Republic of Moldova

Balti district

Root Cause Analysis of Immunization at subnational level and Improvement Plan

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UCRAINA
ROMÂNIA
Ocniţa
Fruntaşi
Otaci
OCNIŢA
Briceni
BRICENI
Lipcani
Nistru
Prut
DONDUŞENI
Donduşeni
Edineţ
EDINEŢ
Cupcini
Soroca
SOROCA
Camenca
Drochia
DROCHIA
Rîşcani
RÎŞCANI
FLOREŞTI
Floreşti
Ghindeşti
Mărculeşti
Costeşti
ŞOLDĂNEŞTI
Şoldăneşti
Ribniţa
Rezina
REZINA
Glodeni
GLODENI
BĂLŢI
Sîngerei
SÎNGEREI
Fălești
FĂLEŞTI
TELENEŞTI
Teleneşti
ORHEI
Orhei
Cornești
UNGHENI
CĂLĂRAŞI
Călăraşi
Ungheni
Bucovăţ
Străşeni
NISPORENI
STRĂŞENI
Nisporeni
CHIŞINĂU
Durleşti
Codru
Ialoveni
Singera
ANENII NOI
Anenii Noi
TIRASPOL
HÎNCEŞTI
Hînceşti
IALOVENI
BENDER
(TIGHINA)
Slobozia
Căinari
Căuşeni
CĂUŞENI
Dnestrovsc
Cimişlia
CIMIŞLIA
Ştefan Vodă
ŞTEFAN VODĂ
LEOVA
Leova
COMRAT
Basarabeasca
Cantemir
CANTEMIR
UNITATEA
TERITORIALĂ
AUTONOMĂ
GĂGĂUZIA
Ceadîr-Lunga
CAHUL
Cahul
TARACLIA
Taraclia
Vulcăneşti
Capitala Republicii Moldova
Municipiu reşedinţă de unitate teritorială autonomă
Municipiu
Oraş reşedinţă de raion
Alte oraşe
ORHEI Nume de raion
0 km 10 20 30 40 50
0 mi 10 20 30

Contents

1. Situation Analysis

1.1. Country context

1.1.1. Landscape

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 population of around 4.1 million, including the breakaway Transnistria region.

Balti municipality is situated in the central part of the country and is bordered by Riscani district in the North-West, Singerei district in the North-East, Glodeni in the West and Falesti district in the South-West.

1.1.2. Administrative and political structure of Moldova

The territory of the Republic of Moldova is organized in following administrative-territorial units: 2 municipalities, 32 districts, 1 Autonomous Territorial unit (Gagauzia) which is further divided by three districts; 1 Territorial Administrative Unit that includes 2 municipalities and 5 districts;

The details on administrative division of the country are provided in Annex 2 on page 40 below

1.1.3. Demography of Moldova and Balti

Population estimates

According to the data published by the National Bureau of Statistics of Republic of Moldova, the population of the country in 2018 was 3,547,500.[1] The Population of Balti municipality in 2018 was 151,700 residents.

Average age of the population in Balti municipality is 40.1 years, where average age of men is 38.1 years and average age of women is 41.8.

The information on vital statistics of Balti municipality is presented in Table 1 below:

Table 1: Vital Statistics Rates for Balti municipality in 2018

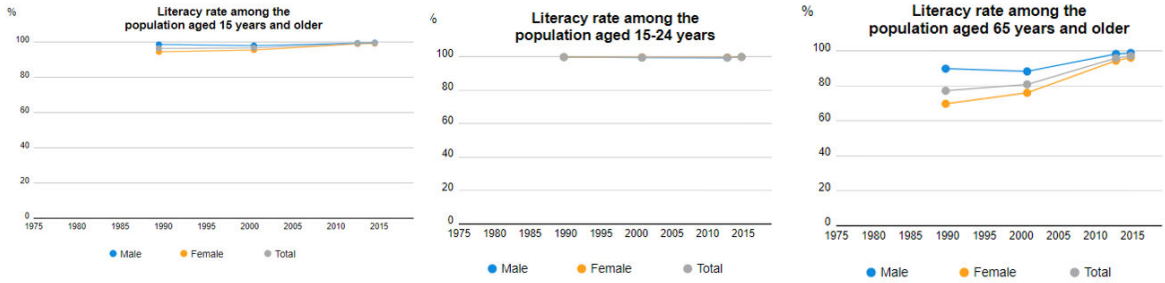
Birth rate	8.0
Mortality rate	8.2
Natural increase	-0.2
Marriage rate	5.1
Divorce rate	3.5
Infant mortality	6.6

[1] The population numbers reflected in the Improvement Plan does not include data on districts from the left side of the river Nistru and Municipality of Bender

1.1.4. Education and literacy

The official language in Moldova is Romanian, but in some districts the main language spoken is Russian. The main language spoken in Balti municipality is Romanian. The literacy rate among the population aged 15 years and older is 99.36; among 15-24 years population group is 99.81% and among the group of 65 years and older is 97.15 (see Figure 1 **Error! Reference source not found.**).

Figure 1: Literacy rate among the different population groups



1.2. Health systems context

1.2.1. Population health

(1) Overview

Life expectancy at birth in Moldova has increased steadily over recent yeas. According to the data published by National Bureau of Statistics of Moldova the life expectancy at birth increased from 69.3 years in 2014 to 70.6 years in 2018, while the rate is still remining lower than the European average rate of 77.91 years.[2] The estimated average life expectancy rate for women in 2018 was 75 years and the estimated rate for men - 66.2 years and both were lower than the average estimated life expectancy at birth rates for the European region – 81.06 and 74.57 years for women and men respectively.

Strong demographic transition faced by Moldova during past several years, has led to major changes in the epidemiological profile of the country in terms of double burden of diseases caused by emerging epidemic of NCDs such as diabetes that are prevalent in industrialized and developing countries alike and, some major infectious diseases such as TB and HIV/AIDS that can be partly attributed to an unfinished health agenda.

The country improved the standardized death rate (SRD) during the recent years. Between 2008 and 2016, the standardized death rate for all causes per 100,000 populations decreased from 1,264 in 2008 to 1,038 in 2016 (the latest available year).

In 2017, most deaths are caused by ischemic heart disease, stroke, cirrhosis, hypertensive heart disease, Alzheimer's diseases, lung cancer, lower respiratory infections, colorectal cancer, COPD and self-harm. [3]

[2] Health for All database accessed on December 2, 2019
[3] Institute for Health Metrics and Evaluation (IHME), 2019.

(2) Maternal and Child Health

During the period 2008-2018 the Neonatal Mortality Rate (NMR) has been gradually decreasing in Moldova. According to the Unicef child mortality estimates, Neonatal Mortality Rate decreased from 13.0 per 1,000 live births in 2008 to 11.9 per 1,000 live births in 2018 as shown in **Error! Reference source not found.** below. In municipality of Balti, NMR was estimated at 11.6 per 1,000 live births in 2018,[4] which was in line with the national average rates estimated by the country.

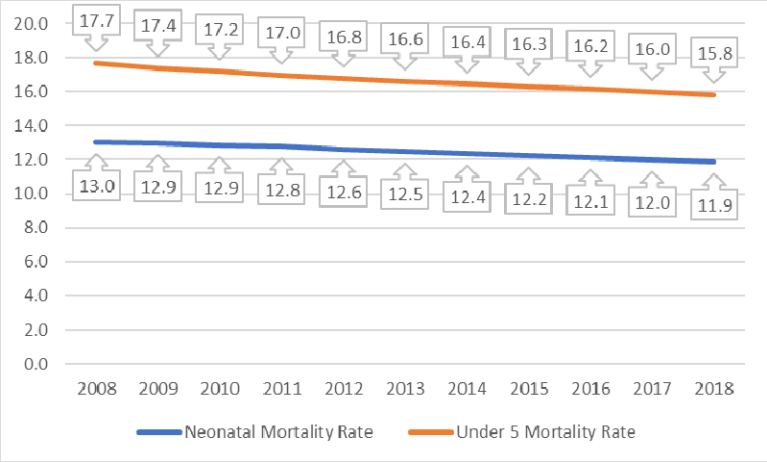
Neonatal mortality rates in Moldova are higher than in neighboring Romania with recorded 3.4 versus 11.9 neonatal deaths per 1,000 live births in 2018. For the European Region the neonatal mortality per 1,000 live births in 2018 was estimated at 6.45, which is lower than the neonatal mortality rate in Moldova (11.9 in 2018).

For maternal mortality, there are data gaps both in terms of years (e.g. Chisinau has no data for 2011, 2013 and 2017 and shows a peak of 45 deaths per 100,000 live births in 2010 due to the high degree of flu in that year) and districts providing data. The municipality of Balti, similar to the administrative-territorial units of the country has no record on maternal mortality due to the small number of deaths (for all country from 5 up to 16 deaths per year).

The under-five mortality rate (U5MR) in Moldova decreased from 17.7 in 2008 to 15.8 per 1,000 live births in 2018 as shown in as shown inFigure 2 below. [5]

In Balti municipality U5MR was estimated at 21 and 10 per 1,000 live births in 2017 and 2018 respectively.[6]

Figure 2: Under 5 mortality rate in Moldova during 2007-2017



Source: UNICEF Child Mortality Estimates 2019

(3) VPD Epidemiology

The government efforts to implement strong immunization program, monitor and control VPD morbidity, prepare and implement the outbreak prevention and response measures maintained the strong protection of population against vaccine preventable diseases.

[4] Statistical Yearbook of the Health System, Moldova 2018
[5] Child Mortality Estimates, UNICEF, 2019
[6] Statistical Yearbook of the Health System, Moldova 2018

Moldova sustained polio free status and there were no cases of polio (caused by wild or circulated vaccine-derived polio virus) registered in the country. Also, no tetanus, neonatal tetanus, diphtheria, acute viral hepatitis B in children, rubella and CRS and invasive forms of Haemophilus influenza (Hib) was detected in Moldova in 2018.

The Pan-European measles outbreak reached the country in 2018 with a total of 340 confirmed cases of which 245 - were registered only in August 2018. No measles cases were detected and registered in Balti municipality.

The Government of Moldova led by the Prime Minister, demonstrated high political commitment to plan and implement adequate measures in response to the outbreak. The government organized Public health emergency committees at the national level and the sub-national level in the ten affected by measles outbreak. The Ministry of Health and National Center of Public Health with support provided by the international development partners (UNICEF and WHO) developed and implemented the Crisis communication Action Plan, that included media outreach campaign through the traditional media and the social networks. In addition, the NCPH organized and implemented an MMR catch-up campaign that in total covered 9,360 children.

Table 2: Number of measles cases in the most affected districts of Moldova in 2018

#	Location	# of cases
1	Ceadir-Lunga	164
2	Vulcanesti	35
3	Soroca	35
4	Drochia	21
5	Ungheni	20
6	Chisinau	16
7	Taraclia	12
8	Cahul	10
9	Cantemir	10
10	Ocnita	7
11	Nisporeni	4
12	Glodeni	3
13	Hincesti	1
14	Riscani	1
15	Tiraspol	1
	Total cases	**340**

Source: NAPH, 2019

The Ministry of Education, Culture and Research of Moldova (MECR) issued an order restricting admission of unvaccinated children to all schools in the country. The UNICEF and the Ministry of Health engaged with religious leaders securing their support for vaccination. With support provided by UNICEF ECA regional office and in partnership with Sabin Vaccine Institute, the training courses were organized for the top journalists of the country. The training topics included communication, measles epidemiology and key messages to the population. Finally, UNICEF and

MoH facilitated Parliamentary hearing aiming at focusing attention of key policy- and decision-maker authorities on importance and benefits of immunization, as the most cost-effective public health intervention.

1.3. Immunization system

1.3.1. Background of the National Immunization System

Since its establishment in early 60th National Immunization Program (NIP) of Moldova has achieved remarkable progress in controlling vaccine preventable diseases (VDP) and protecting the country against the VPD through immunization of the target population groups with routine immunization vaccines included in the national routine immunization schedule (see the details of RI schedule in Table 3 below:

Table 3: Immunization Schedule of National Immunization Program of Moldova 2016-2020

Vaccination age	Vaccination against:									
	Hepatitis B virus	Tuberculosis	Poliomyelitis	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		bOPV-1	RV-1	Hib-1	PCV-1	DTP-1			
4 months	HepB-2		bOPV-2	RV-2	Hib-2	PCV-2	DTP-2			
6 months	HepB-3		bOPV-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	
10 years girls										HPV-1 HPV-2
15-16 years								Td	MMR-3	
Adults at 20, 30, 40, 50 and 60 years								Td		

Source: cMYP Moldova 2016-2020

The Immunization System in Moldova is not centralized, and the different components of the system are implemented by the different structures of the Ministry of Health. The responsibility for technical and logistical components is assigned to the National Agency for Public Health (NAPH), while the service delivery – is responsibility of the PHC sector.

The Government of Moldova practices mid-term planning of the national immunization program, which considers the development of the five-year for national immunization program implementation. This five-year plan includes all interventions of the national immunization program and the respective budget for implementation of the immunization specific activities.

The five-year planning approach significantly contributes to the financial and programmatic sustainability of the immunization program, as it is based on sub-national level resource requirements for program implementation. The five-year planning approach has been instrumental for ensuring consistency in vaccine procurement and uninterrupted supply of vaccines to all service delivery points. The government fully covers the cost of traditional vaccines and allocates sufficient funds for co-financing the new and underused vaccines provided and co-financed by Gavi. Table 4 below highlights the history of new vaccine introduction in Moldova during the last two decades:

Table 4: Introduction of the new and underused vaccines into the National Immunization Schedule of Moldova

Vaccine	Year of introduction into the National Immunization Schedule
Hep B birth dose	1995
DTP-Hib	2008
Pentavalent	2011
Rotavirus vaccine	2012
PCV	2013
IPV	2018
HPV	2017

1.3.2. National Immunization Program 2016-2020

The current 5th National Immunization Program 2016-2020 was approved by the Government of Moldova on October 06, 2016, (Decree #1113).[7] The program is aligned with the European Vaccine Action Plan 2015-2020 (EVAP), the regional interpretation of the GVAP, which aims at addressing the specific needs and challenges of the immunization in the WHO European Region.

Specific objectives of the National Immunization Program 2016-2020 aim at increasing vaccination coverage over 95% target at the national and district level, maintenance of the polio free status and contribution into the Global Polio Eradication; eliminate measles and control rubella and CRS; control hepatitis B and protection of population of the country against the different VDP.

1.3.3. Immunization system outcomes

(1) Immunization coverage trends

Immunization coverage in Moldova is measured based on the monthly immunization reports prepared and submitted by all front-line health facilities to their respective public health centers at the district and/or city level. The district (city) level public health centers conduct initial analysis and aggregation of the immunization coverage data and submit the results to the National Agency of Public Health.

Traditionally, the immunization program in Moldova has been strong and well-performing in achieving high immunization coverage rates, but since 2009 the country has been experiencing decline in coverage rates for all antigens of the national immunization schedule.

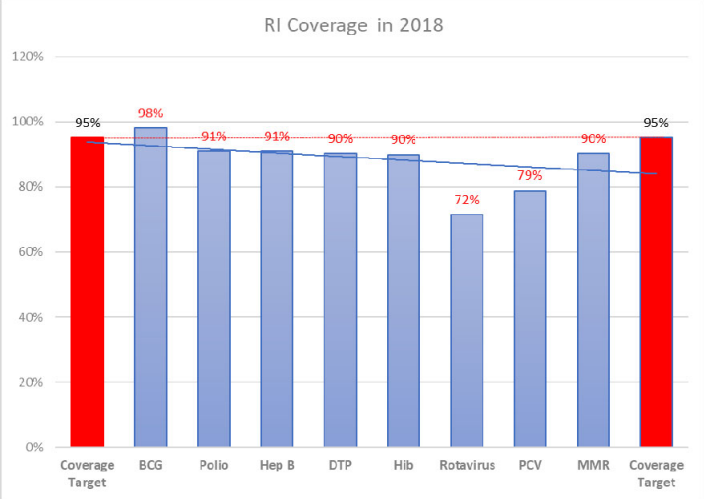
[7] OM MDA No. 353-354 of October 11, 2016.

In 2018, decreasing trend in vaccination coverage rates continued. The country failed to achieve target vaccination rates (95%) for the most of antigens except for BCG vaccine coverage, which is administered in maternity hospitals (see Figure 3 below).

According to the number of studies carried out in the country, the decrease in coverage can be attributed to the growing skepticism among parents and health care workers about benefits of vaccination and vaccine safety leading to the high number of contraindications (most of them false) provided by Doctor Specialists and General Practitioners (Family Doctors). As a result, high number of false contraindications led to the delays in vaccination, leaving children unprotected against all vaccine preventable diseases. Especially this vaccination delays affected immunization with Rotavirus vaccine, leaving children totally unprotected due to the age restrictions.[8]

Immunization in Moldova is mandatory, however there are documented cases when caregivers refuse to vaccinate their children, as they are influenced by various anti-vaccination advocates in social media,[9] among religious leaders and even among the doctors promoting anti-vaccination. Although attendance at kindergarten/school is usually dependent on a complete vaccination card (vaccination status of a child), vaccine-hesitant caregivers easily find ways to avoid this "barrier", so children can attend school. Informed consent forms required in Moldova are perceived by caregivers as putting the responsibility for any consequences on them, rather than on the institution and/or state.[10] [11]

Figure 3: Routine Immunization Coverage in Moldova, 2018



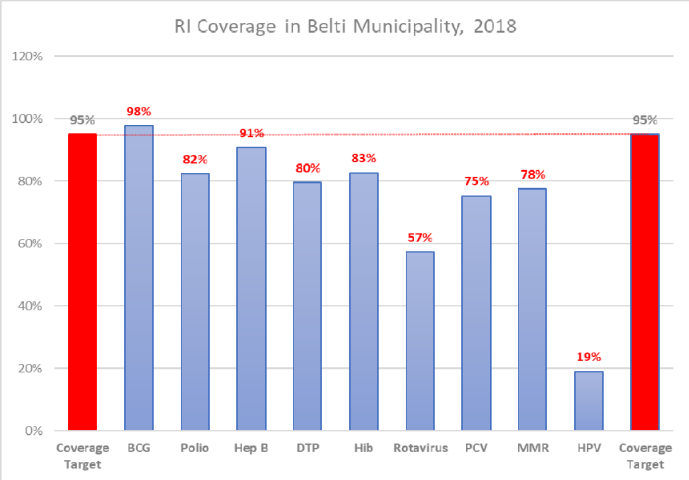
Source: NIP Review, 2019

Figure 4 below presents coverage data of one of the underperforming areas - Balti municipality. The presented data shows that the coverage rates for all routine immunization vaccines (except for the BCG vaccine) is lower than the average coverage rates reached by the NIP at the national level and the Balti municipality achievements in coverage are significantly lower than the rates targeted by the national immunization program (95%).

[8] According to the WHO recommendations the 1st dose of the Rotavirus vaccine must be administered no later than 2.5 months after birth
[9] UNICEF ECARO, December 2017 - *"Immunization and vaccine hesitancy in Europe and Central Asia: A systematic review of literature (2008-2017) and field visits to BiH, Moldova, Romania and Ukraine."*
[10] UNICEF/Public Health Institute, Republic of Srpska. KAP Survey on routine immunisation (2011).
[11] Franklin, Barbara. A.K/WHO EUR. Launching the HPV Vaccine in Moldova'. (2017).

The analysis of coverage rates by districts shows that the insufficient performance of NIP in low performing municipalities can be the main contributing factor, preventing NIP from achieving national coverage target rates. Therefore, improving performance of NIP at the sub-national levels i.e. in municipalities (mostly in underperforming municipalities) is a **top priority of immunization system**, that requires specific analysis of NIP performance at the district level and planning and implementation of the custom-tailored interventions at the sub-national and national levels.

Figure 4: RI Coverage in Balti Municipality of Moldova



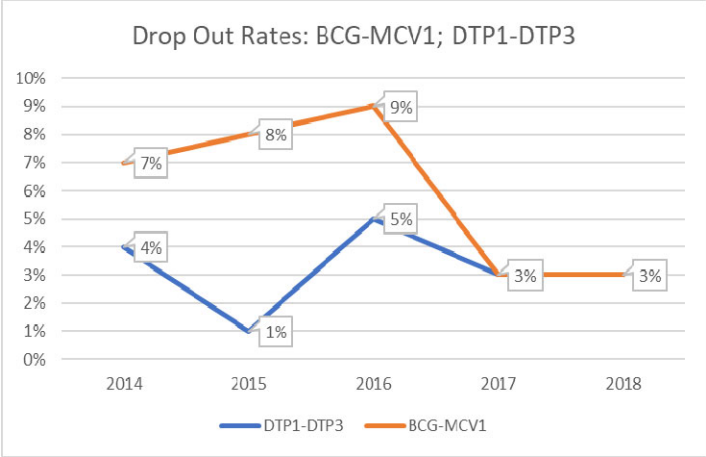
Source: NCPH, 2019

(1) Immunization coverage equity

Similar to the rest of the country, socio-economic, religious, gender or other contextual factors are not apparent to influence the difference in coverage rates in Balti municipality.

The analysis of the drop-out rates highlighted substantial decrease of these rates over the last five years, suggesting about significant improvement of NIP performance in service delivery.

Figure 5: Trends in Drop-out rates between BCG and MCV1



Source: WHO UNICEF Coverage Estimates, 2019

Figure 5 presents dynamics of the drop-out rates between DPT1 and DPT3 vaccination and BCG and MCV1 vaccination. The dropout rates between DPT1 and DPT3 decreased from 5% in 2016

to 3% in 2018 and similarly, the dropout rate for BCG and MCV1 vaccine – from 9% in 2016 to 3% in 2018.

Decreasing trends of dropouts confirm progress of the national immunization program in service delivery. However, the achievement of district and national level targets in coverage still remain a challenge for NIP, making impossible to ensure equitable service delivery of immunization services to all children across different socioeconomic, cultural groups and geographic locations all over the country.

1.3.4. Immunization system performance by components

(1) Governance/Decision making

The principal agency for coordination and management of the National Immunization Program is the National Agency of Public Health (NAPH). The Agency is authorized by the MoH to provide overall management of the National Immunization Program and to ensure development and maintenance of the strong and effective links to other departments within the health sector.

In general, the National Immunization Program (NIP) of Moldova is an integrated effort, involving national, regional and local authorities from different sectors, a range of institutions and health services, including public health and primary health care (PHC) services. The NIP is led by experienced and highly qualified professionals and has effective communication channels with National and International Developing Partners, such as Gavi, UNICEF and WHO.

The strategic decisions of NIP development are discussed and validated by the NITAG and ICC. NITAG with well-defined structure and strong political support is in charge of providing technical recommendations for improvement NIP performance through implementation of the new strategies and vaccines and ICC with high-level political and professional representations is instrumental for validation and endorsement of key strategic decisions.

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.

At the district level the day-to-day coordination and management of the national immunization program is provided by the District Public Health Centers.

(2) Vaccination service delivery

The greater part of the vaccination services in Moldova are provided by PHC service providers, i.e. family doctors and family nurses through the network of Family Health Centers covering all geographic locations of the country. The Hep B birth dose and BCG vaccines are administered by health personnel at the Maternity Hospitals.

The vaccination services in Moldova are provided universally to all children regardless of their birthplace and the vaccination service delivery is directly funded by the Government through the central budget. The services are provided based on the national immunization schedule approved by the Ministry of Health.

According to the existing regulations, all immunization services in Moldova are provided through the fixed site service delivery mode at the PHC centers based on the lists of households

registered with their respective family doctors. The vaccination process is managed by Family Doctors and administered by Family Nurses. The immunization services are delivered based on the specific immunization plans prepared by each Family Doctor and are included into the broader immunization plan for the entire district. Immunization service delivery is monitored, coordinated and managed by the district center of public health responsible for overall management of the immunization program in their respective district including surveillance and monitoring and control of immunization related activities.

(3) Program management

Management of the National Immunization Program implementation in Balti municipality of Moldova is provided by the department of Epidemiology of the Balti Municipal Center of Public Health.

(4) Workforce

The Human Resource capacity for management of the national immunization program at the district level **is extremely limited**.

The Department of Epidemiology of the Balti Municipal Center of Public Health is represented by the epidemiologist and the assistant epidemiologist who are in charge of monitoring, coordination and management of all immunization related activities at the district level.

Immunization services in Balti municipality are provided by 67 family doctors and 165 family nurses through the 6 PHC health centers and 2 Family Medicine Offices. The immunization service delivery is based on the specific immunization plans developed for each family doctor and the respective health facility.

(5) Reporting

All Family Doctors are responsible for development and submission of a monthly standardized reports on immunization, that include data on the immunization coverage, including number of children planned for vaccination with respective dose of the routine immunization vaccine and the number of children who were actually vaccinated with the respective dose of the RI vaccine.

These monthly reports are used to monitor implementation of the monthly immunization plans that are specifically developed for each level of the system: health facility, district and city.

In addition, monthly reports are used for the development of the annual immunization coverage data to measure the progress made by the national immunization program in achieving target coverage rates for all vaccines included in the national immunization schedule. The annual forms include data on number of children who reached one year old age in the reporting year, the number of children who were fully vaccinated by the age of 12 months in accordance with the national immunization schedule.

(6) Cold-chain and vaccine management=

Vaccine procurement

All vaccines included into the national immunization schedule of Moldova are purchased from the WHO prequalified manufacturers to ensure the highest quality and safety of vaccines. The vaccine procurement is funded through the central national budget and procurement is carried out through the UNICEF SD procurement mechanism.

Effective vaccine management

The NIP Moldova established a strong and effective cold-chain system. The cold-chain equipment is properly maintained and almost fully upgraded with the WHO prequalified equipment. There is a number of ageing refrigerators requiring replacement. The cold-chain upgrade and improvement plan has been developed and approved by the NAPH and procurement of the new equipment is in the pipeline.

(7) Surveillance

Surveillance of VPDs 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 in line with the EU legislation. The VPD surveillance documentation was aligned to the WHO standards.

According to the existing procedure the reports are prepared on a monthly basis by the dedicated statistician at the district/municipality Center of Public Health (CPH). The reports on all confirmed cases are prepared through application of the aggregate reporting form 2. The monthly reports are regularly submitted to the national level authorities at the NCPH in electronic form (through e-mails) and on hard-copies (through the regular mail).

The NIP established the strong routine AEFI surveillance system for registration and monitoring of all AEFI cases. According to the existing data for the last four years (between the period 2015-2018) the greater share of AEFIs cases are related to the BCG vaccination. The comparative analysis of AEFI cases during the period 2015-2018 indicates that the number of AEFI registered are at the same level during the last four years (see Table 5 below).

Table 5: The AEFI cases, Republic of Moldova 2015-2028

Vaccine	2015			2016			2017			2018		
	# of doses	AEFI	%	# of doses	AEFI	%	# of doses	AEFI	%	# of doses	AEFI	%
BCG	45,899	103	0.22	43,923	64	0,14	40,126	142	0,35	38,474	108	0,28
HVB	101,398	0	0	97,604	0	0,0	108,808	0	0,0	40,793	0	0,0
Polio	235,766	0	0	128,103	0	0,0	198,781	0	0,0	192,950	0	0,0
DTP-HepB-Hib	119,635	6	0,005	125,909	5	0,004	114,949	1	0,0008	111,497	2	0,002
DTP	36,469	1	0,003	32,688	1	0,003	38,259	1	0,002	37,459	0	0,0

DT	42,162	1	0,002	43,034	0	0,0	42,206	0	0,0	43,777	0	0,0
Td	278,967	0	0	203,176	0	0,0	219,473	1	0,0004	238,161	1	0,0004
ROR	114,608	5	0,004	121,729	15	0,12	110,627	8	0,007	133,350	34	0,025
Rotaviral	58,684	0	0	52,646	0	0,0	55,378	0	0,0	53,687	0	0,0
Pneumo	101,446	0	0	94,007	0	0,0	102,089	0	0,0	98,021	0	0,0

Source: NAPH, 2018

(8) Demand generation, communication and advocacy

In general, demand for vaccination in Moldova is one of the most problematic issues. The country lacks a comprehensive operational plan for increasing demand for vaccination among the target population. Generation of demand for routine immunization has never been a part of the national immunization program and therefore no budget is allocated for the implementation of specific demand generation interventions.

Currently, the country is implementing a number of different strategies in the health care field, however, all these strategies are exclusively and fully funded by the implementing partner organizations. According to the report on Assessment of Healthcare System Development Strategy 2008-2017 of the Republic of Moldova, the strategies implemented in Moldova are following:

- "National Campaign on Health of the Mother and Child", implemented with the support of Unicef and Swiss Agency for Development and Cooperation (SDC);
- "National Campaign on Health Risks of Migration" – implemented through the financial support of the International Organization for Migration (IOM);
- "National Campaign Against Smoking" – supported by WHO; and
- "Communication Strategy on Promoting Vaccination" – supported by Unicef;

According to the in-country experience in implementation of communication campaigns, that theoretically contribute to the increased demand for vaccination, the main obstacle for effective implementation of the communication activities is high staff turnover that leads to the lack of the trained and experience staff. This aspect should be further considered while planning communication campaigns and/or specific interventions for improving communication with the immunization target population and increasing demand for immunization among the key target groups (parents and caregivers).

1.4. Summary of RCA Diagnostics

The Root Cause Analysis (RCA) of performance of NIP Moldova at sub-national level aims to identify three different types of factors affecting overall performance of national immunization program in the low performing districts of the country. These three factors are:

- *Primary root causes* – the critical factors that if addressed effectively through implementation of the specific improvement plan can yield the highest performance improvement.

- *Constraints* – important factors that affect performance of immunization system at sub-national level but are beyond the scope of control of the sub-national level stakeholders or even National Agency of Public Health or the Ministry of Health. The Constraints are the factors that cannot be addressed within the framework of the improvement plan but should be considered while elaborating key objectives and strategies of the plan.

The primary root causes identified during RCA of the sub-national level performance of the NIP Moldova were related to following components of the national immunization system: 1. Program Management, 2. Service Delivery, 3. Information Systems, and 4. Communication and Immunization Demand.

Program Management – the implications of these root causes (red ovals on the diagram) are mainly related to the supportive supervision mechanisms and practices to ensure high standard organization and coordination of the immunization service delivery.

Service Delivery – the root causes related to the service delivery are accountable for the quality of the delivered services including quality of the services provided by the doctor specialists for immunization program.

Information systems – the root causes accountable for the shortcomings of existing management information system that needs to be improved for better contribution in the informed decision-making process, improved measurement of the progress done by the program and eventually – in improved management of the national immunization program.

Communication and Immunization demand – the root causes accountable for inadequate capacity of the service providers for effective communication and immunization demand generation for sustaining high uptake of vaccines and high demand for immunization. On the other hand, these root causes are responsible for strong anti-vaccination campaigns, vaccine hesitancy and refusals of the parents, caregivers and specific groups (Roma communities and religious groups) to vaccinate their children.

(a) Primary Root Causes

Table 6 presents short description of the priority root causes that should be addressed within the framework of the district level "Performance Improvement Plan" custom tailored to the context of Balti district of Moldova:

Table 6: Primary Root Causes

Primary Root Causes	**NIP component and short description**
A1.1.1 Family Doctors Feel Insecure	**Service Delivery** Family doctors feeling insecure to insist on vaccination and therefore postponing vaccination sessions due to the: a) Limited knowledge of immunization specific issues and most recent recommendations of WHO related to the contraindications for a particular RI vaccine; and b) Insecurity of family doctors against caregivers, demanding to postpone vaccination;
A1.1.2	**Service Delivery**

Primary Root Causes	NIP component and short description
Insufficient knowledge of specialists in contraindications	• One of the key factors of low coverage rates is high number of "short-term" contraindications (mostly false) provided by the district and central level (Chisinau) doctor specialists, due to the insufficient knowledge of these doctors in contraindications.
A1.2.1 Inability to track mobile population groups	**Information Systems** • Inability of current MIS to track mobile population is one of the root causes negatively affecting ability of service providers to improve performance and increase coverage among their respective population groups.
A1.3.1 Low readiness of Roma communities to immunize their children	**Communication/Demand Generation** • Low readiness of Roma communities to vaccinate their children is of the most critical root cause, accountable for underperformance of NIP in equitable service delivery to all population groups in the country. • Roma population has lower coverage when compared with non-Roma population groups partially due to the lack of information on vaccines/immunization form health care professionals. (Please see details in section 1.5 of this document "description of key findings). • However, experience of Balti district of Moldova shows that low uptake of immunization services by Roma communities can't be attributed to the religious or anti-vaccination aspects, but it is mostly related to the socio-cultural aspects of Roma communities, lack of interest in interaction with the formal institutions such as health care and educational institutions. For instance, Roma families do not send their children to the kindergartens and hardly attend the schools.
A1.3.2 Religious groups refusing to immunize their children	**Communication/Demand Generation** • Vaccine hesitancy and resistance of religious communities due to their skeptical attitude towards the immunization is one of the most serious factors,
A1.4.1 Insufficient supportive supervision mechanisms	**Program Management** • Staff responsible for supportive supervision visits do not use (or do not follow) supportive supervision procedure, SoPs, Guides and data collection and analysis tools, due to the insufficient enforcement of supportive supervision procedures by the national immunization program management. • No supportive supervision reports, recommendations or notes were provided to 58.8% of visited facilities due to the lack of supportive supervision practices and insufficient enforcement of supportive supervision mechanisms by the NIP.
A1.4.2 Poor practice of supportive supervision to Epidemiologists and Family Doctors	**Program Management** • According to EPI review findings, immunization service providers were not trained and lack sufficient skills for effective organization of the supportive supervision activities. • There are no sufficient fund allocation for conducting

Primary Root Causes	NIP component and short description
	supportive supervision visits to the sites. • Supportive supervision visits have not been conducted in 35% facilities, 24.1% of facilities was visited only once and in 29% of facilities supportive supervision visits were provided twice.
A2.1.1 Intensive Anti-vaccination campaigns in Social Media	**Communication/Demand Generation** • One of the critical root causes significantly affecting uptake of the immunization services by the population and leading to vaccine hesitancy and refusal of parents to vaccinate their children. • Anti-vaccination advocates are active across ECA and influence all countries at the national and sub-national level. These advocates utilize blogs and social-media (Facebook and Twitter). The main advocates are: o Medical professionals: actively supporting anti-vaccination activities or casting doubt on vaccination based on the risk perceptions and concerns on vaccine safety; o Homeopathic medicine practitioners promoting homeopathic medicine as safer, healthier, more effective based on vaccine safety concerns; o Religious groups and leaders that are focused on religious, moral ethics and beliefs; o Conspiracy theorists: focused on distrust in governments, health authorities, pharmaceutical industry, due to a lack of transparency/conflicts of interest and plots by foreign countries' governments to reduce populations by killing children and making people infertile. o Pro-rights movements: concerned with violation of" rights" such as mandatory vaccination prevents parent's "freedom of choice" and infringes the right to education.[12]
A2.1.2 Parents are not aware about benefits of immunization	**Communication/Demand Generation** • Since 2011 growing skepticism about benefits of vaccination is observed among parents and caregivers, which can be attributed to the lack of knowledge of parents on specific issues and benefits of immunization. • According to the Regional study on Vaccine Hesitancy in Europe and Central Asia, caregivers think that their knowledge on vaccination is insufficient due to a lack of information provided by health professionals. They wanted more information on the quality/effectiveness of vaccines, vaccination-related complications and contraindications, together with more interpersonal communication/counselling from health professionals. [13] • During the RCA workshop conducted in Balti district, the workshop participants confirmed that the most caregivers have never received sufficient and clear

[12] Immunization and Vaccine Hesitancy in Europe and Central Asia: *A systematic review of literature (2008-2017) and field visits to BiH, Moldova, Romania and Ukraine, 2017 p.8*

Primary Root Causes	NIP component and short description
	information on vaccination and thus their knowledge on vaccines and immunization is limited, which in turn makes impossible for them to make informed decisions on immunization of their children.
A2.2.1 Weak capacity of service providers for effective communication	**Communication/Demand Generation** • Inability of front-line service providers to effectively communicate with the target population groups, is one of the most contributing factor in addressing anti-vaccination and vaccine hesitancy issues.

(b) Constraints

Constraints	Description
A. 1.2.2 Poor tracking of infants	**Information Systems** • Lack of defaulter tracking system is major issue preventing family doctors from precise planning and improving performance in vaccination coverage. Taking into account that this issue cannot be addressed autonomously at the sub-national level, it is regarded as the constrain for the sub-national level improvement plan. The decision for development and establishment of an effective defaulter tracking system must be made at the national level. Also the enforcement and application of the new system should also be done by the national level authorities, while monitoring of implementation and application of the newly developed system at the sub-national level should be provided by the sub-national level authorities.
A..2.2 Existing communication strategy is not effective	**Communication/Demand Generation** Moldova developed specific communication strategy aiming at achieving targeted 95% coverage with Routine Immunization Vaccines, which is currently being implemented. Moldova developed specific communication strategy aiming at achieving targeted 95% coverage with Routine Immunization Vaccines, which is currently being implemented. However, the low demand for immunization shows that the communication strategy needs to be revised and fine-tuned in order to better contribute into the vaccination demand generation. In addition, the budget for the strategy implementation should also be revised and sufficient funds should be allocated into the NIP budget in order to ensure uninterrupted implementation of the communication and demand generation interventions.
A3.1 Insensitive MIS to track defaulters	**Information Systems** • Current MIS is not effective enough to easily identify the children who missed a scheduled visit more than expected, as well as fails to generate lists of defaulters due to design and/or shortfalls.
A.3.2 Low motivation of doctors to correct denominator	**Program Management** • Taking into account the current PHC financing system, family doctors are not interested in revision of the lists of

Constraints	Description
	registered households (even if these households are not residing in the country), as such revision will lead to decrease of per capita financing of a particular health facility. • The country established incentive system for achievement of immunization targets, however family doctors lack knowledge about how this system works, as this change has not been sufficiently communicated to them. On the other hand, the existing incentives are much lower than per capita remuneration/financing received by Family Doctors and thus these health professionals give preference to the per capita payments rather than opt for incentives.

1.5. Description of Key Findings

(a) Primary Root causes

Root cause	Description	Implication
A1.1.1 **Family doctors feel insecure**	One of the main reasons of high rate of false contraindications provided by family doctors are caused by two factors: • Insufficient knowledge of family doctors on the immunization specific issues and most recent recommendations of WHO on contraindications. • Insecurity of family doctors against caregivers, demanding to postpone vaccination According to the HPV PIE report,[13] knowledge of the benefits of HPV vaccine in preventing different types of cancer and anogenital warts was not satisfactory among health workers. The evaluation also found a number of false contraindications to the HPV vaccination provided by the health workers in Moldova. The workshop participants confirmed that in some cases family doctors postpone vaccination due to the strong demand and aggressive behavior of caregivers, which affects program implementation. EPI review, carried out by NAPH in 2019 found that the knowledge and practices of the medical personnel on the immunization related problems is insufficient, including knowledge on contraindications for each vaccine of the national immunization schedule. Significant difference was observed in the level of trainings of health personnel in different geographic areas. 31% of doctors from rural health facilities have not received any training during the last five years, while in urban settings 100% of doctors were trained.	Implication of this root cause is high rate of the postponed vaccination, which leads to the increased rate of missed opportunities and contributes into the insufficient achievement of target coverage rates. Sufficient training of the family doctors will strengthen their decision-making capacity and will empower them to insist on their decisions and provide parents and caregivers with precise justification of their decision to vaccinate their children.

[13] HPV pie conducted in Moldova conducted in 2018.

A1.1.2 **Insufficient knowledge of specialists in contraindications**	Contraindications provided (most of them – false contraindications) by the doctor specialists at the district and central levels (in Chisinau) remains one of the most serious challenge leading to the increased rate of missed opportunities for vaccination. The review of the primary data on immunization showed that the level of documented contraindications is not high, as the formally documented reports include information on the long-term contraindications only (that are precisely documented). The key problem is related to the short-term contraindications, that are not registered in the formal reports, but verbally communicated to the caregivers and parents. These short-term contraindications especially affect vaccination with the Rotavirus vaccine, which due to the age restrictions cannot be administered to the children older than 3.5 months and thus, in cases when the short-term contraindications are provided by the doctors, the children miss opportunity to be vaccinated with the Rotavirus vaccine. These findings were confirmed by the JA report in 2015, which found that doctor specialists and general practitioners (family doctors) provide medical contraindications (most of them false) against all vaccines to significant proportion of infants, that leads to the delays in vaccination.	The main implication of this root cause is to increase the rate of missed opportunities. Increased rate of missed opportunities for immunization of children with Rotavirus vaccine.
A1.2.1 **Mobile population**	Population migration makes impossible: a) to ensure precise reporting on coverage and b) to achieve high coverage rates. According to service providers, the coverage is measured based on the list of registered children (denominator), while in reality a part of these children is not physically available in the country and thus cannot be reached by the immunization service providers.	Main implication of this root cause is inability of family doctors to understand number of residing population. In the context of insensitive MIS, family doctors can not precisely measure coverage rates of vaccination.
A1.3.1 **Roma communities- ow interest and no motivation for immunization**	There is an extremely low uptake of immunization services by the Roma communities, that remains one of the most challenging problems for the NIP Moldova in ensuring equitable service delivery to all community groups regardless their size and geographic location. • Low readiness of Roma communities to vaccinate their children is of the most critical root cause, accountable for underperformance of NIP to ensure equitable service delivery to all population groups in the country. • According to the national and regional studies,[14] Roma population has lower coverage when compared with non-Roma population groups,	Implications of this root cause are high risk posed by under- or unvaccinated children for spread of VPD, especially in the context of measles outbreaks in neighboring countries (Romania and Ukraine).

[14] Immunization and Vaccine Hesitancy in Europe and Central Asia: *A systematic review of literature (2008-2017) and field visits to BiH, Moldova, Romania and Ukraine, 2017*

	due to the negative attitudes and mutual mistrust between Roma communities and public institutions and negative perceptions of, and attitudes towards Roma and others by healthcare staff. • Roma communities (as well as other marginalized communities) lack sufficient information on vaccines/immunization from health professionals. In some cases, Roma families are often unaware of their entitlement to register with family doctors and receive free services.[15] • According to the regional studies, there is an insufficient data and evidence to understand the scale of and reasons for vaccine hesitancy/refusal of Roma communities to vaccinate their children. Also, the capacity to conduct sufficient social mobilization strategies and increase uptake of immunization services is limited. • However, experience of Balti district of Moldova shows that low uptake of immunization serviced by Roma communities can't be attributed to the religious or anti-vaccination aspects, as it is mostly related to the socio-cultural aspects of Roma communities, lack of interest in interaction with the formal institutions such as health care and educational institutions. For instance, Roma families do not send their children to the kindergartens and hardly attend the schools. • All these findings suggest that specific and effective interventions, including communication and social mobilization are necessary to generate sufficient demand for immunization among Roma communities.[15]	
A1.3.2 **Religious groups refusing to immunize their children**	Vaccination of religious groups remain a major challenge for NIP in Moldova. According to the HPV PIE many facilities reported pockets of resistance among vaccine hesitant parents. Refusals of religious communities to vaccinate their children is considered to be one of the root causes accountable for low coverage in some districts. According to EPI review findings 70.7% of all refusals can be attributed to the existing religious groups. According to the findings of the regional study on vaccine hesitancy[16] According to the religious leaders and groups are among the most active	The direct implication of this root cause is inability of the NIP to achieve targets for district and national level coverage rates. On the other hand, unvaccinated pockets of population pose serious risk to the protection of general population against VPD.

[15] Immunization and Vaccine Hesitancy in Europe and Central Asia: *A systematic review of literature (2008-2017) and field visits to BiH, Moldova, Romania and Ukraine, 2017*

[16] Immunization and vaccine hesitancy in Europe and Central Asia: A systematic review of literature (2008-2017) and field visits to Bosnia and Herzegovina, Republic of Moldova, Romania and Ukraine

	advocates of anti-vaccination movement, who tend to influence their respective communities with anti-vaccination messages, that are based on religious, moral and ethical believes of a particular confession.	
A1.4.1 **Insufficient supportive supervision mechanisms** **A1.4.2** **Poor practice of supportive supervision to Epidemiologists and Family Doctors**	During supportive supervision visits, the responsible staff conducting these visits do not use (or do not follow) SoPs, guides and data collection and analysis tools for supportive supervision. No reports on supportive supervision activities were provided to 58.8% of visited facilities. EPI review highlighted weak capacity of the staff in organization and coordination of the immunization service delivery. Especially it is related to the health facilities in the rural areas of the country. One of the primary causes for the weak supportive supervision practices was named Public Health Reform, which lead to significant reduction of the staff responsible for supportive supervision process.	The main implication of this root cause is inability to ensure high quality of provided services. In the context when service provider medical staff, especially in rural areas lack capacity for organization and planning of immunization services.
A2.1.1 **Intensive Anti-vaccination campaigns in Social Media**	According to the workshop participants the anti-vaccination campaigns in social networks is the most influential factor, affecting performance of immunization program. This was confirmed by PIE HPV findings, showing that hesitancy and refusals are the major factors accountable for low coverage rates. This included parents who were influenced by anti-vaccination comments in the mass media (mainly on internet publications).	In the situation of growing anti-vaccination campaign, the main implication of this root cause is further decline in immunization coverage rates and vulnerability of population against VPD at all levels. This root cause also contributes to increased risk of VPD outbreaks taking into account major measles outbreaks in neighboring countries.
A2.1.2 **Parents are not aware about benefits of immunization**	Insufficient knowledge of parents and caregivers about the benefits of immunization is one of the root causes for a high number of refusals of caregivers to vaccinate their children. As confirmed by the HPV PIE report findings, the low knowledge of parents and caregivers about vaccination in general and vaccines in particular lead to the low uptake of immunization services. One of the main reasons for refusal of parents to vaccinate their children is their concerns related to the safety of vaccines. This was confirmed by the regional study on immunization and vaccine hesitancy, which found that majority of caregivers thought that their knowledge on vaccination was insufficient due to a lack of information provided through different information channels, including health professionals. This was further confirmed in the most recent JA report, which found that growing skepticism about vaccination benefits and concerns about the vaccine safety among parents and medical workers can be regarded as one of the	Similar to the implication of the previous root cause, the insufficient knowledge of parents about vaccination, is accountable for refusals of parents to vaccinate their children and increased resistance and vaccine hesitancy. If not addressed the immunization rates will continue to decrease.

	main reasons for declining vaccination coverage.	
A2.2.1 **Weak capacity of service providers for effective communication**	The situation analysis of the current cMYP shows that poor communication between immunization service providers and caregivers/parents of immunization target children is one of the root causes of insufficient coverage. This root cause is accountable for inability of service providers to promote immunization services among parents and caregivers, increase demand for immunization services, which will contribute to increased uptake and coverage of the routine immunization vaccines. The regional study on immunization and reasons of vaccine hesitancy confirmed that vaccination information is crucial for decisions on whether to vaccinate children. Without clear information, caregivers may be reluctant to vaccinate children; linked to risk perception and fears of vaccine safety. When they do receive sufficient information, they are more likely to accept vaccination. According to the study findings on health professionals' skills, knowledge and attitudes, health professionals were perceived by caregivers as lacking sufficient education and knowledge on immunization/vaccines; and lacking IPC/counselling skills (which are generally not included in pre-service training in most countries. Disrespectful or even hostile attitudes of doctors leads to the refusal of parents to return to the doctors in the future and seek information in internet and social media, where they may not receive accurate information. The regional study confirmed that in some countries, doctors themselves also wished to enhance their interpersonal communication skills and help reduce caregivers' fear of side effects. Countries where high immunization coverage is maintained, generally have well-qualified personnel at all levels, high-quality training materials in all institutions and continuous education provided.	Implication of this root cause is inability of the immunization system to raise awareness of immunization target groups on the benefits of immunization, transfer information on vaccines and vaccine safety and contribute into uptake of the immunization services among the target population.

(b) Constraints

Table 7 below presents the key constraints that significantly limit improvement of NIP performance both at sub-national and national levels. These issues cannot be responded within the framework of the district level Performance Improvement Plan as it is far beyond the scope of responsibilities of sub-national level stakeholders. However, these issues should be considered while formulating strategies of the performance improvement plan designed and custom-tailored to the context and challenges of national immunization program municipality (Balti) and districts of the country.

Table 7: Factors beyond the scope of responsibilities of the National Immunization Program

Issues	Prospect for addressing	Responsibility
A1.2.2 Poor tracking of infants	- Development of the effective defaulter tracking system - Training service providers and public health staff (epidemiologists) in application of defaulter tracking system	National Agency of Public Health/MoH
A2.2.2 Existing communication strategy is not effective	- Revise existing communication strategy - Development of the strategy implementation plan - Discuss and ensure financial sustainability of strategy implementation - Implement and effectively monitor implementation of the communication strategy	National Agency of Public Health/MoH
A3.1 Ineffective MIS	- Development of the immunization module of MIP compatible with the broader HMIS - Allocate and train respective staff at each health facility for ensuring application of MIS tools	National Agency of Public Health/MoH
A.3.2 Low motivation of doctors to correct denominator	- Revise existing coverage-based incentive system to motivate family doctors to correct denominator in their respective patient registration lists - Develop and enforce mechanisms ensuring revision of the patient registration lists in the PHC facilities	National Agency of Public Health/MoH/ MoF/HIC[17]

[17] Health Insurance Company

1.5.1. Program objectives, strategies and main activities

Objectives	Strategies	Activities
1. Achieve >95% coverage of immunization target population in Balti Municipality with all routine immunization vaccines	1 Decrease rate of missed opportunities	*1.1 Address false contraindications* *1.1.1 Training family doctors in contraindications and vaccine safety* *1.1.2 Train doctor specialists (from in- and out-patient facilities) in contraindications and vaccine safety* *1.1.3 Select and adopt immunization module for training of doctors, nurses, pediatricians and other non-immunization specific staff in contraindications and vaccine safety* *1.1.4 Facilitate inclusion of the training module in the continuous medical education curricula* *1.1.5 Develop web-based training module in immunization* *1.1.6 Revise and introduce new procedure for recording contraindications in vaccination cards* *1.1.7 Revise procedure, SOPs and budgets for ensuring strong supportive supervision of immunization service delivery* *1.1.8 Conduct planning, allocate funding and provide supportive supervision of the service delivery and public health staff on regular basis*
	2 Strengthen defaulter tracking capacity of NIP	*2.1 Develop defaulter tracking system* *2.2 Integrate defaulter tracking system into the primary health care health information system (PHIS)* *2.3 Train FDs, FNs and public health staff (DCPH) in defaulter tracking system application*
	3 Increase coverage of Roma communities through design and implementation of the specific strategy	*3.1 Conduct mapping of the vaccine-hesitant population groups in Balti Municipality* *3.2 Elaborate specific strategy for increasing coverage of Roma communities that includes following components:* *3.2.1 Communication component custom tailored to the needs and specific behavior of Roma community members seeking health care services;* *3.2.2 Communication component for ensuring engagement of community leaders in immunization activities among the Roma communities;* *3.2.3 Service delivery mode, custom tailored to the needs of the Roma community members*
	4 Increase coverage of vaccine hesitant religious groups through design and implementation of the specific strategy	*4.1 Conduct mapping of the vaccine – hesitant religious communities in Balti municipality* *4.2 Elaborate specific strategy for increasing coverage of vaccine hesitant religious groups that includes following specific components:* *4.2.1 Communication component that is custom tailored to the specifics of the religious community groups;* *4.2.2 Communication component for ensuring engagement of religious leaders in immunization activities among the vaccine-hesitant religious groups* *4.2.3 Service delivery mode, that is custom tailored to the context of target population (vaccine-hesitant religious groups)*
	5 Increase uptake of immunization services	*5.1 Development of the specific awareness raising plan for Balti municipality* *5.2 Train service providers (family doctors and nurses, pediatricians, neonatologists and public health specialists) in interpersonal communication for immunization*
	6 Revision of the reporting system	*6.1 Revise reporting forms – resident population vs. registered population* *6.2 Training of the service providers in application of revised forms*

1.6. Components and interventions of the Improvement Plan

Components and interventions of the Improvement Plan	Root causes	Impact weight
1 Decrease rate of missed opportunities		
1.1 Address false contraindications		
1.1.1 Training of family doctors and nurses in false contradictions and vaccine safety	A.1.1.1	High
1.1.2 Training of doctor specialists from outpatient and in-patient care in contraindications	A.1.1.2	High
1.1.3 Development of the immunization module for institutionalization (inclusion into the continuous medical education curricula for doctors and nurses). Mandatory module for pediatricians and family doctors, nurses of family doctors.	A.1.1.1 A.1.1.2	Medium
1.1.4 Development of the web-based training platform and insure sustainability	A.1.1.1 A.1.1.2	Medium
1.1.5 Revise and introduce new procedure for contraindication records in the vaccination cards (diagnosis, justification, specific contraindication against antigen vs. vaccine)	A.1.1.2	High
1.1.6 Revise supportive supervision mechanisms and provide supportive supervision on immunization to Family Doctors and Epidemiologists	A.1.4.1 A.1.4.2	High
1.2 Strengthen defaulter tracking capacity:		
1.2.1 Development and institutionalization of the defaulter tracking system. Include default tracking system into primary health care information system (PHIS)	A.1.2.1	High
1.2.2 Training of Family Doctors and Nurses in application of defaulter tracking system	A.1.2.1	High
1.3 Increase coverage of hard-to-reach population groups		
1.3.1 Elaboration and implementation of set of specific interventions for increasing vaccination coverage rate among Roma communities	A.1.3.1	High

1.3.2 Elaboration and implementation of set of specific interventions for increasing vaccination among the representatives of religious groups	A.1.3.2	High
2 Increase uptake of immunization services		
2.1 Development and implementation of targeted interventions for improving communication and increasing awareness of target population groups on immunization	A.1.2.1 A.1.2.2	Medium
2.2 Train service providers (Family doctors, nurses of family doctors, pediatricians, neonatologists, Public Health specialists) in communication	A.1.2.1 A.1.2.2	High
3 Revision of the reporting system		
3.1 Revise reporting form – resident population vs. registered population	A.3.1	High
3.2 Training of service providers in application of the revised reporting forms	A.3.2	Medium

2. Budget – including national and sub-national level activities

#		Item	# of items	Item cost	Total
1	**Addressing false contraindications**				
1.1	Development of the immunization training module (contraindications, vaccine safety) - National TA	day	14		
1.2	Development of the web-based training module/platform - National TA	lump sum	1		
1.3	Revise procedure for recording contraindications - National TA	day	7		
1.4	Revision of supportive supervision mechanisms	day	14		
1.5	Train staff in supportive supervision procedure	participant	234		
1.6	Training of family doctors in contraindications and vaccine safety	participant	67		
1.7	Training of doctors from in- and out-patients facilities in contraindications and vaccine safety	participant	67		
1.8	Training of neonatologists in contraindications and vaccine safety	participant	5		
1.9	Advocacy activities - institutionalization of new procedure for recording contraindications	meeting	2		
1.10	Stakeholder workshop - procedure for recording contraindications - 1 day workshop for 25 participants	workshop	2		
1.11	Advocacy activities - inclusion immunization module into the continuous education curricula	meeting	2		
1.12	Advocacy activities - inclusion immunization module into the continuous education curricula	workshop	1		
2	**Strengthening defaulter tracking capacity**				
f	Development of defaulter tracking system - International TA	day	14		
2.2	Development of defaulter tracking system - national TA	day	14		
2.3	Training family doctors in defaulter tracking system application	participant	67		
2.4	Training of family nurses in defaulter tracking system application	participant	165		
3	**Increase coverage in hard-to-reach population groups (Roma and Religious groups)**				
3.1	Development of the set of specific interventions for accessing Roma communities - International TA	day	14		
3.2	Development of the specific set of interventions for accessing the religious groups - International TA	day	14		
3.3	Results dissemination workshop - specific interventions for accessing Roma and religious communities	Workshop	1		
4	**Increase uptake of immunization services**				
4.1	Development of the set of interventions for improving communication and awareness raising - International TA	day	14		
4.20	Train family doctors and nurses in interpersonal communication for immunization	participant	234		
4.3	Campaign materials - posters	poster	1000		
4.4	Campaign materials - brochures	brochure	1000		
4.5	Campaign materials - TV spot	TV spot	5000		
4.6	Campaign materials - Radio spot	Radio spot	2000		

4.7	Campaign materials - Social Network materials	set	500		
4.8	Meetings	meeting	2		
4.9	Workshops	workshop	2		
4.9	Monitoring and Evaluation - international TA	day	14		

2.1. Budget – sub-national level activities

#		Item	# of items	Item cost	Total
1	**Addressing false contraindications**				
1.1	Development of the immunization training module (contraindications, vaccine safety) - National TA	day	14		
1.5	Train staff in supportive supervision procedure	participant	234		
1.6	Training of family doctors in contraindications and vaccine safety	participant	67		
1.7	Training of doctors from in- and out-patients facilities in contraindications and vaccine safety	participant	67		
1.8	Training of neonatologists in contraindications and vaccine safety	participant	5		
1.10	Stakeholder workshop - procedure for recording contraindications - 1 day workshop for 25 participants	workshop	2		
2	**Strengthening defaulter tracking capacity**				
2.3	Training family doctors in defaulter tracking system application	participant	67		
2.4	Training of family nurses in defaulter tracking system application	participant	165		
3	**Increase coverage in hard-to-reach population groups (Roma and Religious groups)**				
3.1	Development of the set of specific interventions for accessing Roma communities - TA	day	14		
3.2	Development of the specific set of interventions for accessing the religious groups - TA	day	14		
3.3	Results dissemination workshop - specific interventions for accessing Roma and religious communities	workshop	1		
4	**Increase uptake of immunization services**				
4.1	Development of the set of interventions for improving communication and awareness raising - TA	day	14		
4.20	Train family doctors and nurses in interpersonal communication for immunization	participant	234		
4.3	Campaign materials - posters	poster	1000		
4.4	Campaign materials - brochures	brochure	1000		
4.5	Campaign materials - TV spot	TV spot	5000		
4.6	Campaign materials - Radio spot	Radio spot	2000		
4.7	Campaign materials - Social Network materials	set	500		
4.8	Meetings	meeting	2		
4.9	Workshops	workshop	2		
4.9	Monitoring and Evaluation - international TA	day	14		

	Total Budget				

2.2. Budget – National level activities

#		Item	# of items	Item cost	Total
1	**Addressing false contraindications**				
1.2	Development of the web-based training module/platform - National TA	lump sum	1		
1.3	Revise procedure for recording contraindications - National TA	day	7		
1.4	Revision of supportive supervision mechanisms	day	14		
1.9	Advocacy activities - institutionalization of new procedure for recording contraindications	meeting	2		
1.11	Advocacy activities - inclusion immunization module into the continuous education curricula	meeting	2		
1.12	Advocacy activities - inclusion immunization module into the continuous education curricula	workshop	1		
2	**Strengthening defaulter tracking capacity**				
2.1	Development of defaulter tracking system - International TA	day	14		
2.2	Development of defaulter tracking system - national TA	day	14		
	Total Budget				

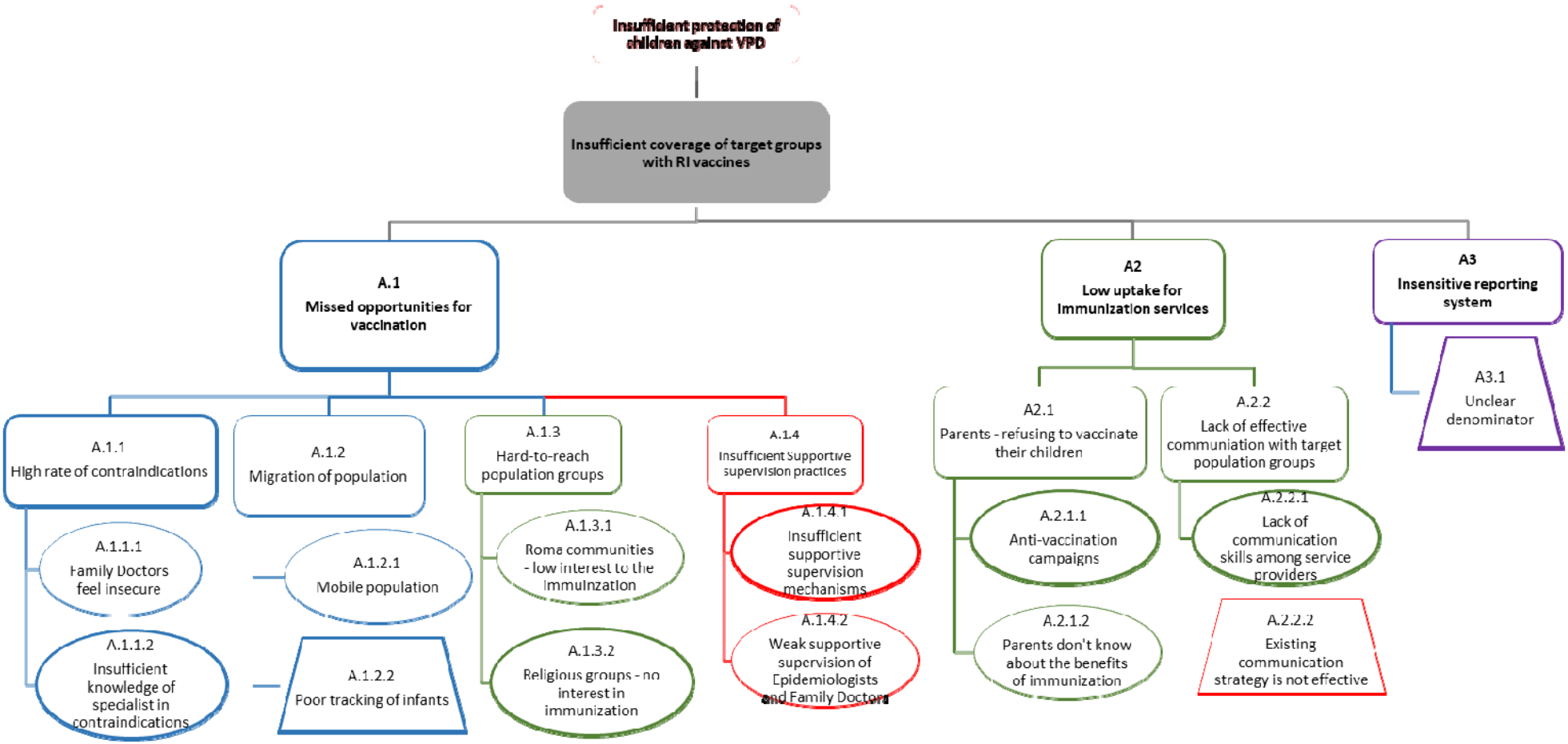
3. Implementation timeline

Implementation timeline	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
1. Decrease the rate of missed opportunities												
1.1 Address false contraindications												
1.1.1 Training of family doctors in false contradictions												
1.1.2 Training of doctor specialists from outpatient and in-patient care in false contraindications												
1.1.3 Development of the immunization module for institutionalization (inclusion into the continuous medical education curricula for doctors and nurses). Mandatory module for pediatricians and family doctors, nurses of family doctors.												
1.1.4 Development of the web-based training platform and insure sustainability												
1.1.5 Revise and introduce new procedure for contraindication records in the vaccination cards (diagnosis, justification, specific contraindication against antigen vs. vaccine)												
1.1.6 Revise supportive supervision mechanisms and provide supportive supervision on immunization to Family Doctors and Epidemiologists												
1.2 Strengthen defaulter tracking capacity:												
1.2.1 Development and institutionalization of the defaulter tracking system. Include default tracking system into primary health care information system (PHIS)												
1.2.2 Training of Family Doctors and Nurses in application of defaulter tracking system												
1.3 Increase coverage of hard-to-reach population groups												
1.3.1 Elaboration and implementation of specific strategy for increasing vaccination coverage rate among Roma communities												
1.3.2 Elaboration and implementation of specific strategy for increasing vaccination among the representatives of religious groups												
2 Increase uptake of immunization services												

2.1 Development and implementation of awareness raising and communication campaign												
2.2 Train service providers (Family doctors, nurses of family doctors, pediatricians, neonatologists, Public Health specialists) in communication												
3 Revision of the reporting system												
3.1 Revise reporting form – resident population vs. registered population												
3.2 Training of service providers in application of the revised reporting forms												

4. Annexes

Figure 6: Root cause analysis of National Immunization Program performance in Balti municipality of Moldova



Annex 1: Problem inventory and description

Issues	Description	Source	Evidence strength	Health system component	Importance
A. Insufficient coverage of target groups with RI vaccines	According to the recent studies, since 2011 the immunization coverage has been decreasing due to the increased vaccine hesitancy of parents and caregivers in Moldova, influenced by growing anti-vaccination campaigns in the communities, mass media and social networks. . In 2018, the national level coverage with DTP3 vaccine accounted for 90.2%, while district level coverage varied between 64.6% in Cimislia to 98% - in Glodeni, which is substantially below of target coverage rates set by the NIP for National Immunization Program.	NIP review, 2019[18]	Strong	Service delivery	
A.1 Missed opportunities for vaccination	Storage and distribution of vaccines from the national warehouse down to the health facilities is traditionally and effectively managed by National Immunization Program, but due to the inability of the system to effectively address vaccine hesitancy problems and promote immunization among the target groups, immunization eligible children miss their scheduled vaccinations. According to the HPV PIE report, published in 2018, the main reasons for low coverage were vaccine hesitancy and refusals of caregivers to vaccinate their children. The main reasons for vaccine hesitancy were concerns about the vaccine safety, influence of anti-vaccination campaigns (mainly via the social networks) and religious considerations.	NIP review, 2019, HPV PIE report 2018	Strong	Demand for vaccination	
A.1.1 High rate of contraindications	According to the multiple publications,	HPV PIE, JA	Strong	Service	

[18] National Immunization Program Performance Review, conducted by the National Agency of Public Health in 2019 (unpublished draft report)

	contraindications remain one of the key challenges of NIP, that is accountable for insufficient coverage rates with routine immunization vaccines. HPV PIE conducted in 2018 found that the list of contraindications used in health facilities widely differed from the MoH's official list. Specifically, 46% of health care workers cited start of sexual activity as contraindication for HPV vaccination. The Joint Appraisal report (2015) shows that the main reason for declining coverage is…"contraindications provided by medical specialists and family doctors (most of which are false contraindications) against all vaccines to significant proportion of infants, which leads to delay in vaccination and notably leaves children unprotected against rotavirus due to age restrictions.	report, ECA RWG meeting report, etc.		delivery	
A.1.1.1 Family doctors feel insecure	Described in previous section	HPV PIE, JA report, Workshop discussion results	Strong	Service delivery	High
A.1.1.2 Insufficient knowledge of specialists in contraindications	Detail description is provided in previous section	Workshop discussions JA report	Strong	Service delivery	High
A.1.2 Migration of population	Migration of population in and out of the country significantly complicates vaccination of immunization target groups with RI vaccines. According to the JA report, up to 7% of the unvaccinated children were not vaccinated due to the migration of families within and outside the country in 2015. Population migration makes impossible: a) to ensure precise reporting on coverage and b) to achieve high coverage rates. According to service providers, the coverage is measured based on the list of registered children (denominator), while in reality a part of these children are not physically available in the country and thus		Strong	Information Systems	
A.1.2.1 Mobile population		JA Report, workshop participants			

	cannot be reached by the immunization service providers.				
A.1.2.2 Poor tracking of infants	Poor tracking of defaulters (children not showing up for scheduled vaccination session) due to the lack of effective MIS for defaulter tracking is one of the major challenges accountable for sub-standard achievement in coverage target population. In the context of Moldova, with the strong anti-vaccination campaign and high vaccine hesitancy, low capacity for defaulter tracking has critical implications on the achievement of target coverage rates.	Workshop participants	Strong	Information systems	High
A.1.3 Underserved population groups	There are two major groups that were classified as underserved population groups, or hard-to-reach population groups in Moldova. These are Roma communities, with the low readiness for vaccination and religious groups that have no willingness to vaccinate their children due to the religious considerations.	Workshop participants	Strong	Service delivery	High
A.1.3.1 Roma communities – readiness of Roma communities for vaccination	Detail description is provided in previous section	Workshop participants	Weak	Demand generation	Medium
A.1.3.2 Religious communities refusing to immunize their children	Detail description is provided in previous section	Workshop participants HPV PIE EPI Review	Strong	Demand generation	High
A.1.4 Insufficient supportive supervision practices	Although it is reported that supportive supervision takes place regularly at all levels, there was no evidence found on supervision. Workshop participants reported that supportive supervision practices are insufficient and need to be strengthened. These assumptions of workshop participants are confirmed by the EPI review findings showing that on average 1.2 supportive supervision visits are conducted per year per facility providing immunization services. Only 29% of facilities have been visited twice, 24.1% of facilities visited once and nearly 35% of facilities has never been visited for supportive supervision purposes.	cMYP 2016-2020 EPI review PIE HPV	Strong	Service delivery	High

	A.1.4.1 Insufficient supportive supervision mechanisms		EPI Review	Strong	Service Delivery	High
	A.1.4.2 Poor practice of supportive supervision of Epidemiologists and Family Doctors	Detail description is provided in previous section	EPI Review	Strong	Service Delivery Cold-chain management	High
A.2 Low uptake of immunization services		Low uptake of vaccination is result of high refusal rates of parents to immunize their children leading to inability of the immunization system to achieve targeted 95% coverage of population with routine immunization vaccines. In the context of Moldova, when willingness and readiness for vaccination is extremely low (due to anti-vaccination campaigns in mass media and social networks) only the capacity of service providers to deliver vaccination services is insufficient to reach necessary coverage rates and achieve NIP goals and objectives.				High
A.2.1 High vaccine hesitancy among parents and caregivers		In the context of Moldova, vaccine hesitancy is the leading factor for refusals of caregivers to vaccinate their children. This factor determined by the strong anti-vaccination campaigns (primarily in mass-media and social networks) and the low awareness of caregivers about the benefits of vaccination. According to the EPI review findings "previous studies and reports on the achievement of NIP documented that immunization program in Moldova was strong and sustainable, however, during the years of 2011-2015 the increased vaccine hesitancy and resistance of caregivers to vaccinate children complicated to reach and maintain target coverage rates. In result vaccination coverage rates decreasing, preventing NIP from achieving targeted 95% coverage with all 13 antigens included in the national immunization schedule."	EPI review	Strong	Service Delivery Demand Generation	High
	A.2.1.1 Intensive Anti-Vaccination	Detail description is provided in the previous	HPV PIE Report	Strong	Demand	High

	Campaigns in Social Media	section			Generation	
	A.2.1.2 Low awareness of parents on benefits of immunization	Detailed description of the root cause is provided in previous section	HPV PIE Report JA report cMYP 2016-2020	Strong	Demand Generation	High
A.2.2 Lack of effective communication with immunization target groups		Lack of effective communication capacity of service providers remains one of the key challenges of NIP. The results of assessment of communication and demand generation showed that there is a growing proportion of parents refusing to vaccinate their children due to concerns about vaccine safety and religious beliefs.		Strong		High
	A.2.2.1 Weak capacity of service providers in communication			Strong	Demand generation	High
	A.2.2.2 Existing communication strategy has not been effectively implemented	Currently NIP Moldova implements Communication and Behavior Change Strategy aiming at restoring 95% coverage rate with routine immunization vaccines. However, the strategy is in the stage of implementation and the results could not be observed at this stage.	cMYP, Communication Strategy	Strong	Demand generation	High
A.3 Denominator issue		The problems in precise tracking of population migration in both urban and rural areas of the country and consequent denominator problems leads to the inability to precisely estimate actual coverage of population with RI vaccines, as well as make evidence-based decisions and design and implement effective corrective measures.	cMYP, JA report, other publications.	Strong	Information systems	High
	A.3.1 Ineffective MIS	Similar to other transitioning countries, the denominator issue has been one of the most challenging issues in Moldova, affecting immunization coverage rates. The root cause for existing incorrect denominator is insensitive MIS that is not able to track population migration and defaulters and leads to inability of NIP authorities at the central level, public health staff and family doctors at local	cMYP, JA	Strong	MIS	High

	levels to precisely measure real achievements in immunization coverage and based on the results, plan and implement respective measures for performance improvement. Overall, Ineffective MIS is the constraint that is beyond of control of district level authorities and should be addressed by the national level authorities and top management at the National Agency of Public Health and/or Ministry of Health.				
A.3.2 Low motivation of service providers to improve denominator issue	According to the workshop participants, family doctors less likely to be interested with revision of target population numbers and correction of denominator for immunization coverage. Taking into account current per capita mechanism for financing of PHC service delivery and expected decrease of target population number as the result of revision which will lead to the decrease of PHC facility and family doctor's income. The payments received by Family Doctors through the performance based payment scheme, in case of achievement target immunization coverage is much less, than per capita payment, and thus is not motivating enough for family doctors to revise patient registration lists.	Workshop participants	Strong	MIS	High

Annex 2: Administrative Structure of Moldova

Administrative unit	# of administrative units	Name of administrative unit
Municipalities	2	Chisinau, Balti
Districts	32	Anenii Noi, Basarabeasca, Briceni, Cahul, Cantemir, Calarași, Causeni, Cimislia, Criuleni, Donduseni, Drochia, Dubasari, Edinet, Falesti, Floresti, Glodeni, Hincești, Ialoveni, Leova, Nisporeni, Ocnita, Orhei, Rezina, Rișcani, Singerei, Soroca, Straseni, Soldanești, Stefan Voda, Taraclia, Telenesti, Ungheni
Autonomous Territorial Unit	1	Gagauzia
Districts of Autonomous Territorial Unit	3	Comrat, Ceadir-Lunga, Vulcanesti
Territorial Administrative Unit	1	Transnistria
Municipalities of Territorial Administrative Unit	5	Camenca, Dubasari, Drigoriopol, Ribnita, Slobozia