

Moldova

Balti Plan for Improving Performance of National Immunization Program



For National Immunization Program of Moldova

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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 administratively in administrative-territorial units: districts, cities and villages. The statute of village (commune), sector, city (municipality) is elaborated based on the framework statute, approved by the Parliament of the Republic of Moldova and it is approved by the local Council. The administrative territorial organization of the Republic of Moldova is made on 2 levels: villages (communes), sectors and cities (municipalities) constitute the first level, districts, Chisinau municipality, **Balti** municipality constitute the second level.

Village in Moldova is an administrative territorial unit which comprises the rural population united by the territory, geographical conditions, economic, social-cultural relations, traditions and customs. Two or more villages, depending on the economic, social-cultural, geographical and demographical conditions, can be united forming a single administrative territorial unit called commune. The *Commune* is the administrative territorial unit which comprises the rural population united by the community of interests and customs.

District is a territorial administrative unit made up of villages (communes) and cities united by the territory, economic and social cultural relations.

City is the territorial administrative unit which is more developed than the village from the economic and social cultural point of view. The cities comprise the urban population with corresponding economic, industrial and commercial structures. The population of the cities are employed mostly in industry, in the field of public services and in different fields of intellectual activity, in cultural and political life.

Municipality is a locality of urban type with a special role in the economic, social-cultural, scientific, political and administrative life and development of the country, taking into account the important industrial, commercial structures and institutions in the field of education, protection of health and culture.

In this way, the Republic of Moldova is divided into:

2 municipalities (Chisinau and Balti), **32 districts** (Anenii Noi, Basarabasca, Briceni, Cahul, Cantemir, Calarasi, Causeni, Cimislia, Criuleni, Donduseni, Drochia, Dubasari, Edinet, Falesti,

Floresti, Glodeni, Hincești, Ialoveni, Leova, Nisporeni, Ocnita, Orhei, Rezina, Rîșcani, Singerei, Soroca, Straseni, Soldanești, Stefan Voda, Taraclia, Telenesti, Ungheni); Autonomous Territorial Unit Gagauzia, including 3 districts (Comrat, Ceadir-Lunga and Vulcanesti); territorial administrative units from the left part of Nistru River, widely known as Transnistria including 2 municipalities (Tiraspol and Bender) and 5 districts (Camenca, Dubasari, Grigoriopol, Ribnita, Slobozia).

Transnistria is a part of the Republic of Moldova, but this region is not controlled by its government, as the so-called “*Moldovan Republic of Transnistria*” self-proclaimed its independence in 1990. The independence of Transnistria were not recognized by any state in the world. Tiraspol municipality is in fact the capital of Transnistria which comprises 5 districts (Camenca, Ribnița, a part of Dubasari, Grigoriopol, Slobozia) and two municipalities (Tiraspol and **Bender**).

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

Population of Balti municipality accounts for 151,700 residents.

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

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

Table 1: Vital Statistics Rates for Belti 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

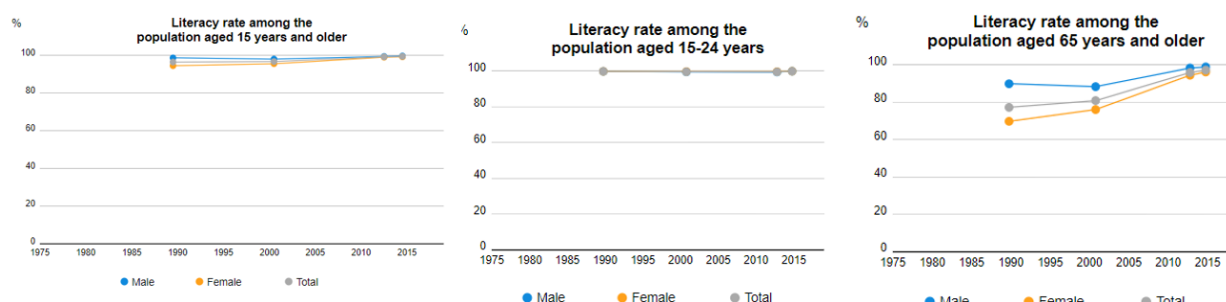
1.1.4. Education and literacy

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

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

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 years. 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 remaining 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) Maternal and Child Health

Between 2008-2017, the neonatal mortality rate per 1,000 live births fluctuated. It fell for females from 2008 to 2011, peaked in 2012, fell again until 2014, and has increased again since then. The male neonatal mortality rate grew from 2008 to 2010, fell in 2011-2013, grew again until 2015 and has been decreasing since 2016 as shown in Figure 2 below.

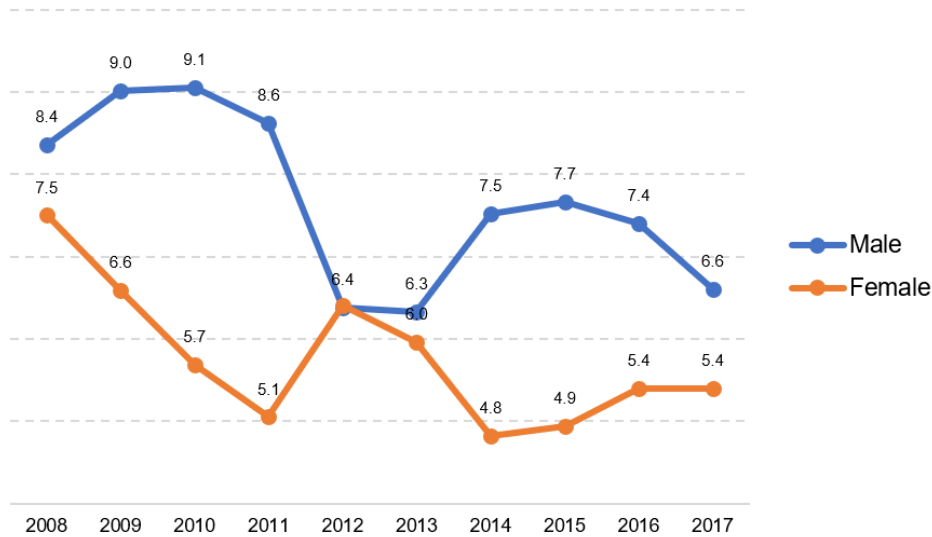
Neonatal mortality rates in Moldova are higher than in neighbouring Romania with recorded 6.3 versus 4.3 neonatal deaths per 1,000 live births in 2015. The European HFA does not report data

² Health for All database accessed in December 2, 2019

³ Institute for Health Metrics and Evaluation (IHME), 2019.

for the average of CSI countries but for the WHO European Region the number of deaths per 1,000 live births in 2014 was 4.6 (data for 2015 not available), which is lower than the neonatal mortality rate in Moldova (6.2 in 2014).

Figure 2: Neonatal mortality in Moldova, 2017⁴

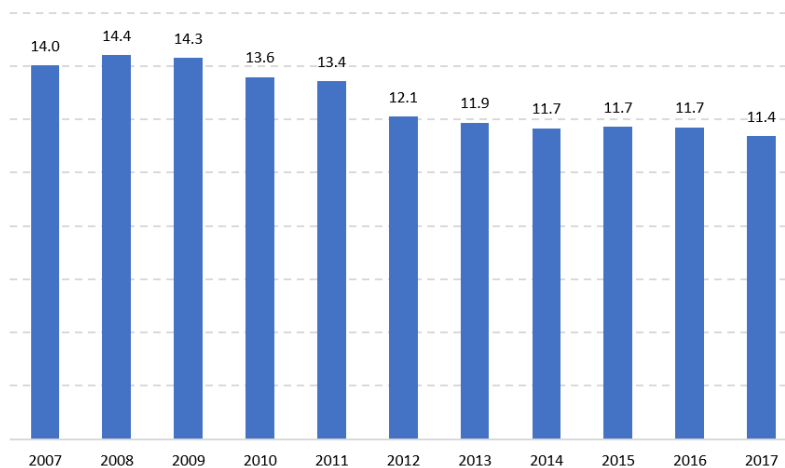


Source: National Center of Public Health, 2019

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 in 2010 due to the high degree of flu in that year) and districts providing data. Most districts do not have any records due to the small number of deaths (for all country from 5 up to 16 deaths per year).

The under-five mortality rate decreased from 14 in 2007 to 11.4 per 1,000 live births in 2017 as shown in Figure 3 below⁵

Figure 3: Under 5 mortality rate in Moldova during 2007-2017



Source: National Center for Public Health

⁴ Assessment of HSDS of Moldova, August 7, 2019

⁵ UNICEF (2016). Children of Moldova. Chişinău: United Nations International Children Emergency Fund.

(3) VPD Epidemiology

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

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 by September 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 to all schools restricting admission of unvaccinated children. 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 90ths National Immunization Program (NIP) of Moldova has achieved remarkable progress in controlling vaccine preventable diseases (VDP) and protecting the immunization target population groups 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 performed by the different structures of the Ministry of Health. For instance, 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 plan and the budget for the immunization program, which significantly contributes to the financial and programmatic sustainability of uninterrupted implementation of all immunization related activities.

The 5-year budget planning has also been instrumental for ensuring consistency in vaccine procurement and availability of vaccines at all service delivery points of the country. 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. In addition, the government makes substantial investments to expand protection of population against VPDs through introduction of the new vaccines into the national immunization schedule. 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, Decision #1113.⁶ The program is aligned with the Global Vaccine Action Plan (GVAP) and the European Vaccine Action Plan 2015-2020 (EVAP), the regional interpretation of the GVAP aiming 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 health facilities to their respective public health centers at the district and/or city level. In the districts and cities, the public health centers conduct initial analysis and aggregation of the immunization coverage data and submit results to the National Agency of Public Health.

⁶ OM MDA No. 353-354 of October 11, 2016.

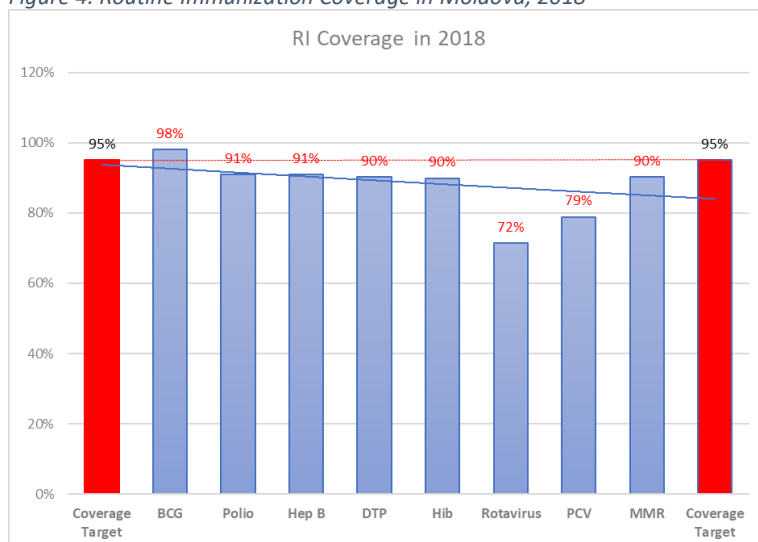
Overall the immunization program in Moldova remains strong and well-performing, however since 2009 the country has been experiencing declining coverage rates for all antigens included in the national immunization schedule.

In 2018, decrease of coverage rates continued and the country failed to achieve target vaccination rates (95%) for the most of antigens except for BCG vaccine coverage (see Figure 4 below) which is administered in Maternity Hospitals.

According to the number of studies and results of research carried out in the country, the decrease in coverage can be attributed to the growing skepticism about benefits of vaccination and concerns among service providers and parents about vaccine safety. Medical specialists and general practitioners (family doctors) 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.⁷

Parents and caregivers 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 family doctors. On the other hand, some infants are unvaccinated, or their vaccination status is unknown because their parents migrate within and outside the country.

Figure 4: Routine Immunization Coverage in Moldova, 2018



Source: NIP Review, 2019

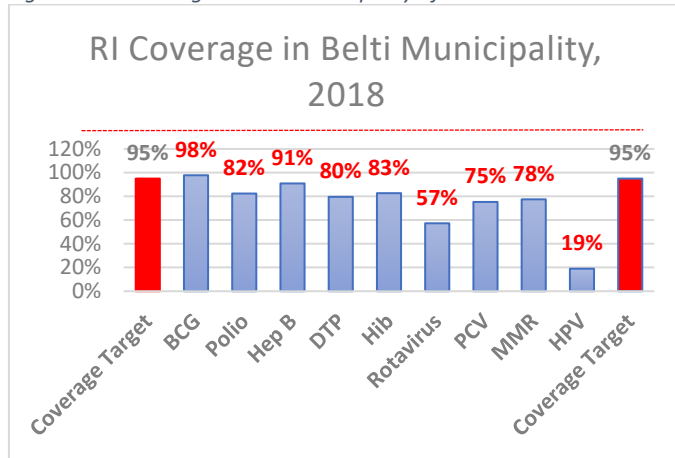
Figure 5 below presents coverage data of one of the underperforming areas Balti municipality. The presented data shows that the coverage rates for all routine immunization vaccines (except for BCG vaccine) is lower than the average coverage rates reached by the NIP at the national level and the Balti municipality achievements in coverage are significantly lower than the rates targeted by the national immunization program (95%).

The analysis of coverage rates by districts shows that the insufficient performance of NIP in low performing districts can be the main contributing factor, preventing NIP from achieving national coverage target rates. Therefore, improving performance of NIP at the sub-national levels in districts (mostly in underperforming districts) and Balti municipality is a **top priority of immunization**

⁷ According to the WHO recommendations the 1st dose of the Rotavirus vaccine must be administered no later than 2.5 months after birth

system, that requires specific planning and implementation of custom-tailored interventions at both national and sub-national levels.

Figure 5: RI Coverage in Balti Municipality of Moldova

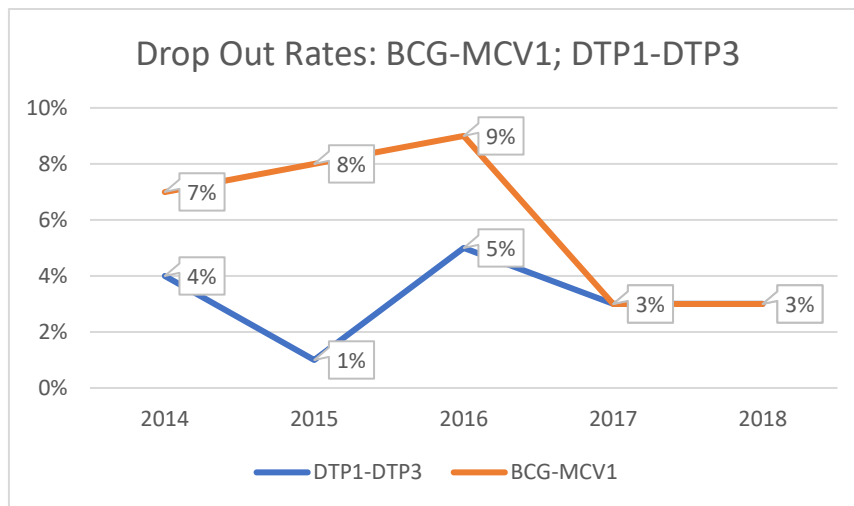


Source: NCPH, 2019

(2) Immunization coverage equity

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 6 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.

Figure 6: Trends in Drop-out rates between BCG and MCV1 – Attn! Check oY axes for MCV1 ; indicate variable



Source: WHO UNICEF Coverage Estimates, 2019

Decreasing trends of drop-outs 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 to reach all children across different socioeconomic, cultural groups and geographic locations to ensure equitable delivery of immunization services 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 Center of Public Health (NIPH). 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.

In general, the National Immunization Program 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 services (PHC). 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 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 (see Table 5 below).

Table 5: National Immunization Schedule of Moldova, 2019

AGE RECOMMENDED	VACCINE TYPE	COMMENTS
First 24 hours of life	Hepatitis B birth dose	In maternity
2-5 days age	BCG	
2 months	Penta1 Rota1 bOPV1 PCV1	Family doctors
4 months	Penta2 bOPV2 Rota2 PCV2	Family doctors

6 months	Penta3 bOPV3	Family doctors
12 months	MMR1 PCV3	Family doctors
12-24 months	bOPV4 DTP4	Family doctors
6-7 years	bOPV5 DT; MMR2	Family doctors
10-year-old girls	HPV1 HPV2	Family doctors
15-16 years	Td MMR3	Family Doctors
Adults at 20, 30, 40, 50 and 60 years	Td	Family doctors

Source: cMYP 2016-2020

According to the existing regulations, all immunization services in Moldova should be and are provided through the fixed site service delivery mode at the PHC centers and outreach service delivery is not practiced in the country. The vaccinations are administered by the Family Nurses and are managed by the Family Doctors. The service delivery is based on the household registration lists of Family Doctors. The immunization services are delivered based on the specific immunization plans prepared by each Family Doctor. Immunization service delivery is monitored, coordinated and managed by the district center of public health responsible for immunization program management, including surveillance monitoring and control of implementation of immunization related activities at the district level.

(3) Program management

Program management of National Immunization Program in Balti municipality is provided by the department of Epidemiology of the Balti Municipality 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 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, the monthly reports are used for 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 of 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 one of the best and most advanced cold chain in the CIS countries. 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 6 below).

Table 6: 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. Country experienced strong anti-vaccination campaigns and one of the main reasons preventing NIP from achievement of high coverage rates is vaccine hesitancy among the parents and caregivers.

According to the report on Assessment of Healthcare System Development Strategy 2008-2017 of the Republic of Moldova, currently the country with support of the international development partners is implementing multiple strategies in different areas of the health care system. “National Campaign on Health of the Mother and Child” is implemented with support provided by Unicef and Swiss Agency for Development and Cooperation (SDC); “The National Campaign on the Health Risks of Migration” - implemented in collaboration with the International Organization for Migration (IOM); the implementation of the “A Communication Strategy on Promoting Vaccination” is supported by UNICEF, “National Campaign Against Smoking” - in collaboration with WHO, and “National

Communication Campaign to Prevent Home Accidents for Children Aged 0 to 5 years” - in collaboration with the MoH, the Ministry of Education, Ministry of Labor and Social Protection and the Ministry of Interior.

According to the in-country experience in implementation of communication campaigns, the main obstacle in implementation process is high staff turnover that affect implementation process and its effectiveness, as those who receive trainings very often leave their current jobs. This aspect should be further considered while planning communication campaigns and/or specific interventions for increasing demand of the immunization services and/or increasing awareness of key stakeholders (target groups, parents/caregivers/health professionals) on the benefits of immunization program.

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.
- *Assumptions pending evidence collection* – the important factors that cannot substantiated at the moment due to the lack of sufficient and quantitative evidence but could be “transferred” to the category of “primary root causes” upon obtaining of sufficient qualitative evidence.
- *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 7 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 7: Primary Root Causes

Primary Root Causes	NIP component and Short description
<p>A1.1.1 Family Doctors Feel Insecure</p>	<p>Service Delivery</p> <p>Family doctors feeling insecure to insist on vaccination and therefore postponing vaccination sessions due to following reasons:</p> <ol style="list-style-type: none"> 1. Limited knowledge of immunization specific issues and most recent recommendations of WHO related to the contraindications for a particular RI vaccine; and 2. Lack of motivation/incentives to vaccinate children and achieve target coverage rates;
<p>A1.1.2 Insufficient knowledge of specialists in contraindications</p>	<p>Service Delivery</p> <ul style="list-style-type: none"> • Short-term contraindications (mostly false contraindications) provided by doctor specialists at district and central levels (Chisinau) is one of the key factors contributing in low coverage rates.
<p>A1.2.1 Mobile population</p>	<p>Information Systems</p> <ul style="list-style-type: none"> • 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.
<p>A1.3.1 Low readiness of Roma communities to immunize their children</p>	<p>Communication/Demand Generation</p> <ul style="list-style-type: none"> • Low readiness of Roma communities to vaccinate their children is the root cause for inability of the NIP to ensure equitable service delivery in all parts and among all communities of the country. • It is believed that the reasons for the low readiness is the cultural and behavioral factor. It is typical for Roma community members not to engage in any formalized systems and/or settings and to try secure needed services individually. In Moldova, children from the Roma families are not sent to the kindergartens, and hardly attend the schools. • However, experience in different countries shows that the refusals of Roma parents and caregivers to immunize their children are not based on religious or any other strong believes and therefore the specific and effective communication, could be instrumental for

Primary Root Causes	NIP component and Short description
	convincing Roma community members to vaccinate their children.
A1.3.2 Religious groups refusing to immunize their children	Communication/Demand Generation <ul style="list-style-type: none"> Vaccine hesitancy and resistance of religious communities is one of the most serious factors,
A1.4.1 Insufficient supportive supervision mechanisms	Program Management <ul style="list-style-type: none"> Staff responsible for supportive supervision visits do not use (or do not follow) supportive supervision procedure, SoPs, Guides and data collection and analysis tools. No supportive supervision reports, recommendations or notes were provided to 58.8% of visited facilities.
A1.4.2 Poor practice of supportive supervision to Epidemiologists and Family Doctors	Program Management <ul style="list-style-type: none"> According to EPI review findings, immunization service providers lack capacity to effectively organize and coordinate immunization activities. 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 <ul style="list-style-type: none"> One of the most critical root causes significantly affecting performance of National Immunization Program in achieving target coverage rates. This root cause is regarded as triggering factor for vaccine hesitancy and refusal of parents and caregivers to vaccinate their children.
A2.1.2 Parents are not aware about benefits of immunization	Communication/Demand Generation <ul style="list-style-type: none"> 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.
A2.2.1 Weak capacity of service providers for effective communication	Communication/Demand Generation <ul style="list-style-type: none"> 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) Assumptions pending collection of evidence

RCA analysis have not identified any assumption that required additional data collection.

(c) Constraints

Constraints	Description
A. 1.2.2 Poor tracking of infants	Information Systems <ul style="list-style-type: none"> 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-

Constraints	Description
	<p>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.</p>
<p>A..2.2 Existing communication strategy is not effective</p>	<p>Communication/Demand Generation</p> <ul style="list-style-type: none"> • Moldova developed specific communication strategy aiming at achieving targeted 95% coverage with Routine Immunization Vaccines, which is currently being implemented. According to the initial results, and taking into account multiple communication strategies currently implemented by the MoH and other key stakeholders, the immunization communication strategy needs to be revised and fine-tuned in order to ensure achievement of its main objectives.
<p>A3.1 Insensitive MIS to track defaulters</p>	<p>Information Systems</p> <ul style="list-style-type: none"> • 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.
<p>A.3.2 Low motivation of doctors to correct denominator</p>	<p>Program Management</p> <ul style="list-style-type: none"> • Taking into account the current PHC financing system, family doctors are not interested in revision of the lists of 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 the family doctors lack knowledge about how this incentive system works. In addition, the existing incentives are much lower than per capita remuneration/financing received by Family doctors and thus the family doctors 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

<p>A1.1.1</p> <p>Family doctors feel insecure</p>	<p>One of the main reasons of high rate of false contraindications provided by family doctors are caused by two factors:</p> <ul style="list-style-type: none"> • Insufficient knowledge of family doctors on the WHO recommended contraindications. • Insecurity of family doctors against caregivers, demanding to postpone vaccination <p>According to the HPV PIE report, conducted in Moldova in 2018, knowledge of the full scope of benefits from HPV vaccine in preventing different types of cancer and anogenital warts was not satisfactory and false contraindications were found in interviews with health care workers.</p> <p>According to the RCA workshop participants, in some instances family doctors opt to postpone vaccination due to the strong demand and aggressive behavior of caregivers.</p> <p>According to the EPI review, carried out by NCPH in 2019, the level of knowledge and practices of the medical personnel on the immunization related problems is very low, including knowledge on contraindications for each vaccine included into the national immunization schedule. A significant difference was observed in training level of training in different geographic areas. 31% of doctors from rural health facilities have not received any training during the last five years, while 100% of doctors in urban settings were trained.</p>	<p>Implication of this root cause is high rate of the contraindications provided by family doctors, which will lead to the increased contraindications due to the growing anti-vaccination campaign.</p> <p>Sufficient training of the family doctors will strengthen their decision-making capacity as well as their ability to take equal part in decision making related to the providing contraindication for immunization or to provide precise contraindication against particular antigen and not for all routine immunization vaccines.</p>
<p>A1.1.2</p> <p>Insufficient knowledge of specialists in contraindications</p>	<p>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.</p> <p>In the official reports, the contraindication levels are not high, as the reports include information on the long-term contraindications (that are precisely documented). The problem is related to the short-term contraindications, that are not registered in the monthly reports, as these short-term contraindications especially affect the Rotavirus vaccination which due to the age restrictions can not be administered to the children older than 3.5 months and thus, in case of the short-term contraindications provided by the specialists, the NIP misses opportunity to vaccinate children with Rotavirus.</p> <p>The above is confirmed by the JA report (2015) stating that doctor specialists and general practitioners (family doctors) provide medical contraindications (most of them false) against all vaccines to significant proportion of infants, which significantly delays vaccinations.</p>	<p>The main implication of this root cause is high rate of unjustified false contraindications.</p> <p>According to existing procedure, doctor specialists does not record specific reason for contraindication and do not indicate specific antigen for which he/she provides contraindication, which leads to the high rate, false contraindications.</p>

<p>A1.2.1</p> <p>Mobile population</p>	<p>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 can not be reached by the immunization service providers.</p>	<p>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.</p>
<p>A1.3.1</p> <p>Roma communities-low interest and no motivation for immunization</p>	<p>There is extremely low readiness for vaccination among Roma communities as it was reported by the Workshop Participants. Although the share of Roma communities is insignificant in comparison with the total population, it is still critical to pay special attention and increase coverage of immunization among these community groups, taking into account their mobility and lifestyle.</p>	<p>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).</p>
<p>A1.3.2</p> <p>Religious groups refusing to immunize their children</p>	<p>Vaccination of religious groups remain a major challenge for NIP in Moldova.</p> <p>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.</p> <p>According to EPI review findings 70.7% of all refusals can be attributed to the existing religious groups.</p>	<p>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.</p>
<p>A1.4.1</p> <p>Insufficient supportive supervision mechanisms</p>	<p>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.</p>	<p>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.</p>
<p>A1.4.2</p> <p>Poor practice of supportive supervision to Epidemiologists and Family Doctors</p>	<p>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.</p>	<p>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.</p>
<p>A2.1.1</p> <p>Intensive Anti-vaccination</p>	<p>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</p>	<p>In the situation of growing anti-vaccination campaign, the main implication of this</p>

<p>campaigns in Social Media</p>	<p>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).</p>	<p>root cause is further decline in immunization coverage rates and vulnerability of population against VPD at all levels. This root cause also contributes in increased risk of VPD outbreaks taking into account major measles outbreaks in neighboring countries.</p>
<p>A2.1.2 Parents are not aware about benefits of immunization</p>	<p>According to the HPV PIE findings one of the reasons of low coverage rates is refusal of caregivers concerned with the vaccine safety, to vaccinate their children.</p> <p>Growing skepticism about benefits of vaccination and concerns about the vaccine safety among medical workers and parents can be regarded as the main reasons for declining coverage, according to the JA report.</p>	<p>Similar to the previous root cause, the main implication of the insufficient knowledge of parents about benefits of immunization will be strengthened resistance and growing vaccine hesitancy. If not addressed, the immunization coverage rates will continue to decrease.</p>
<p>A2.2.1 Weak capacity of service providers for effective communication</p>	<p>The situation analysis of the current cMYP shows that poor communication between the target families and the doctor is one of the factors accountable for inability of immunization system to increase awareness of caregivers on benefits of immunization and generate sufficient demand for immunization.</p> <p>The need for addressing vaccine skepticism and safety concerns through effective communication of service providers was highlighted in multiple publications, such as “communication analysis and solutions”, SWOT on communication; communication plan 2013, rotavirus vaccine refusal cases and etc. However, the workshop discussions showed that capacity of service providers in communication and awareness raising still needs to be substantially strengthened for generating sufficient demand for vaccination among the immunization target groups.</p>	<p>Implication of this root cause will be inability of the national immunization system to raise awareness of general population and immunization target groups on the benefits of immunization, as well as inability to address major challenges related to the vaccine hesitancy and resistance.</p>

(b) Assumptions

There were no factors identified through the desk reviewing additional data collection and thus could have been categorized as assumption.

(c) Constraints

Table 8 below presents the key constraint that significantly limits improvement of NIP performance both at sub-national and national levels. These factor 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 factors should be considered while formulating strategies of the performance improvement plan designed and custom-tailored to the context and challenges of national immunization program in particular municipality (Balti) and districts of the country.

Table 8: Factors beyond the scope of responsibilities of the National Immunization Program

Issues	Prospect for addressing	Responsibility
A1.2.2 Poor tracking of infants	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - Revise existing communication strategy - Development of the strategy implementation plan - Discuss and ensure financial sustainability of strategy implementation - Implement the strategy 	National Agency of Public Health/MoH
A3.1 Ineffective MIS	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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

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

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 in false contradictions	A.1.1.1	High
1.1.2 Training of doctor specialists from outpatient and in-patient care in false 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 specific strategy for increasing vaccination coverage rate among Roma communities	A.1.3.1	High

1.3.2	Elaboration and implementation of specific strategy 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 awareness raising and communication campaign	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

#	Description	Item	# of items	Item cost	Total
1	Addressing false contraindications				
1.1	Development of the immunization training module - International TA	day	14	\$600	\$8,400
1.2	Development of the immunization training module - National TA	day	14	\$150	\$2,100
1.3	Development of the web-based training module/platform - National TA	lump sum	1	\$10,000	\$10,000
1.4	Revise procedure for recording contraindications - National TA	day	14	\$150	\$2,100
1.5	Revision of supportive supervision mechanisms	day	14	\$150	\$2,100
1.6	Train staff in supportive supervision procedure	participant	234	\$65	\$15,156
1.7	Training of family doctors in contraindications	participant	67	\$65	\$4,340
1.8	Training of doctors from in- and out-patients facilities in contraindications	participant	67	\$65	\$4,340
1.9	Training of neonatologists in contraindications	participant	5	\$324	\$1,619
1.10	Advocacy activities - institutionalization of new procedure for recording contraindications	meeting	4	\$1,000	\$4,000
1.11	Stakeholder workshop - recording contraindications - 1 day workshop for 25 participants	workshop	2	\$1,000	\$2,000
1.12	Advocacy activities - inclusion immunization module into the continuous education curricula	meeting	4	\$1,000	\$4,000
1.13	Advocacy activities - inclusion immunization module into the continuous education curricula	workshop	2	\$1,000	\$2,000
2	Strengthening defaulter tracking capacity				
f	Development of defaulter tracking system - International TA	day	14	\$600	\$8,400
2.2	Development of defaulter tracking system - national TA	day	14	\$150	\$2,100
2.3	Training family doctors in defaulter tracking system application	participant	67	\$65	\$4,340
2.4	Training of family nurses in defaulter tracking system application	participant	165	\$65	\$10,687
3	Increase coverage in hard-to-reach population groups (Roma and Religious groups)				
3.1	Development of the specific strategy for accessing Roma communities - TA	day	21	\$600	\$12,600
3.2	Development of the specific strategy for accessing the religious groups	day	21	\$600	\$12,600
4	Increase uptake of immunization services				
4.1	Development of the awareness raising and communication campaign	day	30	\$600	\$18,000
4.2	Campaign materials - posters	poster	1000	\$2	\$2,000
4.3	Campaign materials - brochures	brochure	1000	\$2	\$2,000
4.4	Campaign materials - TV spot	TV spot	5000	\$4	\$20,000
4.5	Campaign materials - Radio spot	Radio spot	2000	\$4	\$8,000

4.6	Campaign materials - Social Network materials	set	500	\$12	\$6,000
4.7	Meetings	meeting	4	\$1,625	\$6,500
4.8	Workshops	workshop	4	\$1,000	\$4,000
4.9	Monitoring and Evaluation - international TA	day	14	\$600	\$8,400
4.10	Train family doctors and nurses in communication	participant	234	\$65	\$15,156
	Total Budget				\$202,937

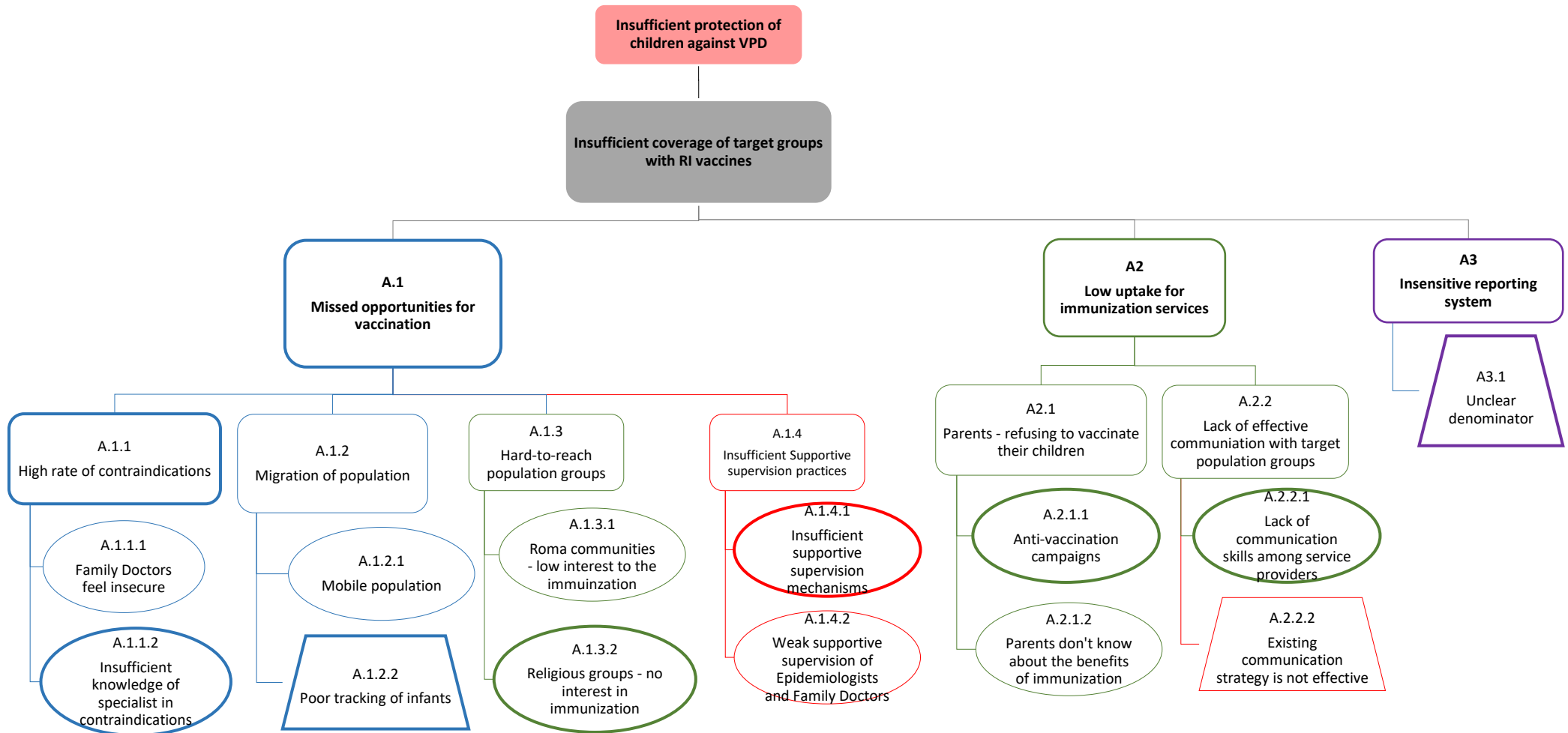
3. Implementation timeline

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 7: Root cause analysis of National Immunization Program performance in Belti municipality of Moldova



Issues	Description	Source	Evidence strength	Health system component	Importance
A. Insufficient coverage of target groups with RI vaccines	<p>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. .</p> <p>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.</p>	NIP review, 2019 ⁸	Strong	Service delivery	
A.1 Missed opportunities for vaccination	<p>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.</p> <p>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</p>	NIP review, 2019, HPV PIE report 2018	Strong	Demand for vaccination	

⁸ National Immunization Program Performance Review, conducted by the National Agency of Public Health in 2019 (unpublished draft report)

	concerns about the vaccine safety, influence of anti-vaccination campaigns (mainly via the social networks) and religious considerations.				
A.1.1 High rate of contraindications	<p>According to the multiple publications, contraindications remain one of the key challenges of NIP, that is accountable for insufficient coverage rates with routine immunization vaccines.</p> <p>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.</p> <p>The Joint Appraisal report (2015) shows that the main reasons 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.</p>	HPV PIE, JA report, ECA RWG meeting report, etc.	Strong	Service 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	JA Report, workshop participants	Strong	Information Systems	
A.1.2.1 Mobile population					

	<p>children were not vaccinated due to the migration of families within and outside the country in 2015.</p> <p>Population migration makes impossible: a) to ensure precise reporting on coverage and b) to achieve high coverage rates.</p> <p>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 can not be reached by the immunization service providers.</p>				
A.1.2.2 Poor tracking of infants	<p>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.</p>	Workshop participants	Strong	Information systems	High
A.1.3 Underserved population groups	<p>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.</p>	Workshop participants	Strong	Service delivery	High
A.1.3.1 Roma communities – readiness of Roma communities for vaccination	<p>Detail description is provided in previous section</p>	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	<p>Although it is reported that supportive supervision takes place regularly at all levels, there was no evidence found on supervision.</p> <p>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.</p>	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				High

	service providers to deliver vaccination services is insufficient to reach necessary coverage rates and achieve NIP goals and objectives.				
A.2.1 High vaccine hesitancy among parents and caregivers	<p>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.</p> <p>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.”</p>	EPI review	Strong	Service Delivery Demand Generation	High
A.2.1.1 Intensive Anti-Vaccination Campaigns in Social Media	Detail description is provided in the previous section	HPV PIE Report	Strong	Demand Generation	High
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

<p>A.2.2 Lack of effective communication with immunization target groups</p>	<p>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.</p>		<p>Strong</p>		<p>High</p>
<p>A.2.2.1 Weak capacity of service providers in communication</p>			<p>Strong</p>	<p>Demand generation</p>	<p>High</p>
<p>A.2.2.2 Existing communication strategy has not been effectively implemented</p>	<p>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.</p>	<p>cMYP, Communication Strategy</p>	<p>Strong</p>	<p>Demand generation</p>	<p>High</p>
<p>A.3 Denominator issue</p>	<p>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.</p>	<p>cMYP, JA report, other publications.</p>	<p>Strong</p>	<p>Information systems</p>	<p>High</p>
<p>A.3.1 Ineffective MIS</p>	<p>Similar to other transitioning countries, the denominator issue has been one of the most challenging issues in Moldova, affecting immunization coverage rates.</p> <p>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</p>	<p>cMYP, JA</p>	<p>Strong</p>	<p>MIS</p>	<p>High</p>

	<p>levels to precisely measure real achievements in immunization coverage and based on the results, plan and implement respective measures for performance improvement.</p> <p>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.</p>				
<p>A.3.2 Low motivation of service providers to improve denominator issue</p>	<p>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.</p> <p>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.</p>	<p>Workshop participants</p>	<p>Strong</p>	<p>MIS</p>	<p>High</p>