

**Ministry of Health of
the Republic of Moldova**

**National Immunization Programme
Comprehensive Multi-Year Plan 2016-2020**

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Executive Summary

The below Executive Summary provides a short summary of the main achievements, challenges identified and ways forward for the Republic of Moldova Immunization Programme for 2016-2020. The ways forward proposed remain intentionally quite generic, this in order to keep the Executive Summary short and concise. Further information and list of strategies and core activities will then be provided in the core parts of this cMYP and in chapter 4 in a tabular format. Concerning the Transnistria Region, specific information will be provided in each chapter.

Immunization services

Routine immunization and service delivery

The Immunization programme in the Republic of Moldova remains strong and well performing, with performances of the programme being high as shown by the overall coverage for the routine vaccines between 89% and 97% in 2014 (exclude rotavirus and pneumococcal vaccines).

Challenges: The country has been experiencing declining coverage rates for several years, and is below the Regional objectives of 95% for most of the vaccines. Medical specialists and general practitioners provide medical contraindications - most of them considered to be false - against many vaccines to significant proportion of infants, which delays vaccinations and dropouts. There is a growing scepticism about benefits of vaccination and concerns among parents and medical workers about vaccine safety.

Way forward: Ensure universal access of population to immunization services and reach everybody targeted for immunization; Ensure the high quality of immunization services practices; Increase demand for immunization services.

New vaccines introduction

Rotavirus and pneumococcal vaccines were added to the National Immunization Programme.

Challenges: Problems exist with the coverage of rotavirus and pneumococcal vaccines.

Way forward: Strengthen surveillance for new vaccines; Increase coverage of newly introduced vaccines.

Diseases control

The polio-free status was sustained and confirmed by the NCCPE for 2014. AFP surveillance and active surveillance continue to function. In 2014, the incidence for measles cases was as low as 0.05/100,000 population. No rubella cases have been detected since 2013.

Challenges: The NCCPE is concerned about the trend in polio routine immunization coverage decreasing, due to the refusal of vaccination on philosophical and religious reasons. The NCCPE is also concerned about the insufficient level of detection of acute flaccid paralysis, the system being not sensitive enough. Then there are concerns about the trend in MMR routine immunization coverage decreasing, increasing the risk of growing susceptible population. Blood sample collection remains a problem, with ethic committee new, low interest in collecting and logistics problems.

Way forward: Increase and maintain a high coverage with OPV; Introduction of IPV and switch to bOPV; Improve non-polio AFP surveillance performance. Increase and maintain a high coverage with MMR vaccine; Improve measles and rubella and CRS surveillance and laboratory investigation.

Vaccine quality, supply and management

Vaccine regulation

Improvements made in term of managerial stability within the MMDA. The Quality Management system started to be established, with a Quality Management unit, the development of Quality Manual, SOPs.

Challenges: A conflict of interest remains as the MMDA is involved in the procurement of medicines. Human Resources are not secured within the MMDA, with understaffing, and the limited capacity of existing staff to perform their duties.

Way forward: Enhance self-reliance in quality assurance and regulatory oversight, by implementing the IDP activities.

Vaccine supply and procurement

No real achievements in term of vaccines procurement in recent years. Vaccine forecasting is properly done.

Challenges: The current procurement and tendering processes hold considerable challenges, as described in several reports, when considering the issue of securing vaccines supply. Difficulties noticed in procuring several vaccines (3 tenders without offers in 2015), mainly due to high prices in the offers.

Way forward: Ensure full procurement and supply of quality-assured vaccines; Explore alternative procurement options, notably procurement of all available antigens through UNICEF Supply Division.

Vaccine management, cold chain and logistics

In general vaccine management, cold chain and logistics are of a high quality, as shown with almost all EVM criteria above 80% at levels of the vaccine supply chain.

Challenges: Replacement of refrigerators at the service delivery level is a real challenge, especially in the loop of the reform where health centres became more autonomous. Moreover the use of domestic refrigerators or with low performances may put vaccines at risk.

Way forward: Strengthen vaccine management, cold chain and logistics, by continuing the implementation of the EVM improvement plan developed in compliance with the recommendations of 2014 EVM assessment, and ensuring the progressive replacement of refrigerators at the service delivery level.

Surveillance and reporting

VPD surveillance

The VPD surveillance system is in place and integrated into the communicable diseases surveillance system.

Challenges: The surveillance capacity is somehow limited, mainly due to migration of staff, lack of incentives and lack of training. The sensitivity of the overall surveillance system appears quite variable.

Way forward: Strengthen the VPD surveillance system, through a better integration to the communicable diseases surveillance system; Strengthen laboratory capacity for investigation of VPDs.

AEFI surveillance

The AEFI surveillance system appears detecting cases, although the sensitivity of the system within the country may need to be assessed at some point. AEFI cases are investigated and no media crisis occurred.

Challenges: There is a lack of clear description of roles and responsibilities for AEFI surveillance between the concerned organizations (NCPH and MMDA). National guidelines do not have enough information about case definitions, case investigation, and causality assessment process.

Way forward: Strengthen surveillance and response to AEFI cases; Ensure better definition of roles and responsibilities for AEFI surveillance between NCPH and MMDA.

Immunization coverage reporting

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

Challenges: Problems exist in timely registration of children under 1 within primary health care, especially in urban areas with subsequent denominator problems leading to misestimating administrative vaccination coverage figures.

Way forward: Strengthen vaccination coverage reporting and monitoring system, through developing regular analysis of vaccination coverage data at primary health care and district PHC levels.

Demand generation and communication

An assessment on demand generation and communication was conducted in the Republic of Moldova, and problems identified. An action plan on communication was then drafted and activities implemented.

Challenges: There is a growing proportion of parents refusing to vaccinate their children due to concerns about vaccine safety and religious beliefs. General scepticism exists among medical workers about safety of vaccines and benefits of vaccination.

Way forward: Strengthen the national capacity for health promotion and communication; Develop materials for demand generation, communication and social mobilization.

Programme management

Leadership, Governance, legislation and programme management

The structure and the operating of the immunization programme, within the overall management by NPCH, continue to function. Some legislative documents concerning the immunization programme have been drafted and approved in the recent years, especially for new vaccines and diseases control.

Challenges: The immunization programme appeared not to be a full priority by the Government and MoH anymore, maybe due to all the current political and economic challenges, and the recent change of ministers. The current instability may put at risk the immunization programme. There is also a lack of legislation/approval concerning key documents like contraindications, AEFI and others.

Way forward: Enhance Leadership, Governance, legislation and programme management; Implement high-level advocacy, using Partners support, to reposition the NIP as a priority programme.

Human resource management

No real achievements in term of human resources management in recent years. Some training courses were implemented at the time of introduction of new vaccines.

Challenges: There is a lack of epidemiologists and family doctor at national level and in some districts. Moreover the current staff is ageing and replacement with young professionals is difficult. Migration, lack of motivation, high turnover of staff and insufficient salary are among the reasons for the lack of health professionals within the immunization programme.

Way forward: Ensure human resources are secured, with attention be given on how to attract Public Health professionals for the Immunization programme in the coming years, unless the programme will risk serious challenges.

Programme cost and finance

The Republic of Moldova has met funding requirements for vaccines in 2012, 2013 and 2014, even as co-financing increased. Vaccine resource requirements have been adequately calculated and well communicated to relevant budget holders.

Challenges: Political and economic situation in the Republic of Moldova is stretching the immunization programme and starting to put at risk the financing of the programme. As an example the Government recently refuse the adoption of the HPV for introduction in 2018. Not accessing the UNICEF SD prices for EPI vaccines, and especially newly introduced vaccines, after graduation will put the programme in a really challenging financial situation.

Way forward: Ensure programme costing and financing are secured, through implementation of high-level advocacy using Partners support; Strongly consider accessing UNICEF SD prices for EPI vaccines.

Joint Appraisal Process

The Joint Appraisal was conducted from 7 to 10 July 2015. All information and recommendations related to this exercise are provided in the relevant section 3.6.

List of Acronyms

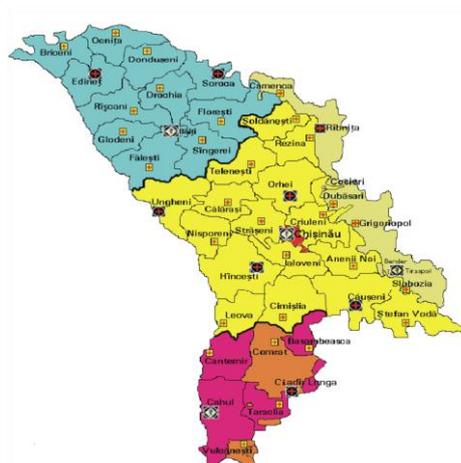
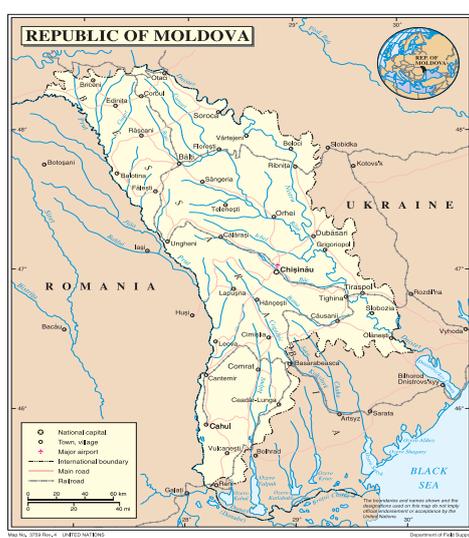
AD Syringe	Auto Disable Syringe
AEFI	Adverse Events Following Immunization
AFP	Acute Flaccid Paralysis
BCG	Bacillus Calmette Guerin (tuberculosis vaccine)
bOPV	Bivalent Oral Polio Vaccine
cMYP	Comprehensive Multi-Year Plan (on immunization)
CRS	Congenital Rubella Syndrome
DTP	Diphtheria Tetanus Pertussis Vaccine
DPHC	District Public Health Centre
DT/Td	Diphtheria Tetanus Vaccine
EVAP	European Vaccine Action Plan
EVM	Effective Vaccine Management
FD	Family Doctor
GAVI	Global Alliance for Vaccines and Immunization
GVAP	Global Vaccine Action Plan
HepB/HBV	Hepatitis B Vaccine
HPV	Human Papilloma Virus
Hib	<i>Haemophilus Influenzae</i> type b Vaccine
ICC	Inter Agency Coordination Committee
IDP	Institutional Development Plan
IPV	Inactivated Polio Vaccine
MDG	Millennium Development Goals
MDL	Moldova Lei (currency)
MDVP	Multi Dose Vial Policy
MMDA	Medicines and Medical Devices Agency
MMR	Measles Mumps and Rubella Vaccine
MOF	Ministry of Finance
MOH	Ministry of Health
NCCPE	National Control Committee on Polio Eradication
NCPH	National Centre for Public Health
NHIC	National Health Insurance Company
NIP	National Immunization Programme
NITAG	National Technical Advisory Committee
NRA	National Regulatory Authorities
OOP	Out of Pocket Payment
OPV	Oral Polio Vaccine
PCV	Pneumococcal Vaccine
Penta	Pentavalent Vaccine (DPT HepB Hib)
PHC	Primary Health Care/Centre
tOPV	Trivalent Oral Polio Vaccine
UNICEF	United Nations Children's Fund
VAPP	Vaccine Associated Paralytic Polio
cVDPV	Circulating Vaccine Derived Polio Virus
VPD	Vaccine Preventable Disease
VVM	Vaccine Vial Monitor
WHO	World Health Organization

1. Background

1.1. General information

Introduction ¹

The Republic of Moldova is a non-coastal state in Eastern Europe, bordered to the west by Romania and to the north, east and south by Ukraine. It is one of the most densely populated European countries, with an area of 33,700 sq. km and a population of 4.1 million, including the breakaway Transnistria region. The country is divided into 40 districts and 4 municipalities.



Basic statistics

	Statistics	Year
Population (thousands), including Transnistria region	3487	2013
Population aged under 15 (%)	17	2013
Population aged over 60 (%)	17	2013
Median age (years)	36	2013
Population living in urban areas (%)	45	2013
Total fertility rate (per woman)	1.5	2013
Number of live births (thousands)	42.4	2013
Number of deaths (thousands)	43.3	2013
Birth registration coverage (%)	100	2012
Cause-of-death registration coverage (%)	90	2011-2013
Gross national income per capita (current US\$)	2484	2013
WHO region	European	2013
World Bank income classification	Lower middle	2013

Source: Country statistics and global health estimates by WHO and UN partners – Global Health Observatory

¹ Source: UNDP Republic of Moldova: www.md.undp.org/content/moldova/en/home/countryinfo

Population data (2015)

	Urban	Rural	Total
Total population	1,856,492	2,203,820	4,060,312
Adult population	1,540,793	1,735,043	3,275,840
Children 0-17 years	315,700	468,777	784,473
	Children 0-2 years		129,606
	Children 3-6 years		179,682
	Children 7-17 years		475,185

Source: National Center for Public Health

Life expectancy ²

Despite the Republic of Moldova being the poorest country in the WHO European Region, life expectancy estimates are 2-5 years higher than similar estimates for considerably richer countries in the Commonwealth of Independent States (CIS), namely 69.13 years in 2010. Mortality rates are particularly high for the working age population – and the reduction of life expectancy through death before 65 years of age was 12 years for men and 6.4 years for women in 2010. This has contributed to a significant and growing gender gap in life expectancy: 64.86 for males and 73.5 years for females in 2010. This is also reflected in disability-adjusted life expectancy (DALE), which was 58 years for men and 63 years for women in 2007.

Life expectancy (years), 2012

		Country	WHO region	World Bank
Life expectancy	At birth	71	76	66
	At age 60	17	22	17
Healthy life expectancy	At birth	63	67	57

Source: Country statistics and global health estimates by WHO and UN partners – Global Health Observatory

Main causes of death

The Republic of Moldova has a double epidemiological burden as rates of both communicable and non-communicable diseases have steadily increased since independence. The main causes of death in the Republic of Moldova are diseases of the circulatory system followed by cancer and diseases of the digestive system. Many of these deaths can be attributed to very heavy alcohol and tobacco consumption – 57.6% of total male mortality and 62.3% of female mortality in 2010 could be attributed to smoking-related causes while 18.8% of male mortality and 13.7% of female mortality were related to alcohol consumption. Though incidence of chronic liver disease and cirrhosis has decreased over the last five years, this remains a very significant overall cause of mortality in the Republic of Moldova (118.95 per population of 100,000 men and 89.82 per population of 100,000 women in 2010).

² Source: WHO EURO: www.euro.who.int/en/countries/republic-of-moldova/data-and-statistics

Infant mortality

The infant mortality rate has been falling steadily since the mid-1990s reaching 11.8 per 1000 live births in 2010, which is close to average for countries of the CIS (11.7 per 1000 live births in 2010), but still more than double the European Union average of 4.2 per 1000 live births in 2010.

Maternal mortality levels have fluctuated widely, reaching a low of 16 per 100,000 births in 2006 and a high of 44.5 maternal deaths per 100,000 live births in 2010. This is almost double the average for countries of the CIS (20 per 100,000) and more than seven times the average for countries of the European Union, which was 6.1 in 2010. However, actual numbers are low (18 in 2010, 7 in 2009) and as there are only around 40,000 births annually each tragic death increases the maternal mortality rate substantially.

Millennium Development Goals (MDGs)

	Statistics	
	Baseline*	Latest**
Under-five mortality rate (per 1000 live births)	32	15
Maternal mortality ratio (per 100,000 live births)	61	21
Deaths due to HIV/AIDS (per 100,000 population)	0.3	1.7
Deaths due to malaria (per 100,000 population)	0.0	0.0
Deaths due to tuberculosis among HIV-negative people (per 100,000 population)	17	14

Source: Country statistics and global health estimates by WHO and UN partners – Global Health Observatory

* 1990 for under-five mortality and maternal mortality; 2000 for other indicators

** 2012 for deaths due to HIV/AIDS and malaria; 2013 for other indicator

1.2. Political and socio-economic trends

History³

The Republic of Moldova became independent in 1991. Since that time the country has become a parliamentary republic and has embarked on an ambitious programme of economic reform. Agriculture and food processing dominate the economy and the country is dependent on imports for its energy needs. Economic transition has caused great socioeconomic hardship in the country and the health status of the population has fallen. There has been a steep rise in the death rate and there has been large-scale labour migration – currently 40% of the working age population works abroad and remittances account for 30% of GDP (World Bank, 2011).

Notwithstanding recent growth, the Republic of Moldova remains the poorest country in Europe, with an estimated per capita gross national income of US\$ 2560 in 2014 (World Bank, 2015). The Republic of Moldova is experiencing negative population growth in spite of a slight increase in the birth rate.

³ Source: UNDP Republic of Moldova: www.md.undp.org/content/moldova/en/home/countryinfo

Since its independence, the Republic of Moldova passed through a complex stage of transition to democracy and market economy. The country has witnessed political instability and de facto territorial disintegration, whereby the breakaway Transnistria region succeeded in establishing de facto independence from Moldova in 1992, but it is not recognized by the international community. The still unresolved status of the Transnistria region has posed significant development challenge to the Republic of Moldova and can be seen as major obstacle for better human wellbeing for population on both banks of the Dniester River.

A new Constitution was adopted on 29 July 1994. On March 2, 1992, Moldova joined the United Nations. There have been many positive changes in recent years, in particular in relation to poverty reduction and democratic governance. Key reforms in justice sector and decentralization underpinned progress on the path of the country's European integration. However, further progress is needed to ensure sustainability of economic growth and implementation of major reforms.

Challenges and successes

After nearly twenty years of transition to the market economy, the Republic of Moldova remains the poorest country in Europe, although poverty has steadily declined throughout the last decade. Despite high economic growth and decline in poverty, significant concerns about its inclusiveness and economic sustainability remain. Indeed, the growth has remained unbalanced in geographical terms as a couple of big cities grew rapidly, while many villages and small towns languished. As 82% of the poor reside in rural areas and rural population faces other multiple deprivations such as access to safe water, sanitation, education and health services, the urban-rural divide has emerged as a key development challenge for Moldova.

Furthermore, the current model of economic development cannot secure stable economic growth in the future. With all the drive for change, the growth remains overly dependent on the private consumption fuelled by the remittances sent by Moldovan labour migrants. With demographic outlook turning dim (permanent emigration and aging) and regional growth prospects uncertain, Moldova increasingly needs new engines for economic development that would combine economic expansion with social inclusion.

However the Republic of Moldova has made good progress in its dialogue with the EU, concluding negotiations on a number of important matters, such as customs cooperation, setting up of a common aviation area, protection of geographical indications, and association to the 7th Framework Programme for Research and Technological Development, which opens up access to EU thematic programmes. With these agreements, Moldova has been among the strongest performers in the Eastern Partnership countries aspiring to conclude Association Agreements with the European Union. By end of 2012, 23 out of 24 chapters of the Association Agreement have been provisionally closed.

Decentralization reform progressed significantly, with the Decentralization Strategy adopted by the Parliament on 5 April 2012. The strategy aims to strengthen the role of local public authorities in making public expenditure more transparent and efficient, and to equitably improve people's

access to basic public services, such as education, health, and water and sanitation. While major challenges such as administrative territorial reform remain to be addressed, in the long term it is expected that the decentralization reform will also help Moldova overcome the rural-urban divide.

1.3. Health care system

Organization and governance⁴

The health system of the Republic of Moldova is organized according to the principles of universal access to basic health services and equity and solidarity in health care financing; it is funded from both the state and individuals. The health system includes a mix of public and private medical facilities, as well as public agencies and authorities involved in the provision, financing, regulation and administration of health services.

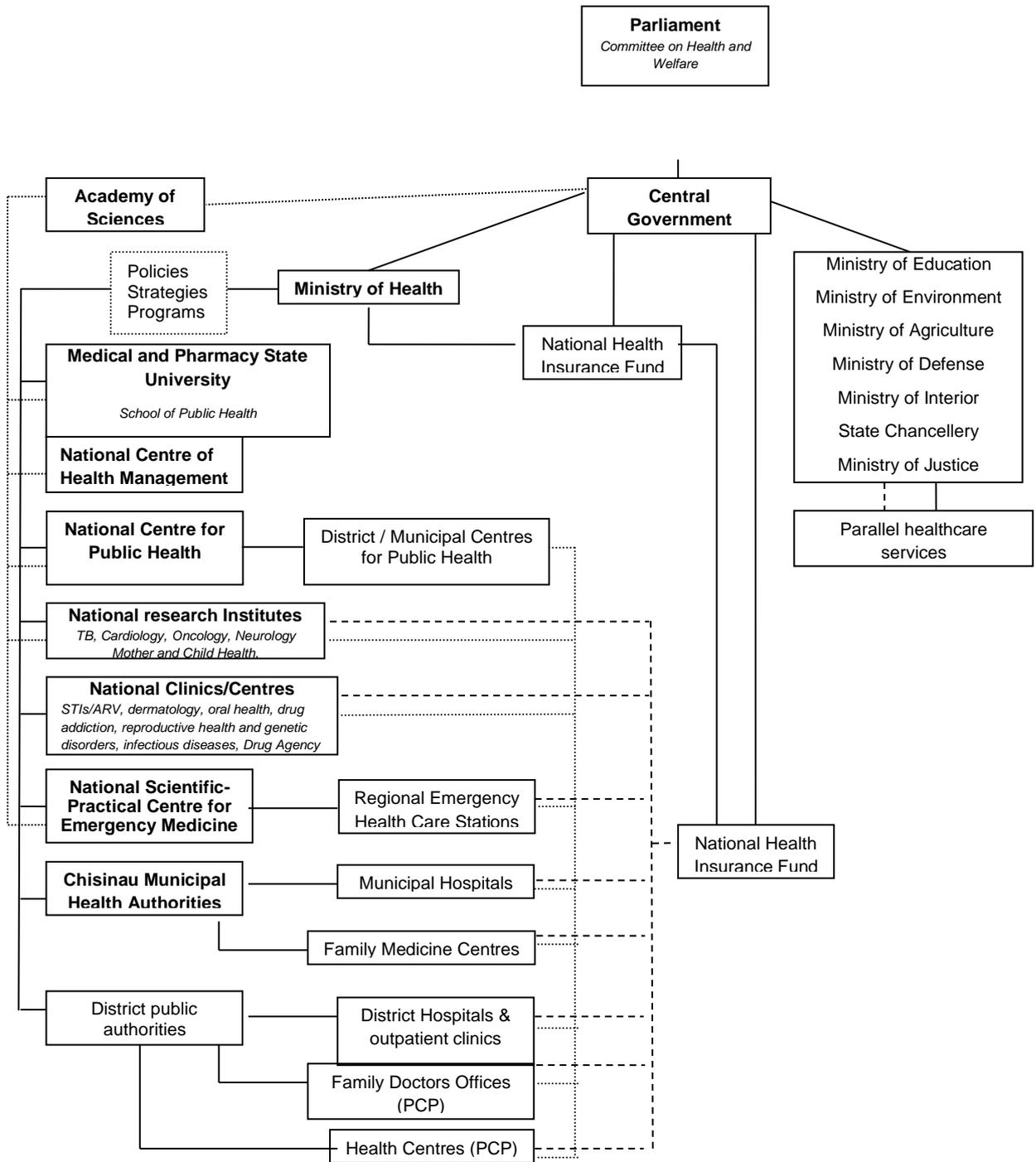
Public medical facilities at primary and secondary levels provide services to the community and belong to local public authorities. In every district, there are also providers of emergency care (ambulance services) belonging to the Ministry of Health. Medical facilities at the tertiary level provide specialized and highly specialized medical care for the whole population; almost all of these tertiary facilities are located in Chisinau and belong to the Ministry of Health. Public medical facilities are autonomous self-financing non-profit-making organizations that are directly contracted by the National Health Insurance Company for the provision of medical services.

Institutions with regulatory functions, such as licensing, supporting the development of health policies or conducting public health surveillance, are financed from the state budget through the Ministry of Health to which they are subordinate. Regulatory functions are thus centralized in the Ministry of Health rather than being the responsibility of independent bodies. Through these institutions, the Ministry of Health collects and analyses data and generates relevant information to contribute to the development of evidence-based policies.

The Ministry of Health addresses the major challenges in the health sector and promotes the principle of Health in All Policies through multi- and intersectoral collaboration, including the coordination of public health activities within the sector and beyond it. This has meant greater transparency in health policy-making and more patient influence in policy-making through the involvement of non-governmental organizations (NGOs) representing patients' rights and interests in the development process.

⁴ Source: *Health Systems in Transition in the Republic of Moldova, 2012, WHO European Observatory*

Structure of the health care system



Financing

Since 2004, health financing in the Republic of Moldova has been organized as mandatory health insurance (MHI). Total health expenditure in 2010 was 11.7% of GDP. Based on revenue source, 40.3% of total health expenditure was from MHI contributions and 44.9% from Out of Pocket Payment (OOP) payments (World Health Organization, 2012). The relatively high level of total health expenditure as well as the balance of prepaid and OOP payments have been maintained despite the ongoing global financial crisis. Contributions from the working population come predominantly through payroll contributions of a fixed percentage of salary (7% in 2011 and 2012: 3.5% to be paid by the employee and 3.5% to be paid by the employer); the self-employed are expected to purchase their own cover for the year at a fixed price. The non-working population (14 categories including pensioners, students, children, registered unemployed, etc.) is covered through transfers from the central budget to the National Health Insurance Company (NHIC), which is the pooling agency for prepaid health care funding. Voluntary health insurance accounted for less than 0.1% of total health expenditure in 2010. The NHIC is also the sole purchaser of health services, which has enabled a purchaser–provider split, and payments for services are made on the basis of contracts, most of which are prospective.

Access to emergency and primary care is universal regardless of insurance status and so are services connected to key public health issues such as HIV infection and AIDS, TB and immunization. The package of benefits available under MHI covers specialized outpatient and hospital care and a very limited range of pharmaceuticals. For those without insurance cover, these services are paid in full as OOP payments. OOP payments are made up of informal payments and direct fee-for-service payments; there are no official user fees or co-payments for services covered under MHI, although there is a sliding scale of co-payments for any pharmaceuticals covered. Informal payments occur at almost all levels of the system, but they are much more widespread for inpatient care; the seriousness of the illness is reflected in the amount patients pay informally for care. The Ministry of Health is committed to reducing informal payments in the system and it is hoped that increasing the salaries of health care workers as well as adding performance-related payment mechanisms, together with improvements in transparency through external auditing, will help to achieve this aim.

Financial allocations to health care system

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total health expenditure (as % of GDP)	4.0%	4.2%	4.2%	4.7%	4.9%	5.4%	6.4%	5.6%	5.2%	5.0%
National Health Budget (public) (mil. MDL)	1,105.2	1,339.2	1,572.4	2,111.8	2,628.4	3,391.3	3,846.8	3,996.5	4,261.1	4,590.6
State budget centralized for health (mil. MDL)	451.7	349.1	425.8	540.1	641.8	670.3	702.4	514.2	568.1	563.0
State budget contribution to NHIC (mil. MDL)	0.9	651.3	839.5	1,001.6	1,195.0	1,477.2	1,456.6	1,926.4	1,984.3	2,158.9
Local Authorities Health Budgets (mil. MDL)	641.2	53.1	38.6	86.3	92.0	149.0	73.0	114.6	77.3	45.4

NHIC Budget (mil. MDL)	12.3	937.0	1,108.0	1,485.4	1,894.6	2,572.0	3,071.4	3,367.7	3,615.7	3,982.2
Government share (%) in the NHIC funds	7.3%	69.5%	75.8%	67.4%	63.1%	57.4%	47.4%	57.2%	54.9%	54.2%

Source: MoH, Republic of Moldova

Combining payroll and budget contributions in a single pool has helped to build equality and solidarity into the system. However, universal coverage has not been achieved; as is always the case with insurance-based systems, there is an explicitly uninsured population (20.3% of the resident population was uninsured in 2011). Those without insurance are most often self-employed agricultural workers or those in informal employment in urban areas; the uninsured often also have low incomes. From 2010, households registered as being below the poverty line automatically receive MHI cover. However, this may not drastically improve equity in the system as 73.1% of all OOP payments in 2010 were for pharmaceuticals, and the list of medicines that can be reimbursed through MHI is extremely limited in order to maintain the financial sustainability of the MHI system.

Physical and human resources

The Republic of Moldova inherited an extensive Semashko style health system with numerous facilities and health care personnel. Infrastructure has been significantly reduced but there is still an oversupply of beds and hospitals in the capital Chisinau. The continued existence of many facilities in parallel health systems under government structures other than the Ministry of Health has also been a challenge to the rationalization of hospital stock. There has been only limited capital investment in secondary and tertiary care provision and most improvements have been only cosmetic. High-technology equipment is available in the capital but the everyday low-technology medical equipment in use is now quite old, particularly in the district hospitals. More capital investment has taken place in primary care, particularly at the health centre level. Information technology is developing, but it is fragmented and uncoordinated.

There is one medical university in the Republic of Moldova (the State University of Medicine and Pharmacy in Chisinau) and there are five nursing colleges across the country. The curriculum has been constantly updated and changed to move closer to EU standards; although clinical qualifications are not yet recognized internationally, this is the aim. Doctors are not registered and the Soviet system of attestation is still used whereby a doctor has to pass examinations and accumulate sufficient experience to progress through second, first and superior qualification categories.

Until recently, strategic planning of human resources has not been a priority, particularly immediately after independence, as so many doctors and nurses had been inherited from the Semashko system. However, professional mobility has meant that many doctors and nurses have left medicine, and often the country, in search of better pay and conditions. This has led to deficits in certain areas, and planning for human resources is, therefore, now one of the most pressing issues in the health system. There are now shortages of health care personnel. The lack of human resources in rural areas impacts on access to services for remote rural populations; however, the problem of shortages is not just related to the absolute number of doctors but also their profile.

Provision of services

In 2010, radical reform of public health began in the Republic of Moldova in order to transform the inherited sanitary-epidemiological services into a broader public health service that was better equipped to deal with the current epidemiological profile of the Moldovan population. The new State Surveillance of Public Health Service has retained the communicable disease control functions but more emphasis has been placed on non-communicable disease control, health promotion and disease prevention. The basic structures are now in place, but full implementation will be a long-term project. Other ongoing public health initiatives in the Ministry of Health include national programmes on immunization, TB, HIV, sexually transmitted infections (STIs) and tobacco control, the last as part of efforts to implement the WHO Framework Convention on Tobacco Control. A national alcohol control programme was approved in June 2012.

The Republic of Moldova has had significant success in reorienting the health system towards primary care, and the primary care system functions wholly on a family medicine basis. In rural areas, primary care services are provided by family doctor offices and health centres while in urban areas, services are provided through big family health centres (formerly the polyclinics). All doctors working at the primary care level practice family medicine and narrow specialists who previously worked in the polyclinics are now attached to hospitals, even if they still work in the same building alongside family doctors. The way in which services are purchased through the MHI system means that family doctors act as genuine gatekeepers to specialist and inpatient services for insured patients. Inpatient care is provided at the municipal and district (secondary care), and republican (tertiary care) levels. Highly specialized tertiary services are concentrated in Chisinau. Most hospital beds are for acute care rather than long-term care. Palliative, long-term and rehabilitation care are not sufficiently developed as parts of the health system, which affects the system's overall efficiency. Most long-term care is provided in the family, and there are few resources available for informal careers.

The pharmaceutical supply network was almost entirely privatized in the early 1990s and, although there is an oversupply of pharmacies in urban areas, there is a shortage in rural areas that has implications for access of rural populations to essential medicines. Access to medicines has been gradually improving, but problems remain. Almost all pharmaceuticals can be bought over the counter, including prescription medicines, which has serious health implications. The burden of OOP expenditure for outpatient pharmaceuticals is very significant as so few are covered under the MHI benefits package.

Principal health care reforms

The National Health Policy for 2007–2021 and the Health System Development Strategy for 2008–2017 have served as the main guiding documents for subsequent reform initiatives in the Moldovan health system – even though there have been three changes of government since that time. This stability has allowed policy-makers to build on the successes of previous reforms while tackling outstanding issues, albeit against a background of severe financial constraints. The overall aims of these documents have been to reduce health inequalities for all social groups as well as to consolidate improvements of the health system and intersectoral working to strengthen population health. The full potential of intersectoral working has not yet been realized, but the national

programmes on tobacco and alcohol control introduced in 2012 are strong evidence that such intersectorality is a genuine new feature of health policy development.

To improve equity in the system, amendments to the Law on Mandatory Health Insurance in 2009 and 2010 sought to expand access to services by making access to primary care universal and to increase the financial protection of vulnerable households by extending automatic MHI cover to families registered as living below the poverty line even if they are formally “self-employed”.

Major changes to pharmaceutical pricing and procurement policies have sought to improve access to pharmaceuticals by introducing reference pricing to ensure pharmaceuticals are not more expensive in the Republic of Moldova than in neighbouring countries and by centralizing procurement of essential medicines for public health facilities. The latter is important not only to optimize purchasing power but also to ensure that the supply of medicines is sufficient; otherwise inpatients would have to pay out of pocket to obtain drugs that should be covered.

Most reforms of the Moldovan health system have sought to reorganize the inherited Semashko system and adapt it to the new conditions and the new social, economic and health demands it faces. The key task has been to improve the efficiency of facilities and the way they are financed. However, changing the mentality of those working in the system as well as service users (who are often resistant to change) is a much greater task. This has an impact on developing new regulatory mechanisms as the Soviet way of working with regulation does not fit with the current socioeconomic reality and many of the regulations still in use pre-date independence. New levers are needed as well as new skills in negotiating the market and ways of working with commercial interests. Different reform initiatives have faced varying levels of political support or resistance – particularly with optimization of the health system as this involves rationalization of the hospital network, which is politically very challenging irrespective of the party in power.

1.4. National immunization programme within health care system

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. The 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 represented an important opportunity to further expand to introduce Rotavirus Vaccine (July 2012) and Pneumococcal Conjugate Vaccine (October 2013).

Management of the NIP

At national level

The coordination of activities of the National Immunization Programme (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.

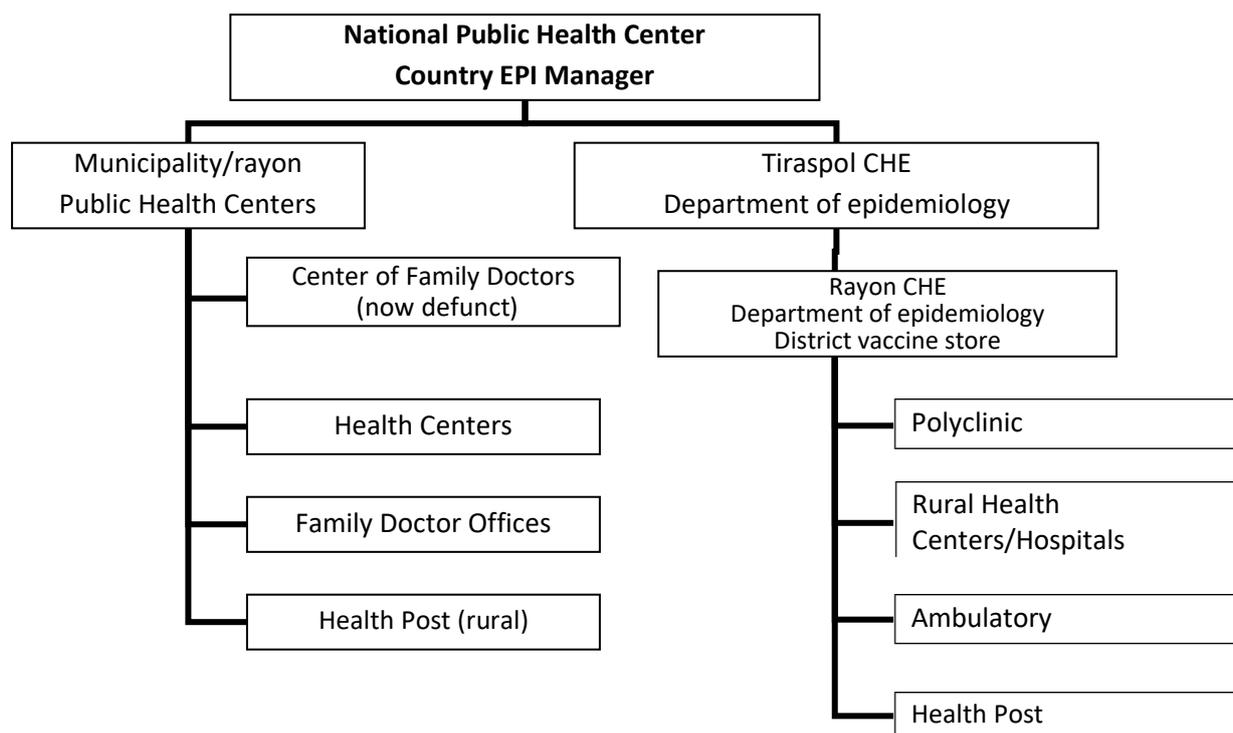
At city and district level

The National Immunization Programme is managed by the municipality/district Center of Public Health (DCPH) in close cooperation with the primary health care services. DCPH 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 programme at district level.

At primary health care level

Primary health care services are represented at district and local levels by the health centers and family doctors' offices. 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. 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.

Structure of the national immunization programme



ICC and NITAG

The ICC is composed of seven members and chaired by the Deputy Minister of Health. ICC members include senior representatives from the MoH, MoF, National Health Insurance Company and NCPH, as well as representatives of WHO and UNICEF country offices. No Civil Society Organizations are currently represented in the ICC, but is currently planned to expand it to include civil society.

The NITAG was established in Moldova in 2013 to provide scientific recommendations to the MoH on immunization policy and practice. The composition and Terms of Reference of NITAG was approved by the MoH order, in line with WHO recommendations (13 core voting experts representing different disciplines and non-voting ex-officio and liaison members). The NITAG met twice in 2014 and developed recommendations on BCG, IPV, seasonal influenza and hepatitis A vaccinations. Next NITAG meeting is scheduled for May 2016.

Delivery of immunization services

Urban population in the Western part of the country is served by Family Doctor, 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 Family Doctors. Rural population in the Western part is served by Family Doctor, which are situated in a Health Centers, Family Doctor Offices and Health Offices.

Planning and reporting of immunization is down up, from vaccine providers to PHC, and from the latter to NPHC. 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 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 analysed at the end of each year with the aim to identify and eliminate any immunization gaps.

The Republic of 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.

Financing of the NIP

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 Programme, 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 Programme. The last NIP was approved for the period 2016-2020 and envisages allocation of sufficient funds for procurement of routine vaccines, including the introduction of IPV, bOPV and potentially HPV.

The NCPH 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 NCPH 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.

It is worth mentioning that happened during the economic crisis that severely affected the Republic of 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 programme in the Republic of Moldova.

Until 2016, the procurement of vaccines and supplies has been done by means of public tenders called for by the National Drug Agency. Starting in 2016, Government of Moldova has been purchasing through the UNICEF Supply Division. 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 is more expensive than MDL 3000 and is funded from the founder's account of the local public administration.

Immunization programme major partners and their contribution

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
- International and non-governmental organizations.

National Immunization Programme 2016-2020

Recently the MoH approved the 5th National Immunization Programme (5 years programme) for the period 2016-2020. The programme is aligned with the Global Vaccine Action Plan, which will enable the achievement of the goals for the Decade of Vaccines (2011-2020). The National Immunization Programme 2016-2020 is also aligned with the European Vaccine Action Plan 2015-2020 (EVAP). The EVAP is a regional interpretation of the Global Vaccine Action Plan developed to address the specific needs and challenges related to immunization in the WHO European Region⁵.

The expected results of the Moldova National Immunization Programme 2016-2020 were defined as follows:

- Ensuring over 95% vaccination coverage, at the national level and at the level of each district and municipality;
- Maintaining the status of the Republic of Moldova as a country free of polio and the country's contribution to the Global Polio Eradication;
- Elimination of sustainable indigenous measles, rubella, congenital rubella, diphtheria;
- Maintaining a unit cases of tetanus in the general population and generalized tuberculosis in children;
- Maintaining the incidence of hepatitis B in the general population below 1 case per 100 thousand people, including children under 0.5 cases per 100,000 population;
- Reducing the incidence of whooping cough and mumps - in 2 cases per 100,000 population;

⁵ Goals, strategies and objectives of the GVAP and the EVAP are provided in the section 4

- Reducing morbidity and mortality from rotavirus infection, meningitis and septic pneumonia caused by *Haemophilus influenzae* type b and Streptococcus pneumonia in children under 5 years;
- Prevention of infection with the human papillomavirus in girls.

1.5. Situation in Transnistria region

In the Transnistria region, a narrow strip of land between the Dniester river and the Ukrainian border which broke away from Moldova in 1990, serious economic challenges have reduced resources available for health services and specifically for the immunization programme. The core organizational structure of health system and immunization programme has changed little there in the past 30 years and reflects features typical of the Soviet health care system. Health expenditures are estimated at US\$ 7 per person (compared to US\$ 300 in the rest of Moldova).

The region participates in major international assistance programs through an agreement with the Moldovan Government in Chisinau. Selected areas, such as HIV, TB, immunization, blood transfusion, reproductive health and perinatal care have benefited from funds provided by GAVI, the Global Fund, UNDP, WHO, UNICEF, UNFPA, UNODC and UNAIDS.

The WHO has been implementing health activities under the Confidence Building Measures Project in the region. The health-specific objective of the Project is to improve access of population on both banks of the Dniester River to quality, evidence-based and cost-efficient immunization and perinatal healthcare services. A comprehensive review of the Immunization Programme was in that regard conducted with the Health Authorities of Transnistria region with the support of the WHO in 2014.

Achievements, challenges and the way forward-solutions of the immunization programme in Transnistria region will be given in section 3.

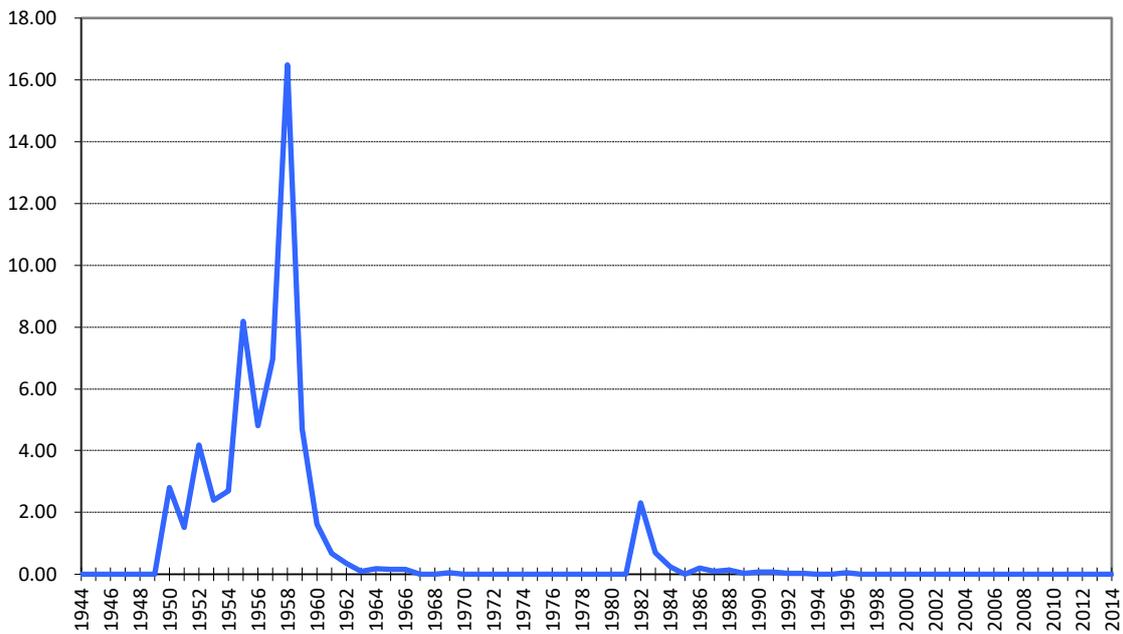
2. Vaccine-preventable disease and vaccination

2.1. Vaccine-preventable diseases

Poliomyelitis

In 2014 were registered, examined and reported 5 cases of acute flaccid paralysis (AFP). AFP rate was 0.8% per 100,000 children under 15 years (2013 => 0.5%; 2012 => 0.8%; 2011 => 1.2%). It didn't reach the minimal indicator of 1 case per 100,000 children under 15 years. 100% of cases were investigated in the laboratory with 2 appropriate stools provided on time. All cases were examined again in the presence of paralysis over 60-90 days after onset and then classified. As a conclusion, AFP surveillance index was 0.8, below the minimum level considered satisfactory by WHO.

Incidence of poliomyelitis 1950-2013

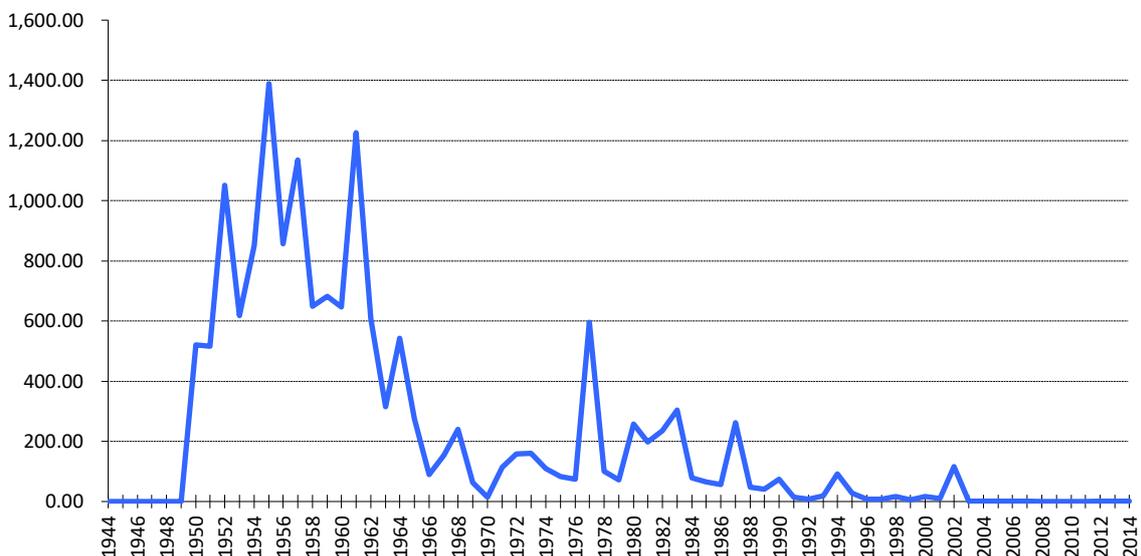


Numar cazuri la 100000 populatie

Measles and rubella

In 2014, following one imported case of measles from the Russian Federation, only one unvaccinated individual became infected. The incidence was 0.05% per 100,000. Both cases of measles were confirmed by laboratory investigation and were epidemiologically linked. In total were received 16 primary information about suspected measles cases, 10 suspects were hospitalized, 15 investigated epidemiologically (93,8%), then the only laboratory confirmed cases were with the 2 patients, and the source of infection was identified. Also, 15 primary information were received about suspected rubella cases, all being investigated epidemiologically, hospitalization for 7 suspects, and no subsequent confirmation by laboratory.

Incidence of measles 1950-2014



Numar cazuri la 100000 populatie

Hepatitis B

In 2014 there were 3 cases of hepatitis B in children with age between 7-17 years (0.62 of the age group per 100,000).

Diphtheria, tetanus and neonatal tetanus

In 2014 there were no case of diphtheria, tetanus and neonatal tetanus reported in recent years.

Pertussis

In 2014 were received 223 primary information about suspected pertussis cases, 194 were investigated epidemiologically (83.3%) and 95 were laboratory confirmed. Laboratory confirmation of this high rate of diagnosis has significantly increased due to the implementation of serological investigation, especially in Chisinau. The source of infection was identified in 23 cases (11.9%). The percentage of patients with pertussis hospitalization constituted 42.1% of the primary diagnostic, laboratory confirmation was 73.4%. The number of confirmed cases of pertussis (incidence 4.61 per 100,000 population) was significantly higher compared to previous years (2013 => 2.82; 2012 => 2.26 per 100,000 population). Most cases of pertussis, 139 (73.9%) were registered in urban areas (incidence of 7.54 per 100,000) than rural (incidence of 2.2‰). Those most affected by pertussis were children younger than 2 years (incidence of 58.9‰) compared with children aged 3-6 years (incidence of 25.6‰) and those aged 7-17 years (incidence of 10.2‰). Among patients with pertussis, 61.7% were not vaccinated and 8.5% did not have available data on vaccination. Most cases were registered in municipality Chisinau (128) and Slobozia district (24), where during many years there was low vaccination coverage.

Mumps

In 2014, primary information about 171 suspected mumps cases were presented. Based on epidemiology were investigated 166 cases (97.1%) and hospitalized 53 patients (31.0%). The laboratory data confirmed the diagnosis for 15 cases (8.8%). The incidence of mumps 1.25 per 100,000 (51 cases) decreased compared to 2013 (incidence of 1.47‰ for 60 cases). Mumps was also most affecting urban population (incidence of 1.78‰) than rural (incidence of 0.82‰). Mumps most commonly affected children aged 3 to 6 years (incidence of 5.8‰), followed by 7-17 years old children (incidence of 3.3‰) and children aged less than 2 years (incidence of 3.1‰). Among adults mumps incidence was 0.64‰. Of the 51 patients with mumps 8 were unvaccinated (15.7%), 9 had no data available (17.6%), 16 had received one dose of vaccine (31.4%) and 18 (35.3%) were vaccinated.

Meningococcal infection

In 2014 were presented 106 primary information about meningococcal infection suspected cases, were investigated 94 cases (88.7%), the source of infection was detected only in 3 cases (3.2%). With suspected meningococcal infection were hospitalized 100 patients (94.3%), primary diagnosis was confirmed by laboratory findings in 17.0%. The incidence of meningococcal infection was 0.98 per 100,000 (40 patients) was rising slightly compared to 2013 with 0.76‰ (31 patients). Meningococcal infection was most affecting rural population with an incidence of 1.13‰ (62.5% of the patients). The most affected age group remained the 0-2 years (27 case, 67.5% of the patients), followed by the age group of children 3-6 years (5 cases, 12.5% of the patients).

Rotavirus

Vaccination against rotavirus infection contributed to the reduction of morbidity by 2.7 between 2012 and 2014: from 782 cases (incidence of 19.2 per 100,000) in 2012, to 367 of cases in 2013 (incidence of 9.02‰), and to 297 cases (incidence of 7.29‰) in 2014. Most affected remained children in the age group 0-2 years.

Tuberculosis

In 2014, according to statistical reports (Form no. 2) submitted, were registered 3249 (incidence of 79.9 per 100,000) new cases of respiratory tuberculosis (TB OR), compared to 3592 cases in 2013 (incidence of 88.4‰). The incidence in the rural population was 85.58‰ (58.4% of the cases), higher than in the urban population which was 73.1‰ (41.6% cases of the cases). In the population aged over 18 years were registered 3117 cases (95.9%) with respiratory TB. Among children aged 0-2 years, there were 20 cases (0,62% of the cases), among children aged 3-6 years, 20 cases (0.62%), among children aged 7-17 years, 92 cases (2.8%).

VPD indicators (without Transnistria region)

	2011	2012	2013	2014
Number of wild polio virus cases	0	0	0	0
Number of diphtheria cases	0	0	0	0
Number of measles cases	0	11	27	2
Incidence of measles cases per 100,000 population	0	0,27	0,66	0,05
Number of rubella cases	0	3	0	0
Incidence of rubella in 100,000 population	0	0,08	0	0
Number of congenital rubella cases	0	0	0	0
Number of tuberculosis cases in children (0-17 years)	203	177	164	145
Incidence of tuberculosis cases per 100,000 children (0-17 years)	27,6	24,6	23,2	20,9
Number of tetanus cases	0	0	0	0
Number of neonatal tetanus cases	0	0	0	0
Number of hepatitis B cases in children (0-17 years)	7	2	3	3
Incidence of hepatitis B per 100,000 children (0-17 years)	0,84	0,25	0,38	0,38
Incidence of pertussis per 100,000 population	2,38	2,26	2,83	4,63
Incidence of mumps per 100,000 population	3,51	3,22	1,48	1,26
Mortality of septic meningitis in children aged under 5 years per 100,000 population	ND	ND	ND	ND
Incidence of septic meningitis in children aged under 5 years per 100,000 population	ND	ND	ND	ND
Mortality of pneumonia in children aged under 5 years per 100,000 population	ND	ND	ND	ND
Incidence of pneumonia of children aged under 5 years per 100,000 population	ND	ND	ND	ND
Number of bacterial meningitis cases in children (0-17 years)	3	3	7	4
Number of invasive <i>Haemophilus influenzae</i> type b cases in children (0-17 years)	2	0	1	0
Number of invasive pneumococcal cases in children (0-17 years)	0	0	2	2
Number of children aged 0-5 years hospitalized with rotavirus infection in sentinel sites	511	731	314	117

Source for all indicators: National Center for Public Health

Note: Above given information on VPD are provided as a summary. More information, achievements, challenges and the way forward-solutions of the immunization programme will be detailed in section 3.

2.2. National immunization schedule

The immunization schedule in the Republic of Moldova has been evolving throughout the years, as already mentioned in the section 1.4 “National immunization programme within health care system”. Currently the immunization schedule is as follows.

The immunization schedule up to 2015

Vaccination age	Vaccination against:								
	Hepatitis B virus	Tuberculosis	Polio myelitis	Rotavirus infection	Hib Infection	Pneumococcal	Diphtheria Tetanus Pertussis	Diphtheria Tetanus	Measles Mumps Rubella
24 hours	HepB-0								
2-5 days		BCG-1							
2 months	HepB-1		OPV-1	RV-1	Hib-1	PCV-1	DTP-1		
4 months	HepB-2		OPV-2	RV-2	Hib-2	PCV-1	DTP-2		
6 months	HepB-3		OPV-3		Hib-3		DTP-3		
12 months						PCV-1			MMR-1
22-24 months			OPV-4				DTP-4		
6-7 years		BCG-2	OPV-5					DT	MMR-2
15-16 years			OPV-6					Td	MMR-3
Adults at 20, 25, 30, 35, 40, 50 and 60 years								Td	

Note: Hep B vaccines, Hib, DTP doses 1-3 are provided through the combined pentavalent vaccine.

The new immunization schedule in the recently approved in the National Immunization Programme 2016-2020 will be implemented as described below (bOPV and IPV in 2016, and HPV potentially in 2018).

The immunization schedule in the National Immunization Programme 2016-2020

Vaccination age	Vaccination against:									
	Hepatitis B virus	Tuberculosis	Polio myelitis	Rotavirus infection	Hib Infection	Pneumococcal	Diphtheria Tetanus Pertussis	Diphtheria Tetanus	Measles Mumps Rubella	Papilloma-virus*
24 hours	HepB-0									
2-5 days		BCG-1								
2 months	HepB-1		bVPO-1	RV-1	Hib-1	PCV-1	DTP-1			
4 months	HepB-2		bVPO-2	RV-2	Hib-2	PCV-2	DTP-2			
6 months	HepB-3		bVPO-3 VPI		Hib-3		DTP-3			
12 months						PCV-3			MMR-1	
22-24 months			bVPO-4				DTP-4			
6-7 years			bVPO-5					DT	MMR-2	
12 years girls										PVU-1 PVU-2
15-16 years								Td	MMR-3	
Adults at 20, 30, 40, 50 and 60 years								Td		

Note: Hep B vaccines, Hib, DTP doses 1-3 are provided through the combined pentavalent vaccine.

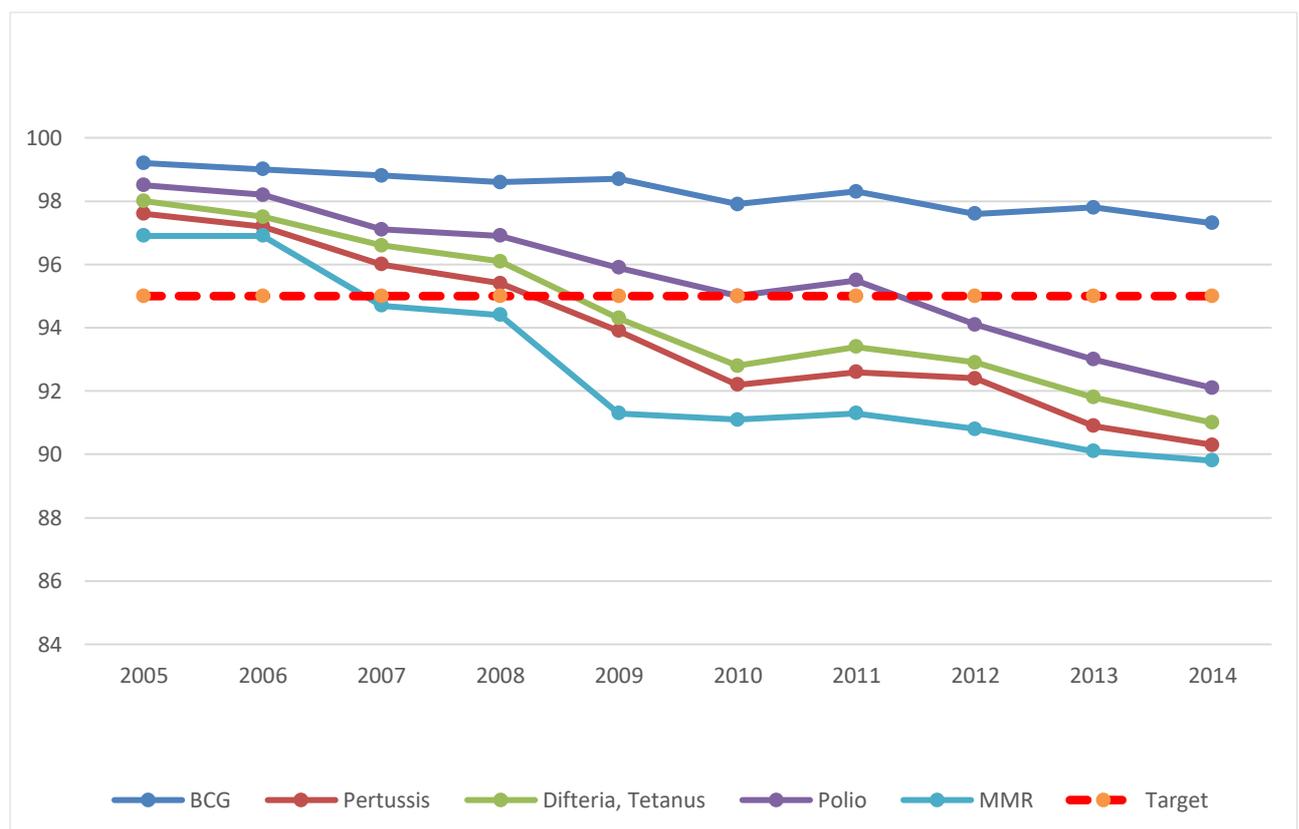
* - suggested during initial draft of NIP, subject to subsequent rejection by the Government

Vaccination against other infectious diseases (rabies, influenza, hepatitis A, chicken pox, cholera, tularemia, typhoid fever, brucellosis, etc.) will be carried out in population groups with high risk of infection, according to the epidemiological situation and in accordance with decisions of the Ministry of Health and individually, including fee. Vaccination against yellow fever, encephalitis mites fever will be applied to people who leave in endemic individually, including fee. The updated draft of the NIP suggests HPV vaccination as optional.

2.3. Vaccination coverage

Immunization programme in the Republic of Moldova remains strong and well-performing: the overall coverage with the routine and new vaccines in 2014 was between 89% and 97%. However, the country has been experiencing steadily declining coverage rates since 2009 for all antigens included in the national immunization schedule. In 2014, this decline continued, with the country failing to reach target vaccination rates (95% coverage) for most antigens, with the exception of BCG and hepatitis B (birth dose) vaccines.

Routine immunization coverage rates 2005-2014



Primary vaccination coverage (%) by antigen/age group 2011-2014

	2011	2012	2013	2014
BCG at age 12 months	98,5	98,2	98,0	97,9
Hepatitis B at age 1 year	96,3	95,1	93,7	92,5
Polio at age 1 year	95,7	94,8	93,7	92,5
Rotavirus age 12 months	x	24,9	48,2	75,6*
Hib age 1 year	80,1	92,5	92,5	91,3
Pneumococcal age 1 year	x	x	x	32,8*
Pertussis age 1 year	94,1	94,1	93,1	91,7
Diphtheria, tetanus at age 1 year	94,4	94,4	93,5	92,2
Measles, mumps, rubella at age 1 year	92,8	92,2	91,5	90,3
Polio at age 3 years	96,8	96,3	96,7	95,5
Pertussis age 3 years	95,9	95,2	96,1	94,9
Diphtheria, tetanus at age 3 years	96,3	95,6	96,4	95,2
BCG at the age of 7 years	94,7	93,1	92,0	x
Polio at age 7 years	98,1	97,2	96,9	96,7
Diphtheria, tetanus at age 7 years	98,0	97,1	96,8	96,6
Measles, mumps, rubella at age 7 years	96,9	96,0	95,1	95,2
Polio at age 15 years	97,6	97,2	97,1	96,5
Diphtheria, tetanus at age 15 years	97,8	97,1	97,1	96,5
Measles, mumps, rubella at age 15 years	91,5	95,8	94,6	95,3

Source: National Center for Public Health

* - excluding Transnistria region

A MICS survey was conducted in 2012 showing the following results. By the age of 12 months, 98% of children age 15-26 months received a BCG vaccination, 98% the first dose of Hepatitis B vaccine and 94-95% the first doses of DPT and Polio vaccines. Where the primary vaccination course requires three doses, the proportion of vaccination coverage declines for subsequent doses of Hepatitis B vaccine to 96% for the second dose, and 94% for the third dose. There is also a decline in the Polio vaccination from 95% for the second dose, and 89% for the third dose, as well as in DPT: 92% for the second dose, and 91% for the third dose. However, the dropout rate does not exceed 10% for any vaccination, reaching 6% for Polio and 4% for both Hepatitis B and DPT vaccines. The coverage for the MMR vaccine by 15 months is 8%. The percentage of children who received all WHO and UNICEF recommended vaccinations, as also stipulated by the Moldovan National Schedule for the primary immunization cycle in the first year of life, is 79%.

Vaccination coverage survey (MICS 2012)

Below table and graph provide the percentage of children age 15-26 months immunized against childhood diseases at any time before the survey and by 12 months of age (by 15 months for MMR).

	Vaccinated at any time before the survey according to:				Vaccinated by 12 months of age (by 15 months of age for MMR)
	Data from medical facility documents	Vaccination certificate	Mother's report	Any of these sources	
BCG¹	94.3	1.1	2.6	98.0	97.8
Polio					
1	92.9	0.9	2.7	96.6	94.8
2	90.9	1.4	3.0	95.3	94.5
3 ²	90.1	1.2	2.2	93.6	88.5
DPT					
1	92.3	1.2	2.8	96.3	94.3
2	90.5	1.4	2.9	94.7	92.0
3 ³	89.4	1.2	2.7	93.3	90.6
Measles, Mumps, Rubella⁴	88.4	0.4	4.0	92.8	89.3
HepB					
At birth	90.2	0.3	5.4	95.9	95.9
1	94.9	1.1	2.1	98.0	97.9
2	92.7	2.0	1.9	96.5	96.4
3 ⁵	90.9	0.7	2.2	93.7	93.6
All vaccinations	87.4	0.0	1.2	88.7	78.8
No vaccinations	0.0	0.0	0.9	0.9	0.9
Number of children age 15-26 months	383	383	383	383	383

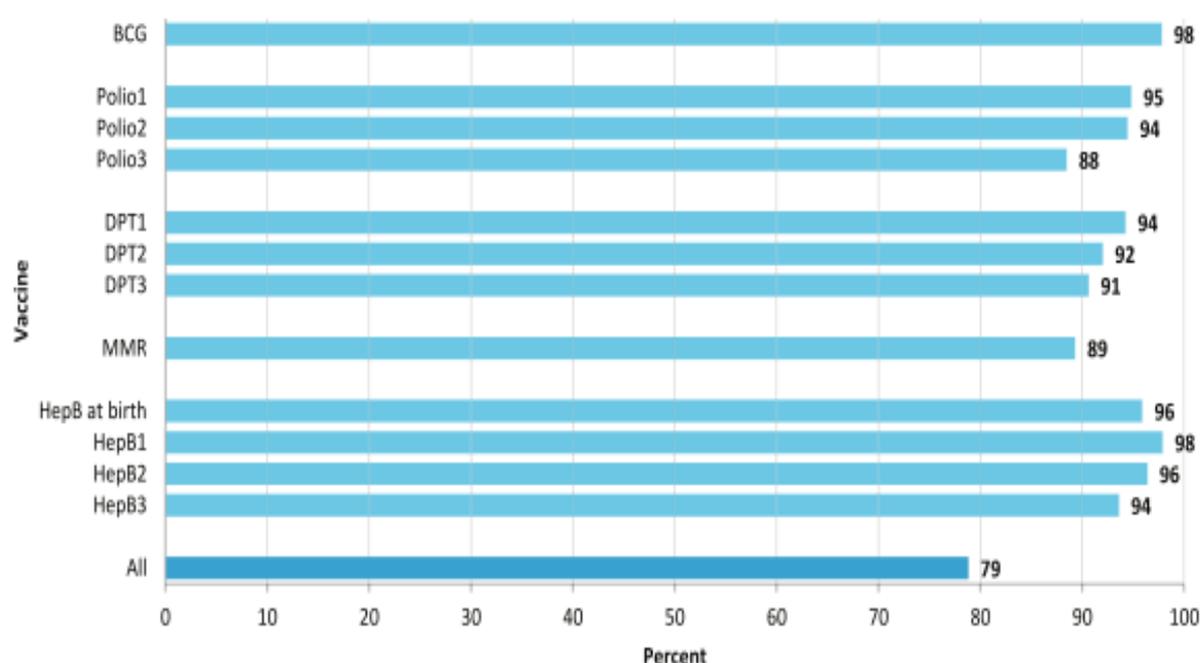
¹ MICS indicator 3.1

² MICS indicator 3.2

³ MICS indicator 3.3

⁴ MICS indicator 3.4; MDG indicator 4.3

⁵ MICS indicator 3.5



Note: Above given information on vaccination coverage are provided as a summary. More information, achievements, challenges and the way forward-solutions of the immunization programme will be detailed in section 3.

3. Immunization programme components and characteristics (achievements, challenges and the way forward-solutions)

This section provides information on five immunization programme components and their characteristics. It refers to the findings and recommendations of several assessments, evaluations and studies conducted in the recent years (references are provided in each chapter and a full list will be attached as an annex). Proposed “way forward” at the end of each chapter are guided and justified by all those documents. Further information on objectives, strategies and activities will be provided in section 4.

3.1. Immunization services

3.1.1. Routine immunization and service delivery

The below analysis is based on the following documents (non exhaustive list):

- Join appraisal report (July 2015)
- Annual report NCPH 2014
- GAVI graduation report 2012
- Immunization review Transnistria region 2014

Immunization services are provided through the various health care facilities over 1500 primary health care facilities and maternity wards by variety of health staff: medical nurses, family doctors. Immunization services are implemented by family doctors in the Western and by paediatricians in the Eastern part of the country. They are equally accessible for both urban and rural population. 97% 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. 96% of children from the Western part and 90% of these in the Eastern part need less than one 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 family doctors done immediately before that. Proportion of deliveries at maternity ward is over 98% and represents an important opportunity toward providing the birth hepatitis B dose and BCG vaccine. In all of Moldova’s PHC facilities, immunization is delivered as a fixed strategy and no outreach activities are being carried out. Vaccines administrations are performed 2 times a week (Tuesday, Thursday), allowing mother to know about the sessions and family doctors to properly plan their immunization activities. School and adolescent vaccination are organized and functioning.

The country has been experiencing steadily declining coverage rates in recent years. The main reasons are growing scepticism about benefits of vaccination and concerns among medical workers and parents about vaccine safety. Medical specialists and general practitioners provide medical contraindications (most of them – false) against all vaccines to significant proportion of infants, which delays vaccinations and notably leaves children unprotected against rotavirus due to age restrictions. Many parents who are influenced by anti-vaccination publications in mass media or by their religious beliefs refuse to vaccinate their children and submit written refusals to general practitioners. Some infants are not vaccinated or their vaccination status is unknown because their parents migrate within and outside the country.

Republic of Moldova implemented several activities to address challenges with acceptance of routine and new vaccines and improve coverage. In 2014, two trainings on contraindications and vaccine safety for medical academia, leading health care professionals from national and regional levels, and immunization programme staff were conducted in Chisinau and Transnistria with WHO

support. The WHO developed manual and training materials which will be used to conduct further trainings for medical workers in sub-regions in 2015.

Achievements

- The Immunization programme remains strong and well-performing in the Republic of Moldova. The health personnel within health infrastructure in place continue to provide high-quality immunization services.
- The performances of the programme remain high as shown by the overall coverage⁶ for the routine vaccines being between 89% and 97% in 2014 (exclude rotavirus vaccine and pneumococcal vaccine).
- Several legislative documents and guidelines⁷ have been renewed and implemented in the recent years.
- The immunization calendar has been evolving and upgraded, including new vaccines like rotavirus vaccine and pneumococcal vaccine, and planning to introduce IPV and bOPV. The immunization calendar is in line with WHO recommendations.

Challenges

- The country has been experiencing declining coverage rates for several years, and is below the Regional objectives of 95% for most of the vaccines. In 2014, this decline continued, with the country failing to reach target vaccination rates (95% coverage) for most antigens, with the exception of BCG and hepatitis B (birth dose) vaccines.
- Medical specialists and general practitioners provide medical contraindications - most of them considered to be false - against many vaccines to significant proportion of infants, which delays vaccinations and drop-outs.
- There is a growing scepticism about benefits of vaccination and concerns among parents and medical workers about vaccine safety⁸.
- Implementation of supervision activities is facing difficulties because the budget didn't increase, due to government order limitation, while the official prices did (food, housing, etc.). The impact of the health reform, with family doctor centres not supervising health centre anymore, challenged also the implementation of the supervision.
- Problems still exist in timely registering of children under one with primary health care, especially in urban areas. Consequently denominator problems arise leading to misestimating administrative vaccination coverage figures.
- International immigration (1/5 parents living abroad) and internal migration, with people movements, drive incomplete immunization, or difficulties to synchronize immunization deliveries. The system is not making it possible to properly track the kids.

Transnistria region

- The Transnistria region is facing higher problems than the rest of the Republic of Moldova, for a full implementation of the immunization programme, and performances are lower. The coverage rates in the Transnistria region are significantly lower than in the rest of the country. The contraindication issue is also a major challenge.
- The immunization coverage based on administrative data for children up to 23 months of age with all other antigens is low. In 2013 it ranged from 74% to 85% at central level. In some

⁶ More information on immunization coverage will be provided in the relevant section

⁷ Legislative documents and guidelines renewed and implemented are listed in the annual reports

⁸ More information on demand generation will be provided in the relevant section

districts/cities coverage was even lower, down to 61%. The vaccination is significantly delayed. Only 23% to 37% of children born from January to December 2013 received primary series of vaccination on time.

Way forward

- Ensure universal access of population to immunization services and reach everybody targeted for immunization
- Ensure the high quality of immunization services practices
- Increase demand for immunization services

Note: As previously mentioned, proposed “way forward” will be completed with further information on objectives, strategies and activities in section 4.

3.1.2. New vaccines introduction

The below analysis is based on the following documents (non exhaustive list):

- Annual report NCPH 2014
- Pneumococcal conjugate vaccine PIE report 2014
- Rotavirus vaccine PIE report 2013
- Immunization review Transnistria region 2014

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 introduced in 2009 using a combined DTP-Hib vaccine with the GAVI support.

Rotavirus vaccine (RV) was added to the National Immunization Programme in July 2012. The Republic of Moldova is the first middle-income country in the WHO European Region to introduce rotavirus vaccine. The vaccine currently used is Rotarix. The rotavirus vaccine is provided to all children at no cost through health care centers, family doctor centers, and family doctor offices. The vaccine is administered in two doses at age two months and four months. The age restrictions for rotavirus vaccination are age two to three and one half months for the first dose and age four to seven months for the second dose. A WHO recommended post-introduction evaluation (PIE) took place from 8-15 April 2013.

Pneumococcal Conjugate Vaccine (PCV) was added to the National Immunization Programme (NIP) in October 2013 in all areas of the country except Transnistria region. The Republic of Moldova is the first GAVI eligible country in the WHO European Region to introduce pneumococcal vaccine. The vaccine currently used is Prevnar 13. The pneumococcal vaccine is provided to all children at no cost through health care centers, family doctor centers, and family doctor offices. The vaccine is administered in three doses at age two months, four months and twelve months. A WHO recommended post-introduction evaluation (PIE) took place from 18-24 November 2014.

IPV and bOPV are currently planned to be introduced in 2016.

HPV vaccine introduction in 2018 was recently presented to the Government, but currently rejected due to financial issues.

Achievements

- Rotavirus vaccine was added to the National Immunization Programme. Prior to introduction of the rotavirus vaccine, the National Center of Public Health organized national and four regional conferences. Public health center staff later conducted trainings with all health facility staff in their jurisdiction. Health care worker knowledge was generally good.
- Coverage without Transnistria region amounted 75,6% for RV in 2014.
- PCV was added to the National Immunization Programme. All visited sites during the 2014 evaluation reported that the implementation of PCV was a smooth process. Prior to the start of the PCV introduction, cascade-training sessions were held for medical experts and district and health facility staff and PCV materials were distributed. Healthcare worker knowledge was generally good about PCV.
- Coverage amounted 32,8% for PCV in 2014 due to start in October 2013 for the cohort of children born after August 2013 getting 3 doses (without Transnistria region).
- Planning for introduction of IPV is on its way, and the vaccine was supposed to be introduced in October 2015, but was delayed due to procurement issues and will happen in late 2016.
- Planning for introduction of bOPV is on its way, and the vaccine is supposed to be introduced in April 2016.

Challenges

- Problems exist with the coverage of rotavirus. The national level reported that medical specialists (neurologists, oncologists, and surgeons) often provide false contraindications against RV. Twenty-six percent (26%) of health care workers experienced resistance from the community regarding rotavirus vaccine. Vaccine hesitant parents are influenced by anti-vaccine publications and some religious groups have also taken a stand against vaccines.
- PCV coverage still low, although seminars for introduction (experts from abroad). Parents are concerned with too many injections, and medical staff are not totally convinced of this vaccine, and are afraid of AEFI. During the evaluation, of the health facilities visited, 33% reported resistance from the community regarding PCV. The evaluation team noted also that some healthcare workers were sceptical and lacked confidence in vaccines.
- The 2014 coverage with three doses of PCV could not be assessed because only a small proportion of infants were eligible for the 3rd dose of vaccine in 2014. PCV was introduced in October 2013 and the 3rd dose is administered to children at the age of 12 months. Coverage with the 1st and 2nd doses of PCV is lower than with the 1st and 2nd doses of pentavalent vaccine due to the above-mentioned reasons.
- There were recently problems of procurement for IPV, which are delaying the introduction of this vaccine to 2016.
- The Government rejected very recently the demand for introduction of HPV in 2018, due to financial constraints.
- Cost-efficiency studies are lacking (HPV, RV, PCV), as high-level advocacy for new vaccines financing sustainability is concerned.

Transnistria region

- Transnistria region did not introduce PCV, mainly for financial reasons. The reasons for not implementing PCV in Transnistria region are lack of funds to reimburse co-financing payment to the Ministry of Health and the need to amend local Law on Immunization to include new vaccines into immunization schedule.
- Concerning RV, The evaluation identified several unique challenges in the Transnistria region including suspension of rotavirus vaccine, vaccine supply issues which led to the late introduction of the rotavirus vaccine, a lack of supervision from the national level, deficiencies in healthcare worker knowledge and rotavirus vaccine acceptance, and problems with vaccine waste disposal.

Way forward

- Introduce new vaccines with evidence-based information
- Strengthen surveillance for new vaccines

3.1.3. Diseases control

The objectives of the National Immunization Programme in term of diseases control are:

- 1) Maintaining the status of the Republic of Moldova as a country free of polio and the country's contribution to the Global Polio Eradication;
- 2) Elimination of sustainable indigenous measles, rubella, congenital rubella, diphtheria;
- 3) Maintaining a few cases of tetanus in the general population and generalized-form tuberculosis in children;
- 4) Maintaining the incidence of hepatitis B in the general population below 1 case per 100 thousand people, including children - under 0.5 cases per 100 thousand;
- 5) Reducing the incidence of whooping cough and mumps - in 2 cases per 100 thousand population;
- 6) Reducing morbidity and mortality from rotavirus infection, meningitis and septic pneumonia caused by *Haemophilus influenza* type b and *Streptococcus pneumonia* in children under 5 years;
- 7) Prevention of infection with the human papillomavirus girls.

3.1.3.1. Polio-free sustaining

The below analysis is based on the following documents (non exhaustive list):

- Annual progress report polio 2014
- Annual progress report polio containment 2014
- Polio & enterovirus surveillance 2014
- Immunization review Transnistria region 2014

WHO certified the Republic of Moldova as a polio-free country in 2000 (last paralytic case due to wild poliovirus in 1991) and sustained up to now. Active surveillance and zero weekly polio/non-polio AFP reporting was introduced in 1996 and timeliness and completeness of reporting are regularly monitored by the NPHC.

The National Committee for Certification of Poliomyelitis Eradication (NCCPE) of the Republic of Moldova as a result of the study and evaluation of the documents on vaccination coverage, surveillance for acute flaccid paralysis, control of the circulation of enteroviruses in children and in the external environment, quality of polio WHO-accredited laboratory, was claiming that in 2014 the Republic of Moldova maintained the status of the country polio-free.

The statement by the NCCPE was based on the followings:

- High level of immunization coverage of children with polio vaccine. Primary vaccination with 3 doses of OPV in children aged 1 year is 92.1% and 96.2% for 2 years. First revaccination (OPV4) in children under 3 years is 94.6%, second revaccination at the age of 7 years is 96.0%, and third revaccination at 15 years is 95.7%. The high level of coverage is achieved in most administrative territory with coverage over 90%. The country has no compact living high-risk populations with low immunization coverage.
- The surveillance system for acute flaccid paralysis is relatively sensitive. In 2014 AFP rate per 100,000 children under the age of 15 years was 0.8. All AFP cases were detected up to 7 days

from the onset of paralysis, and for all AFP cases stool samples were collected and analysed within 2 to 14 days from the onset of paralysis, and investigated within 2 days of detection. All 5 patients with AFP were vaccinated with 3 doses of polio vaccine.

- Completeness of weekly reports AFP was 93.6%. Active surveillance for detection of AFP covers 88% of the 138 hospitals that could potentially hospitalized patients with AFP. In addition to AFP surveillance conducted research to identify poliovirus transmission in the population of all regions of the country.
- Laboratory for Polio and enterovirus infection has been assessed and accredited in 2014 by the National Commission on Accreditation of the Ministry of Health, and has been accredited by the WHO European Office.
- All the researches on polio enterovirus infections were conducted and carried out at the National Laboratory for the diagnosis of these diseases and supervision of the circulation of poliovirus and other enteroviruses in the population and the environment.
- Wild polio virus was destroyed in 1998. The last strain of wild poliovirus type 1 was isolated in 1991 from patients with poliomyelitis. All strains of poliovirus isolated in the country (and the start of the national programme to eradicate polio in 1996) were delivered to Moscow Institute of Poliomyelitis and Viral Encephalitis them. Mikhail Chumakov for ITD and over the years (since 1991), they had only vaccine-derived. For all the time has not been assigned any strain DPA, including DPV2.
- The country has approved the Ministry of Health a National Plan of Action for the Maintenance of the Status of Polio-free, including a section on the response actions in identifying cases of polio with relevant WHO guidelines and manuals.

WHO EURO put the Republic of Moldova in medium risk country, because of the coverage under 95%, for each district, and also the main cause with Transnistria region challenges.

Non-polio AFP cases 2011-2014

	2011	2012	2013	2014	2015
Number of non-polio AFP cases	8	5	3	5	5
Non-polio AFP cases rate *	1.2	0.8	0.5	0,8	0,8
Surveillance index	1,0	0,85	0,56	0,86	0,86

Source: NCPH

* - rate per 100,000 children under the age of 15 years

Achievements

- The polio-free was sustained and confirmed by the NCCPE for 2014.
- AFP surveillance and active surveillance continue to function.
- The National Polio Laboratory received its annual accreditation by the WHO Reference Laboratory.
- Environmental surveillance of poliovirus circulation is performed.

Challenges

- The NCCPE is concerned about the trend in polio routine immunization coverage decreasing, due to the refusal of vaccination on philosophical and religious reasons.

- The NCCPE is also concerned about the insufficient level of detection of acute flaccid paralysis, the system being not sensitive enough. It appears that health professionals do not see non-polio AFP surveillance as a priority anymore (interest, incentive, etc.).

Transnistria region

- The NCCPE is concerned about the political situation in the Transnistria region, with the risk for poliovirus circulation, if any importation.
- In the 2014 Immunization review, it was mentioned: “risk of outbreaks of VPD exists due to low coverage”; “no AFP case detected for at least 5 years, although in accordance to WHO indicator, there should be at least 1 case of AFP per 100,000 children under 15 years of age”.

Way forward

- Increase and maintain a high coverage with OPV
- Introduction of IPV and switch to bOPV
- Improve non-polio AFP surveillance performance
- Strengthen research on population immunity and poliovirus circulation
- Ensure probe of polio-free status in the Republic of Moldova

3.1.3.2. Measles and rubella elimination

The below analysis is based on the following documents (non exhaustive list):

- Annual update MR elimination 2013
- MR elimination report (Apr2015)
- Immunization review Transnistria region 2014

The last large 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% of children 8-19 years of age and students aged 20-23 years, and with monovalent rubella vaccine 97% 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 and rubella diagnosis is certified on annual base by WHO.

The National Committee of Measles and Rubella Elimination reported the followings:

- In 2013 measles epidemic was limited to 27 cases of measles related 5 cases imported into two administrative areas (22 locally infected). The cases were registered among Roma, who were not vaccinated against measles and rubella. Moreover the MMR vaccination coverage was lower than 90% against in the eastern region, where the cases of measles occurred.
- In 2014 there were 2 cases of measles following an imported case (1 locally infected). The cases occurred among children aged 3 to 6 years. Both cases of measles were confirmed by laboratory investigation and were epidemiologically linked. The incidence for 2014 was 0.05/100,000 population.
- In 2015 no case of measles was registered so far.
- No rubella cases were registered in the years 2013 and 2014.
- Although the country was fully secured with MMR vaccines in the recent years, procuring vaccines for 2015 was really difficult after three unsuccessful bids up to April 2015.

	2011	2012	2013	2014
Number of measles cases	0	11	27	2
Incidence of measles cases per 100,000 population	0	0,31	0,76	0,06
Number of rubella cases	0	3	0	0
Incidence of rubella in 100,000 population	0	0,08	0	0
Number of congenital rubella cases	0	0	0	0

Source: NCPH

Achievements

- In 2014, the incidence for measles cases was as low as 0.05/100,000 population.
- No rubella cases have been detected since 2013.
- The National Measles and Rubella Laboratory received its annual accreditation by the WHO Reference Laboratory.

Challenges

- There are concerns about the trend in MMR routine immunization coverage decreasing, increasing the risk of growing susceptible population.
- Blood sample collection remains a problem, with ethic committee new, low interest in collecting and logistics problems⁹.
- In 2014, 47 cases were put in the laboratory, which remains below the indicator for testing the laboratory (80 cases will be necessary). In 5 months of 2015, only 13 cases of MR were laboratory investigated.

Transnistria region

- According to yearly reports since 2008, no confirmed case of measles has been registered. But in 2011 there was one case of measles in a 16-years old adolescent to be considered as imported. There were no suspected cases of measles detected in 2013, but in 2012 there were 4 suspected cases of measles reported (in the town Bendery, Slobozia district). Possible under-detection may occur.
- Serological surveys results demonstrated low level of measles immunity in 16-17 years old adolescent (for 2012 results showed 82% & for 2013 results showed 75,3%), and in adults (for 2012 results showed 64% & for 2013 results showed 76,4%). It seems that no standard methodology was applied to the serological surveys which limit the use of data to identify proper immunity gap.

Way forward

- Increase and maintain a high coverage with MMR vaccine
- Improve measles and rubella and CRS surveillance and laboratory investigation
- Strengthen research of the population immunity against measles and rubella
- Ensure probe of progress of measles and rubella elimination in the Republic of Moldova

3.1.3.3. Hepatitis B control

The below analysis is based on the following documents (non exhaustive list):

- National plan hepatitis 2012-2016
- Annual progress report 2014

⁹ More information will be provided in the surveillance section

Hepatitis B vaccine was first introduced for newborns at risk in 1989 and then, expanded to all newborns since 1995. For 2000 to 2014, hepatitis B cases decreased from 751 to 50 in adults, and from 85 to 3 cases in children (per 100,000 populations). There were 3 cases of hepatitis B in children with ages between 7-17 years, which represents 0.65 of the age group per 100,000.

There are separate national programme and team on control of hepatitis, including different hepatitis diseases. It is ruled by the Order Nr. 90 from 2012 named "The national programme to control viral hepatitis B, C and D for the years 2012-2016".

Achievements

- Incidence of hepatitis B has sharply decreased in the past years.
- There is a special programme dedicated for the control of hepatitis.

Challenges

- There was some concern about the financing of the programme on control of hepatitis.
- The incidence is not yet to the level of the objective for control.

Transnistria region

- In Transnistria region, viral hepatitis B incidence was 1.76 in 2013, while it was 0.94 per 100,000 populations in 2012. Hepatitis B incidence has decreased considerably following the introduction of Hepatitis B vaccine in routine immunization schedule in 1996. The incidence has declined from 25.2 in 2001 to 1.76 per 100,000 populations in 2013. Among the child population, no case was registered between 2007 and 2013.

Way forward

- Increase and maintain a high coverage with hepatitis B vaccine
- Strengthen hepatitis B surveillance
- Strengthen research about transmission and population immunity against hepatitis B

3.2. Vaccine quality, supply and management

3.2.1. Vaccine regulation

The below analysis is based on the following documents (non exhaustive list):

- Vaccine regulation & AEFI 2013 (presentation)
- NRA IDP follow-up, action plan and training plan 2014
- Joint appraisal report (July 2015)

The Republic of Moldova does not have a local production of vaccines. The Medicines and Medical Devices Agency, aka National Drug Agency (MMDA) 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 prequalified by the WHO, is admitted to national registration and procurement (except rabies and influenza vaccines).

In addition, the MMDA organizes national tenders and all contracting procedures for procurement of vaccines and immunization injection supplies. However, the MMDA does not perform all required regulation functions at a desired level of performance (lot release, AEFI/MS, registration and access

to the laboratories). Moreover, there is a conflict of interests as the MMDA is purchasing and regulating vaccines and other products, and thus holds a dual role of both the regulatory body and holder of procurement functions.

In the recent years, to try to improve the status of the MMDA, the following workshop/missions were conducted:

- Medicines Regulatory Authority Assessment, September 2011
- NRA IDP workshop, Istanbul, October 2013
- WHO NRA IDP follow-up, February 2014

However, it appears that the IDP activities planned (28 proposed activities; 11 to be supported by WHO/GAVI; 17 to be supported by Government of the Republic of Moldova), mainly for implementation in 2014 are still lacking behind of schedules.

Achievements

- Improvements were achieved in term of managerial stability within the MMDA.
- The Quality Management system started to be established, with a Quality Management unit, the development of Quality Manual, SOPs, etc.
- The transparency and visibility of the MMDA started through a comprehensive new website.

Challenges

- A conflict of interest remains as the MMDA is involved in the procurement of medicines.
- Human Resources are not secured within the MMDA, with understaffing, and the limited capacity of existing staff to perform their duties.
- Communication between the MMDA and National Centre of Public Health is not up to the level it should be.

Way forward

- Enhance self-reliance in quality assurance and regulatory oversight, by implementing the IDP activities

3.2.2. Vaccine supply and procurement

The below analysis is based on the following documents (non exhaustive list):

- Vaccine tenders evaluation (Dec 2014 and June 2015)
- Vaccine supply shortage report (Feb 2015)
- Vaccine calculation and forecast 2014-2017
- Joint appraisal report (July 2015)
- Immunization review Transnistria region 2014

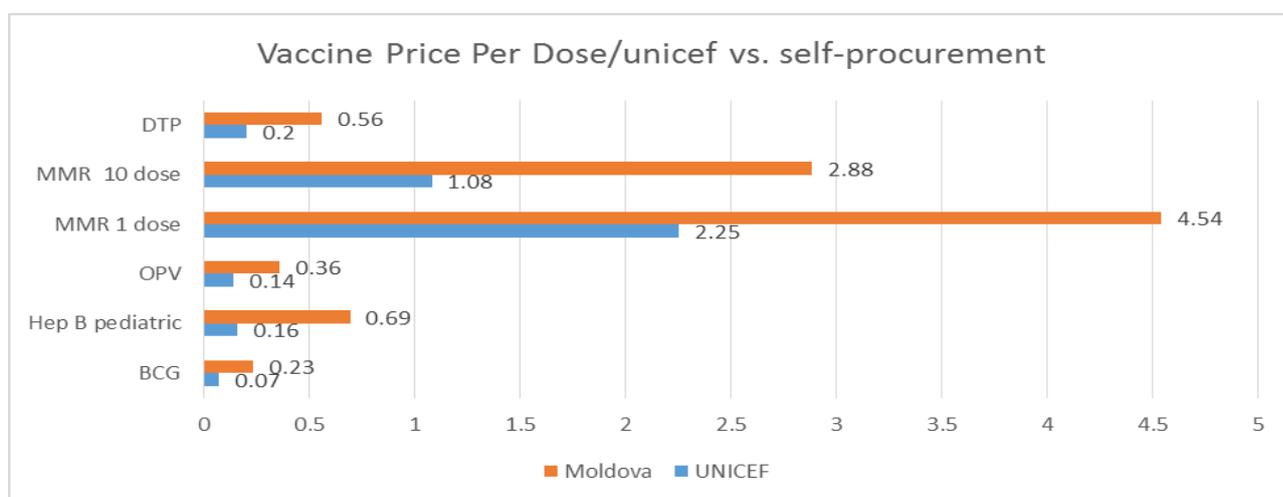
The Republic of Moldova is procuring all GAVI-supported vaccines through UNICEF Supply Division, including the country's co-financed portion. Other vaccines and supplies, including syringes and safety boxes for GAVI-supported vaccines, are self-procured through open public tenders called by the MMDA. The National Policy specifies that only WHO-prequalified vaccines can be subject to tender offers carried out by the State.

Identification of technical requirements for vaccines, syringes and safety boxes, as well as definition of quantities of required vaccines and preparation of supply schedule is done by the NCPH staff responsible for the National Immunization Programme. Vaccine forecasts are prepared on evidence based population size, and actual wastage rates in the calculation, with the anticipated coverage of

95% used. All requirements are submitted to the MoH for endorsement and further submission to the MMDA, which then initiates public tenders through the National Agency for Public Tenders. Procurement contracts are concluded by product suppliers, with the MMDA and the NCPH acting as beneficiaries of goods. Prices of vaccines and other supplies differ significantly from those offered by UNICEF.

Moreover, due to the current procurement, 3 tenders were unsuccessful this year, conducting to a very unfavourable situation for vaccines supply in 2015. That was concerning as many vaccines as BCG, MMR, DPT, DT, Td. Meeting between MoH, NCPH and the Partners was held in February 2015, to examine the situation with the decision to move to purchase vaccines through UNICEF Supply Division of the MoH under the Memorandum and UNICEF in 2008.

Vaccine prices from UNICEF versus self-procurement



Source: UNICEF

The current procurement processes hold considerable potential for improvement related to institutional setting of the procurement system as well as tendering process and opportunities for achieving low and sustainable vaccines prices. Alternative options for vaccine procurement are essential for the Republic of Moldova, as increased pressure on national budget after graduation may put adequate financing of the immunization programme at risk. The new Minister of Health who assumed this role in August 2015 confirmed the MoH commitment to explore alternative procurement options, notably procurement of all available antigens through UNICEF Supply Division. However in July 2015, the Government of the Republic of Moldova approved new law on State Procurement, prohibiting advance payment for the State Procurement contracts. The law is in conflict with the UNICEF procurement mechanism procedures, which requires 100% advance payment for the vaccines. More in-depth discussions on this issue were planned in the 2nd part of 2015.

For the Transnistria region, the vast majority of vaccines (except influenza vaccine) arrive from Chisinau, through the procurement of the Republic of Moldova. Vaccines procured for childhood and adolescent immunization are WHO prequalified vaccines.

Achievements

- No real achievements in term of vaccines procurement in the recent years.
- Vaccine forecasting is properly done.

Challenges

- The current procurement and tendering processes hold considerable challenges, as described in several reports, when arises the issue of securing vaccines supply.
- Difficulties in procuring several vaccines (3 tenders without offer in 2015), mainly due to high prices in the offers.
- The devaluation of the MDL (12.5 MDL/USD in end of 2014, and currently around 20 MDL/USD) directly impacted on the vaccine supply. Difficulties to plan and budget in such a context are obvious.
- Financial sustainability will impact on securing vaccine supply, especially in the context where co-financing is to be taking over by the Government¹⁰, and new vaccines will be introduced. More high-level advocacy toward Government has to be made.

Transnistria region

- There have been vaccine and immunization supplies stock-outs at different levels; overstocks were also noticed in some facilities.

Way forward

- Ensure full procurement and supply of quality-assured vaccines
- Explore alternative procurement options, notably procurement of all available antigens through UNICEF Supply Division

3.2.3. Vaccine management, cold chain and logistics

The below analysis is based on the following documents (non exhaustive list):

- Effective Vaccine Management (EVM) 2014
- NIP achievements 2014
- Wastage rate (form 5) 2014
- Joint appraisal report (July2015)

An Effective Vaccine Management (EVM) assessment was carried out in October 2014. The first assessment was performed in 2011. It provides all information concerning vaccine management.

A number of strengths of the system were identified:

- Arrival procedures are appropriate ensuring vaccines of proper quality arrive in good condition.
- Vaccine storage volumes at the central level in the National Centre of Public Health are sufficient and the stock recording system at the central level is adequate, as well as knowledge of personnel working with vaccines at the central level.
- Most of the required Standard operating procedures are available at the central store, but not all which are needed.
- The District Public Health Centres (DPHC) collect vaccines from NCPH quarterly, according to a distribution plan prepared by the NCPH through a “push” system.
- A national multi-dose vial policy exists (Order of MoH, 1996), however it is recommended to revise it according to WHO Policy statement: Multi Dose Vial Policy (MDVP) revision 2014.
- Service providers collect vaccines at the PHC monthly according to their monthly needs, therefore, utilizing a “pull” system.
- Actually, service providers bring monthly reports on immunization, which include balance at the end of the month, wastage and the number of children planned to be vaccinated in the

¹⁰ More information on financial sustainability will be provided in the relevant section

following month, then PHCs calculate the needs and deliver vaccines based on the calculation.

There is room for improvement of the system:

- At the central level, a complete set of SOPs should be prepared and made available to personnel.
- Lot release certificates issued by the NRA of the country of production should be provided for every batch of vaccine received.
- At the lowest distribution (LD) level, diluents should be recorded separately for vaccines which are packed separately from vaccines.
- At the SP level, there are no stock-recording systems. SP health facilities prepare monthly inventories. If the existing form is used properly (a separate page for each vaccine and diluent), the form (Form 2) would be appropriate for stock management.
- Knowledge on stock management at all levels is excellent.
- Freeze indicators are not used in vaccine transportation, since the country policy is to use cool packs instead of conditioned ice-packs.
- Although at all levels supportive supervision is reported to take place regularly, there is no recorded evidence of this supervision.
- Although training manuals, guidelines and posters are available at all levels, SOPs are not available at LD level and SP level facilities, so we recommend preparation of SOPs for all levels with the assistance of EPI staff.
- There is visual evidence of maintenance being carried out, however, at most facilities preventive maintenance programmes don't exist, therefore, we recommend preventive maintenance programmes for buildings and cold chain equipment should be prepared at all levels with a dedicated line item in the facility's budget.

Also improvements were made following the EVM assessment performed in 2011:

- A number of SOPs were prepared by EPI staff for the central vaccine store
- Product arrival reports (PAR) were introduced
- Temperature mapping of cold rooms has been performed, report is pending
- Continuous temperature recorders are distributed to district PHCs and personnel trained in their use
- Thermometers have been calibrated at the central store
- Standard forms are improved
- CFC-free refrigeration equipment is being procured
- The national vaccine and dry store is renovated
- Passive vaccine containers which do not comply with WHO standards are being replaced with WHO prequalified equipment

As a summary, the below 9 criteria scores provide the level of quality of the vaccine management at the 4 levels of the vaccine supply chain:

- PR Primary level
- SN Sub-national level
- LD Lowest distribution level
- SP Service point level

EVM 2014 criteria scores (%) by level

	PR (1)	SN (1)	LD-s (16)	Service Points (19)

E1: Pre-shipment and arrival procedures	95%	N/A	N/A	N/A
E2: Vaccines and diluents storage temperatures	83%	90%	83%	81%
E3: Sufficiency of storage and transport capacity	94%	100%	93%	91%
E4: Quality of buildings, cold chain equipment and transport systems	90%	85%	87%	76%
E5: Maintenance of buildings, cold chain equipment and vehicles	100%	68%	81%	88%
E6: Stock management systems and procedures	99%	93%	90%	82%
E7: Effectiveness of distribution	91%	95%	95%	87%
E8: Adoption and implementation of appropriate vaccine management policies	100%	100%	100%	99%
E9: Information systems and supportive management functions	83%	90%	82%	87%

In order to strengthen the chain cold, equipment were donated by GAVI, including 30 refrigerators, 1200 vaccine carriers, devices for continuous temperature monitoring in 400 units, all equipment meeting the WHO requirements (Performance, Quality and Security - PQS). The total amount was 1,390,800 MDL (around 112,000 USD with a change rate at 12.5 MDL/USD). For immunization monitoring and VPD surveillance, PHC were equipped with computer and UPS (45 units) in the amount of 348,840.00 lei (around 28,000 USD with a change rate at 12.5 MDL/USD).

Achievements

- In general vaccine management, cold chain and logistics in the Republic of Moldova is of a high quality, as shown with almost all criteria above 80% at levels of the vaccine supply chain (except 2 indicators below 80%).
- The country has an uninterrupted and efficient vaccine supply (with stock-outs rare and brief, no unopened vial wastage and low open vial wastage).

Challenges

- Replacement of refrigerators at the service delivery level is a real challenge, especially in the loop of the reform where health centres became more autonomous. Moreover the use of domestic refrigerators or with low performances may put vaccines at risk.
- Among the few challenges recorded in the EVM, there was the non-compliance of national multi-dose vial policy with the latest updated version published by WHO in 2014, and the insufficient use of structured supervisory tools.

Transnistria region

- There are no available electronic temperature monitoring devices, and prevention practices for avoiding vaccine freezing are not always respected. Lack of temperature monitoring during the weekend.
- Most of the available refrigerators are ageing (> 15 years) and some of them don't meet WHO standards, as well as most of the cold boxes. Currently there is no replacement plan.
- There is no standard operating procedure (SOP) for vaccine management. Storekeepers have not been trained on effective vaccine management.

Way forward

- Strengthen vaccine management, cold chain and logistics, by continuing the implementation of the EVM improvement plan developed in compliance with the recommendations of 2014 EVM assessment, and ensuring the progressive replacement of refrigerators at the service delivery level

3.3. Surveillance and reporting

3.3.1. VPD surveillance

The below analysis is based on the following documents (non exhaustive list):

- Communicable diseases surveillance ECDC report 2014
- Surveillance data (form 2 bulletin)
- Diseases morbidity data (up to 2014)

Surveillance of VPDs in the Republic of Moldova is integrated with the general surveillance system of infectious diseases. 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. On a monthly basis, the statistician from the district/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 district/municipality level CPMs are submitting their reports by both electronic mail and ordinary land mail.

In 2009 an “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 was aiming 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.

Concerning laboratories, all district/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. Laboratory diagnosis for viral infections is done mainly by the NSPCPM. National Measles and the national Polio laboratories are functional and both of them were certified by WHO.

In April 2014, an assessment on communicable diseases surveillance was conducted with the support of ECDC and WHO EURO. It concluded with the below achievements and challenges¹¹.

On surveillance:

- Surveillance is based primarily on a national passive system, with a clear and comprehensive legislative and regulatory framework, which appears generally well accepted by healthcare

¹¹ *The conclusions of the ECDC/WHO assessment go beyond VPD surveillance, but as VPD surveillance is integrated, most of these conclusions are valid for VPD surveillance*

staff. System development proceeds in the context of well established strategic planning within overall public health system development.

- The surveillance system has a case classification system that is coherent with WHO and EU reporting requirements, and applied to reported cases by epidemiologists at local level. A pilot electronic surveillance system (SAE), is well established nationally, with good acceptance by data providers and public health staff.
- Regular descriptive reporting and analysis, mostly at national level, supports use of surveillance data for ongoing epidemic intelligence, monitoring of national programme targets, and to support national policy development and planning. Good use is made of web sites at both local and national level for dissemination of information.
- Although there has been considerable technical and legislative work since 2001 on developing priorities for communicable disease prevention and control, little of this appears reflected in daily work or annual reviews of the epidemiology services, at either district or national levels. Reported diseases are processed by district staff in a similar manner, with little analysis beyond reporting counts to NCPH on standard forms. Skills in the analysis of surveillance data at district level, and the IT infrastructure to support it, both appear very limited. This is only partly compensated for by a small epidemiological surveillance team at national level, which appears still heavily engaged by the demands of further development of the electronic surveillance system (SAE).
- With the exception of a few diseases, there is little tailoring of either information required, or the investigation approach to the public health importance of the disease, or for understanding of the local epidemiology, or for the needs of national prevention and control programmes, or policy development. Analytical skills for the investigation of outbreaks remain limited at district level, and analytical methods are infrequently used, even when supported by national outbreak support teams. Continuing professional education of district epidemiologists and their support staff in these areas must be a priority.
- The SAE remains under pilot status, despite its clear effectiveness and acceptability. The lack of legislative legitimization of case information reported through it hinders its ability to support the implementation of a public health priority based approach to communicable disease surveillance, prevention and control. The SAE reproduce the traditional forms of reporting, and can generate different type of reports but there are limited data analytical capacities especially at the local level. Partly for this reason, data analysis even at national level remains limited, even in descriptive terms.
- The presence of a national system of surveillance case definitions, and its use by epidemiologists close to the case at district level, is a real strength of the system. However there appear to be no guidelines for, or training in, their use, and their precision in practice is uncertain.
- The sensitivity of surveillance appears quite variable, and there are some diseases of public health importance essentially unrecognized by the system. While some diseases appear to be subject to reasonable ascertainment, others are almost certainly grossly under-reported, or not detected at all, based on the limited laboratory capacities for confirmation. It is difficult to develop, and have a balanced approach to development of policy, planning, surveillance and prevention for communicable diseases that are not reasonably recognized and reported.
- Some important diseases remain under surveillance through parallel systems. There may be benefits in integrating at least some of these into the main surveillance system, particularly when the SAE is fully operational. Integration of surveillance should have clear benefits. However, the effectiveness and efficiency benefits, and necessary precautions of such integration, for disease ascertainment and practical prevention and control purposes, need to be carefully assessed. Improved data protection arrangements may be required.

On Public health laboratories:

- Primary diagnostic laboratories have benefitted from recent World Bank and European Union investment; facilities and equipment are generally modern and adequate, with a reasonable range of bacteriology and serology services and well-established patterns of referral to national reference laboratories for selected pathogens. The reporting system provides a good overview of pathogens diagnosed by the national laboratory system. National reference laboratories carry out all the core functions expected in a European context. Some are internationally accredited, and participate in external quality assurance schemes; some are recognized as WHO national centres, and there is involvement in international surveillance and research projects. There is a good collaboration between microbiologists and epidemiology and clinical staff, at both local and national levels.
- The primary diagnostic laboratories have been recently upgraded, and basic primary services and referrals appear to work well. However there are significant challenges for the ongoing provision and development of national reference laboratory services, including appropriate modern equipment and diagnostic technologies, consistent procurement (e.g. of test reagents), and housed in adequate buildings. Recruitment and retention of microbiology specialists is an increasing problem. There is no national system of biosafety and biosecurity regulation. There is insufficient liaison with laboratories in other sectors (veterinary, food, and environment). The role of laboratories in supporting communicable disease outbreak identification and management is unspecified.

Achievements

- The VPD surveillance system is in place and integrated to the communicable diseases surveillance system.
- In 2015, an updated new “electronic system on surveillance on infectious diseases” was installed and is now fully functional, including family doctors, PHC, NCPH, and also laboratories.

Challenges

- The surveillance capacity is somehow limited, mainly due to migration of staff, lack of incentives and lack of training.
- The sensitivity of the overall surveillance system appears quite variable.
- Surveillance documents need to be updated.
- The capacity for appropriate use and analysis of surveillance data is weak; the availability of epidemiologist at the district level is also a challenge.
- There is a lack of adequate operational funds/support for case investigation, transportation of specimens to reference laboratories.
- There are limited laboratory capacities for analysis of pertussis, mumps, rotavirus, bacterial meningitis, severe pneumonia case (funds, material, staff); test and reagent at high price, lacking funding.

Transnistria region

- Primary health care staff has limited training on VPD surveillance. Doctors did not demonstrate a clear knowledge and/or don't use the standard case definition issued by the Health Authorities.

Way forward

- Strengthen the VPD surveillance system, through its integration to the communicable diseases surveillance system
- Strengthen laboratory capacity for investigation of VPDs
- Explore ways to improve the collection of specimens to be brought to the reference laboratories for laboratory investigation (specifically measles, rubella and non-polio AFP)

3.3.2. AEFI surveillance

The below analysis is based on the following documents (non exhaustive list):

- Immunization & VPD surveillance report 2014
- AEFI cases (form 5) 2014
- Joint appraisal report (July 2015)
- Immunization review Transnistria region 2014

The AEFI surveillance system is mainly ensured National Centre of Public Health (NCPH) although the Medicines and Medical Devices Agency has also a function for AEFI surveillance. All 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.

Most AEFI were recorded after BCG immunization. BCG AEFI were 85 regional lymphadenitis, 14 cold abscesses at the injection site, 4 keloids, 2 ulcers at the injection site. Pentavalent (DTP-HepB-Hib) and DTP AEFI were hyperpyrexia, continuously crying, convulsions, local reactions, all ending with recovery after appropriate treatment within 2 days of hospitalization. MMR AEFI were mild fever, swollen salivary glands, ending with treatment for 2 days.

Number and frequency of adverse reactions following vaccination (AEFI) 2012-2014

Vaccines	2012			2013			2014		
	No. doses given	AEFI	%	No. doses given	AEFI	%	No. doses given	AEFI	%
BCG	78,571	117	0,15	76,646	100	0,13	49,869	105	0,21
HVB	92,034	0	0,0	156,246	0	0,0	132,634	0	0,0
Polio	239,919	0	0,0	233,775	0	0,0	230,526	0	0,0
DTP-HepB-Hib	115,759	11	0,01	112,225	11	0,01	116,214	8	0,007
DTP	41,546	1	0,0	38,753	1	0,003	37,534	2	0,005
DT	40,826	0	0,0	40,712	0	0,0	40,896	0	0,0
Td	386,280	0	0,0	369,750	0	0,0	355,747	0	0,0
ROR	119,157	15	0,013	113,551	5	0,005	110,253	5	0,005
Rotaviral	25,223	0	0,0	60,558	0	0,0	62,607	0	0,0
Pneumococcal	X	X	X	9222	0	0,0	76,154	0	0,0
Influenza	103,403	1	0,001	156,890	0	0,0	155,562	0	0,0

Source: National Center for Public Health

Although there is a documented evidence of successful management of serious AEFI cases, the existing system faces a number of challenges. Particularly, the AEFI system lacks guidelines that define organizational structure, provide clear description of roles and responsibilities and the scope of AEFI surveillance, as far as both organizations are involved (NCPH and MMDA). The national guidelines should also include case definitions, case investigation forms, and define causality assessment process. It was also observed a lack of qualified specialists in diagnosis and treatment of AEFI. Then there is also no specific evidence based laboratory researches for confirmation/exclusion of AEFI.

Achievements

- The AEFI system continues detecting cases, although the sensitivity of the system within the country may need to be assessed at some point.
- AEFI cases are investigated and no media crisis occurred.

Challenges

- Lack of clear description of roles and responsibilities for AEFI surveillance between the concerned organizations (NCPH and MMDA).
- National guidelines do not have enough information about case definitions, case investigation, and causality assessment process.
- There is a lack of qualified specialists for diagnosis and treatment of AEFI.

Transnistria region

- Health Authorities regulation documents on AEFI surveillance are neither approved nor updated in the Transnistria region. There is no Investigation Committee.
- Due to limited knowledge of the health professionals on AEFI case definition, there is a low sensitivity of the AEFI reporting system (almost no AEFI reported).

Way forward

- Strengthen surveillance and response to AEFI cases
- Ensure better definition of roles and responsibilities for AEFI surveillance between NCPH and MMDA

3.3.3. Immunization coverage reporting

The below analysis is based on the following documents (non exhaustive list):

- Immunization & VPD surveillance report 2014
- Joint appraisal report (July 2015)
- MICS survey 2012
- Coverage monitoring tool 2015 Rom
- Immunization review Transnistria region 2014

The reporting of immunization coverage is done on monthly basis from primary health facility level to upper levels – to district/municipality PHC and to NPHC – using standard forms (forms 6 and 5), in an electronic and manual manner. Timeliness of vaccinations is being monitored.

Immunization programme in the Republic of Moldova remains strong and well-performing: the overall coverage with the routine and new vaccines in 2014 was between 89% and 97%. However, the country has been experiencing steadily declining coverage rates since 2009 for all antigens included in the national immunization schedule. In 2014, this decline continued, with the country failing to reach target vaccination rates (95% coverage) for most antigens, with the exception of

BCG and hepatitis B (birth dose) vaccines. Among the reasons invoked, growing scepticism about benefits of vaccination and concerns about safety of vaccines among medical workers and parents. Medical specialists and general practitioners provide medical contraindications, most of which are false, against all vaccines to significant proportion of infants, which delays vaccination and leaves children unprotected¹².

The coverage rates in the Transnistria region are significantly lower than in the rest of the country.

¹² *More information on the reasons for declining coverage will be provided in the relevant sections*

Vaccination coverage within different age groups in 2014, and low performance districts

	Total coverage	Without Transnistria	Only Transnistria	Districts with low vaccination coverage
At 1 year				
BCG	98,5	97,8	98,7	
Polio	91,9	92,5	87,1	<i>Sângerei – 82,4, Ceadâr - Lunga - 82,5 Dubăsari SN-59,2</i>
Hep B	91,7	92,5	85,5	<i>Tiraspol – 75,2, Bender, Camenca, Dubăsari SN, Grigoriopol – 88,0</i>
DT	91,0	92,2	81,6	<i>Chişinău, Bălţi, Briceni, Donduşeni – 89,0 Sângerei, Ceadâr – Lunga - 82,5 Slobozia – 74,0, Tiraspol – 70,0</i>
DTP	90,3	91,7	79,7	
Hib	89,0	91,3	71,5	<i>Chişinău, Bălţi, Briceni, Donduşeni – 89,0 Sângerei, Ceadâr – Lunga - 82,5 Tiraspol – 70,0, Râbniţa – 38,4</i>
Rotaviral	71,5	75,6	40,2	<i>Chişinău - 65,0, Bălţi – 64,0, Donduşeni – 53,0 Ceadâr – Lunga - 46,0, Ocnîţa – 43,0</i>
Pneumococcal	29,0	32,8	0	<i>Ceadâr – Lunga - 22,0, Cimişlia – 14,0</i>
ROR	89,8	90,3	85,8	<i>Chişinău, Bălţi-86,0, Sângerei, Stefan Voda 83, Ceadâr – Lunga - 76,0, Tiraspol, Dubăsari - 78</i>
At 3 years				
Polio	94,6	95,5	87,2	<i>Ceadâr–Lunga – 88,0, Râbniţa – 84,0 Tiraspol -82,0</i>
DTP	92,7	94,9	76,1	<i>Ceadâr–Lunga, Stefan Vodă-88, Slobozia- 78, Tiraspol -70</i>
At 7 years				
Polio	96,0	96,7	90,9	<i>Sângerei – 86,0, Râbniţa – 73,4</i>
DT	95,6	96,6	88,9	<i>Sângerei – 86,0, Râbniţa – 65,0</i>
ROR	93,4	95,2	80,7	<i>Sângerei – 86,0, Comrat – 85,1, Bender – 73,5, Râbniţa – 68,0 Camenca - 6,1</i>
At 15 years				
Polio	95,7	96,5	88,9	<i>Căuşeni – 87,0, Râbniţa – 84,0, Camenca – 9,3</i>
Td	96,1	96,5	92,9	<i>Căuşeni – 87,0, Râbniţa – 84,0</i>
ROR	93,4	95,3	77,8	<i>Sângerei, Căuşeni – 85,0, Tiraspol – 80,0, Râbniţa – 70,0, Bender – 61,0, Camenca – 9,0</i>

Source: National Center for Public Health

Achievements

- The Republic of Moldova retains an overall high coverage for routine and new vaccines in 2014, between 89% and 97%
- Both survey and administrative reported vaccination coverage data reveal that more than 90% of children receive their immunization doses during the first year of life (15 months for MMR vaccine).

Challenges

There is a steadily declining coverage rates due to:

- General scepticism among medical workers about safety of vaccines and benefits of vaccination;
- Growing proportion of parents refusing to vaccinate their children due to concerns about vaccine safety and religious beliefs;
- Missed opportunities to vaccinate children due to false contraindications;
- Lack of staff in some remote health facilities, inadequate resources for ensuring transportation of staff and vaccines down to the service area;
- Problems in timely registration of children under 1 within primary health care, especially in urban areas and consequent denominator problems leading to misestimating administrative vaccination coverage figures;
- Very high migration of population in and out of the country, affecting timely coverage and target population estimates.
- Drop-out rates remain relatively low for administrative reported coverage figures but higher based on survey estimates like MICS 2012.

Transnistria region

- Long-standing problems in the Transnistria region, with lower immunization coverage than the rest of the country, and where vaccination for certain antigens and target groups is implemented with significant delays

Way forward

- Strengthen vaccination coverage reporting and monitoring system, through developing regular analysis of vaccination coverage data at primary health care and district PHC levels

3.4. Demand generation and communication

The below analysis is based on the following documents (non exhaustive list):

- Communication analysis & solutions
- SWOT on communicating
- Communication plan 2013
- Rotavirus vaccine refusal causes

As previously mentioned, the situation in the Republic of Moldova regarding vaccination coverage is steadily worsening. There are many reasons for parents not vaccinating their children. Fortunately some of these reasons can be addressed. According to a 2012 report by UNICEF on vaccination it names: religious refusals, media, poor quality of vaccines, poor communication between the family and the doctor, poor trust of the health system and a few more. A small qualitative study was also done by WHO and the Center for Health in order to see how the parents and doctors would like to have information presented. The following results were found.

Contraindications remain a big issue in both delaying and cancelling vaccinations. The contraindication is not always the one recommended by WHO or the manufacturer but some that are unique to this geographic region. Often the G P wants to vaccinate the child but this is then being cancelled by a specialist such as neurologists.

The parent's reasons for not vaccinating or being fearful of the vaccines were the following:

- There was a fear of vaccines due to "side effects". This was read up on in the internet and discussed with other moms.
- Since specialists that prescribe contraindications do not always explain why to the parents this causes doubt in the vaccine.
- Country of origin of the vaccine.
- Mass media always shows a negative view on vaccines and even the parents felt that they were vaccinated they doubt the vaccines now.
- There is a lack of information, or the information is too heavy.
- Fear of side effects and reactions.
- Not understanding the priority of vaccination i.e. why vaccinate?

A brief Action Plan on Communication was developed in 2013 to promote immunization through public communication. Some communication activities were already implemented (MoH website on vaccination, pro-vaccine accounts in social media, etc.). More activities are planned in 2015-2016 with WHO EURO consultancy and technical support. The whole idea is to create products that appeal to the audience and makes the empowered to take informed decisions, to reduce the fear experienced and to provide correct information of vaccines for parents based on evidence and not on assumptions.

Achievements

- An assessment on demand generation and communication was done, and problems were identified.
- An action plan on communication was drafted and some activities were implemented.
- The Republic of Moldova participated to the European Immunization Week.

Challenges

- Growing proportion of parents refusing to vaccinate their children due to concerns about vaccine safety and religious beliefs.
- General scepticism among medical workers about safety of vaccines and benefits of vaccination.
- Limited resources and capacity for developing and promoting social mobilization tools and activities.

Transnistria region

- The situation in Transnistria region appears to be even more acute, with no communication plan and little technical and financial support.

Way forward

- Strengthen the national capacity for health promotion and communication
- Develop materials for demand generation, communication and social mobilization
- Increase community demand for immunization services through enhanced communication and information dissemination

3.5. Programme management

3.5.1. Leadership, Governance, legislation and programme management

The below analysis is based on the following documents (non exhaustive list):

- National Public Health Strategy 2014-2020
- National Immunization Programme 2016-2020
- Joint appraisal report (July2015)
- Legal documents on communicable diseases and immunization
- Immunization review Transnistria region 2014

In the National Public Health Strategy 2014-2020, there is an existing specific objective related to communicable diseases:

- “to reduce the burden of communicable and non-communicable diseases by reducing the risk factors and ensuring fair access of population to primary, secondary, and tertiary prevention services.”

And one of the defined tasks to fulfil that specific objective is:

- “to prevent and control vaccine-preventable diseases by covering the target groups with vaccines in line with the provisions of the national immunization programs and to decrease communicable diseases’ morbidity by 2% by 2020 via measures of primary and secondary prevention.”

The Government of the Republic of Moldova recognizes NIP as a priority national public health programme, as confirmed by the Government commitment to provide adequate financing to the NIP and 100% execution of approved budgets. The Deputy Minister of Health chairs the ICC and senior representatives from a number of ministries are among the ICC members. The National Immunization Programme has benefitted from strong political commitment and support until now, but recent political and economic challenges in the country create significant challenges for maintaining political and especially financial support for the Immunization Programme.

On the legislation framework, there are two key policy documents regulating immunization-related aspects: the Law on public health of the Republic of Moldova and the Decree of the Government of the Republic of Moldova on Approval of National Immunization Programme. The law on Public Health guarantees free access to immunization services against the specific illnesses listed in the National Immunization Programme. The MoH sets regulations related to the list of infectious diseases to be addressed through the routine immunization.

Recently the MoH developed the new National Immunization Programme for 2016-2020. This programme was developed in the accordance to the Global Plan of Action on Vaccines (WHA resolution WHA65.17); to the European Action Plan on Vaccines for the years 2015-2020 (WHO European Regional Committee resolution EUR/RC64/R5); to AMS resolution WHA65.5 on the Global Polio Eradication by 2018; and to the resolution on elimination of indigenous measles and rubella in WHO European Region (EUR/RC60/R12).

Specific Orders have been drafted and approved in the recent years:

- Order MoH nr.662 of 28.06.2012 "On the implementation of vaccination against rotavirus infection of children in the Republic of Moldova"
- Order no. 646 of 04.06.2013 "On verification procedures achieve measles and rubella elimination"

- Order no. 1022 of 25/09/13 "on the implementation of pneumococcal vaccination of children against infection in the Republic of Moldova"
- Order No. 376 of 05.05.2014 MS "On approval of the national action plan for maintaining the status of the Republic of Moldova as a country free of polio for the years 2014-2015"
- Order no. 1316 of 24.11.2014 "On cancelling the exclusion of national vaccination calendar of BCG revaccination"
- Order no. 336-d of 06.04.2015 "On intensification of supervision and control of measles and rubella"

More Orders have been already drafted by the NCPH, but it was mentioned that several Orders are still not approved by the MoH, possibly due to recent political challenges. It is a concern that needs to be addressed.

In term of programme management, the National Centre of Public Health (NCPH) is authorized by the MoH to provide overall management of the NIP and to ensure development and maintenance of strong and effective links to other departments within the health sector. Overall, the NIP is an integrated effort involving national, regional and local authorities, different sectors, a range of institutions and health services, including public health and primary health care services. The Programme has experienced and highly qualified programme management, existing communication channels with major international organizations (GAVI, UNICEF and WHO) and policy- and decision-makers, newly established influential NITAG with well-defined structure enjoying a strong political support, and ICC with a high-level political and professional representation. However concerning those committees, the ICC seems not to be really active anymore, and the NITAG was mentioned not to have the quality it is expected. For information, the ICC and NITAG are structured and should be functioning as follow:

On the health reform side, in 2014 a reform on health center autonomy was implemented. The Family Doctor Centres were relocated/renamed as Health Centres, still keeping the reporting on immunization as before, but not having anymore supervision on health centres (Family Doctor Centre and Health Centre were placed at the same level). Therefore it made a higher burden on the Municipality and Districts PHC to supervise and also teach all health centres. Then there is currently a PHC reform under development, and they will be 10 core PHC for the all country, with optimizing of staff and redefinition of responsibilities. It was mentioned that still a lot of questions are still open.

Achievements

- The structure and functioning of the immunization programme, with the overall management by NPCH continues
- Some legislative concerning the immunization programme have been drafted and approved in the recent years, especially for new vaccines and diseases control.
- The ICC and NITAG are in place, and could be well functioning.
- The National Immunization Programme 2016-2020 was recently drafted and approved, and Annual Plan of Activities is issued on a yearly basis.

Challenges

- Although said to be, the immunization programme appeared not to be a full priority by the Government and MoH anymore, maybe to all current political and economical challenges, and the recent change of ministers recently. The current instability may put at risk the immunization programme.

- There is a lack of legislation concerning contraindications, AEFI. There are also old documents to be updated (e.g. diphtheria). The way of finalizing documents in MoH appears to be complicated and delayed.
- Currently the ICC is neither active enough nor activated. The newly formed NITAG was mentioned not to be satisfying in term of quality and independence. The Committees for Polio and for Measles/Rubella needs also to be reviewed/reactivated.
- The impacts of the Primary Health Centres reform are not properly identified and need to be assessed, and questions around the new PHC reform need to be clarified.

Transnistria region

The Transnistria region faces many challenges in term of Leadership, Governance, legislation and programme management.

- Although the immunization programme is said to be a priority, it was observed that the Authorities do not place it at the level it should be.
- Currently the epidemiological section of central CHE is the only body that provides advice to the Health Authorities on immunization financing and implementation.
- No comprehensive multi-year plan exists, including the different components, and which could help resolving some of the key issues (new vaccines introduction, equipment replacement, advocacy, etc.), in line with WHO guidelines and recommendations.

Way forward

- Enhance Leadership, Governance, legislation and programme management
- Implement high-level advocacy, using Partners support, to reposition the NIP as a priority programme
- Ensure NIP is integrated in the context of health sector development
- Continuously evaluate the national immunization programme

3.5.2. Human resource management

The below analysis is based on the following documents (non exhaustive list):

- Joint appraisal report (July2015)
- National Public Health Strategy 2014-2020
- Immunization review Transnistria region 2014

At the national level, the NCPH team in charge of the immunization programme coordinates all activities and oversees the epidemiologists of the municipality or district PHC. At the municipality or district level, the immunization programme is managed by the epidemiologists in close cooperation with the Primary Health Facilities that provide immunization services to the population. In urban areas immunization services are provided through Family Medicine Centers, while in rural areas, service provision is responsibility of the Health Centers, Family Doctor Offices and Health Offices. Personnel involved in immunization organization and delivery are paediatricians, family doctors and home care and vaccination nurses.

The migration of health workers affects heavily the entire country, as health workers leave looking for better working conditions and new career opportunities abroad. Health care staff migration from rural to urban areas contributes to widening gaps in the health care network affecting all national programs, including immunization. As a result, the Republic of Moldova experiences shortage of health professionals in PHC facilities that are primarily staffed with aging workforce due to lack of incentives to attract young and qualified trained specialists to work in the field of

immunization, lack of epidemiologists in some districts and very limited supervision, resulting in high staff turnover in many areas of the country.

In the National Public Health Strategy 2014-2020, among the problems identified in staffing with human resources, it was mentioned:

- There are no clear and attractive opportunities for specialists from public health area; the system for personnel motivation is deficient and it does not include decent incomes, adequate work conditions and possibilities for professional promotion based on some objective criteria.
- The process of personnel professional training for public health system is not fully in line with the society exigencies and international standards; the professional training roadmap is not defined.
- A misbalance is registered between the staffing with human resources from geographic and areas of residence point of view; there is a deficit in number of young specialists.

Achievements

- No real achievements in term of human resources management in recent years.
- Some training courses were implemented at the time of introduction of new vaccines.

Challenges

- There is a lack of epidemiologists and family doctor at national level and in some districts. Moreover the current staff is ageing and replacement with young professionals is difficult.
- Migration, lack of motivation, high turnover of staff and insufficient salary are among the reasons for the lack of health professionals within the immunization programme.
- Training of staff, especially family doctors, is insufficient (2012 assessment shows low performance), for the several components of immunization programme, including how to efficiently communicate with parents.

Transnistria region

- The challenges are similar in the Transnistria region.
- Transnistria immunization managers are rarely exposed to international meetings and experts, to get the latest recommendations in the field of immunization.
- Knowledge and skills for immunization managers and health staff are not always upgraded, because a lack of regular training.

Way forward

- Ensure human resources are secured, with attention be given on how to attract Public Health professionals for the Immunization programme in the coming years, unless the programme will risk serious challenges

3.5.3. Programme cost and finance

The below analysis is based on the following documents (non exhaustive list):

- Joint appraisal report (July2015)
- National Immunization Programme 2016-2020

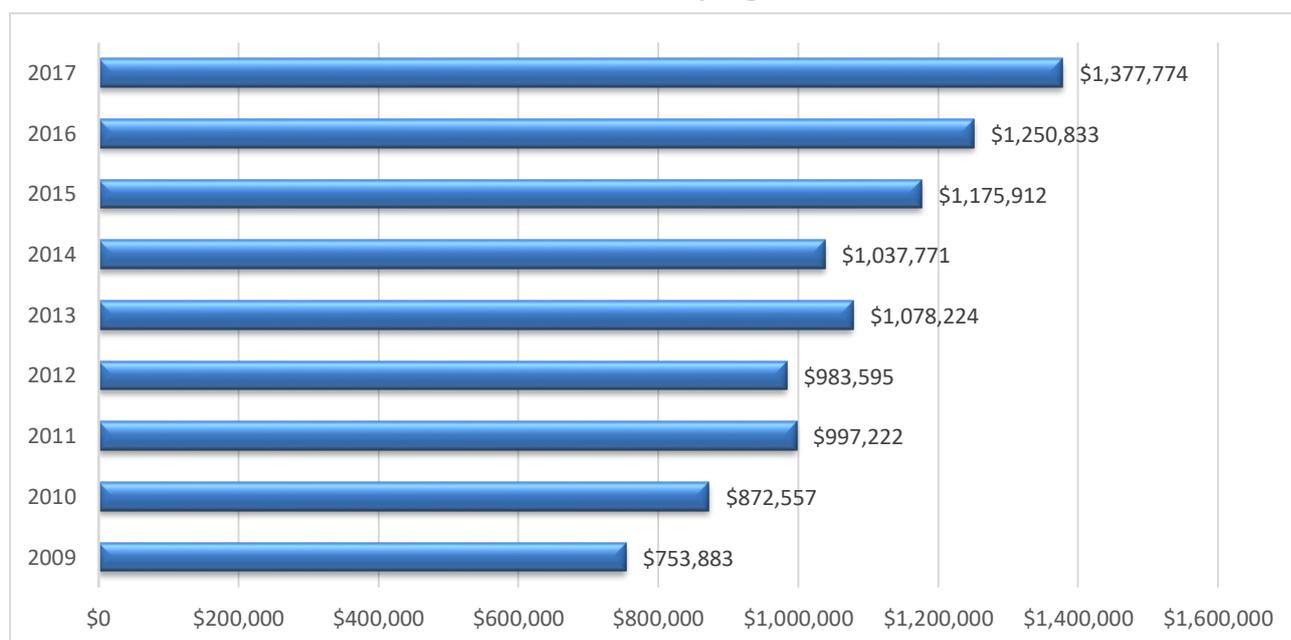
This section will be completed with all costing financial data in chapter 6. A short summary will however be given below.

The Government of the Republic of Moldova showed sustainable gradual increase of its financial commitment toward the NIP and until now has fully covered all programme antigens with the exception of GAVI co-financed vaccines. New National Immunization Plan for 2016-2020 has been drafted and approved. There is no separate immunization line in the state budget law. Immunization expenditure is integrated into the consolidated budget line for health care programs (once the law on budget is passed, the MoH makes local break-down of the health care programs budget and approves the share for immunization). The Government financing of immunization services in the Republic of Moldova is shared between the central budget and National Health Insurance Agency. Central Government is responsible for procurement of routine vaccines and injection supplies and cold chain and laboratory equipment as part of the targeted national programme.

The National Health Insurance Agency (NHI) is responsible for covering personnel and operational costs of service provision, i.e. salaries of PHC teams as well as training, vaccine storage and transportation costs. It also maintains facilities at the national level. 1% of NHI Budget is allocated for the prophylactic fund. Nearly 50% of the prophylactic fund goes to procurement of non-routine vaccines (such as anti-rabies, flue, HepA and HepB vaccines for risk groups). Donor support is mainly targeting programme activities such as training, programme management and disease surveillance. Health Care Sector financing is included in the Mid-Term Evaluation Framework (MTEF) that ensures availability of funds for implementation of all national programs related to the health care sector. According to the finance department of the MoH, the current MTEF for the period 2016-2018 is at the stage of development and will include financial allocations for implementation of the National Immunization Programme.

Vaccine resource requirements have been adequately calculated and well communicated to relevant budget holders. The process benefits from multi-year planning in calculation of costs and forecasting funding with involvement of all stakeholders in the process.

Government financial allocations for immunization programme, 2009-2017



Source: Ministry of Health

Total Government Funding for Health 2009-2014

Years	2009	2010	2011	2012	2013	2014
GDP (Million USD)	5,438	4,887	5,149	4,989	4,800	4,304
The Approved (Million USD)	350	315	332	321	309	277
The Executed Million USD	346	311	328	318	306	274
The % of GDP	6.4	5.6	5.2	5.4	5.2	5.3
Exchange rate	11.1	12.4	11.7	12.1	12.6	14.0

Source: Ministry of Health

GAVI provides funding for new and underused vaccines and injection supplies. Budget estimates for immunization supplies are approved by the Governmental Decree for a period of five years while approving the National Immunization Programme. The Republic of Moldova has met funding requirements for vaccines in 2012, 2013 and 2014, even as co-financing increased. The 2015 co-financing requirements have so far not been fulfilled (according to the information as of 15 September 2015) due to a very challenging fiscal situation in the Republic of Moldova and lack of sufficient funds at the National Treasury level. As of 2017, the Republic of Moldova will fully finance all of its EPI vaccines with the exception of IPV. Vaccine expenditures will be even higher with the addition of other vaccines such as Rabies and Hepatitis A. Potential introduction of HPV would also increase domestic funding requirements. The Republic of Moldova's ability to access GAVI prices for EPI vaccines after graduation will be critical. If self-procured, the cost of pentavalent, rotavirus and PCV vaccines could rise to \$3-4 million a year, based on experience of other middle-income countries procuring directly from suppliers.

The International Monetary Fund (IMF) and the World Bank have halted their lending to the Republic of Moldova earlier in 2015 following a protracted banking crisis. The IMF is planning a mission to the Republic of Moldova in September 2015 to look at prospects for a new support programme to the country. This visit may lead to a new bailout programme which could unlock withheld budgetary support money from the EU and the World Bank.

The budget presented at the time of release of the National Immunization Programme 2016-2020 (below table) showed a sharp increase (almost double) from the Government side, not to mention the impact of the fluctuation of the MDL versus the USD.

The programme budget includes expenditure required to purchase vaccines and immunization supplies to carry out the timetable for vaccinations. Potential sources for the programme will be:

- The state budget within the total resources for healthcare;
- Health insurance funds to purchase vaccines and supplies and immunization services in public health institutions;
- Local authorities for capital repairs and equipment necessary equipment cabinets and vaccination points;
- Financial resources of international organizations (GAVI, UNICEF, WHO).

Budget presented in the National Immunization Programme 2016-2020

	Total cost million MDL *	Covered by			
		State budget	NIHIC	Local public authorities	Foreign sources (WHO, UNICEF)
2016	34.4	25.8	3.0	0.5	5.1
2017	46.2	38.7	3.0	0.5	4.0
2018	47.6	40.1	3.0	0.5	4.0
2019	52.9	48.9	3.0	0.5	0.5
2020	54.2	50.2	3.0	0.5	0.5
Total	235.3	203.7	15.0	2.5	14.1

Source: Ministry of Health

* The MDL rate is sharply fluctuating. As of early 2015, 1 USD = 12.5 MDL. As of September 2015, 1 USD = 20 MDL

Achievements

- The Republic of Moldova has met funding requirements for vaccines in 2012, 2013 and 2014, even as co-financing increased.
- Vaccine resource requirements have been adequately calculated and well communicated to relevant budget holders.

Challenges

- Political and economic situation in the Republic of Moldova is stretching the immunization programme and starting to put at risk the financing of the programme. As an example the Government recently refuse the adoption of the HPV for introduction in 2018.
- Not accessing the UNICEF SD prices for EPI vaccines, and especially newly introduced vaccines, after graduation will put the programme in a really challenging financial situation.
- The MDL rate sharp fluctuation (almost double in 6 months) put an even higher challenge to the programme.

Transnistria region

- The financial situation in the Transnistria region is very acute, where per capita public spending on health is very low.
- For the whole immunization programme in 2013, only 43% of the requested funds was allocated. For the year 2014, currently only 35% was promised.
- The availability of funds is not always predictable, and often delayed at the beginning of the year.

Way forward

- Ensure programme costing and financing are secured, through implementation of high-level advocacy using Partners support
- Strongly consider accessing UNICEF SD prices for EPI vaccines

3.6. Joint Appraisal Process

The Joint Appraisal was conducted from 7 to 10 July 2015. During the mission, participants from GAVI Secretariat, WHO EURO office, UNICEF Regional Office and Sabin Institute met with representatives of the Ministry of Health, National Center of Public Health, National Immunization Program, National Health Insurance Company, Ministry of Finance, NITAG, and the WHO and UNICEF country offices. Based on the discussions during the JA mission and relevant background documents, the Joint Appraisal report was drafted by independent technical expert in close cooperation with GAVI SCM and WHO DCI VPI. The report was shared for feedback with mission members and in-country stakeholders met during the mission, and the final findings and recommendations were discussed with and endorsed by the Deputy Minister of Health and ICC members.

3.6.1. Technical Assistance: current areas of activities and responsibilities

In 2014 and 2015, Moldova received the following technical assistance from the GAVI Alliance partners:

WHO EURO:

1. Continued support in implementation of rotavirus sentinel surveillance and case control study to evaluate an impact of rotavirus vaccine
2. Participation of National Immunization Programme Manager in Global Immunization Meeting held on 23-26 June 2015 in Barcelona, Spain to share experiences in rotavirus and pneumococcal vaccines introductions
3. Technical support in conducting EPI review in Transnistria on 7-11 April 2014 and presenting recommendations on immunization programme strengthening to policy- and decision makers
4. Technical support in conducting PCV post-introduction evaluation
5. Consultancy support in developing of training materials and conducting trainings for medical academia and leading health care professionals from national and regional levels on vaccines safety and contraindications. Two trainings were conducted in Chisinau and Tiraspol (Transnistria)
6. Participation of NITAG members in WHO Regional meeting on “New Vaccine Introduction: Experience and Issues in the European Region” held on 25-27 June 2014 in Izmir, Turkey
7. Participation of the Chair of NITAG in SAGE meeting was held on 14-16 April 2015 in Geneva, Switzerland
8. Participation in the Vaccine Safety-Related Events Communications training workshop on 7-10 April 2015
9. Ongoing technical support in developing and testing vaccine information statements
10. Technical support in conducting Immunization communication review
11. EVM assessment and development of EVM improvement plan
12. NRA assessment
13. Graduation re-assessment and development of an action plan to address identified challenges
14. Capacity building in immunization information systems and immunization financing areas

UNICEF:

1. EVM assessment and development of improvement plan in October 2014
2. Technical support for the development of the new Immunization programme

3. Guidance in strengthening the immunization programme with focus on communication for immunization and diversification of procurement mechanisms
4. Preparatory work for PCV introduction
5. Advocacy on ensuring procurement of GAVI supported vaccines (100% advance payment from public budget in 2015) at the level of MoH and Ministry of Finances
6. Liaise between UNICEF SD and counterparts on availability and possibility to procure vaccines (traditional, new and GAVI supported vaccines)
7. Support to the Immunization week (annually in partnership with MoH and WHO)
8. Comprehensive assessment of cold chain equipment conducted in June 2014
9. Procurement of the most critical pieces of equipment considering the current immunization schedule and potential new vaccines that might be used in the Transnistria Region during the next five years (2015)
10. Development and distribution of immunization promotion materials in Transnistria region (2015)
11. Interpersonal and crisis communication trainings delivered to the epidemiologists and paediatricians (2015)
12. Supported participation of one representative of the National Center of Public Health (NCPH) and one representative of the Agency on Medicine and Medical Devices to the Vaccine Procurement Practitioners Exchange Forum (VPPEF) organized by UNICEF SD. Stakeholders were informed about the vaccine market changes, different ways of vaccine procurement, sources on information on vaccine procurement, UNICEF SD support to countries in vaccine procurement, etc. (2015)
13. The draft plan in partnership with NCPH on ensuring sustainable mechanisms on vaccine procurement is under development (working group on legislative framework revision)
14. The existing communication plan/strategy on vaccine promotion, including crisis communication was adjusted
15. C4D strategy on promotion of immunization was drafted

Sabin Vaccine Institute:

16. Communication support on immunization sustainable financing: documenting immunization budget process and assess sustainability of immunization financing; mapping stakeholders and developing stakeholder-specific messages (2015)
17. Strengthening immunization legislation: reviewing literature on immunization regulations; developing minimum set of legislation provisions (in collaboration with WHO); reviewing immunization-related legislation of Moldova (2015)
18. Advocacy for the sustainable immunization financing at the level of Parliament, MoH and MoF (2015)

3.6.2. Future Needs

The key future needs and priorities for Moldova, as reported by the country in the 2014 APR and re-confirmed during the Joint Appraisal, are:

1. Development of a Comprehensive Multi-Year Plan for the 2016-2020 period
2. Development and approval of the National Immunisation Plan for the 2016-2020 period
3. Introduction of a single-dose inactivated polio vaccine into the children's vaccination schedule
4. Transition from the use of trivalent OPV to bivalent OPV as of April 2016

5. Implementation of the transition plan to full self-procurement of vaccines once GAVI support ends
6. Continuation of measures aimed at increasing immunisation coverage, maintaining the polio-free status, and eliminating measles and rubella
7. Upgrade of refrigerating equipment based on needs assessment, enhancing control over storage conditions and vaccine administration
8. Continuation of measures aimed at increasing the level of knowledge of medical staff in the area of immunization and efficient vaccine management
9. Capacity strengthening of National Immunization Technical Advisory Group and strengthening of the ICC
10. Strengthening ability to ensure new investment in immunization and long-term sustainable resources for immunization
11. Resource mobilization and efficiency
12. Evidence-based decision on introduction of HPV vaccine, and in case this decision is positive – implementation of required preparatory activities prior to the development of application for support to GAVI
13. Improving vaccine safety-related events resilience and communication response capacities communication
14. Improving immunization communication for informing the population on the benefits and safety of vaccination
15. Revise the legal framework on vaccine procurement in order to ensure application of different procurement mechanisms of vaccines
16. Conduct a cost-effective analysis on HPV introduction, especially for target groups
17. Strengthening and institutionalization of supportive supervision system, including in PHC

For the majority of these priority activities, technical assistance has already been secured through the Graduation Grants signed with the WHO and UNICEF in 2015 and scheduled to be implemented between 2015 and 2016. Some of these priorities, however, have not been covered in the Graduation Action Plan and will require additional technical assistance to be secured through the Joint Appraisal channel.

The key technical assistance activities that have been recommended to address priorities identified by the country are the following:

Short-term 2015-2016

- Assess existing legislative framework on vaccine procurement in order to identify and address gaps and bottlenecks in development of diverse procurement mechanisms that will ensure sustainable vaccine availability (UNICEF)
- Elaborate and propose recommendations on adjustments of existing legislation (based on the assessment findings) (Sabin & WHO)
- Evaluate NITAG performance and elaborate recommendations for NITAG capacity strengthening (2015)
- Conduct trainings for medical workers in sub-regions on vaccine safety and contraindications

Medium- to long-term

- Collecting evidence for decision-making on HPV vaccination and potential introduction of HPV vaccine (2016)
- Continued capacity-strengthening of the NITAG (2015-2016)
- Increasing capacities of the national procurement agency to deal with vaccine products and vaccine markets and preparing efficient and sustainable procurement of new vaccines after GAVI support (2015-2016)
- Ensuring stability and predictability of domestic financing (2015-2016)
- Capacity building for resource mobilization advocacy and development of a resource mobilization action plan (2015-2016)
- Strengthening national regulatory capacities (on regulatory framework, market authorization and pharmacovigilance) (2015-2016)
- Increasing access to immunization services by improving quality of services (particularly in low performing districts) (2015-2016)
- Strengthening immunization legislation through facilitating country-level meetings and peer exchanges and conducting regional workshop on immunization legislation (Sabin and WHO, 2016)
- Strengthening vaccine safety-related events communications preparedness and response capacities through capacity building, planning and strategy development, spokesperson training and strengthening collaboration between AEFI investigation teams and communication (2015-16)
- Increasing demand for immunization services by assessing and changing behaviour of immunization providers and parents (including public)

Based on above (medium-to-long term) priorities and key recommendations, the technical assistance areas and activities listed below have been proposed. Detailed list of activities for the next year – 2016 – that require technical assistance, together with intended outcome/s, indication of the implementing agency (potential provider), modality and potential sources of funding, is provided in Annex D.

Immunization financing & resource mobilization	<ul style="list-style-type: none"> • Develop resource mobilization plan and advocacy materials for resource mobilization (WHO TA) • Conduct trainings in resource mobilization for relevant staff (WHO TA) • Conduct analysis of potential savings and efficiencies from using alternative procurement channels (e.g. UNICEF Supply Division) (UNICEF and WHO TA) • Develop parliamentary network for sharing best practices in immunization financing and legislation and providing joint effort for improvements (Sabin Institute) • Implementation of resource mobilization guidelines and immunization advocacy library (WHO) • Engagement of national institutional counterparts (Parliament, MoH and MoF) with local NGOs and think tanks in joint advocacy activities for immunization financing (Sabin)
Vaccine procurement	<ul style="list-style-type: none"> • Conduct a comprehensive review of vaccine procurement practices to identify existing bottlenecks and inefficiencies and propose solutions (UNICEF TA) • Continue building country's self-procurement capacities for vaccines purchased outside of UNICEF Supply Division by improving knowledge on vaccine market dynamics, on evolution of vaccine prices and measures to increase procurement efficiency (WHO and UNICEF TA) • Conduct procurement-related training workshops (UNICEF and WHO TA) • Provide support with preparing efficient and sustainable procurement of new vaccines after GAVI support (WHO and UNICEF TA)
Evidence- based decision- making	<ul style="list-style-type: none"> • Continue providing support to the NITAG (e.g. through disseminating guidance documents, providing trainings, facilitating participation in ETAGE, SAGE and other WHO meetings and visits to other NITAGs, organizing study tours, etc.) and review NITAG performance (WHO TA) • Develop SOPs for NITAG and define the process of declaration of conflict of interests (WHO TA) • Provide technical assistance to NITAG in collecting and evaluating quality of evidence to prepare topics for NITAG discussion (WHO TA) • HPV: Assess costs of HPV vaccine introduction; conduct cost-effectiveness evaluation; provide technical assistance in defining HPV delivery strategy and assessing school readiness for HPV introduction (if relevant); support development of national plan on comprehensive cervical cancer prevention and control (WHO TA) • Provide support in implementation of rotavirus surveillance and impact study in Moldova for 2016 (WHO TA) • Train and equip relevant bodies (NITAG, CNSP) with skills and methods to assess cost-effectiveness (WHO TA)

Programme performance	<ul style="list-style-type: none"> • Review and update immunization protocols and guidelines (WHO TA) • Technical support in addressing vaccine hesitancy (WHO TA) • Provide technical assistance with the tOPV – bOPV switch (WHO TA) • Review implications of public health reform on the National Immunization Program to ensure adequate opportunities for the NIP (WHO TA – check with Maria S.) • Conduct trainings for medical workers in sub-regions on vaccine safety and contraindications; continue such trainings on a central level (WHO TA) • Provide Mid-level Management training to rayon level immunization managers (WHO) • Provide Immunization in Practice training to district level trainers
Data quality	<ul style="list-style-type: none"> • Conduct a data quality audit (WHO TA) • Support the development and implementation of electronic immunization register, including a vaccine stock management module (WHO TA)
Communication & social mobilization	<ul style="list-style-type: none"> • Provide technical assistance in development of a communication plan – WHO TA • Conduct further (in-country) trainings to key staff (including spokespersons) on communications (UNICEF) • Provide training to media staff (UNICEF) • Supporting the Programme in developing and printing key communication materials (UNICEF) • Support the Programme (financially) in conducting communication activities (UNICEF) • Develop communication strategy and messages for HPV introduction (prior to potential HPV application) (UNICEF) • Participation in sub-regional workshop on social media for relevant staff (WHO TA) • Tailor immunization practices for relevant groups and conduct communication activities to change behaviour (WHO) • Develop a tailored communication C4D strategy that targets specific groups of population based on assessment of their attitude, misconceptions and fears related vaccination (UNICEF)

Vaccine management & logistics	<ul style="list-style-type: none"> • Based on a large part of cold chain equipment reaching the end of its useful life, conduct inventory and develop a renewal plan (WHO TA) • Develop a sustainable supportive supervision system that would cover public health and PHC systems and data collection and analysis tools to facilitate systematic identification of issues and follow up on improvement (WHO TA) • Conduct supportive supervision with special emphasis in low performing districts and facilities (WHO TA) • Develop integrated national regulations on storage of vaccines and cold chain requiring pharmaceuticals that would be applicable to all players, including customs, wholesalers, public health and primary health care facilities (WHO TA) • Establish a quality management system, including definition of roles and responsibilities and development of SOPs for each task to be performed at each level of the supply chain (WHO TA) • Improve the use of computerized data management systems (i.e. vaccine stock management, cold chain inventory) at national and sub-national levels • Develop a national systematic training programme on immunization and vaccine management
Vaccine regulations & AEFI surveillance system	<ul style="list-style-type: none"> • Develop comprehensive national AEFI surveillance policy, guidance and tools (defining scope of AEFI surveillance, organizational structure, roles & responsibilities, list of reported conditions and case definitions and standardized AEFI case notification and investigation forms) • Establish the national AEFI review committee and its terms of reference • Causality assessment training (AEFI review committee, EPI, NRA) • Assessment of AEFI and revised guidelines • National training of trainers based on developed guidelines • Establish an AEFI electronic database to facilitate notification, access to and use of case based data • Train staff on market authorization and licensing and AEFI surveillance system (reporting, case investigation) (WHO) • Provide pharmacovigilance training (WHO) • Support a visit to another NRA with well-established QMS to understand the QMS implementation for a regulatory system (WHO) • Train key NRA staff on Good Regulatory Practice (WHO TA)
New Vaccine Support	<ul style="list-style-type: none"> • HPV: in case of positive decision on HPV introduction, provide support in preparing GAVI application and introduction of HPV vaccine (education of medical workers, development and implementation of communication strategy) (WHO TA) • Support with tOPV/bOPV switch • Support with Post-Introduction Evaluation for IPV vaccine • Continue implementation of rotavirus sentinel surveillance and case control study to monitor rotavirus vaccine impact • Conduct a study to evaluate impact of PCV

4. Immunization programme objectives, strategies and key activities

The Global Vaccine Action Plan highlights 6 strategic objectives, which will enable the achievement of the goals for the Decade of Vaccines (2011-2020). The GVAP also identifies key indicators, which can be used at the national level to monitor progress towards meeting these global objectives.

GVAP Strategic Objectives	Key indicators to monitor progress at national level
1. All countries commit to immunization as a priority	<ul style="list-style-type: none"> • Presence of a legal framework of legislation that guarantees financing • Presence of an independent technical advisory group
2. Individuals and communities understand the value of vaccines and demand immunization as both their right and responsibility	<ul style="list-style-type: none"> • Level of public trust in immunization as monitored through knowledge, attitude and practice surveys
3. The benefits of immunization are equitably extended to all people	<ul style="list-style-type: none"> • Percentage of districts with <80% DPT3 coverage • Coverage gaps between the lowest and highest wealth quintile
4. Strong immunization systems are an integral part of a well-functioning health system	<ul style="list-style-type: none"> • DPT1 to MVC1 dropout rates • Quality of immunization data
5. Immunization programmes have sustainable access to predictable funding, quality supply and innovative technologies	<ul style="list-style-type: none"> • Percentage of routine immunization costs financed through government budgets
6. Country, regional and global research development innovations maximize the benefits of immunization	<ul style="list-style-type: none"> • Capacity for vaccine manufacturing • Capacity to conduct clinical trials • Capacity to conduct relevant operational research

In September 2014, the Member States of the WHO European Region unanimously adopted the European Vaccine Action Plan 2015-2020 (EVAP). The EVAP is a regional interpretation of the Global Vaccine Action Plan developed to address the specific needs and challenges related to immunization in the WHO European Region. Aligned with Health 2020 and other key regional health strategies and policies, EVAP was endorsed by the European Technical Advisory Group of Experts on Immunization before submission to the 64th session of the Regional Committee for Europe in September 2014. EVAP's aim is to guide Member States in the European Region towards their joint vision of a Region free of vaccine-preventable diseases. It establishes six goals (sustain polio-free status, eliminate measles and rubella, control hepatitis B infection, meet regional vaccination coverage targets at all administrative levels throughout the Region, make evidence-based decisions on introduction of new vaccines and achieve financial sustainability of national immunization programmes) and outlines a path to achieve them through defined objectives, priority action areas, proposed actions and an evaluation and monitoring framework.

EVAP goals	EVAP objectives
1. Sustain polio-free status	<ul style="list-style-type: none"> All countries commit to immunization as a priority
2. Eliminate measles and rubella	<ul style="list-style-type: none"> Individuals understand the value of immunization services and vaccines and demand vaccination
3. Control hepatitis B infection	<ul style="list-style-type: none"> The benefits of vaccination are equitably extended to all people through tailored, innovative strategies
4. Meet regional vaccination coverage targets at all administrative levels throughout the Region	<ul style="list-style-type: none"> Strong immunization systems are an integral part of a well-functioning health system
5. Make evidence-based decisions about introduction of new vaccines	<ul style="list-style-type: none"> Immunization programmes have sustainable access to predictable funding and high-quality supply
6. Achieve financial sustainability of national immunization programmes	

At the National level, the Republic of Moldova recently approved the National Immunization Programme 2016-2020, which is stating the following goal:

- Eliminating or reducing morbidity, disability and mortality of the population to immunization compulsory, guaranteed by the state, tuberculosis, hepatitis B, polio, diphtheria, tetanus, pertussis, measles, mumps, rubella, *Haemophilus influenzae* type b, with rotaviruses with pneumococcus, human papillomavirus vaccination calendar according to 2016-2020 years, as well as immunizations indications in situations of high risk of epidemic disease and the spread of infections.

Specific objectives of the National Immunization Programme 2016-2020 were defined in line with the EVAP objectives:

- Promote the belief of every person and community to realize the importance of immunization and to promote the idea that vaccination is one of human rights and obligations;
- Ensure at least 95% vaccination coverage in target populations nationwide, through equitable and universal access to immunization services guaranteed by the state for all people through the use of innovative strategies adapted to local conditions;
- Strengthen immunization, epidemiological surveillance and control of infectious diseases preventable by vaccination as an integral part of the health system;

Main actions to achieve the objectives of the NIP 2016-2020 were identified:

- Regularly informed and active involvement in implementing the programme of central and local government, ministries, institutions, non-governmental organizations, public and citizens;
- Review and adjustment of the legal framework on immunization, surveillance and control of diseases preventable by vaccination;
- Managerial capacity building of staff responsible for organizing the Programme and the National Advisory Committee of Experts on Immunization;

- Familiarization and information service providers immunizations and vaccinations with a promoter in the field of immunization WHO documents, elimination and eradication programs of infectious diseases through immunization;
- Drafting, editing and dissemination of information materials, based on real data and scientific arguments about the benefits and importance of personal and public health immunization;
- Organizing and conducting annual Immunization Week in the European and Global Immunization Week;
- Maintaining continuous dialogue with supporters and opponents of vaccinations in social networks and other means of Internet-based communication technologies;
- Sociological conducting investigations to identify the causes of refusals of vaccination;
- Vaccination of persons involved in the promotion of new followers of immunizations among workers in the sphere of education, religious leaders, leaders of media practitioners, medical studies media workers, activists, volunteers, professional medical associations;
- Ensuring universal access of the population to performing immunization vaccination coverage of more than 95% of the population ages national targets in each administrative area, vaccination of all persons who have medical contraindications to vaccination and quotas venture as part of the package unique healthcare;
- Monitoring of the vaccination status of every person through the implementation of electronic filing immunization records as an integral part of the health information systems;
- Identifying groups and individuals inaccessible for vaccination and ensure their immunization;
- Ensuring adequate supplies permanent vaccine international standards, kept in a cold chain interrupted us and immunization services quality;
- Strengthening immunization services, epidemiological surveillance and control of infectious diseases preventable by vaccination;
- Capacity building for the managers and staff involved in providing services for immunizations, supervision and control of diseases preventable by immunization;
- Conducting research in the field of immunization and vaccine-preventable disease surveillance;
- International and intersectoral collaboration within the Programme;
- Sustainable Financing Programme.

In order to better define the objectives, strategies and key activities, and help tracking them with timeline of implementation, the below table provides all required details.

Objectives	Strategies	Core activities	Year				
			2016	2017	2018	2019	2020
1. Meet regional vaccination coverage targets at all administrative levels	1.1. Ensure universal access of population to immunization services and reach everybody targeted for immunization	Monitor and review provision of immunization services in each primary health care unit, especially in loop of the new autonomy by HC, in order to identify gaps, high-risk groups and bottlenecks	√	√	√	√	√
		Conduct targeted activities towards medical doctors and specialists to alleviate contraindications	√	√	√		
		Enhance supportive supervision, from national to district, and from district to primary health facilities; Identify option to solve per-diem issue	√	√	√	√	√
		Continue adjusting immunization calendar with new vaccines introduction, and removal of some booster doses	√	√	√	√	√
	1.2. Ensure the high quality of immunization services practices	Provide mid-level management (MLM) training in priority districts		√	√		
		Provide immunization in practice (IIP) training in priority districts		√	√		
		Review current immunization national guidelines (including IPV, bOPV, AEFI, etc.)		√	√		
	1.3. Increase demand for immunization services	<i>Activity covered under section 8</i>					
2. Sustain polio-free status and prepare for the polio end-game	2.1. Increase and maintain a high coverage with OPV	<i>Activity covered under sections 8 and 9</i>					
		Evaluate immunization gaps and population at risk; If required, implement additional vaccination activities (SIA, SNID)	√	√	√	√	√
	2.2. Implement WHO global recommendations on IPV and bOPV	Introduce IPV one dose after 3 rd dose of OPV	√				
		Switch from tOPV to bOPV	√				
	2.3. Improve non-polio AFP surveillance performance	Advocate for the importance of AFP surveillance at policy/decision-making level to mobilize more resources	√			√	

Objectives	Strategies	Core activities	Year					
			2016	2017	2018	2019	2020	
		Conduct seminars on AFP surveillance for neurologists, infectionists and family doctors	√			√		
		Strengthen AFP surveillance detection through enhanced regular supervision and active surveillance	√	√	√	√	√	
		Continue to advocate the importance of stool specimen collection, and provision to laboratory on time	√			√		
		Ensure the annual accreditation of the polio laboratory	√	√	√	√	√	
	2.4. Strengthen research on population immunity and poliovirus circulation	Asses population immunity against polio among children, youths and young adults	√					
		Continue evaluating poliovirus circulation in the environment	√	√	√	√	√	
	2.5. Ensure probe of polio-free status in Republic of Moldova	Issue annual documentation for the National and Regional Polio Certification Committees	√	√	√	√	√	
	3. Eliminate measles and rubella	3.1. Increase and maintain a high coverage with MMR vaccine	<i>Activity covered under sections 8 and 9</i>					
			Evaluate immunization gaps and population at risk; If required, implement additional vaccination activities (catch up, mop up)	√	√	√	√	√
		3.2. Improve measles and rubella and CRS surveillance and laboratory investigation	Advocate the importance of specimen collection; Develop and distribute materials for counselling managers, health staff and parents	√	√	√	√	√
Conduct seminars on proper detection and case definition of MR by emergency staff, infectionists and family doctors			√			√		
Collect samples for children with fever and rash and send all suspected cases to laboratory for investigation			√	√	√	√	√	
Continue conducting studies to assess feasibility of using alternative specimens for case detection				√				
Provide IgG tests to laboratories				√				

Objectives	Strategies	Core activities	Year				
			2016	2017	2018	2019	2020
		Ensure the annual accreditation of the MR laboratory	√	√	√	√	√
	3.3. Strengthen research of the population immunity against measles and rubella	Conducting studies to assess measles and rubella immunity levels by age groups to identify populations at risk		√	√		
	3.4. Ensure probe of progress of measles and rubella elimination in Republic of Moldova	Issue annual documentation for the National and Regional Measles and Rubella Elimination Committees	√	√	√	√	√
4. Control hepatitis B infection ¹³	4.1 Increase and maintain a high coverage with hepatitis B vaccine	<i>Activity covered under sections 8 and 9</i>	√	√	√	√	√
		Evaluate immunization gaps and population at risk; If required, implement specific vaccination activities	√	√	√	√	√
	4.2. Strengthen hepatitis B surveillance	Assess the high risk groups for acquiring hepatitis B infection, including pregnant women, youths, young adults and high risk groups	√		√		√
		Implement countrywide the diagnostics algorithm for all suspected acute hepatitis cases, including hepatitis B	√				
	4.3 Strengthen research about transmission and population immunity against hepatitis B	Research and implement management algorithms to reduce/prevent perinatal transmission	√				
		Continue conducting sero surveys to assess immunity levels and impact of hepatitis B vaccination		√			
		Introduce IPV one dose after 3 rd dose of OPV	√				

¹³ There is an existing separate National Programme for Control of Hepatitis B, C and D. Objectives, strategies and activities listed above are immunization-related objectives, strategies and activities. The objectives, strategies and activities of the overall programme for control of Hepatitis B, C and D are therefore wider.

Objectives	Strategies	Core activities	Year				
			2016	2017	2018	2019	2020
5. Expand NIP through introduction of new vaccines	5.1. Introduce new vaccines with evidence-based information	Switch from tOPV to bOPV	√				
		Advocate the introduction by 2018 of HPV vaccine with evidence-based information	√	√			
		Conduct activities linked to new vaccine introduction: Draft, approve and distribute orders, guidelines; conduct appropriate training courses	√	√	√		
		Evaluate the need for introduction of other new vaccines, with evidence-based information			√	√	√
	5.2. Strengthen surveillance for new vaccines	Expand sentinel based surveillance system for rotavirus infection and integrate it with surveillance of acute diarrhoea diseases	√	√			
		Expand surveillance for Hib, Str. pneumonia, N. meningitidis with sentinel surveillance of influenza, ARI and LARI	√	√			
		Strengthen surveillance for Hib, Str. pneumoniae, N. meningitidis in public health laboratories, in view of the coming reform of the 10 district PHC	√	√	√		
6. Ensure vaccine quality, vaccine supply and vaccine management	6.1. Enhance self-reliance in quality assurance and regulatory oversight	MDA to continue the implementation of activities agreed upon in the Institutional Development Plan developed in compliance with the recommendations of 2011 NRA assessment (functions, financial and human resources, capacity building, QMS, etc.)	√	√	√		
		Conduct a follow-up assessment of the NRA (Medicines and Medical Devices Agency) with WHO HQ regulatory experts support		√			
	6.2. Ensure full procurement and supply of quality-assured vaccines	Advocate at high-level to ensure full financing of all required childhood vaccines	√				
		Secure the procurement and supply of all required childhood vaccines, considering the 2015 constraints with unsuccessful tenders	√				

Objectives	Strategies	Core activities	Year				
			2016	2017	2018	2019	2020
		Explore alternative procurement options, notably procurement of all available antigens through UNICEF Supply Division; Adjust legislation as necessary for that alternative procurement	√				
	6.3. Strengthen vaccine management, cold chain and logistics	NCPH to continue the implementation of the EVM improvement plan developed in compliance with the recommendations of 2014 EVM assessment (financial and human resources, capacity building, equipment, maintenance, guidelines, SOPs, etc.)	√	√	√		
		Ensure the progressive replacement of refrigerators and continuous temperature monitoring equipment at the service delivery level	√	√	√		
		Conduct an EVM follow-up assessment			√		
		Ensure the continuous accreditation of the national vaccine store	√	√	√	√	√
7. Strengthen surveillance of vaccine preventable diseases, AEFI and coverage monitoring	7.1. Strengthen the VPD surveillance system, through its integration to the communicable diseases surveillance system	Renew and approve legislation (decrees, orders) for VPD surveillance	√	√			
		Collaborate in the implementation of the recommendations of 2014 ECDC surveillance assessment (financial and human resources, capacity building, equipment, guidelines, etc.)	√	√	√		
		Renew the National Guidelines on integrated surveillance of VPDs in line with WHO recommendations	√				
		Explore ways to improve the collection of specimens to be brought to the reference laboratories for investigation (specifically non-polio AFP, measles and rubella)	√	√			
	7.2. Strengthen laboratory capacity for investigation of VPDs	Strengthen laboratory capacity for investigation of VPDs (financial and human resources, capacity building, equipment, guidelines, etc.), in the loop of the reform of the district PHC	√	√	√		
		Ensure the qualification of laboratories for investigation of VPDs (specifically accreditation of polio, measles and rubella laboratories)	√	√	√	√	√
		Renew legislation on AEFI surveillance	√	√			

Objectives	Strategies	Core activities	Year				
			2016	2017	2018	2019	2020
	7.3. Strengthen surveillance and response to AEFI cases	Coordinate with MMDA the implementation of the AEFI activities agreed upon in the Institutional Development Plan; Better define roles and responsibilities for AEFI surveillance/response between NCPH and MMDA	√	√	√		
		Review the AEFI surveillance component in the current immunization national guidelines		√	√		
		Envisage an AEFI surveillance review, involving NCPH and MMDA			√	√	
	7.4. Strengthen vaccination coverage reporting and monitoring system	Improve accuracy of denominator through systematic exchange of data between birth registration offices, primary health care centres and local administrations	√	√			
		Strengthen communication channels and documentation on newborns between maternity wards and primary health care centres	√	√			
		Develop the regular analysis of vaccination coverage data at primary health care and district PHC levels, to enable identifying gaps and difficulties, and tailoring actions	√	√	√		
8. Increase demand generation, communication and social mobilization	8.1. Strengthen the national capacity for health promotion and communication	Advocate at MoH level health promotion and communication to be a priority component, especially for increasing immunization coverage	√	√	√	√	√
		Develop a health promotion and communication strategic plan, looking after next 5-10 years, and advocate for financing that plan	√	√			
		WHO and UNICEF to continue their support for enhancing health promotion and communication for the immunization programme	√	√	√	√	√
		Plan and implement the European Immunization Week, emphasizing on covering gaps and challenges of the programme	√	√	√	√	√
		Organize health promotion and communication skills training for managers and health staff, with support of communication experts	√	√			
		Produce periodic press releases and situation analysis notes to inform stakeholders on progresses of routine immunization activities	√	√	√	√	√

Objectives	Strategies	Core activities	Year				
			2016	2017	2018	2019	2020
	8.2. Develop materials for demand generation, communication and social mobilization	Continue elaborate programme messages on benefits of immunization targeting parents, medical staff and media	√	√	√	√	√
		Develop information, education and communication (IEC) materials with new technology/network on benefits of immunization	√	√	√	√	√
	8.3. Increase community demand for immunization services through enhanced communication and information dissemination	Contact community and religious leaders to improve public involvement and participation through increased awareness on immunization benefits	√	√	√	√	√
		Inform schoolchildren/students with new technology/network on benefits of immunization to communicate messages to families		√	√		
		Further involve the civil society and NGOs in demand generation, communication and social mobilization for immunization services		√	√		
	9. Strengthen the Leadership, Governance and programme management	9.1. Enhance Leadership, Governance, legislation and programme management	Implement high-level advocacy at Government and Parliament levels, with the visit of International and European partners, in order to reinstate the immunization as a real priority programme, including in the Transnistria region	√			
Promote and/or reinforce partnership, national and international collaboration to support the immunization programme, in order to reach national, regional and global objectives			√	√	√	√	√
Reactivate the Inter-agency Coordination Committee (ICC), with priority to find solutions to revert the trend of decreasing immunization coverage			√		√		√
Review the functioning of and strengthen the National Immunization Technical Advisory Group (NITAG)				√			
MoH to approve the cMYP 2016-2020 with the costing/financing component; MoH and MoF to ensure that the cMYP is part of and integrated into the broader Health Sector Plan			√				

Objectives	Strategies	Core activities	Year				
			2016	2017	2018	2019	2020
		MoH to process and approve timely the Orders issued by the NCPH and related to immunization, diseases control and VPD surveillance	√	√	√	√	√
	9.2. Ensure human resources are secured	Advocate at Government level to ensure health facilities are fully staffed with family doctors, nurses and epidemiologists for immunization tasks	√	√	√		
		Find solutions (e.g. incentives) on how to attract new Public Health professionals for the Immunization programme in the coming years, unless the programme will face serious challenges		√	√	√	
		Work on curricula for medicine students, family doctors, nurses and assistant epidemiologist, to enhance the immunization teaching			√	√	√
	9.3. Ensure programme costing and financing are secured	MoH and MoF to approve the cMYP 2016-2020 with its costing/financing component	√				
		Implement high-level advocacy at Government and Parliament levels, using Partners, to ensure funds are secured for the next 5 years at least	√				
		Government and MoH to strongly consider accessing UNICEF SD prices for NIP vaccines	√				
	9.4. Ensure NIP is integrated in the context of health sector development	Conduct a study to assess potential impacts of the current health reforms on immunization, and identify further actions to strengthen NIP in the context of the health sector development		√	√		
		Inform and sensitize local authorities on NIP achievements, and on needs for support and collaboration to prioritize and better integrate the immunization programme		√	√		
		Ensure NIP managers are involved in working groups planning and assessment of the health reforms, to ensure that immunization activities are properly considered		√	√		

Objectives	Strategies	Core activities	Year				
			2016	2017	2018	2019	2020
	9.5. Continuously evaluate the national immunization programme	Conduct annual evaluation of the immunization programme with participation of partners present at national level	√	√	√	√	√
		Assess the need for specific evaluation (DHS, MICS, coverage survey, NIP programme review, etc.), with support and participation of international Partners	√				
10. Support strengthening the Immunization programme in Transnistria region		UNICEF and WHO in collaboration with NCPH to provide technical support and coordination to help strengthening the Immunization programme in Transnistria region	√	√	√	√	√

5. Monitoring and evaluation framework (indicators and targets)

At the National level, the Republic of Moldova recently approved the National Immunization Programme 2016-2020, which is stating the following monitoring indicators:

1. Vaccine coverage rate for each dose of vaccine administered to persons who require vaccination will be calculated monthly and annual statistical reports branch (Form 5-san) at national, regional and healthcare institution;
2. Global vaccination coverage rate will be calculated annually based on the state statistical report (Form 6) at national, regional and healthcare institution;
3. Rate of incidence of infectious diseases preventable by vaccination, will be calculated monthly and annually under state statistical report (Form 2) at regional and national level;
4. Lack of indigenous transmission of wild polio virus, the causative agent of measles, rubella, diphtheria;
5. Proportion of administrative territories with vaccine coverage indicators not less than 95%;
6. Administrative territories proportion of children with indicators of losses of 5% of the immunization programme.

In order to better define and adjust the indicators and targets with the defined objectives, strategies and key activities, the below table will be using the objectives listed in chapter 4.

Objectives	Indicators	Source of data	Baseline year value	Target value (by years)				
				2016	2017	2018	2019	2020
1. Meet regional vaccination coverage targets at all administrative levels	Percentage of infants vaccinated with 3 doses of DTP-containing vaccine at national level	Admin. data NCPH	91.0% (2014)	91,5%	92,0%	93,0%	94,0%	95,0%
	Percentage of districts with more than 90% coverage with DTP3	Admin. data NCPH	77% (2014)	80%	85%	90%	95%	100%
	MLM training courses – Number of districts/municipalities covered	NCPH	44 (2015)	8	7	10	10	9
	IIP training courses – Number of districts/municipalities covered	NCPH	00 (2014)	10	10	7	9	8
2. Sustain polio-free status and prepare for the polio end-game	Number of cases of wild poliovirus transmission cases	AFP surveil- lance NCPH	0 (2014)	0	0	0	0	0
	OPV-3 vaccine coverage	Admin. data NCPH	91.7% (2014)	93%	95%	96%	97%	98%
	Non-polio AFP rate	AFP surveil- lance NCPH	0.8 (2014)	1.5%	2.0%	2.0%	2.0%	2.0%
	Polio laboratory accreditation	WHO EURO	Accredited (2014)	Accredited	Accredited	Accredited	Accredited	Accredited
3. Eliminate measles and rubella	Number of cases of measles and rubella (indigenous)	NCPH	2	0	0	0	0	0

Objectives	Indicators	Source of data	Baseline year value	Target value (by years)				
				2016	2017	2018	2019	2020
	MMR-1 vaccine coverage	Admin. data NCPH	90.6% (2014)	93%	95%	96%	97%	98%
	Measles laboratory accreditation	WHO EURO	Accredited (2014)	Accredited	Accredited	Accredited	Accredited	Accredited
4. Control hepatitis B infection	Penta-3 vaccine coverage	Admin. data NCPH	91.0% (2014)	91,5%	92,0%	93,0%	94,0%	95,0%
	Number of cases of hepatitis B in children (0-17 years)	NCPH	3	0	0	0	0	0
5. Expand NIP through introduction of new vaccines	Introduction of IPV	NCPH	Not (2014)	Introduced	n/a	n/a	n/a	n/a
	Switch of bOPV	NCPH	Not (2014)	Introduced	n/a	n/a	n/a	n/a
	Introduction of HPV	NCPH	No (2014)	No	Yes	n/a	n/a	n/a
6. Ensure vaccine quality, vaccine supply and vaccine management	Purchaser-provider split to ensure NRA functionality	MMDA	No (2014)	Yes	n/a	n/a	n/a	n/a
	Vaccine supply – Number of tenders unsuccessful	NCPH	3 tenders (2014)	0	0	0	0	0
	National vaccine store accreditation	WHO EURO	Accredited	Accredited	Accredited	Accredited	Accredited	Accredited

Objectives	Indicators	Source of data	Baseline year value	Target value (by years)				
				2016	2017	2018	2019	2020
			(2014)					
	Number of refrigerators provided at primary health centres	Local Authorities	70 (2014)	300	300	300	250	250
7. Strengthen surveillance of vaccine preventable diseases, AEFI and coverage monitoring	Legislative documents and national guidelines renewed and approved	MoH	3 (2014)	5	5	5	5	5
	AEFI surveillance specialists conference – Number of districts/municipalities covered	NCPH	2 (2014)	10	10	7	9	8
8. Increase demand generation, communication and social mobilization	Communication strategic plan developed	NCPH	Not (2014)	Yes	n/a	n/a	n/a	n/a
	European Immunization week implemented	NCPH	Yes (2014)	Yes	Yes	Yes	Yes	Yes
	Number of meeting, training, media events	NCPH	2 (2014)	5	5	5	5	5
9. Strengthen the Leadership, Governance and programme management	High-level meeting implemented, with Partners participation	MoH	1 (2014)	1	0	1	0	1
	ICC meeting	MoH	3 (2014)	2	2	2	2	2
	Percent of immunization budget not secured	MoH, MoF	0% (2014)	0%	0%	0%	0%	0%

Objectives	Indicators	Source of data	Baseline year value	Target value (by years)				
				2016	2017	2018	2019	2020
	Number of programme evaluation (DHS, MICS, coverage, review), with international partners	MoH	1 (2014)	1	1	1	1	1
10. Support strengthening the Immunization programme in Transnistria region	Visit and meeting of Partners in Transnistria region	WHO, UNICEF	4 (2014)	2	2	2	2	2

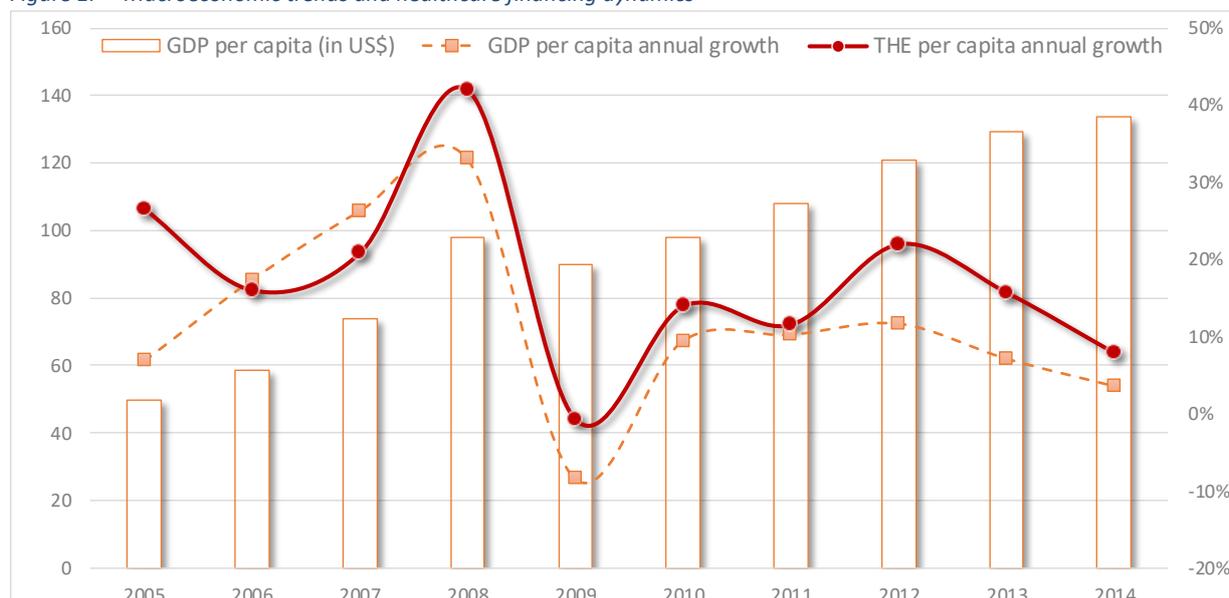
6. Immunization programme costs, financing and funding gaps

6.1. Macroeconomic context and demographics

The following assumptions have been used for macroeconomic projections for Moldova cMYP 2016-2020 costing exercise:

- GDP per capita rate was set based on WHO estimates:
 - -0.1 and 9.4% GDP range of annual growth rate during 2010-2014 in accordance with the WB annual GDP growth rate forecast.
- GDP per capita (in current US\$) was estimated at 2,217 in 2014 (according to the WHO Global Health Expenditure Database (GHED)) as shown in Figure 26.
- Total Health Expenditure (THE) per capita was 229 US\$ in 2014 (in accordance with the WHO NHA GHED). THE per capita projections were made using the GDP per capita annual growth rate (range -0.1% and 9.4%) as described above
- GHE as % of THE – constant value at the rate for baseline year (2014) – 51.4% (in accordance with the WHO NHA GHED).
- Inflation rate (Consumer price index) was estimated at level of 4.64 – 5.09 in previous 3 years (according to the World Bank World Development Indicators);

Figure 1: Macroeconomic trends and healthcare financing dynamics



Source: WHO Global Health Expenditure Database

The total population was estimated at 4,061,550 in 2014 (in accordance with information provided by the National Bureau of Statistics):

- The population growth was projected at the annual growth rate of -0.1% (in accordance of the projections of National Bureau of Statistics. The rate is in line with the WB data on population annual growth % in last five years.

- Infant mortality rate – constant at the rate 9 per 1000 live birth in 2014 in accordance with the National Bureau of Statistics of Moldova. Data on infant mortality rate estimates for projection years was not available and thus the constant rate was used for cMYP costing and financing analysis.
- According to the EPI Moldova:
 - The number of surviving infants was 45,799 in 2014, that translates into 46,215 newborns at the infant mortality rate of 9 per 1,000 live births (that is 1.14% of the total population in 2014).

6.2. Current programme cost and financing

Expenditures on immunization in the baseline year

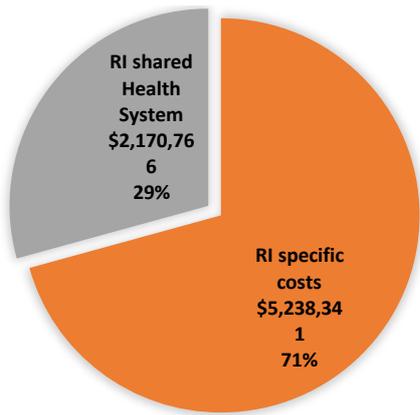
The national immunization program expenditures in 2014 amounted to 7.41 million US\$ (with shared health system costs) as shown in Figure 2 below:

Figure 2: Baseline Indicators (2014)

Total Immunization Specific Expenditures	\$5,238,341
Supplemental immunization activities	\$0
Routine immunization only	\$5,238,341
Per capita	\$1.29
Per DTP3 immunized child	\$127
% Vaccines and Supplies	36.21%
% Government Funding	44.95%
% Of Total Health Expenditures (THE)	0.56%
% Government Health Expenditures	1.10%
% GDP	0.06%
Total shared costs	\$ 2,170,766
% Shared Health Systems Cost	29.30%
Total Immunization Expenditures	\$7,409,107

No supplemental immunization activity was conducted in 2014.

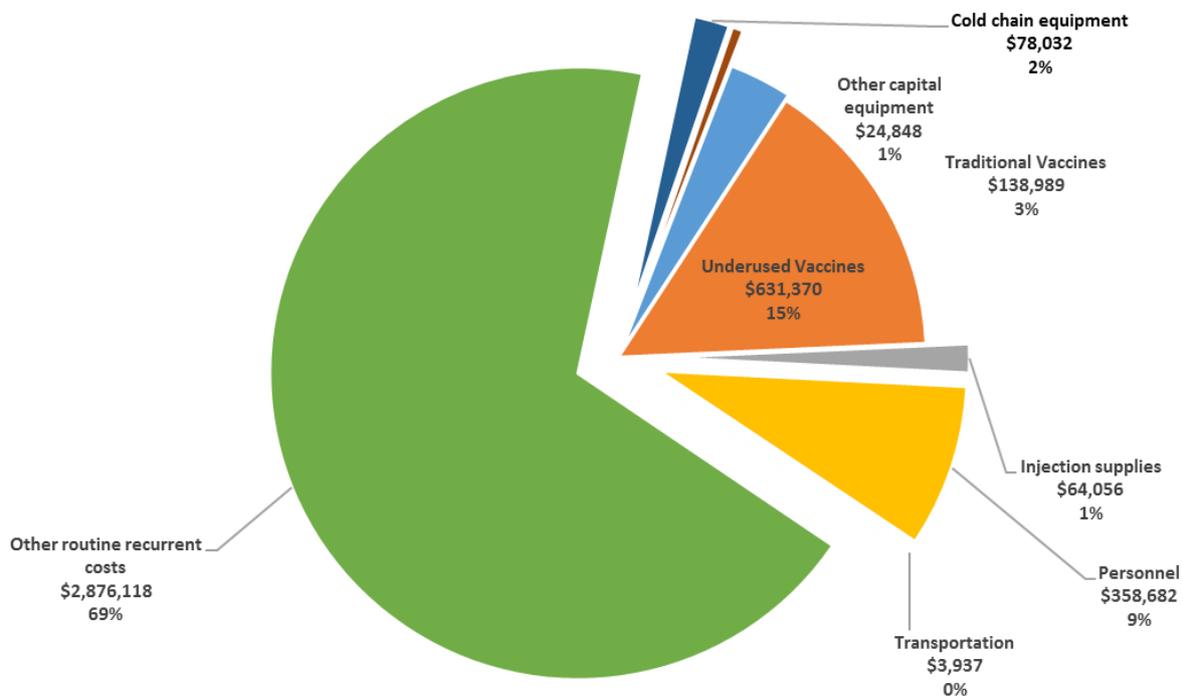
Shared health system costs (2.2 million US\$) accounted for 29% of the immunization expenditures in 2014 and the rest was spent specifically on routine immunization. The cost of fully (DTP3) immunized child was 127 US\$.



0.56% of the total health expenditures (or 1.1% of the government health expenditure) was spent on routine immunization in 2014.

“Other routine recurrent costs” were the major cost driver accounting for 54.91% (or 2.9 million US\$) of all expenditures as shown in **Error! Reference source not found.** below:

Figure 3: Routine Immunization baseline cost structure



“Vaccines and injection supplies” costs were the second major cost driver accounting for 36% (or 1.06 million US\$) of the total expenditures. “Personnel” expenditures constituted 6.85% of the total costs (or 358.682 US\$); 1.49% or 78,032 US\$ was spent on “cold-chain equipment; 0.47% or 24,848 US\$ - on “other capital equipment and 0.08% or 3,937 was spent on transportation in 2014.

Routine immunization cost structure

Personnel

Out of the total of 574 persons engaged in the national immunization program 467 (81%) are shared health system personnel (allocating some portion of work time to immunization) and 107 (19%) persons dedicate full work time to immunization as shown in Figure 21.

Vaccines

In total 138,989 US\$ (2.65% of total program cost) were spent on traditional vaccines; 631,370 US\$ (12.05% of total program cost) - on underused vaccines and 1,062,309 US\$ (20.28% of total program cost) on new vaccines in 2014; the total expenditures on vaccines and injection supplies amounted to 1,896,724 US\$ (or 36% of total program costs).

Other Routine Recurrent Costs

The total for “other routine recurrent costs” amounted to 2,876,118 US\$ in the baseline year.

“Disease surveillance” was the main cost driver of “Other routine recurrent costs” accounting for 56.28% (or 1.6 million US\$). This was followed by “program management”, consuming 18.03% (or 518,585 US\$) of other routine recurrent costs of the program. “Building overheads” accounted for 12.64% (or 363,468 US\$) and “maintenance and overhead of cold-chain” accounted for 8.72% (or 250,804 US\$) of total other routine recurrent costs. 2.19% and 2.09% of total routine recurrent costs (or 63,126 US\$ and 60,000 US\$) was spent on “IEC/Social Mobilization” and “Short-term trainings” respectively, and 0.05% (or 1,463 US\$) accounted for “maintenance of other capital equipment”.

Vehicles and Transportation

Transportation expenditures for vaccine distribution from the Central level to the sub—national levels amounted to 0.08% of total program costs (or 3,937 US\$) in baseline year.

No funds were spent for vehicle procurement in the baseline year.

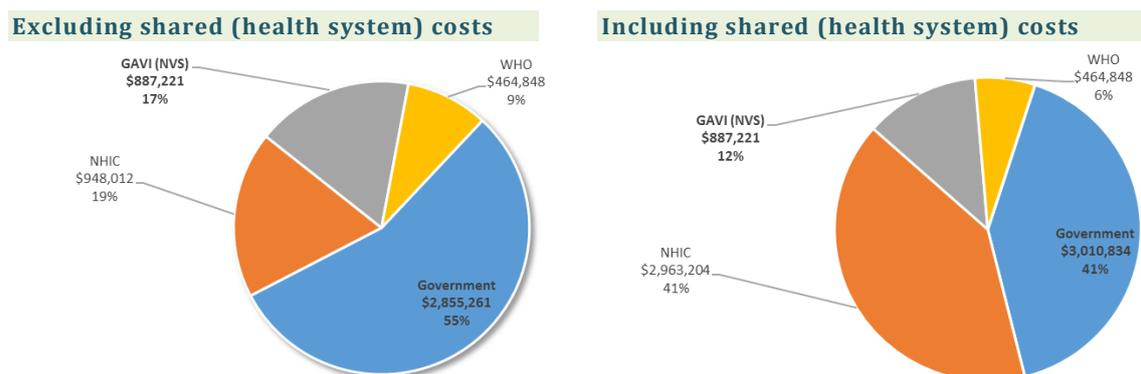
Supplementary immunization costs

No SIA was conducted in 2014.

Immunization financing in baseline year

The Government was the major source of financing of the national immunization program accounting for 41% of all funds if shared health system costs are excluded and 55% if shared health system costs are included as shown in Figure 4 below:

Figure 4: Immunization financing profile – baseline year



National Health Insurance Company (NHIC) was the second major source of funding. In 2014 NHIC provided 2.96 million US\$, accounting for 40% of the total funding (excluding shared costs). GAVI contribution accounted for 12% of total program funding (or 887,221 US\$). WHO contribution accounted for 6% of total program financing (or 464,848 US\$) and EU provided 1% of total program financing (or 83,000 US\$) in baseline year.

6.3. Future resource requirements

Overview of the resource requirements' structure

The total resource requirements were estimated at 37.5 million US\$ (including shared health system costs) for 2016-2020 as shown in Figure 5 below:

Figure 5: National immunization program costs summary by system components and years – basic scenario

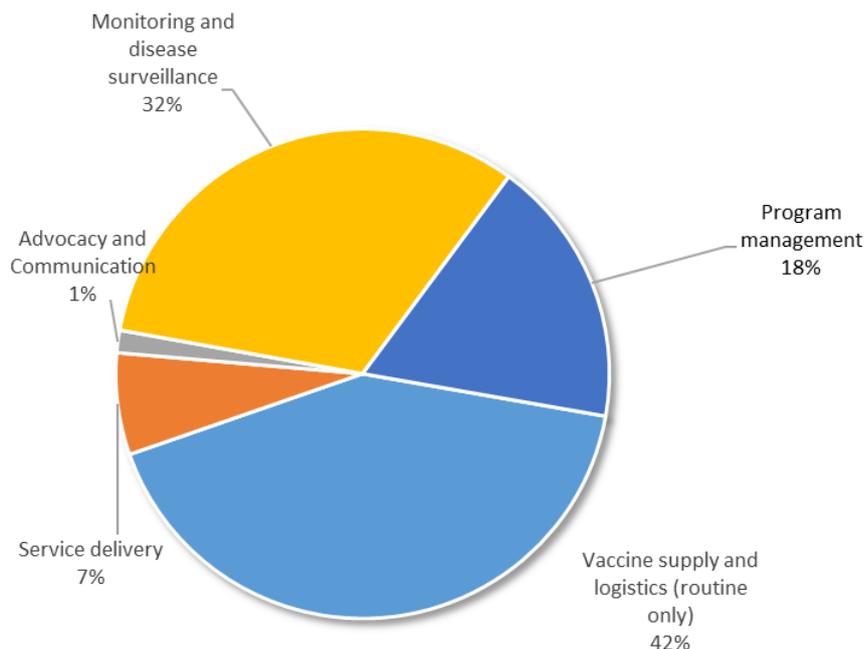
Immunization system components	Expenditures		Future resource requirements				Total 2016 - 2020
	2014	2016	2017	2018	2019	2020	
Vaccine supply and logistics (routine only)	2,251,872	1,976,273	2,367,100	2,225,125	2,283,188	2,338,688	11,190,374
Service delivery	358,965	358,965	358,965	358,965	358,965	358,965	1,794,823
Advocacy and Communication	63,126	92,133	117,898	37,296	118,702	31,115	397,144
Monitoring and disease surveillance	1,622,327	1,631,946	1,661,393	1,683,118	1,896,487	1,743,514	8,616,459
Program management	942,053	959,444	1,127,904	641,432	1,395,032	600,703	4,724,516
Supplemental immunization activities (SIAs)	0	0	0	0	0	0	0
Total immunization costs	5,238,341	5,018,761	5,633,260	4,945,936	6,052,374	5,072,985	26,723,316
Shared Health Systems Costs (EPI Portion)	2,170,766	2,170,766	2,170,766	2,170,766	2,170,766	2,170,766	10,853,828
Total immunization resource requirements	7,409,107	7,189,526	7,804,026	7,116,702	8,223,140	7,243,751	37,577,145

The details of future resource requirement (by cost categories) is presented in Figure 27.

Description of cost drivers of the future resource requirements

The resources required for “vaccine supply and logistics” account for 42% of the total immunization specific costs for 2016-2020 (excluding shared health system costs) as shown in Figure 6 below. “Monitoring and disease surveillance” is the second major cost driver – accounting for 32% of future immunization specific resource requirements followed by “Program Management” – 18% and “Service Delivery” – 7%. “Advocacy and communication” accounting for approximately 1% of total immunization specific resource requirements. “Shared health system costs” are estimated at 29% of future resource requirements.

Figure 6: The future total resource requirement structure by cMYP components (shared costs excluded)



The resource requirements for routine immunization per annum varies between 5.02 and 6.1 million US\$ in 2016-2020 (excluding shared health system costs):

- The resource requirements for routine immunization decrease in the first projection year (2016) by 4%, from 5.2 million US\$ in the baseline year to 5.02 million US\$ in 2016.
- In the second projection year (2017) routine immunization resource requirements will increase by 11% (or 614,500 US\$) in comparison with the previous year.
- During the last three projection years the resource requirement substantially fluctuates. In 2018 the resource requirements will decrease by 14% (or 687,324 US\$), in 2019 will increase by 18% (or 1.1 million US\$) and in the final projection year (2020) will decrease again by 19% (or 979,389 US\$).
- The analysis of resource requirement fluctuation shows that it is driven with three main components, “vaccines and injection supplies”, “Program management” and “Monitoring and disease surveillance” as it is shown in Figure 7 below.

Figure 7: The structure of future resource requirements by cMYP components and years (shared costs excluded)



Vaccines and injection supplies

The following assumptions were used for the projection of vaccine and injection supply requirements:

- Coverage rates were set in line with the objective and targets of National Immunization Program by 2020 ($\geq 95\%$ by 2020).
- Wastage rates are estimated at 64.4% for BCG and at 19.5% for DT. DTP4 wastage target was estimated at 13.7% and for OPV vaccine at 11.7%. MMR first dose wastage target was estimated at 2%, while for the second and third doses wastage target was estimated at 9.6%. Td wastage target was estimated at 5.8%, HepB – 2.4% and Pentavalent vaccine at 1.4%. 1% wastage target was estimated for IPV and Rotavirus vaccine and the rate for PCV was estimated at 0.2%.

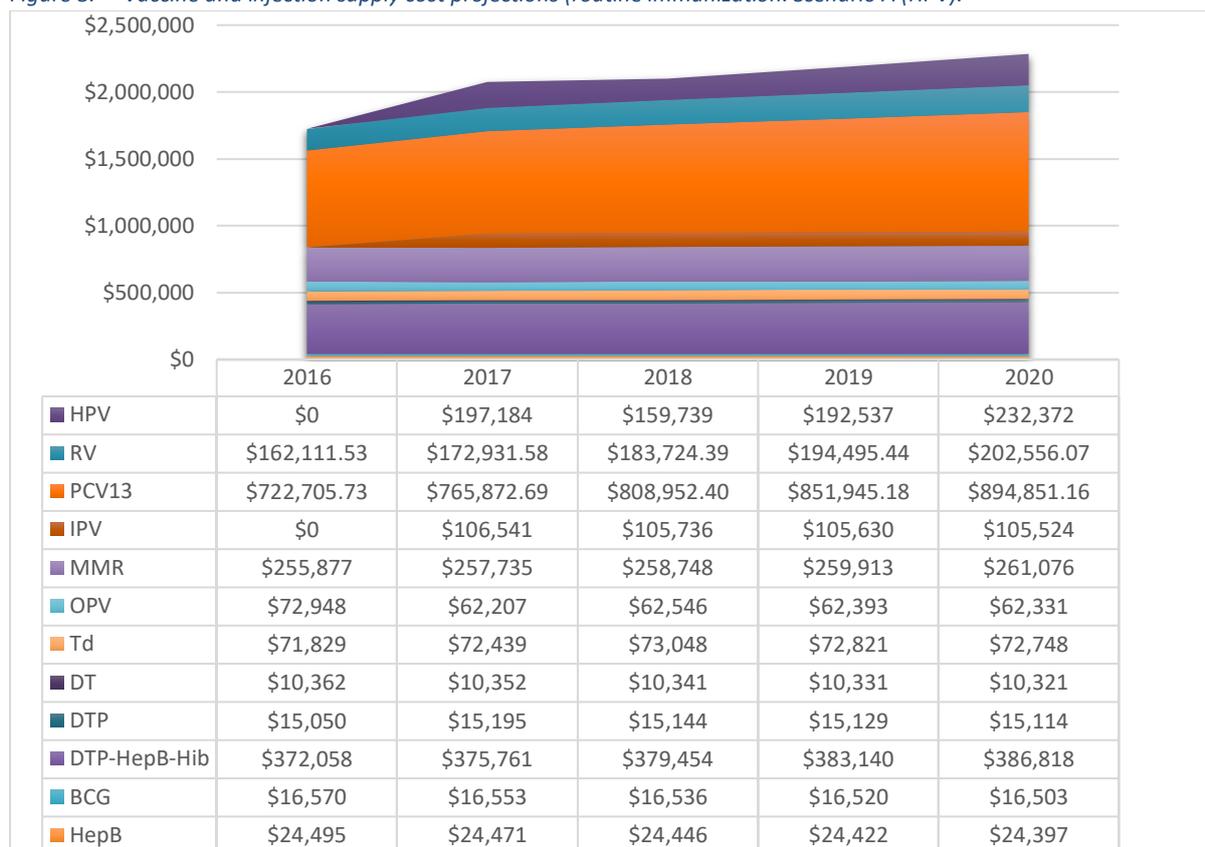
The present projections are based on vaccine price estimates provided by the UNICEF Supply Division and includes 4% Unicef handling fee and 10% fee for freight, insurance and inspection.

The resource requirement projections for vaccines (basic scenario) envisages costs of following vaccines:

- Traditional vaccines: BCG, DTP, DT, Td, OPV and Dt vaccines;
- Underused vaccines: HepB (introduced in Routine Immunization Schedule in 2002), Pentavalent (introduced in Routine immunization schedule 2011) and MMR vaccines; and
- New vaccines: Rotavirus (introduced in Routine Immunization schedule in 2012), PCV (introduced in the routine immunization schedule in 2013) and IPV (planned introduction year - 2017) vaccines.
- For the scenario A of the cMYP – the cost of HPV vaccine which will be implemented within the two-year Demo project during 2017-2018 and will be rolled-out in the country in 2019.

Figure 8 below illustrates the structure of routine immunization vaccine and injection supplies' costs by vaccines and years.

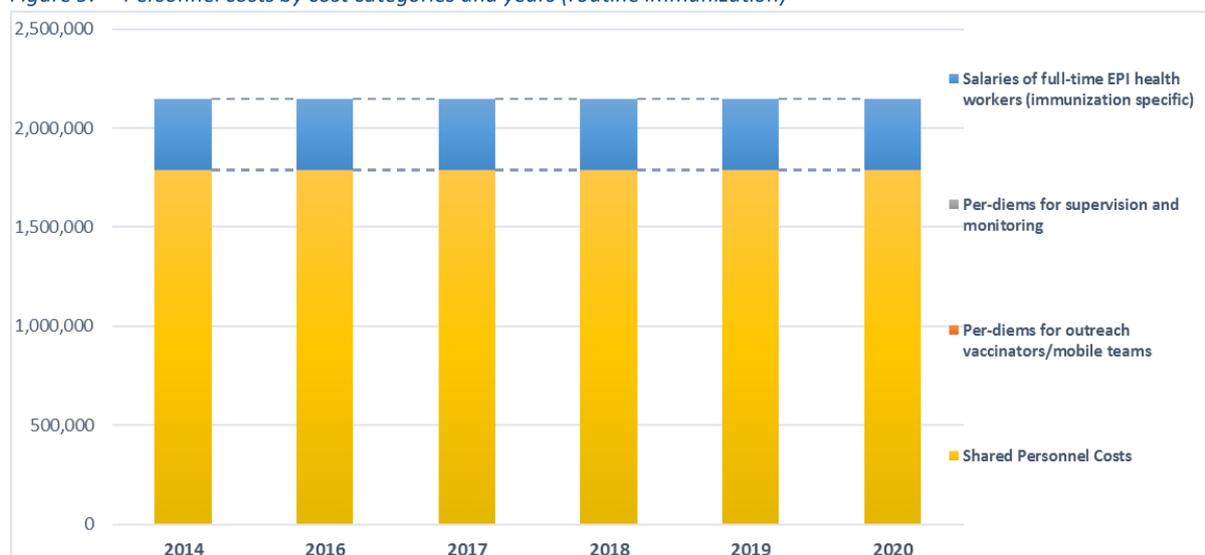
Figure 8: Vaccine and injection supply cost projections (routine immunization. Scenario A (HPV)).



Personnel

Personnel costs were estimated at 10.7 million US\$ in 2016-2020, and salaries of the shared personnel accounted for its 83%.

Figure 9: Personnel costs by cost categories and years (routine immunization)



The personnel costs, per diems for outreach vaccination and supervision and monitoring will remain constant throughout the baseline and projection years as it is shown in Figure 22.

Cold chain equipment

In total 1.6 million US\$ will be invested in the cold-chain during the projection period. Cold-chain maintenance and overhead will be the major cost driver accounting of cold-chain related resource requirements.

Figure 10: Cold chain related resource requirements

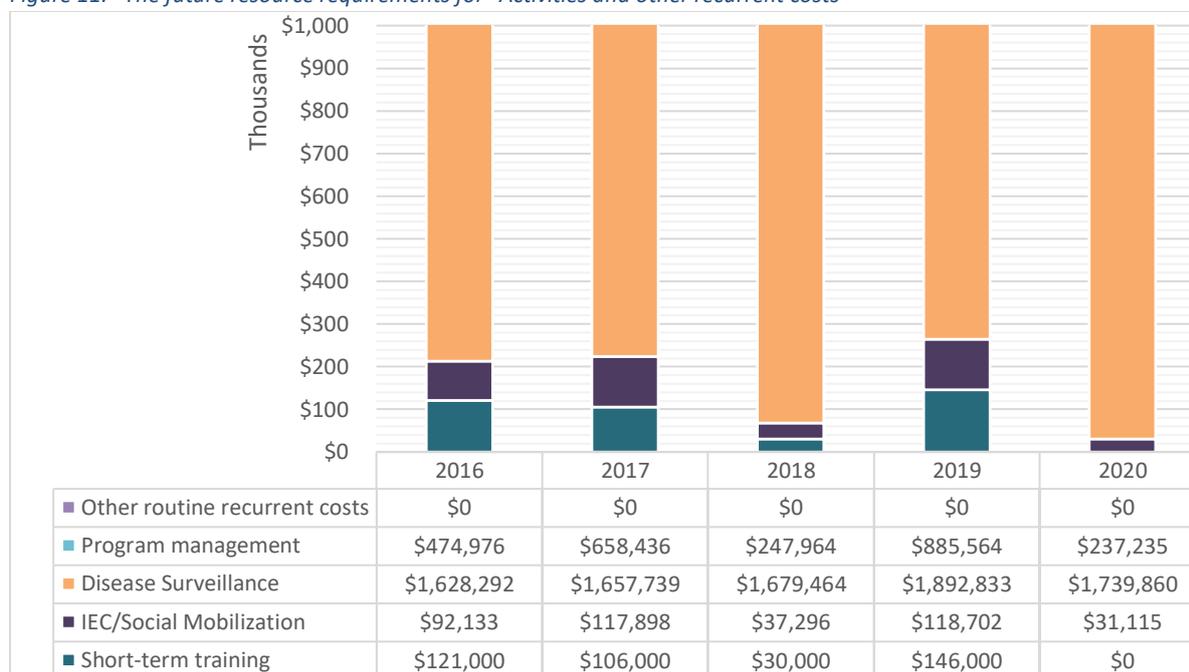
	2014	2016	2017	2018	2019	2020	Total 2016-2020
Cold chain maintenance and overhead	\$250,804	\$250,804	\$284,986	\$284,986	\$284,986	\$284,986	\$1,390,746
Cold chain equipment	\$78,032		\$200,595				\$200,595
Total	\$328,836	\$250,804	\$485,580	\$284,986	\$284,986	\$284,986	\$1,591,341

Cold chain maintenance and overhead costs will account for 87.39% of the 1.6 million US\$ estimated to cover the cold chain related needs as shown in Figure 10 above.

Other recurrent costs

Out of the total 15.1 million US\$ required for “Routine Recurrent Costs”, 56.9% or 8.6 million US\$ will be required to cover the costs of “Disease Surveillance”, followed by “Maintenance and Overhead costs”, which will account for 21.3% (or 3.2 million US\$) and includes “cold-chain maintenance and overhead” (9.2%), “maintenance of capital equipment” (0.05%) and “building overhead” (12%) costs. “Program management” will account for 16.6% (or 2.5 million US\$) of total other recurrent costs and “Short-term training” and “IEC/Social mobilization” will account for 2.7% (403,000 US\$) and 2.6% (or 397,144 US\$) of total recurrent costs respectively (see Figure 11 below).

Figure 11: The future resource requirements for “Activities and other recurrent costs”



Supplementary immunization activities

No SIAs are planned for the next cMYP cycle by EPI Moldova.

Description of scenarios for introduction of new vaccines

Scenario building parameters

Two different scenarios were developed for Moldova cMYP 2016-2020.

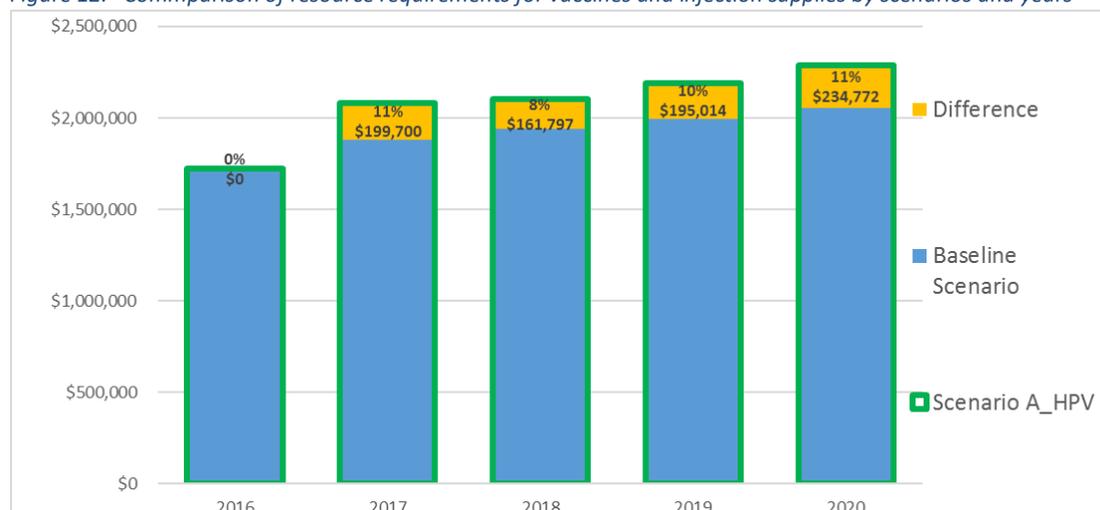
Basic Scenario – which envisions implementation of existing routine immunization program and introduction of IPV in 2017.

Scenario A – in addition to the basic scenario, introduction of HPV two-year Demo project with the following national wide roll-out of HPV vaccine in 2019.

Results – financial implications of vaccine introduction

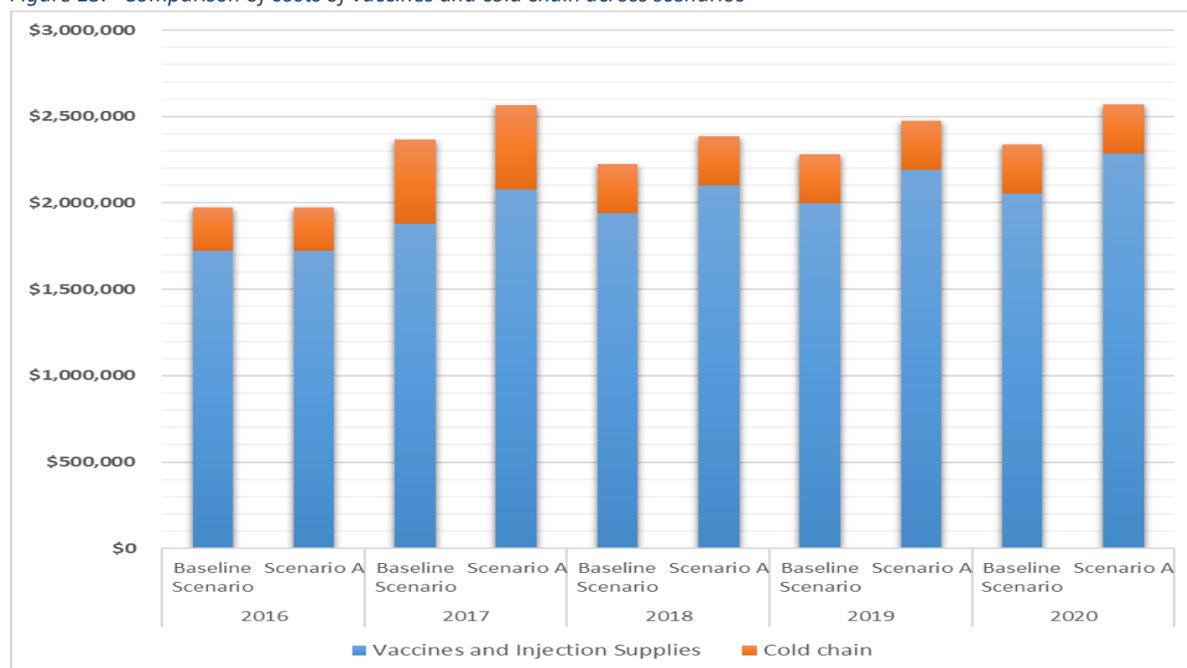
The implication of resource requirements for vaccines and injection supplies by scenarios and years is presented in Figure 12 below. The introduction HPV vaccine in 2017 will increase annual resource requirement by 11% (or 199,700 US\$) in the first year of introduction which will follow by 8% (or 161,797 US\$) increase in the second year of introduction (2018). In 2019 the total program resource requirement will increase by 10% (or 195,014 US\$) and in the final year of projection period (2020) will increase by 11% (or 234,772 US\$).

Figure 12: Comparison of resource requirements for vaccines and injection supplies by scenarios and years



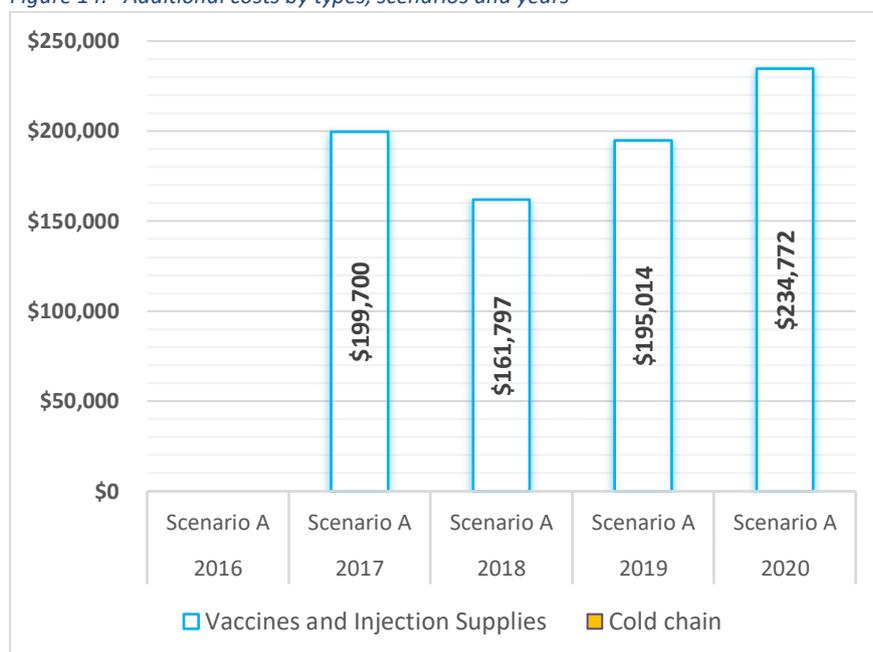
Comparison of costs of vaccines and cold-chain across two different scenarios shows that introduction of HPV vaccine will not require substantial improvement or upgrade of existing cold-chain in addition to already planned upgrade of cold-chain within the basic scenario framework.

Figure 13: Comparison of costs of vaccines and cold chain across scenarios



However, introduction of the new vaccine will have cost implications on the resource requirements for vaccines (see Figure 13 above) increasing total resource requirement for vaccines by 8% or 0.79 million US\$. Additional costs by cost types, years and scenarios are presented in Figure 14 below:

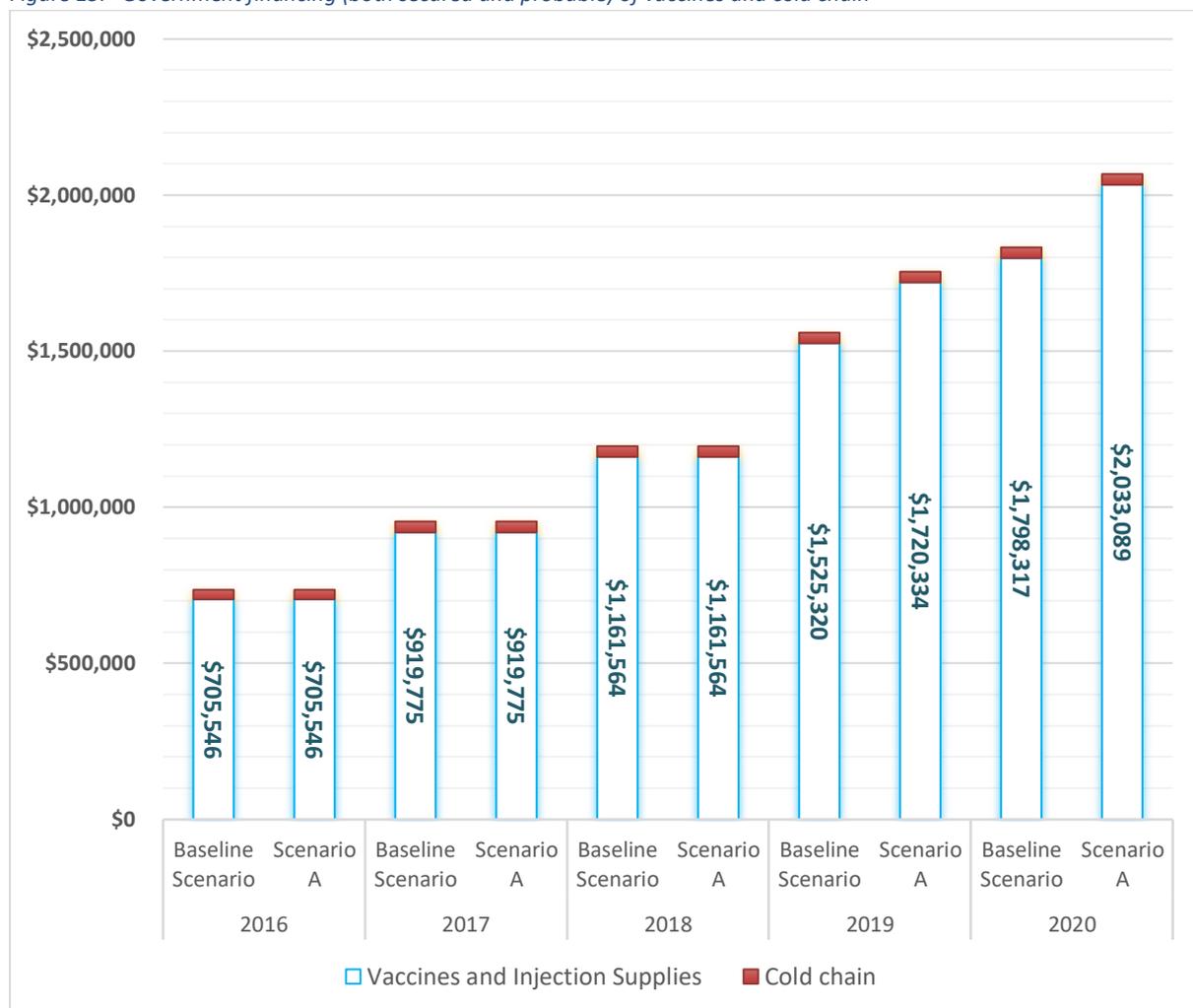
Figure 14: Additional costs by types, scenarios and years



Further analysis of the financial burden of HPV vaccine introduction shows that even though the total resource requirement for vaccines will increase with the HPV vaccine introduction, the Government financing of vaccines and cold chain in 2017 and 2018 will remain the same in both scenarios; therefore, the introduction of HPV vaccine will not have a financial implication on the state budget during the first two years of introduction (see Figure 15 below):

- Increased resource requirements for vaccines will be addressed through the GAVI support provided within the framework of the HPV vaccine demonstration program. The purpose of the program is to assess and develop capacity of the country in delivering a complete multi-dose series of HPV vaccines and gather relevant data to inform a potential nationwide introduction of HPV vaccine. The Demo project will enable the country to implement a small scale HPV vaccine introduction in a typical district of the EPI and gather the data and information necessary to inform any subsequent decision-making on national introduction of HPV Vaccines.
- However, the **introduction of HPV vaccine will have cost implications on the state budget in following years (2019-2020)** if the country decides to roll-out HPV vaccine at the national level and include HPV vaccine into the routine immunization schedule. Particularly, in case of nationwide roll-out of the HPV vaccine **the additional financial burden to the state budget will amount to US\$429,786** for two final years of projection (195.04 US\$ in 2019 and US\$234,772 in 2020) as it is represented in the Figure 15 below.

Figure 15: Government financing (both secured and probable) of vaccines and cold chain



6.4. Future financing and funding gaps

The total financing for 2016-2020 was estimated at 37.6 million US\$ (including shared health system costs) or at 26.7 million US\$ (excluding shared health system costs).

Government is the major source of financing of Moldova National Immunization Program. As it is expected, the Government will provide 15.3 million US\$ to the national immunization program, which constitutes 59.81% of all funding if shared health system costs are excluded and 16 million US\$ if shared health system costs are included which represents 43.98% of all funding (as shown in Figure 16 below). Program financing details for the projection period are presented in Figure 25.

National Health Insurance Company is the second major source of financing, contributing 5.1 million US\$ (or 18.91% of total funding) if shared health system costs are excluded and 15.2 million US\$ (or 40.39% of total funding) if shared health system costs are included.

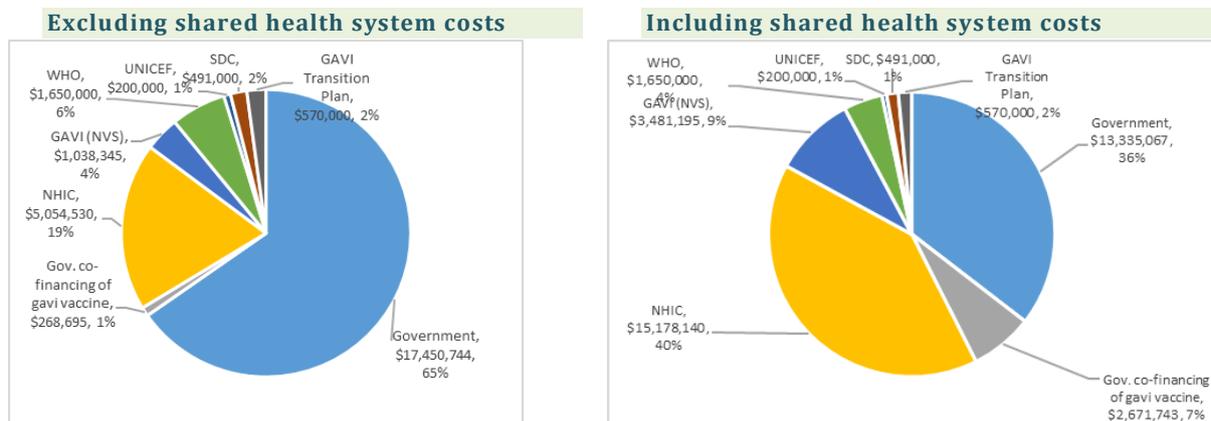
Gavi is one of the major financing sources of NIP. During the cMYP period Gavi through its NVS financial support scheme (1.03 million US\$) and transition grant (570,000 US\$) will contribute 1.61 million US\$ in NIP funding, accounting for 6.02% of total funding when shared health system costs are excluded and 4.28% when shared health system costs are included.

WHO will contribute in total 1.65 million US\$ which constitutes 4.39% of total funding with shared health system costs and 6.17% without shared health system costs.

Unicef contribution in the national immunization program funding will be 200,000 US\$ which accounts for 0.53% of total funding with shared health system costs and 0.75% without shared health system costs.

SDC contribution will amount to 491,000, accounting for 1.84% without shared health system costs and 1.31% without shared health system costs.

Figure 16: The future financing (with secured and probable funds) structure



95.58% (or 25.5 million US\$) of funding is considered to be secured out of the total immunization specific financing 26.7 million US\$ as shown in Figure 25..

When only secured funding is considered (excluding shared health system costs):

- the share of government financing is 59.81% (15.3 million US\$ out of total 25.5 million US\$ secured funds).

- The share of the financing expected from the National Health Insurance Company is 19.79% (or 5.1 million US\$);
- The share of GAVI financing is 15.86% of total secured funds (13.63% or 3.5 million US\$ through the Gavi NVS funding scheme and 2.23% or 0.57 million US\$ through the transition Grant).
- Unicef contribution accounts for 0.78% of total secured funds.

The secured funding is sufficient to cover only 95.58% of the total immunization specific resource requirements in 2016-2020 (without shared health system costs). The funding gap with secured financing accounts to 4% (or 1.17 million US\$) and ranges from 2% in 2018 to 17% in 2019 as shown in Figure 17 below.

Figure 17: Financing by sources and funding gap by years (with secured funds only)

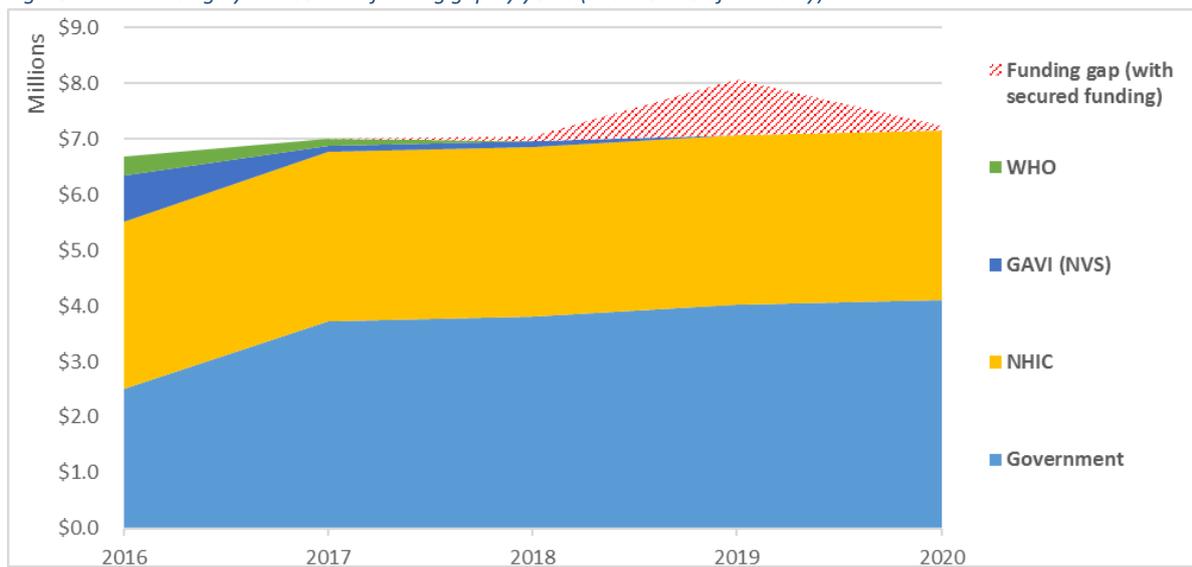
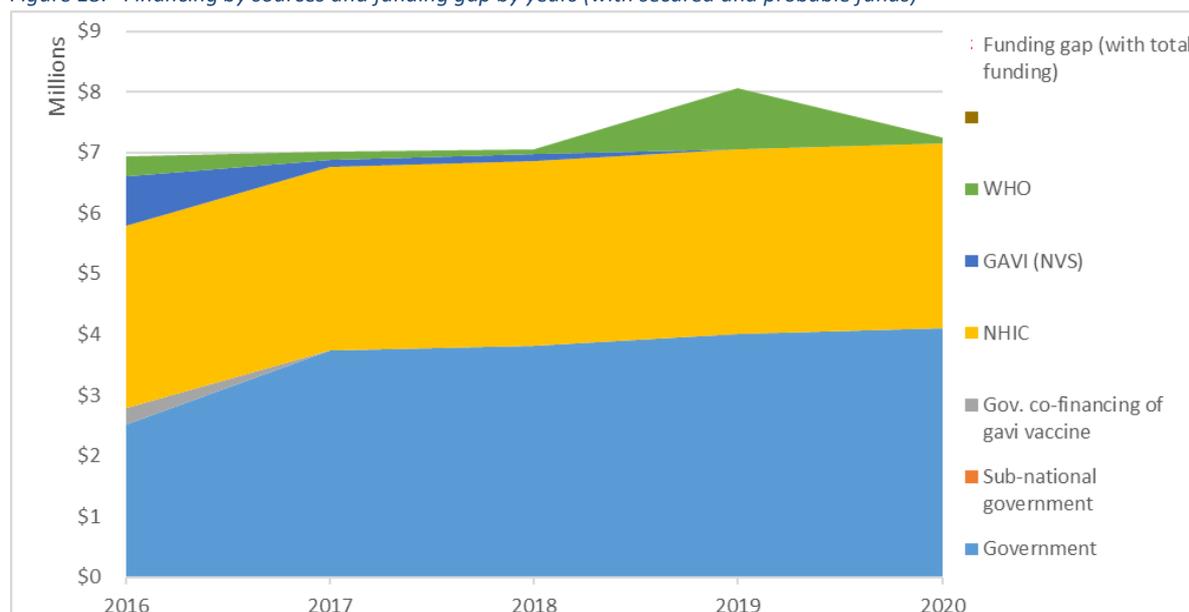


Figure 18 illustrates funding conditions of the national immunization program with secured and probable funding, particularly, if probable funds are secured the available financing will be sufficient to cover 100% of the total resource requirement for 2016-2020.

Figure 18: Financing by sources and funding gap by years (with secured and probable funds)



6.5. Funding gap analysis and sustainability

Implications of funding gap on programmatic performance and sustainability

The funding gap (with secured funds only) in the amount of 1.18 million US\$ does not affect critical components of the immunization system – only “Activities and other recurrent costs” that could be important for the quality of immunization services and its programmatic sustainability, but do not pose immediate threat to the achievement of the immunization outcomes in the projection period.

Figure 19: Funding gap (with secured and secured and probable financing only) structure by years

	2016	2017	2018	2019	2020	Total
With secure financing						
Vaccines & injection supplies	0	0	0	0	0	0
Personnel	0	0	0	0	0	0
Transport	0	0	0	0	0	0
Activities and other recurrent costs	0	0	90,000	1,000,000	90,000	1,180,000
Logistics (vehicles, cold chain and other equipment)	0	0	0	0	0	0
Supplemental immunization activities	0	0	0	0	0	0
Total funding gap	0	0	90,000	1,000,000	90,000	1,180,000
With secure and probable financing						
Vaccines & injection supplies	0	0	0	0	0	0
Personnel	0	0	0	0	0	0
Transport	0	0	0	0	0	0
Activities and other recurrent costs	0	0	0	0	0	0
Logistics (vehicles, cold chain and other equipment)	0	0	0	0	0	0
Supplemental immunization activities	0	0	0	0	0	0
Total funding gap	0	0	0	0	0	0

Figure 19 above shows that the funding gap with secured funding only is related to the “Activities and other recurrent costs” component, which accounts for 100% of total funding gap (1.18 million US\$).

Figure 20: Funding gap (with secured funds only) structure by the major cost categories

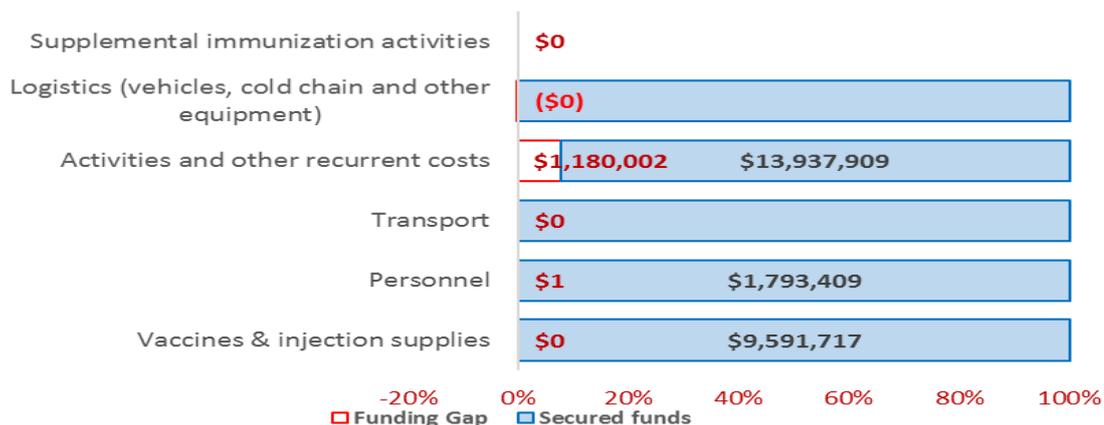


Figure 20 above shows the structure of funding gap with secured funds: the funding gap (1.18 million US) accounts only 8% of the total resource requirement for this category (13.9 million US\$) implying that only a portion of planned/required activities could not be implemented if probable funding is not secured.

The funding gap is caused by a decreasing of external financing, which historically was used for implementation of program activities.

Financial sustainability strategies

The main strategy to ensure financial sustainability of the National Immunization Program during the period 2016—2020 will be directed towards increasing reliability of financing from the domestic sources and optimization and/or minimization of costs related to the program activities – the main driver of existing funding gap.

This could include following:

1. Advocate for budget allocations and timely increase of funds for implementation of all components of national immunization program at all levels;
2. Accelerate fundraising activities and work with donor community over the course of cMYP cycle to secure additional funding for filling program funding gaps.

Immunization program sustainability indicators are presented in Figure 29.

7. Annexes

Figure 21: Health workforce for immunization by levels and type (dedicated and shared)

National						
MoH Head of Public Health Department	1	5%	-	0	0	
MoH Head of Budgeting and Health Insurance	1	5%	-	0	0	
MoH Deputy Head of Budgeting and Health Insurance	1	5%	-	0	0	
MoH Head of Management of National Health Programs	1	10%	-	0	0	
NCPH EPI Manager	1	100%	1	-	1	
NCPH EPI Deputy Manager	1	100%	1	-	1	
NCPH Epidemiologist	4	100%	4	-	4	
NCPH Assistant Epidemiologist	2	100%	2	-	2	
NCPH Cold Store Manager	1	80%	-	1	1	
NCPH Cold Store Technician	1	80%	-	1	1	
NCPH Cold Store Loader	1	50%	-	1	1	
NCPH Cold Store Driver	1	50%	-	1	1	
Subtotal National	16	68%	8	3	11	
City/ Rayon						
DCPH Epidemiologist	44	30%	-	13	13	
DCPH Assistant Epidemiologist	88	30%	-	26	26	
DCPH Driver	44	10%	-	4	4	
Maternity Hospital Doctor	113	5%	-	6	6	
Maternity Hospital Nurse	170	10%	-	17	17	
District Outpatient Clinic Family Doctor	615	5%	-	31	31	
Vaccination Nurse	99	100%	99	-	99	
Outpatient Clinic Driver	99	5%	-	5	5	
Subtotal City/ Rayon	1,272	16%	99	102	201	
Health Center						
Family Doctor	1,113	10%	-	111	111	
Nurse	1,670	15%	-	250	250	
Subtotal Health Center	2,783	13%	-	362	362	
Grand Total	4,070		107	467	574	

Figure 22: Salaries of EPI specific personnel by administrative levels, positions and years

EPI SPECIFIC Salary							Total 2016 -
	2014	2016	2017	2018	2019	2020	2020
National	\$384,228	\$384,228	\$384,228	\$384,228	\$384,228	\$384,228	\$1,921,140
NCPH EPI Manager	\$62,340	\$62,340	\$62,340	\$62,340	\$62,340	\$62,340	\$311,700
NCPH EPI Deputy Manager	\$61,296	\$61,296	\$61,296	\$61,296	\$61,296	\$61,296	\$306,480
NCPH Epidemiologist	\$188,016	\$188,016	\$188,016	\$188,016	\$188,016	\$188,016	\$940,080
NCPH Assistant Epidemiologist	\$72,576	\$72,576	\$72,576	\$72,576	\$72,576	\$72,576	\$362,880
City/ Rayon	\$4,599,936	\$4,599,936	\$4,599,936	\$4,599,936	\$4,599,936	\$4,599,936	\$22,999,680
Vaccination Nurse	\$4,599,936	\$4,599,936	\$4,599,936	\$4,599,936	\$4,599,936	\$4,599,936	\$22,999,680
Total	\$4,984,164	\$4,984,164	\$4,984,164	\$4,984,164	\$4,984,164	\$4,984,164	\$24,920,820

Figure 23: Salaries of shared personnel by administrative levels, positions and years

Shared Salary							Total 2016 -
	2014	2016	2017	2018	2019	2020	2020
National	\$91,071	\$91,071	\$91,071	\$91,071	\$91,071	\$91,071	\$455,355
MoH Head of Public Health Depar	\$3,825	\$3,825	\$3,825	\$3,825	\$3,825	\$3,825	\$19,125
MoH Head of Budgeting and Heal	\$3,825	\$3,825	\$3,825	\$3,825	\$3,825	\$3,825	\$19,125
MoH Deputy Head of Budgeting a	\$3,825	\$3,825	\$3,825	\$3,825	\$3,825	\$3,825	\$19,125
MoH Head of Management of Nai	\$6,120	\$6,120	\$6,120	\$6,120	\$6,120	\$6,120	\$30,600
NCPH Cold Store Manager	\$48,432	\$48,432	\$48,432	\$48,432	\$48,432	\$48,432	\$242,160
NCPH Cold Store Tecnician	\$11,136	\$11,136	\$11,136	\$11,136	\$11,136	\$11,136	\$55,680
Total	\$25,068,148	\$25,068,148	\$25,068,148	\$25,068,148	\$25,068,148	\$25,068,148	\$125,340,741

Figure 24: Supervision per diem costs by administrative levels, positions and years

Supervision							Total 2016 -
	2014	2016	2017	2018	2019	2020	2020
National	\$3,654	\$3,654	\$3,654	\$3,654	\$3,654	\$3,654	\$18,271
NCPH EPI Manager	\$609	\$609	\$609	\$609	\$609	\$609	\$3,045
NCPH EPI Deputy Manager	\$609	\$609	\$609	\$609	\$609	\$609	\$3,045
NCPH Epidemiologist	\$2,436	\$2,436	\$2,436	\$2,436	\$2,436	\$2,436	\$12,181
Total	\$3,654	\$3,654	\$3,654	\$3,654	\$3,654	\$3,654	\$18,271

Figure 25: Financing projections by sources, years, and types of financing

	2016	2017	2018	2019	2020	Total
Secured funding						
Government	2,366,806	2,438,126	2,484,098	2,635,811	2,680,008	12,604,848
Sub-national government	-	-	-	-	-	-
Gov. co-financing of gavi vaccine	76,303	287,802	516,851	763,398	1,027,388	2,671,743
NHIC	982,191	1,014,551	1,016,876	1,019,247	1,021,666	5,054,530
GAVI (NVS)	1,018,460	960,282	777,112	471,419	253,923	3,481,195
WHO	330,000	140,000	-	-	-	470,000
UNICEF	-	200,000	-	-	-	200,000
SDC	105,000	162,500	61,000	162,500	-	491,000
GAVI Transition Plan	140,000	430,000	-	-	-	570,000
EU	-	-	-	-	-	-
	-	-	-	-	-	-
Subtotal secure funding	5,018,761	5,633,260	4,855,936	5,052,374	4,982,985	25,543,316
Probable funding						
Government	-	-	-	-	-	-
Sub-national government	-	-	-	-	-	-
Gov. co-financing of gavi vaccine	-	-	-	-	-	-
NHIC	-	-	-	-	-	-
GAVI (NVS)	-	-	-	-	-	-
WHO	-	-	90,000	1,000,000	90,000	1,180,000
UNICEF	-	-	-	-	-	-
SDC	-	-	-	-	-	-
GAVI Transition Plan	-	-	-	-	-	-
EU	-	-	-	-	-	-
	-	-	-	-	-	-
Subtotal probable funding	-	-	90,000	1,000,000	90,000	1,180,000
Total (secured and probable funding)						
Government	2,366,806	2,438,126	2,484,098	2,635,811	2,680,008	12,604,848
Sub-national government	-	-	-	-	-	-
Gov. co-financing of gavi vaccine	76,303	287,802	516,851	763,398	1,027,388	2,671,743
NHIC	982,191	1,014,551	1,016,876	1,019,247	1,021,666	5,054,530
GAVI (NVS)	1,018,460	960,282	777,112	471,419	253,923	3,481,195
WHO	330,000	140,000	90,000	1,000,000	90,000	1,650,000
UNICEF	-	200,000	-	-	-	200,000
SDC	105,000	162,500	61,000	162,500	-	491,000
GAVI Transition Plan	140,000	430,000	-	-	-	570,000
EU	-	-	-	-	-	-
	-	-	-	-	-	-
Total funding	5,018,761	5,633,260	4,945,936	6,052,374	5,072,985	26,723,316

Figure 26: Healthcare financing trends

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total expenditure on health (THE) in million US\$	23.5	28.5	38.0	45.2	61.3	75.9	100.8	134.3	193.8	189.1	196.8	209.5	242.6	224.7	228.8
Total Health Expenditure (THE) per Capita in US\$	23.5	28.5	38.0	45.2	61.3	75.9	100.8	134.3	193.8	189.1	196.8	209.5	242.6	224.7	228.8
Total Health Expenditure (THE) per Capita in Int\$ (PPP)	123	140	183	197	225	270	340	369	426	442	464	443	502	472	514
Total Health Expenditure (THE) % Gross Domestic Product (GDP)	6.7	7.0	8.3	8.2	8.5	9.2	10.6	10.9	11.4	12.5	12.1	10.6	11.9	10.1	10.3
General government expenditure on health (GGHE) in million US\$	11.4	13.1	18.5	21.8	30.2	34.6	44.8	60.7	91.5	91.7	91.6	104.9	112.8	112.5	117.6
Ministry of Health expenditure in million US\$	4.0	3.4	5.0	5.9	7.1	:	:	:	:	9.1	11.8	7.9	17.2	14.4	20.0
General Government Health Expenditure (GGHE) per Capita in US\$	11.4	13.1	18.5	21.8	30.2	34.6	44.8	60.7	91.5	91.7	91.6	104.9	112.8	112.5	117.6
General Government Health Expenditure (GGHE) per Capita Int\$ (PPP)	59.5	64.3	88.9	95.1	111.0	123.2	150.8	166.8	201.3	214.6	216.1	222.0	233.1	236.0	264.2
General Government Health Expenditure (GGHE) as % of THE	48.5	45.8	48.6	48.2	49.3	45.6	44.4	45.2	47.2	48.5	46.5	50.1	46.5	50.0	51.4
GGHE as % of General government expenditure (GGE)	8.9	10.2	11.8	12.0	11.9	11.3	11.7	11.7	13.0	13.4	13.8	13.6	13.8	13.1	13.3
GGHE as % of GDP	3.2	3.2	4.0	4.0	4.2	4.2	4.7	4.9	5.4	6.1	5.6	5.3	5.5	5.0	5.3
Private expenditure on health in million US\$	12	15	20	23	31	41	56	74	102	97	105	105	130	112	111
Private Health Expenditure (PvtHE) as % of THE	51.5	54.2	51.4	51.8	50.7	54.4	55.6	54.8	52.8	51.5	53.5	49.9	53.5	50.0	48.6
Rest of the world funds / External resources in million US\$		7.4	2.2	1.6	1.7	3.4	4.0	5.7	8.2	13.2	18.2	8.3	11.6	19.1	13.1
Rest of the world funds as % of THE	0.0	26.1	5.7	3.6	2.7	4.5	4.0	4.2	4.2	7.0	9.2	4.0	4.8	8.5	5.7
GDP per capita (in US\$)	353	407	457	549	722	829	949	1,234	1,698	1,514	1,629	1,975	2,043	2,235	2,217
GGE as % of GDP	36.4	31.5	34.3	33.1	35.1	37.0	40.2	42.0	41.6	45.2	40.8	39.0	40.1	38.5	39.8
Exchange rate (MDL per US\$)	12.47	12.88	13.60	13.90	12.30	12.62	13.14	12.10	10.37	11.19	12.38	11.71	12.13	12.63	14.14

Source: WHO NHA

Figure 27: National immunization program expenditures and future resource requirements (basic scenario) by cost categories

Cost category	Future Resource Requirements						Total 2016-2020
	2014	2016	2017	2018	2019	2020	
Routine recurrent costs							
Vaccines (routine vaccines only)	1,832,668	1,657,989	1,809,359	1,867,912	1,925,474	1,980,425	9,241,159
Traditional	138,989	152,750	142,511	143,195	142,858	142,715	724,028
Underused	631,370	628,086	633,450	638,000	642,688	647,365	3,189,589
New	1,062,309	877,153	1,033,399	1,086,718	1,139,929	1,190,344	5,327,542
Injection supplies	64,056	66,017	70,698	70,764	71,265	71,815	350,558
Personnel	358,682	358,682	358,682	358,682	358,682	358,682	1,793,410
Salaries of full-time EPI health workers (immunization specific)	355,028	355,028	355,028	355,028	355,028	355,028	1,775,139
Per-diem for outreach vaccinators/mobile teams							
Per-diem for supervision and monitoring	3,654	3,654	3,654	3,654	3,654	3,654	18,271
Transportation	3,937	3,937	3,937	3,937	3,937	3,937	19,684
Fixed Site Strategy (Incl. Vaccine Distribution)	3,937	3,937	3,937	3,937	3,937	3,937	19,684
Outreach strategy							
Mobile strategy							
Maintenance and overhead	615,735	615,735	649,917	649,917	649,917	649,917	3,215,402
Cold chain maintenance and overhead	250,804	250,804	284,986	284,986	284,986	284,986	1,390,746
Maintenance of other capital equipment	1,463	1,463	1,463	1,463	1,463	1,463	7,316
Building Overheads (Electricity, Water...)	363,468	363,468	363,468	363,468	363,468	363,468	1,817,340
Short-term training	60,000	121,000	106,000	30,000	146,000		403,000
IEC/Social Mobilization	63,126	92,133	117,898	37,296	118,702	31,115	397,144
Disease Surveillance	1,618,673	1,628,292	1,657,739	1,679,464	1,892,833	1,739,860	8,598,189
Program management	518,585	474,976	658,436	247,964	885,564	237,235	2,504,176
Other routine recurrent costs							
Subtotal	5,135,461	5,018,761	5,432,666	4,945,936	6,052,374	5,072,985	26,522,722
Routine capital costs							
Vehicles (100% EPI)							
Cold chain equipment	78,032		200,595				200,595
Other capital equipment	24,848						
Buildings Construction (100% EPI)							
Subtotal	102,881		200,595				200,595
Shared Health Systems Costs (EPI Portion)							
Shared Personnel Costs	1,785,633	1,785,633	1,785,633	1,785,633	1,785,633	1,785,633	8,928,166
Shared Transport Costs – Vehicles, Fuel and Maintenance	204,784	204,784	204,784	204,784	204,784	204,784	1,023,922
Shared buildings - construction							
Shared Buildings – Overhead	180,348	180,348	180,348	180,348	180,348	180,348	901,740
Subtotal	2,170,766	2,170,766	2,170,766	2,170,766	2,170,766	2,170,766	10,853,828
Grand Total	7,409,107	7,189,526	7,804,026	7,116,702	8,223,140	7,243,751	37,577,145
Routine Immunization	7,409,107	7,189,526	7,804,026	7,116,702	8,223,140	7,243,751	37,577,145
Supplemental immunization activities (campaigns)							

Figure 28: Total Resource Requirements, funding from all sources by risk types and government financing by cost categories

Cost category	Future resource requirements Total 2016-2020	Funding from all sources			Funding Gap			
		Secured	Probable	Total	With secured funds only		With secured and probable	
Routine recurrent costs								
Vaccines (routine vaccines only)	9,241,159	9,241,159	0	9,241,159	0	0%	0	0%
Traditional	724,028	724,028	0	724,028	0	0%	0	0%
Underused	3,189,589	3,189,589	0	3,189,589	0	0%	0	0%
New	5,327,542	5,327,542	0	5,327,542	0	0%	0	0%
Injection supplies	350,558	350,558	0	350,558	0	0%	0	0%
Personnel	1,793,410	1,793,410	0	1,793,410	0	0%	0	0%
Salaries of full-time EPI health workers (immunization specific)	1,775,139	1,775,139	0	1,775,139	0	0%	0	0%
Per-diems for outreach vaccinators/mobile teams				0				
Per-diems for supervision and monitoring	18,271	18,271	0	18,271	0	0%	0	0%
Transportation	19,684	19,684	0	19,684	0	0%	0	0%
Fixed Site Strategy (Incl. Vaccine Distribution)	19,684	19,684	0	19,684	0	0%	0	0%
Outreach strategy + Mobile strategy	0	0	0	0	0	0%	0	0%
Maintenance and overhead	3,215,402	3,215,402	0	3,215,402	0	0%	0	0%
Cold chain maintenance and overhead	1,390,746	1,390,746	0	1,390,746	0	0%	0	0%
Maintenance of other capital equipment	7,316	7,316	0	7,316	0	0%	0	0%
Building Overheads (Electricity, Water...)	1,817,340	1,817,340	0	1,817,340	0	0%	0	0%
Short-term training	403,000	303,000	100,000	403,000	100,000	25%	0	0%
IEC/Social Mobilization	397,144	287,144	110,000	397,144	110,000	28%	0	0%
Disease Surveillance	8,598,189	8,328,189	270,000	8,598,189	270,000	3%	0	0%
Program management	2,504,176	1,804,176	700,000	2,504,176	700,000	28%	0	0%
Other routine recurrent costs				0				
Subtotal	26,522,722	25,342,722	1,180,000	26,522,722	1,180,000	4%	0	0%
Routine capital costs								
Vehicles (100% EPI)				0				
Cold chain equipment	200,595	200,595	0	200,595	0	0%	0	0%
Other capital equipment				0				
Buildings Construction (100% EPI)				0				
Subtotal	200,595	200,595	0	200,595	0	0%	0	0%
Shared Health Systems Costs (EPI Portion)								
Shared Personnel Costs	8,928,166	8,928,166	0	8,928,166	0	0%	0	0%
Shared Transport Costs – Vehicles, Fuel and Maintenance	1,023,922	1,023,922	0	1,023,922	0	0%	0	0%
Shared buildings - construction				0				
Shared Buildings – Overhead	901,740	901,740	0	901,740	0	0%	0	0%
Subtotal	10,853,828	10,853,828	0	10,853,828	0	0%	0	0%
Grand Total	37,577,145	36,397,145	1,180,000	37,577,145	1,180,000	3%	0	0%
Routine Immunization	37,577,145	36,397,145	1,180,000	37,577,145	1,180,000	3%	0	0%
Supplemental immunization activities		0	0	0				

Government Funding					
Secured	% of All secured funds	Probable	% of all probable funds	Total	% of Total funds
8,226,463	89%	0		8,226,466	89%
724,028	100%	0		724,029	100%
2,930,028	92%	0		2,930,029	92%
4,572,407	86%	0		4,572,408	86%
326,909	93%	0		326,910	93%
155,116	9%	0		155,117	9%
136,845	8%	0		136,845	8%
0		0		0	
18,271	100%	0		18,272	100%
19,684	100%	0		19,685	100%
19,684	100%	0		19,685	100%
0		0		0	
0	0%	0		0	0%
166,890	12%	0		166,890	12%
7,316	100%	0		7,317	100%
218,081	12%	0		218,081	12%
0	0%	0	0%	0	0%
101,144	35%	0	0%	101,144	25%
8,190,189	98%	0	0%	8,190,190	95%
0		0		0	
307,055	17%	0	0%	307,055	12%
0		0		0	
17,391,938	69%	0	0%	17,391,938	66%
0		0		0	
595	0%	0		595	0%
0		0		0	
0		0		0	
595	0%	0		595	0%
558,957	6%	0		558,957	6%
90,391	9%	0		90,391	9%
0		0		0	
80,871	9%	0		80,871	9%
730,219	7%	0		730,219	7%
18,122,751	50%	0	0%	18,122,752	48%
18,122,751	50%	0	0%	18,122,752	48%
0		0		0	

Figure 29: Macroeconomic and sustainability indicators

	2014	2016	2017	2018	2019	2020
Macroeconomic projections						
Population	4,061,550	4,053,431	4,049,378	4,045,328	4,041,283	4,037,242
GDP (\$)	9,118,179,750	9,099,952,509	9,090,852,556	9,081,761,704	9,072,679,942	9,063,607,262
Per capita GDP (\$)	2,245	2,245	2,245	2,245	2,245	2,245
Total Health Expenditures (THE \$)	930,094,950	928,235,690	927,307,455	926,380,147	925,453,767	924,528,313
Total Health Expenditures (THE) per capita	229	229	229	229	229	229
Government Health Expenditures (GHE \$)	478,068,804	477,113,145	476,636,032	476,159,396	475,683,236	475,207,553
Government Health Expenditure per capita (\$)	118	118	118	118	118	118
Resource requirements for immunization						
Routine and SIAS (Campaigns) includes vaccines and operational costs)	5,218,463	5,018,761	5,633,260	4,945,936	6,052,374	5,072,985
Routine only (includes vaccines and operational costs)	5,218,463	5,018,761	5,633,260	4,945,936	6,052,374	5,072,985
Per DTP3 immunized child	126	120	134	116	141	117
Per capita						
Routine and SIAS (Campaigns) includes vaccines and operational costs)	1.28	1.24	1.39	1.22	1.50	1.26
Routine only (includes vaccines and operational costs)	1.28	1.24	1.39	1.22	1.50	1.26
% Government Health Expenditures						
Routine and SIAS (Campaigns) includes vaccines and operational costs)	1.09%	1.05%	1.18%	1.04%	1.27%	1.07%
Routine only (includes vaccines and operational costs)	1.09%	1.05%	1.18%	1.04%	1.27%	1.07%
% Of Total Health Expenditures (THE)						
Routine and SIAS (Campaigns) includes vaccines and operational costs)	0.56%	0.54%	0.61%	0.53%	0.65%	0.55%
Routine only (includes vaccines and operational costs)	0.56%	0.54%	0.61%	0.53%	0.65%	0.55%
% GDP						
Routine and SIAS (Campaigns) includes vaccines and operational costs)	0.06%	0.06%	0.06%	0.05%	0.07%	0.06%
Routine only (includes vaccines and operational costs)	0.06%	0.06%	0.06%	0.05%	0.07%	0.06%
Funding gap						
Funding gap (with secured funds only)		0	0	90,000	1,000,000	90,000
% of the future resource requirements for immunization		0%	0%	2%	17%	2%
% Government Health Expenditures		0.00%	0.00%	0.02%	0.21%	0.02%
% Of Total Health Expenditures (THE)		0.00%	0.00%	0.01%	0.11%	0.01%
% GDP		0.00%	0.00%	0.00%	0.01%	0.00%
Funding gap (with secured & probable funds)		0	0	0	0	0
% of the future resource requirements for immunization		0%	0%	0%	0%	0%
% Government Health Expenditures		0.00%	0.00%	0.00%	0.00%	0.00%
% Of Total Health Expenditures (THE)		0.00%	0.00%	0.00%	0.00%	0.00%
% GDP		0.00%	0.00%	0.00%	0.00%	0.00%