota and PCV wouldn't have significant effect on the sustainability of the NIP.

Figure 78: Sustainability analysis – Scenario A



In the last year of NIP implementation the burden of immunization-specific costs on GDP will be 0,06% (Figure 19) compared to 0,05% in the Baseline Scenario.

Figure 89: Macroeconomic and Sustainability indicators without shared costs – Scenario A

Macroeconomic and Sustainability Indicators	2011	2012	2013	2014	2015
% Total Health Expenditures					
Resource Requirements for Immunization					
Routine and Campaigns	0.8%	1.0%	1.2%	1.1%	1.2%
Routine Only	0.8%	1.0%	1.2%	1.1%	1.2%
Funding Gap					
With Secure Funds Only	0.1%	0.1%	0.1%	0.1%	0.1%
With Secure and Probable Funds	0.0%	0.0%	0.1%	0.1%	0.1%
% Government Health Expenditures					
Resource Requirements for Immunization					

Macroeconomic and Sustainability Indicators	2011	2012	2013	2014	2015
Routine and Campaigns	1.5%	1.7%	2.1%	2.0%	2.0%
Routine Only	1.5%	1.8%	2.1%	2.0%	2.1%
Funding Gap					
With Secure Funds Only	0.1%	0.1%	0.2%	0.2%	0.2%
With Secure and Probable Funds	0.1%	0.1%	0.1%	0.1%	0.1%
% GDP					
Resource Requirements for Immunization					
Routine and Campaigns	0.06%	0.06%	0.07%	0.06%	0.06%
Routine Only	0.06%	0.06%	0.07%	0.06%	0.06%
Per Capita					
Resource Requirements for Immunization					
Routine and Campaigns	\$0.81	\$0.95	\$1.12	\$1.08	\$1.11
Routine Only	\$0.81	\$0.95	\$1.12	\$1.08	\$1.11

6.1.2 FINANCIAL SUSTAINABILITY STRATEGY

The funding gap with secure and probable funds in Basic scenarios does not pose a substantial risk to the implementation of priority strategies of the NIP and to its financial sustainability in 5 years. However, considering the nature of the funding gap it might significantly affect quality of immunization services or operational performance thus putting the NIP management under constant stress.

Therefore, if the funding gap is not filled, the financial sustainability is not affected - Basic scenario shows that secure and probable funds are enough to pay for vaccines and injection supplies, carry out majority of programmatic activities though.

The funding gap represents a critical barrier to the transition to Scenario A – new vaccines, especially planned vaccine storage capacity upgrade should be secured and realized prior to introduction of Rota.

Figure 920: Desired level of the NIP share in the Government Health Expenditures (GHE)

	2011	2012	2013	2014	2015	Total
Government Health Expenditures (GHE) (in thousands US\$)	\$220,494	\$219,391	\$218,294	\$217,203	\$216,117	\$1,091,499
NIP share in GHE (projected)	1.50%	1.82%	2.11%	2.03%	2.05%	1.90%
Funding Gap (in thousands US\$)	\$118	\$139	\$264	\$290	\$305	\$1,116
Funding Gap as % GHE	0.05%	0.06%	0.12%	0.13%	0.14%	0.10%
Desired level of NIP share in GHE	1.58%	1.93%	2.36%	2.29%	2.34%	2.09%

The NIP team together with partners has to advocate an increase in the share of NIP in the State Health Budget by 0.19 points from an average 1.90% (as planned) to 2.09% (desirable level).

Considering the government's commitment to public health priorities and provided that economic growth is favorable the advocacy efforts could secure necessary funds to fill the funding gap.