Document of
The World Bank

FOR OFFICIAL USE ONLY

Report No: PAD1711

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF US$125 MILLION

TO THE

REPUBLIC OF BELARUS

FOR A

HEALTH SYSTEM MODERNIZATION PROJECT

October 27, 2016

Health, Nutrition & Population Global Practice
Europe and Central Asia

CURRENCY EQUIVALENTS
(Exchange Rate Effective as of October 25, 2016)
Currency Unit = Belarussian ruble (BYN)
US$1 = BYN 1.8990

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

BelMapo	Postgraduate Institute of Physicians
CDSS	Clinical Decision Support System
CHIS	Central Health Information System
CIS	Commonwealth of Independent States
CPS	Country Partnership Strategy
DALY	Disability-adjusted Life Year
EMF	Environmental Management Framework
EMP	Environmental Management Plan
EMR	Electronic Medical Record
EU	European Union
FM	Financial Management
GDP	Gross Domestic Product
GP	General Practitioner
GRS	Grievance Redress Service
ICT	Information and Communication Technology
IHMIS	Integrated Health Management Information System
IRR	Internal Rate of Return
IT	Information Technology
M&E	Monitoring and Evaluation
MoH	Ministry of Health
NCD	Noncommunicable Disease
NPV	Net Present Value
PACS	Picture Archiving and Communication System
PDO	Project Development Objective
PMU	Project Management Unit
POM	Project Operations Manual
RCMC	Republican Center of Mother and Child
RSPC MT	Republican Scientific and Practical Center for Medical Technologies, Informatization, Administration and Management of Health
TA	Technical Assistance
TPCC	Training Program Coordination Committee
UNICEF	United Nations Children's Fund
VNA	Vendor Neutral Archive

Regional Vice President:	Cyril E. Muller
Country Director:	Satu Kristina Kahkonen
Senior Global Practice Director:	Timothy Grant Evans
Practice Manager:	Enis Barış
Task Team Leader:	Susanna Hayrapetyan

BELARUS

Health System Modernization Project in the Republic of Belarus

Table of Contents

PAD DATA SHEET

Belarus

Health System Modernization Project in the Republic of Belarus (P156778)

PROJECT APPRAISAL DOCUMENT

EUROPE AND CENTRAL ASIA

Report No.: PAD1711

Basic Information		
Project ID P156778	EA Category B - Partial Assessment	Team Leader(s) Susanna Hayrapetyan
Lending Instrument Investment Project Financing	Fragile and/or Capacity Constraints [ ] Financial Intermediaries [ ] Series of Projects [ ]	
Project Implementation Start Date 21-Nov-2016	Project Implementation End Date 21-Nov-2021	
Expected Effectiveness Date 31-May-2017	Expected Closing Date 31-May-2022	
Joint IFC No		

Practice Manager/Manager	Senior Global Practice Director	Country Director	Regional Vice President
Enis Baris	Timothy Grant Evans	Satu Kristina Kahkonen	Cyril E Muller

Borrower: Republic of Belarus			
Responsible Agency: Ministry of Health			
Contact:	Vasily Ivanovich Zharko	Title:	Minister of Health
Telephone No.:	375-17-2226095	Email:	mzrb@belcmt.by

Project Financing Data(in USD Million)					
[X]	Loan	[ ]	IDA Grant	[ ]	Guarantee
[ ]	Credit	[ ]	Grant	[ ]	Other

Total Project Cost:	125.00	Total Bank Financing:	125.00
Financing Gap:	0.00		

Financing Source	**Amount**
Borrower	0.00

International Bank for Reconstruction and Development	125.00
Total	125.00

Expected Disbursements (in USD Million)

Fiscal Year	2017	2018	2019	2020	2021	2022				
Annual	0.50	19.00	30.00	30.00	30.50	15.00				
Cumulative	0.50	19.50	49.50	79.50	110.00	125.00				

Institutional Data

Practice Area (Lead)

Health, Nutrition & Population

Contributing Practice Areas

Education, Governance

Cross Cutting Topics

[ ] Climate Change
[ ] Fragile, Conflict & Violence
[X] Gender
[ ] Jobs
[ ] Public Private Partnership

Sectors / Climate Change

Sector (Maximum 5 and total % must equal 100)

Major Sector	Sector	%	Adaptation Co-benefits %	Mitigation Co-benefits %
Health and other social services	Health	100		
Total		100		

☑ I certify that there is no Adaptation and Mitigation Climate Change Co-benefits information applicable to this project.

Themes

Theme (Maximum 5 and total % must equal 100)

Major theme	Theme	%
Human development	Health system performance	50
Human development	Injuries and non-communicable diseases	30
Public sector governance	e-Government	20
Total		100

Proposed Development Objective(s)
The proposed project development objective (PDO) is to contribute to improving selected aspects of the quality of health care delivery in the Republic of Belarus. This PDO is expected to be achieved by the: (a) establishment of e-Health system and adoption of ICT-based clinical decision-support tools for quality improvement; (b) improvement of clinical competencies of health care providers in NCD management; and (c) modernization of neonatal care provision at the RCMC.

Components	
Component Name	**Cost (USD Millions)**
Establishment of E-Health and clinical decision support systems	65.20
Improvement of clinical competencies of health care providers in NCD management	46.20
Modernization of neonatal care at the RCMC	11.60
Project management, monitoring and evaluation	2.00

Systematic Operations Risk- Rating Tool (SORT)	
Risk Category	**Rating**
1. Political and Governance	Substantial
2. Macroeconomic	Substantial
3. Sector Strategies and Policies	Moderate
4. Technical Design of Project or Program	Substantial
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Substantial
7. Environment and Social	Moderate
8. Stakeholders	Substantial
9. Other	
OVERALL	Substantial

Compliance		
Policy		
Does the project depart from the CAS in content or in other significant respects?	Yes [ ]	No [X]
Does the project require any waivers of Bank policies?	Yes [ ]	No [X]
Have these been approved by Bank management?	Yes [ ]	No [X]
Is approval for any policy waiver sought from the Board?	Yes [ ]	No [X]
Does the project meet the Regional criteria for readiness for implementation?	Yes [X]	No [ ]

Safeguard Policies Triggered by the Project	**Yes**	**No**

Environmental Assessment OP/BP 4.01	**X**	
Natural Habitats OP/BP 4.04		**X**
Forests OP/BP 4.36		**X**
Pest Management OP 4.09		**X**
Physical Cultural Resources OP/BP 4.11	**X**	
Indigenous Peoples OP/BP 4.10		**X**
Involuntary Resettlement OP/BP 4.12		**X**
Safety of Dams OP/BP 4.37		**X**
Projects on International Waterways OP/BP 7.50		**X**
Projects in Disputed Areas OP/BP 7.60		**X**

Legal Covenants

Name	**Recurrent**	**Due Date**	**Frequency**
Institutional Arrangements-PCU Staffing and Accounting Software		29-Jul-2017	

Description of Covenant

SCHEDULE 2. SECTION I. A. 1. The Borrower shall vest the overall responsibility for the implementation of the project in MoH and to this end, through MoH shall (a) cause RSPC MT to: (a)-(iii) no later than ninety (90) days after the Effective Date, select and hire a safeguards specialist, an additional procurement specialist, an accounting/disbursement specialist and a civil construction engineer, all under terms of reference and in a manner acceptable to the Bank; and (iv) no later than ninety (90) days after the Effective Date, sign the contract for installation and adaptation of the accounting software for Project accounting, budgeting and reporting under terms and in a manner acceptable to the Bank.

Name	**Recurrent**	**Due Date**	**Frequency**
Institutional Arrangements-RSPC MT, BelMAPO, RCMC	**X**		CONTINUOUS

Description of Covenant

SCHEDULE 2. SECTION I. A. 1. (b). The Borrower shall ensure, throughout Project implementation, the coordination between RSPC MT and other MoH's subordinated agencies (including BelMAPO and RCMC) and regional health departments participating in the implementation of the technical aspects of the Project, all with appropriate powers, functions, capacity, staffing and resources to fulfill their respective responsibilities under the Project as set forth in the POM.

Name	**Recurrent**	**Due Date**	**Frequency**
Project Operational Manual	**X**		CONTINUOUS

Description of Covenant

SCHEDULE 2. SECTION I. A. 2. The Borrower, through MoH, shall cause RSPC MT to : (a) carry out the Project in accordance with the requirements set forth in a manual acceptable to the Bank (Project Operational Manual or POM); and (b) not assign, amend, abrogate, or waive the POM or any of its provisions, except with the prior written approval of the Bank. In case of any conflict between the terms of the POM and those of this Agreement, the terms and conditions of this Agreement shall prevail.

Name	Recurrent	Due Date	Frequency
Steering Committee	X		CONTINUOUS

Description of Covenant

SCHEDULE 2. SECTION I. A. 3. The Borrower shall operate and maintain, throughout Project implementation, a committee (Steering Committee) vested with the responsibility to oversee and coordinate Project implementation, with terms of reference acceptable to the Bank, as described in the POM.

Name	Recurrent	Due Date	Frequency
Project Reports	X		Quarterly

Description of Covenant

SCHEDULE 2. SECTION II. A. 1. The Borrower, through MoH, shall cause RSPC MT to prepare Project Reports, which shall cover the period of one calendar quarter, and shall be furnished to the Bank not later than one month after the end of the period covered by such report.

Name	Recurrent	Due Date	Frequency
Financial Management	X		Quarterly

Description of Covenant

SCHEDULE 2. SECTION II. B. 2. The Borrower, through MoH, shall cause RSPC MT to prepare and furnish to the Bank not later than forty five (45) days after the end of each calendar quarter, interim unaudited financial reports for the Project covering the quarter, in form and substance satisfactory to the Bank.

Conditions

Source Of Fund	Name	Type
IBRD	Issuance of the Ministerial Order designating responsibility for implementation	Effectiveness

Description of Condition

Article V. 5.01. (a) to the Loan Agreement. The Ministerial Order has been issued and is in full force and effect.

Source Of Fund	Name	Type
IBRD	Adoption of Project Operational Manual	Effectiveness

Description of Condition

Article V. 5.01. (b) to the Loan Agreement. The Project Operational Manual has been adopted by the MoH.

Source Of Fund	Name	Type
IBRD	Selection of financial management and procurement specialists	Effectiveness

Description of Condition

Article V. 5.01. (c) to the Loan Agreement. The financial management and procurement specialists referred to in Part 4 (c) of the Project have been selected and hired in a manner acceptable to the Bank.

Team Composition

Bank Staff

Name	Role	Title	Specialization	Unit
Susanna Hayrapetyan	Team Leader (ADM Responsible)	Lead Health Specialist	Lead Health Specialist	GHN03
Joseph Huntington La Cascia	Procurement Specialist (ADM Responsible)	Senior Procurement Specialist	Procurement Specialist	GGO03
Galina S. Kuznetsova	Financial Management Specialist	Sr Financial Management Specialist	Financial Management Specialist	GGO21
Alexei Slenzak	Safeguards Specialist	Senior Environmental Specialist	Safeguards	GEN03
Elena Segura Labadia	Counsel	Senior Counsel	Senior Counsel	LEGLE
Irina Oleinik	Team Member	Operations Officer	Operations	ECCBY
Jennifer Shkabatur	Safeguards Specialist	Consultant	Social Development	GSU03
Johanne Angers	Team Member	Senior Operations Officer	Implementation Arrangements	GHN03
Luis M. Schwarz	Team Member	Senior Finance Officer	Senior Finance Officer	WFALA
Norosoa Andrianaivo	Team Member	Senior Program Assistant	Senior Program Assistant	GHN03
Olena Doroshenko	Team Member	Health Specialist	Health Economist	GHN03
Rouselle F. Lavado	Team Member	Economist (Health)	Health Economist	GHN03
Zlatan Sabic	Team Member	Senior Operations Officer	IT Specialist	GHN03

Extended Team

Name	Title	Office Phone	Location
Benjamin Tien Bun Chan	Quality Improvement Expert	+1 (647)526-2426	Toronto
Kevin Thomas	Medical Education Planning Expert	(613) 798-5555	Ottawa
Peeter Ross	e-Health Expert	+372 563 53460	Tallinn

Locations

Country	First Administrative Division	Location	Planned	Actual	Comments

Consultants (Will be disclosed in the Monthly Operational Summary)	
Consultants Required ?	Yes

I. STRATEGIC CONTEXT

A. Country Context

1. Belarus is an upper middle-income country with a population of 9.5 million, similar in size to many central and eastern European countries and strategically located between the European Union (EU) and Russian Federation. Up until 2008, Belarus was economically strong, with an average gross domestic product (GDP) growth rate of 8.3 percent during 2001–2008, exceeding the rates for the Europe and Central Asia region at 5.7 percent and the Commonwealth of Independent States (CIS) at 7.1 percent.

2. However, since the onset of the global financial crisis in 2008, Belarus has experienced significant economic instability. Growth slowed down substantially and the country has gone through recurring macroeconomic turmoil. A weak external environment, accumulated macroeconomic imbalances, and delays in structural reforms have put Belarus on a low growth path. Although real GDP grew modestly in 2013–14, the macroeconomic situation remained fragile. In 2013, real GDP growth slowed to 1 percent, slightly accelerating to 1.6 percent in 2014. The modest growth, however, was accompanied by monetary expansion, leading to double-digit annual inflation of around 16 percent in 2013 and 2014. From the beginning of 2015, real output has been contracting for the first time in two decades, recording a -3.9 percent decline for 2015. From January to September 2016, real GDP dropped by -2.9 percent compared to the same period a year ago due to weaker demand from Russia and Ukraine. Overall, the economic outlook for the future shows significant challenges ahead, if global conditions remain weak, domestic macroeconomic vulnerability continues, and structural reforms are delayed.

3. Equity and social welfare are the key principles of the country's economic model. In 2010, poverty rates according to the international poverty lines of US$2.50 and US$5 per day were 0.1 percent and 4 percent (the latest available data), respectively, far below the Europe and Central Asia regional averages of 5.8 and 18.8 percent, respectively. The estimated poverty rate (national definition) increased from 3.5 percent in 2014 to 5.1 percent in 2015.

4. Macroeconomic stability and well-sequenced structural reforms geared toward fundamental changes in the economic model are needed to put Belarus on a sustainable growth path. Strong and robust economic growth and development will also necessarily have to rely on the country's human capital. Social service delivery systems, while providing widely accessible and affordable social protection, health, and education services, are costly and display some inefficiencies as shown in the 2013 Public Expenditure Review. Furthermore, similar to many eastern European countries, Belarus has a rapidly declining and ageing population; at the same time, life expectancy remains nine years below the western European average, largely due to high adult mortality, especially among men (whose life expectancy is 12 years less than Belarus's European neighbors). High adult mortality poses additional risks to the future development of the country. Increased attention is needed to improve health and reduce mortality of the workforce in an efficient way. Strengthening the quality and efficiency of health care provision is an important priority for the country. The health sector can benefit from modernization to reduce the duplication and inefficiencies in the use of available resources—

development and introduction of modern e-Health solutions, state-of-art training for health providers, and better prevention and control of noncommunicable diseases (NCDs).

B. Sectoral and Institutional Context

5. **The current Belarussian health care system is based on a hierarchical and nationally controlled system staffed by state employees.** Incremental change, rather than radical reform, has been the landmark of the health care policy. The Ministry of Health (MoH) has overall responsibility for the health care system, although the funding and purchasing of primary and secondary care is devolved to the regional level, which includes six regions including the capital city of Minsk. Highly specialized tertiary care hospitals are funded directly from the MoH budget. There are very few privately owned service providers in the country. Planning for capital investments has been based on legal minimum requirements that have focused on the required inputs. However, per capita budgeting has been introduced for primary care, which has led to some shift toward planning infrastructure according to demographic needs. The MoH is responsible for planning and management functions which are largely integrated. The MoH plays the main regulatory role at all levels of the health system, although regional and district governments are also key stakeholders given that they are responsible for financing the system at their level.

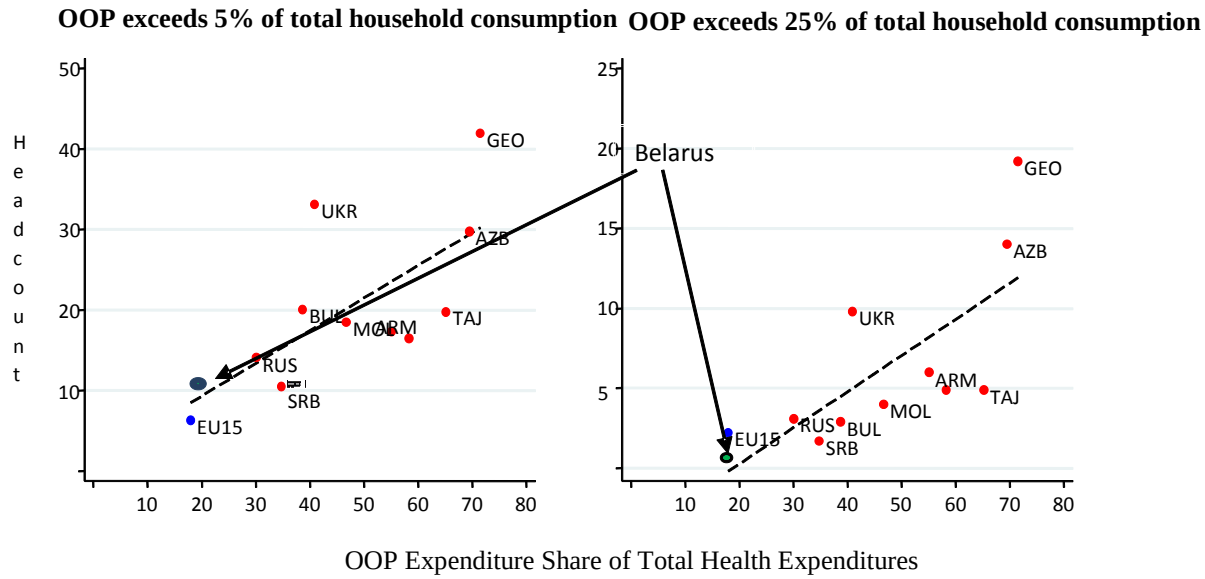
6. **Provision of services involves an extensive network of health care providers throughout Belarus.** The PHC network has two forms of service provision: traditional polyclinics in the cities and rural outpatient clinics led by general practitioners (GPs) and small *feldsher*-midwife points in the remote rural areas. Primary care in Minsk and in the five other regional centers is provided through a network of adult and pediatric polyclinics, where a number of preventive, diagnostic, consultative, and referral services are offered. There have been concerted efforts to introduce GPs who provide primary care services to both adults and children in rural areas.

7. Secondary-level care is provided by district and regional hospitals. While district hospitals provide general secondary care services, regional hospitals deal with more complex cases and offer a wider range of care. Each district and region also has an outpatient polyclinic, which delivers specialized care for the patients in the community. A significant direction for health policy in Belarus has been the growth in the volume of high-tech services (for example, hip replacement, complex heart surgery, and organ transplants) available in the health system. This has come about as a result of a specific policy push. Most of these high-tech procedures take place in highly specialized national centers, which have the best human and material resources. These procedures are also offered in high-tech centers located in some of the regional hospitals.

8. Despite considerable change since independence, Belarus is committed to the principle of universal access to health care, provided free at the point of use through predominantly state-owned facilities organized hierarchically on a territorial basis. Belarus has historically emphasized maintaining access to its health care system for all citizens in contrast to several other former Soviet Union countries. Figure 1 shows that out-of-pocket payments as a share of total health expenditures in Belarus are one of the lowest in the region (20 percent). In addition, the percentage of households that are experiencing catastrophic expenditure is lower than most

neighboring countries, with only 11 percent based on 5 percent of total household consumption and 1 percent based on 25 percent of total household consumption. Since health services are free of charge at the point of delivery, most private spending (over 70 percent) relates to medicines. In fact, financial protection in Belarus is comparable to high-income EU countries.[1]

Figure 1. Financial Risk Protection in Selected Europe and Central Asia Countries



Source: PER 2013 from World Bank Staff Estimates from Country Household Surveys.

9. **With public financing predominantly, the health system has performed effectively on a range of indicators, including maternal and child health and containment of communicable diseases, including HIV and tuberculosis.** In the last 15 years, infant and maternal mortality have improved remarkably to place Belarus among the lowest in the region (infant and maternal mortality of 5/1,000 and 1/100,000 live births in 2013, down from 17/1,000 and 37/100,000 live births, respectively in 1990). These figures are due to strengthening maternal and child health care, as well as ensuring safe deliveries and robust vaccination schedules. The prevalence of anemia among women who are 15 to 49 years old is below the average in the World Health Organization (WHO) European region (22 versus 23 percent). Belarus has also performed successfully with regard to other Millennium Development Goals indicators such as the fight against communicable diseases (mainly HIV and tuberculosis), although some underreporting regarding tuberculosis may have taken place.[2] The current level of public health spending at 3.5 percent of GDP is in line with spending in other middle-income countries in the region (2.7 percent on average for CIS countries and 4 percent for the Europe and Central Asia region), but it remains below the level of public health spending in the EU and Organization for Economic Co-operation and Development countries.

10. However, important challenges remain for the health sector in the areas of efficiency and quality of health care delivery.

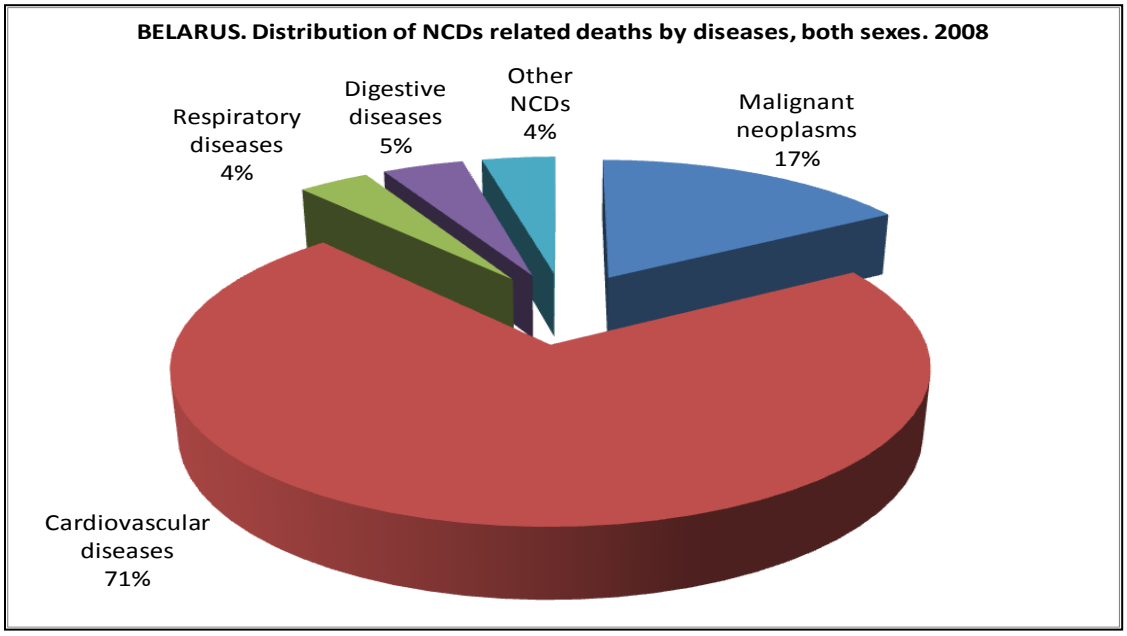
[1] World Bank. 2013. *Belarus Public Expenditure Review: Enhancing Public Services in Times of Austerity*.
[2] Ibid.

11. **Health outcomes.** Life expectancy at birth has not changed substantially in this period (72 in 2013 compared to 71 in 1990 for both sexes), although there have been some improvements more recently. Average life expectancy for women is now higher than it was before independence (77.9 years in 2013), though lower than the average of 79 years for the WHO European region and disability-adjusted life expectancy of only 66 years. Average life expectancy for men has improved (65.8 years in 2013), but it still has yet to recover pre-independence levels and is below the European average of 72 years. Both tobacco and alcohol consumption are key factors for this gender gap. Regional disparities are also observed.

12. A key reason for low life expectancy in Belarus is the growing incidence of NCDs, in particular of cardiovascular diseases, which are now the main cause of mortality. In Belarus, about 114,300 out of a total of 131,300 deaths were registered under the heading NCDs in 2008, while only 2,700 deaths were registered under 'communicable, maternal, perinatal and nutritional conditions'. The remaining 14,300 deaths were registered under the heading 'injuries'.[3] In other words, with more than 87 percent of total deaths, NCDs explain the lack of major improvements in life expectancy at birth in the last two decades. Figure 2 shows the distribution of NCD deaths by disease in both sexes.

13. The causes and mechanisms of the above disease patterns in Belarus are multifaceted. Some identifiable generic causes are the influence of poor dietary patterns, excess tobacco and alcohol consumption, sedentary habits and lifestyles, and so on. Insufficient emphasis on health promotion and disease prevention as well as on interventions at the PHC level with demonstrated effectiveness against NCDs (for example, monitoring personal behavioral issues and metabolic and other risk factors) also influence the emergence of NCD-derived problems.

Figure 2. Distribution of NCD Deaths by Diseases



[3] WHO. 2011. *Global status report on non-communicable diseases 2010.*

14. **Emphasis on PHC services, especially for NCDs.** A strong PHC system is key in addressing major NCD-related health challenges through prevention and control. The development of primary care services in Belarus is considered a priority. Funding for PHC has increased since 2011, reaching 38 percent of total health expenditure allocated to the development of primary care, though this includes the cost of narrow specialists working in urban polyclinics. Policy vision on PHC in Belarus is strongly influenced by the GPs model in both rural and urban areas and the expansion of their scope of practice over time to eliminate inequality between urban and rural areas with regard to access to and quality of health care services. Primary care oriented on general practice was introduced in Belarus in the second half of the 1990s. The first policy initiative on primary care, such as the MoH's Order No. 242 titled 'Regarding the gradual transition of the organization of primary care towards the principals of general practice', contained a description of duties, responsibilities, and rights of the new profession of GPs. It dealt with the qualification requirements and practice conditions of the GPs. The position and tasks of GP nurses were also specified. Following this initial document, the government formulated the vision and major plans for PHC development in two governmental papers and in the 'Concept on the Development of Healthcare in the Republic of Belarus for 2003–2007'. A training program for the GPs has been developed and rural ambulatories have been renovated. Evidence has shown that the confidence of the rural population in the GPs and the utilization of GP-provided services have been growing. However, the implementation process is slowly proceeding. The proportion of rural ambulatories to newly trained GPs is small. Currently, only 12.4 percent of active physicians in Belarus are working in PHC. Among them, only 10 percent are qualified as GPs. The country currently has a four-month retraining program for existing physicians to become GPs. It is moving toward a curriculum for new physicians when the last year of the six-year program will be devoted to general practice, including a one-year internship after graduation. According to the government strategy on PHC development, only physicians who have completed a postgraduate specialization in general practice or GP retraining courses are allowed to work as GPs. The current system of obligatory placement of medical graduates in PHC is considered as a temporary emergency measure until the numbers and skills of GPs reach international standards.

15. The existing training capacity is not sufficient to catch up in the short term. The rollout of general practice is destined to stagnate if the necessary large number of new GPs cannot be recruited and retrained. The recommended rollout of general-practice-based PHC requires a mix of measures, including: (a) investments in financial and human resources; (b) expansion of GP education and training; (c) improvement of medical information; (c) assessment of the responsibilities and tasks of GPs and nurses; and (d) more efficient health care management at all levels.

16. GP training is currently available only at one (Belarus State Medical University) of the four higher medical education institutes in the country, while no new program for training of general practice nurses has been established yet in any of the 17 medical colleges. Expansion of GP training at medical universities in Vitebsk, Grodno, and Gomel and the introduction of general practice nurse training in medical colleges will create the necessary extra capacity for the training/retraining and recruitment of GPs and nurses from these regions. Furthermore, the status and content of the training program deserve attention to improve the involvement of PHC physicians in providing medical procedures. The medical curriculum should pay sufficient attention to the skills needed to provide these services. Both the capacity for GP training and

education and the status of general practice will benefit from the rapid establishment of respective academic departments for general practice at all medical universities in Belarus and the creation of professorship in general practice.

17. **Integrated Health Management Information System (IHMIS).** There is great opportunity to improve quality of care through e-Health according to the population health trends.

18. To improve quality of care and better manage health care delivery, information must be made readily available to all health care workers and citizens who need it. The current paper-based format makes it difficult to access information. E-Health can improve quality of care, through a variety of means, including:

- Reducing delays or duplication of services due to medical records not being accessible between different sites;
- Collecting information about the performance of different providers, polyclinics, and hospitals and holding them accountable for achieving quality of care;
- Prompting health care providers on the latest clinical best practices (that is, drug use, tests, or other services);
- Reducing medical errors due to certain issues such as illegible handwriting; and
- Keeping patients informed about their care so they can be part of the decision making.

19. Overall, an integrated and well-functioning health information system will help integrate PHC and hospital services more effectively. It will also help make strategic decisions and track health outcomes and risk factor trends over time. That implies the systematic collection and analysis of data about the country's NCD burden, the population groups at risk, estimates of mortality, morbidity, risk factors, and determinants. An information and communication technology (ICT) system, regularly updated with clinical information, can provide alerts to physicians about which drugs or treatments to prescribe when needed; and issue reminders to patients regarding when certain tests or follow-up visits are overdue. An ICT system can also identify which patients have the worse control of their disease, so that providers can devote more time to those with poor disease control. Last, an ICT system can report on indicators related to the quality of chronic disease management, so that health care providers can monitor whether changes on how care is being delivered are actually having an impact.

20. An adequate technological infrastructure is a precondition for effective modernization and strengthening of the quality of service delivery in Belarus. The government has already made considerable efforts in the development of e-solutions. However, the implementation of the integrated e-Health strategy has been characterized by large number of disparate information systems that contribute little to the exchange of clinical and health system data between providers at all levels and other agencies. Furthermore, Belarus has embarked on a process of developing electronic medical records (EMRs) in a number of health care facilities in its health

care system. This is part of a broader intent to develop an ICT strategy aimed at creating a common platform for exchange of health information between different settings—polyclinics, village health centers (ambulatories), hospitals, and diagnostic centers. The purpose of such an ICT strategy is to improve communication and coordination of care and reduce duplication of tests. To this end, the government has launched several regional initiatives and pilot projects. The country has demonstrated experience with both building information technology (IT) solutions using its own staff as well as procuring IT software. It has expertise with using secure web-based portals allowing remote access to different records.

21. To enable public e-services, Belarus has also enforced several legal regulations, including the establishment of a unique national ID code for each citizen. A Republican Center for Data Processing has been established to ensure hardware capacity for public e-services. Also, large fiber optic medical networks are ongoing. Both centralized investments are already regulated by government decisions and initial installation works have started. Building of nationwide high-speed fiber optic network for health care was ordered by the MoH and is expected to be deployed during 2016–2018. Legal regulations are in place to use e-prescription. First pilot implementation of e-prescription is being conducted in Minsk since 2015. The law 'About the electronic document and the digital signature' was adopted in 2009. This law refers to the establishment of the legal basis for the application of electronic documents, determination of the main requirements shown for electronic documents, and the legal conditions for the use of digital signature in electronic documents. Overall, there is a solid ground for the establishment of an integrated e-Health system in the country.

22. **Efficiency of public health spending.** At 3.5 percent of GDP, public health spending—the primary source of health financing—is broadly commensurate with Belarus's level of income, but there are signs of operational and allocative inefficiencies in the sector. For its population size, Belarus has a large number of hospitals, hospital beds, doctors, nurses, and other personnel. Belarus has the highest number of hospital beds per capita in the WHO European region—11.3 per 1,000 population in 2011, which is well above the average for both the CIS (8.3 per 1,000 in 2011) and the EU (5.5 per 1,000 in 2010).[4] Scarce resources are spared too thin to maintain existing facilities, preventing more cost-effective use of funds. Moreover, discrepancies exist in the internal efficiency of hospitals, with significant variation in the average length of stay and unit costs for similar treatments across the country.

23. There is also an unfinished agenda of infrastructure modernization, which is considered as an important component of quality improvement. The structural dimension of quality refers to the environment in which health care is provided and characteristics of the facility where services are delivered. In this regard, through years of economic growth, Belarus has made considerable investment to upgrade infrastructure and equipment capacity at all levels of care. The state programs aim to trigger strategic health care delivery improvements. The most recent priorities have been maternity services, building capacity for cardio surgery, and orthopedic care (endo-prosthesis). Meanwhile, the current economic hardship confronts allocation of resources for infrastructure upgrade, forcing the government to seek alternative resources, particularly for modernization of the obsolete Department of Intensive Neonatal Care at the Republican Center

[4] WHO. 2013. *Core Health Indicators in the EURO Region.*

of Mother and Child (RCMC). The poor conditions of this Department greatly hinder the provision of quality care to newborns and the reduction of neonatal mortality.

24. **The government of Belarus is aware of these challenges and has sought to partner with the Bank in finding appropriate solutions.** In early 2013, the Bank presented the findings of in its Public Expenditure Review for Belarus, which covered the health sector. Among its recommendations were calls to optimize health care facilities, especially hospitals; increase emphasis on PHC and preventive services, especially for NCDs; increase autonomy of providers; reform PHC financing and hospital payment system; introduce referral system/clinical pathways; and strengthen quality management and accountability for results. A workshop on 'e-Health Development' was held in Minsk on June 16, 2014. The workshop is considered as one of the early engagements by the Bank in that regard. The workshop generated great enthusiasm for investments in e-Health through cooperation with the Bank. This initial engagement by the Bank in the health sector has led to a High Level Policy Seminar on Health Care Financing and Health Care Delivery System Reforms in the Region and Options for Belarus and brought international expertise in areas covering strategic choices for confronting NCDs and improving health services in Belarus. In 2015, the government of Belarus requested the Bank to support its efforts in strengthening health care delivery with particular emphasis on the IHMIS, health professionals' capacity improvement, and infrastructure modernization.

25. **The proposed project builds on the work done to date but remains modest in its objectives, given that it is the first ever major international investment in the Belarus health sector.** Yet, it is demand driven and responds directly to government requests for Bank support, forming an important foundation for long-term cooperation in the sector. Building on this initial engagement, the Bank and the government of Belarus will develop a strategic plan for cooperation in the health sector over the coming decade through a parallel policy dialogue that goes beyond the narrow-focused activities of the proposed project. This entry project will pave the way for future partnership. Thus, by supporting the IHMIS and training of health professionals, the project will provide an opportunity for engaging in more radical health reforms, including effective financial incentive schemes for PHC providers versus undifferentiated general increases in salary, case-mix hospital payment, hospital optimization, and providers' autonomy, among others.

C. Higher Level Objectives to which the Project Contributes

26. The proposed project is aligned with the Bank Group's Country Partnership Strategy (CPS) for the Republic of Belarus FY2014–2017 and the Bank's Health Sector Strategy. The third pillar of the CPS calls for 'Improved human development outcomes through better delivery of education, health, and social services'. The development goal of 'Greater efficiency and quality of services in health and education' is directly supported by the project design. Meanwhile, the proposed project will also contribute to the Bank's Health Sector Strategy and improve the quality and coordination of health care, as well as efficiency of government spending in line with the Bank Health Sector Strategy on improving health service delivery. Better quality PHC services will reorient the service delivery away from an expensive hospital system, while a more closely integrated and well-functioning health information system will help integrate primary care and hospital services more effectively. This will be achieved by optimizing business processes, addressing the population demand for more qualified and skilled

health care providers, and adopting innovative modalities to ensure meaningful management of chronic health conditions. Particularly, the project's investment in an integrated e-Health system will improve the quality of care provision in the long term through: (a) fast diagnosis and prevention of medical errors; and (b) prevention of drug administration error and reduction in waiting time for treatment. Furthermore, the efficiency of treatment will improve through: (a) reduction in drug and examination costs by preventing overlapping drug administration and examination; (b) reduction in medical costs by reducing the number of days of hospitalization and hospital visits; and (c) reduction of medical expenses for patients. The proposed project will also improve coordination of care to help patients navigate through the health care system and improve management of NCD risk factors and treatment from the first contact point of the patient with the medical care system.

27. The proposed project contributes to the Bank's twin goals of reducing poverty and boosting shared prosperity, as investments in the health sector have long been linked with lower levels of transmission of intergenerational poverty. Specifically, since the poverty level is higher in regions, project interventions will greatly focus on addressing regional disparities through better NCD management in health facilities at the regional level. The regional population will benefit from trained providers and improved coordination of care between different levels of health care. Furthermore, improving statistical data reporting through e-health will enable better understanding of regional public health challenges and inform policies to address them.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

28. The proposed project development objective (PDO) is to contribute to improving selected aspects of the quality of health care delivery in the Republic of Belarus. This PDO is expected to be achieved by the: (a) establishment of e-Health system and adoption of ICT-based clinical decision-support tools for quality improvement; (b) improvement of clinical competencies of health care providers in NCD management; and (c) modernization of neonatal care provision at the RCMC.

B. Project Beneficiaries

29. While the proposed project will benefit the Belarussian population, those who currently have less access to quality health services, such as the rural population, will benefit the most. Specific target groups for this project are men, for prevention and early detection and management of cardiovascular diseases, and women, for early detection and treatment of hypertension. In addition, support to the neonatal center will greatly improve neonatal acute care for newborns. This support will potentially and partly address some of the health consequences in the aftermath of the Chernobyl tragedy that occurred 30 years ago, as measured by the percentage of referrals from areas affected by Chernobyl. The PDO indicators listed below and in Annex 1 will be disaggregated by gender as well as for the rural and urban population, where relevant.

C. PDO Level Results Indicators

30. The following are the proposed PDO indicators:

(a) Percentage of selected health facilities (PHC centers/ambulatories, polyclinics, hospitals, and diagnostic centers) that can electronically exchange patient summaries

(b) Number of oblasts using e-prescription

(c) Percentage of trained PHC doctors in clinical skills at BelMapo Simulation Training Center and at Medical Universities skills labs according to standards (emergency services among others)

(d) Percentage increase in survival rate of newborns at the Intensive Neonatal Department of the RCMC

(e) Percentage of diabetes patients who received A1C blood sugar test once a year

III. PROJECT DESCRIPTION

A. Project Components

31. The proposed project will focus on three main areas, namely: (a) the establishment of e-Health system and the adoption of ICT-based clinical tools for quality management; (b) the improvement of clinical competencies of health care providers in NCD management; and (c) the modernization of neonatal care provision at the RCMC.

Component 1: Establishment of e-Health and Clinical Decision-support Systems (estimated at US$65.2 million)

32. The objective of this component will be to support the government of Belarus in (a) establishing an integrated nationwide health information system based on the available digital information and (b) developing a framework clinical decision-support system for quality improvement, which will ensure effective and up-to-date use of medical information for each citizen and consequently guarantee high-quality health and health care services to the society. This component consists of two subcomponents.

33. **Subcomponent 1.1: Integrated Health Management Information System.** The integration of health and medical information will be achieved by

- developing a Central Health Information System (CHIS) for medical data exchange, including document registry and archive;
- establishing robust and effective medical information exchange procedures and governance where responsibilities of every healthcare institution is clearly described and defined;
- updating currently used Electronic Medical Records (EMR) in hospitals and policlinics and implementing new EMRs where needed to be able to create standardized medical documents and exchange standardized documents with CHIS;

- creating new centralized e-Health services (e-prescription, statistical module to analyze wide variety of quality indicators, etc.);

- developing healthcare data and data exchange standards; and

- carrying out of a review of the legal environment to ensure patient privacy and data security.

34. A new e-Health solution would ensure a more qualified healthcare services to the society. It will allow seamless information exchange between all levels of health care and virtual communities where all stakeholders can freely share and exchange information according to medical consumer choices. In addition, it will provide more reliable information for effective health policy development and improve health care system transparency.

35. This subcomponent will finance: (a) civil works for rehabilitation of regional offices (oblast level) for housing IT-related infrastructure; (b) advisory support for the design of the e-Health system, standardization of health care digital data and data exchange protocols, standardization and customization of business processes, implementation of digital decision-support tools based on clinical protocols, and improvement of laws, regulations, institutions, and instructions for health information protection; (c) hardware and software, including upgrade of current EMRs and development of the CHIS; (d) training of health providers related to the e-Health system; (e) the beneficiaries satisfaction survey; and (f) study tours.

36. **Subcomponent 1.2: Clinical decision support system for quality improvement.** The objective of this subcomponent will be to develop the clinical decision support system (CDSS) for improving quality of care and the rate of adoption of evidence-based clinical practices.

37. The IT system will be used to collect data on quality indicators, provide real-time feedback to health care providers at all levels, and identify problems that need to be addressed. The CDSS will provide reminders or alerts to providers to help them remember what drugs, tests, or other services they should order in which situations and notice of drug interactions. This is essential, given that clinical practice guidelines for medical care are now so complex that it is near impossible for the human brain to remember every task that should be executed in every situation. Lastly, the IT system could improve efficiency and reduce waste of time and resources for both providers and patients, through tools such as improved patient scheduling to reduce wait time and cancellations.

38. Establishing such a system will include the following stages: (a) identification of quality improvement priorities with a focus on PHC (chronic disease management, appointment access, adult health maintenance, and so on); (b) selection of quality indicators, which includes identification of both high-level and micro-level indicators, creation of data collection templates, and design of data collection and data entry processes; (c) development of practice tools (flow sheets, checklists, algorithms for best drug combination and treatment in a given situation, and so on) to help physicians and nurses implement evidence-based best practices; and (d) embedding practice tools into an EMR.

39. This subcomponent will finance (a) advisory support on quality indicators and practice tool development—development of tools, customization and field testing, and clarification of roles and responsibilities; (b) training of clinical staff in selected regions on the use of clinical practice tools; (c) advisory support for incorporation of the flow sheets and practice tools into the EMR; (d) advisory support for the creation of quality monitoring framework, including dashboards for each clinic in selected regions allowing decision makers to monitor a limited number of high-level indicators; (e) publishing reports with established benchmarks to highlight differences in quality between different institutions and identify the highest performers who should be emulated; and (f) development or purchase of a CDSS (the functionality and number of different CDSSs will be specified during the preparation phase).

Component 2: Improvement of Clinical Competencies of Health Care Providers in Noncommunicable Disease Management (estimated at US$46.2 million equivalent).

40. The objective of this component is to support GP training and improve skills and competencies of health providers in the provision of a broad range of health services conforming to international best practices.

41. Belarus has indicated an interest in expanding the skill labs at medical universities and colleges and creating a Simulation Center at the BelMapo for training of medical professionals at all levels, including undergraduate, postgraduate, and retraining or continuing education for practicing physicians. The intent of such labs and center is to continue the shift toward practice-based skills training rather than theoretical knowledge; shorten the time for training, allowing providers to experience higher volumes of rarer or complex cases; and create a safer environment for training where skills are first learned on a mannequin, simulator, or animal parts before real patients.

42. The strategy for improving medical training capacity in the country is in line with the overall goal of improving the quality of health care services and the specific objective of reorienting PHC toward a more cost-efficient system of general practice. The latter was driven by the need to cover the population with more qualified health care providers (physicians and assistants to doctors) capable of providing a wide range of preventive and treatment services at PHC. Following the Order of the Ministry of Health No. 98 of May 25, 1992, ‘On preparation for introduction of the services of GPs in the Republic of Belarus’, the MoH developed a comprehensive plan for the organization of GP training and approved protocols (standards) of examination and treatment of patients within the general practice.

43. The government’s policy on reorganization of GP training is oriented toward eliminating the major drawbacks of the medical education in the past, such as reliance on didactic training and insufficient clinical practice to acquire skills and competencies in handling emergency conditions as well as management of chronic NCDs. The medium-term plan for training of GPs is to complete the retraining of all PHC providers in the next five years. The total number of physicians to be retrained is about 6,000; the total number of nurses to be retrained is yet to be defined. Improved training of doctors and assistants to doctors (nurses) will help improve care for the management of patients, especially those with acute complications of NCD chronic conditions.

44. This component will finance (a) advisory support to review the curriculum and development of unified standards for training of GPs as well as specialists; (b) advisory support for the development of a certification program for verifying student/trainee skills; (c) skill labs for all 4 universities and 17 secondary colleges in Belarus; (d) simulation equipment for a high-tech simulation center at BelMapo; (e) skill labs equipment for medical universities and colleges; (f) advisory support to faculties at universities for the establishment of GP departments; (g) training of trainers; (h) civil works to house a high-tech simulation center in BelMapo and skill labs at universities and colleges; (i) software to program different cases for trainees review; (j) study tours (including conferences and workshops); and (k) beneficiary surveys.

Component 3: Modernization of Neonatal Care at the Republican Center of Mother and Child (estimated at US$11.6 million equivalent)

45. The objective of this component is to support the modernization of the neonatal department at the RCMC in line with international best practice. This will include infrastructure, equipment, and medical staff capacity improvement and advancement of quality improvement measures.

46. It is expected that the modernization of the neonatal department, creation of appropriate infrastructure conditions, provision of modern biomedical equipment, upgrading skills of personnel, and adoption of up-to-date clinical protocols and quality improvement tools will contribute to reducing hospital infection cases and death rate at the department and, as a long-term impact, the disability rate among children born with low and extremely low birth weight.

47. This component will finance: (a) civil works; (b) provision of medical equipment and furniture; (c) provision of telemedicine and simulation equipment, didactic materials; (d) training of medical personnel; (e) study tours; and (f) advisory support to develop quality improvement tools and procedures.

Component 4: Project Management, Monitoring and Evaluation (US$2 million equivalent)

48. The objective of this component is to support the Project Management Unit (PMU) at the national level, which will be responsible for day-to-day project implementation (fiduciary and safeguards) and technical advisory support for Components 1, 2, and 3. This component will also finance financial audits. This component will sponsor complementary data collection and analytical activities for monitoring results (that is, citizen/beneficiary engagement indicators and so on). Information and data collection from the Republican Scientific and Practical Center for Medical Technologies, Informatization, Administration and Management of Health (RSPC MT) will be complemented through evidence-based data on specific areas and ad hoc household and facility surveys. In addition, the component will sponsor learning events to educate and promote better use of evidence for policy.

B. Project Financing

The proposed project is to be implemented over five years, between 2017 and 2022. It will be financed by an IBRD loan in the amount of US$125 million.

Project Cost and Financing (US$ millions)

Project Components	Project Cost	IBRD Financing	% Financing
1. Establishment of e-Health and clinical decision-support systems	65.2	65.2	100%
2. Improvement of clinical competencies of health care providers in NCD management	46.2	46.2	100%
3.Modernization of neonatal care at the RCMC	11.6	11.6	100%
4. Project management, monitoring, and evaluation	2.0	2.0	100%
Total Project Costs	**125.0**	**125.0**	100%

C. Lessons Learned and Reflected in the Project Design

49. **The proposed project design incorporates key lessons learned from existing studies as well as from previous Bank-supported health operations.** These are described below.

50. **Organization and provision of PHC in Belarus.** The design of the proposed project considers the findings and recommendations of the WHO-conducted evaluation of developments in primary care in Belarus,[5] which used a methodology that characterizes a good primary care system as one that is comprehensive, accessible, coordinated, and integrated; that ensures continuity; and that recognizes that all health system functions outlined in the WHO framework are considered equally toward improving the overall health system.

51. The results of the evaluation have shown—especially with regard to comprehensiveness of care—that properly trained GPs make a difference in primary care in Belarus compared to therapists. Therefore, the authors advise speeding up the implementation of the GP-based primary care model in all rural facilities of Belarus. Equally, results have demonstrated that the GP-based primary care model is feasible in the urban environment as well. Therefore, the policy vision on primary care should be expanded to the whole of primary care in the country. The report also suggests that efficiency in primary care can be improved by a critical review of administrative and reporting requirements, an upgrade in the computerization of practices, delegation of nonmedical tasks from physicians to other health workers such as nurses or lay persons in the community, and providing training for staff on rational practice management. Furthermore, the study suggests that to recruit and retain the necessary number of GPs and nurses for a strong primary care system, human resources plans and respective training capacities need to be developed.

52. **Use of ICT in NCDs management and control.** The Bank report, 'Getting Better: Improving Health System Outcomes in Europe and Central Asia' of 2013, identifies 'ingredients' for institutional reform of the health sector to better manage public health threats. Use of ICT to provide information for decision making and quality and efficiency improvement

[5] WHO (World Health Organization).2009. *Evaluation of the Organization and Provision of Primary Care in Belarus*.

is viewed among those important 'ingredients'. Thus, an IT system is critical to accelerating uptake of life-saving treatments for NCDs. Such a system, regularly updated with clinical information, can provide alerts to physicians about which drugs or treatments to prescribe when needed and issue reminders to patients regarding when certain tests or follow-up visits are overdue. An IT system can also identify which patients have worse control of their disease, so that providers can spend their time more wisely by devoting more time with those who have poor disease control. Last, an IT system can report on the indicators of the quality of chronic disease management, so that health care providers can monitor whether improvements they are making on how care is delivered are having an impact. By investing in ICT-enabled clinical decision tools and health information systems, countries as diverse as the Republic of Korea, Canada, and Croatia were able to reform their approaches to management of NCDs to better meet the needs of their population.

53. **Bank experience in the health sector in Belarus.** The design of the project is also informed by the lessons learned under the failed first attempt to borrow from the Bank for the health sector. A Bank project on TB/HIV prepared in 2003 was dropped for the following reasons: (i) incidences of TB and AIDS were declining; (ii) the Global Fund (GF) considered a possibility to provide significant grant financing to Belarus; and (iii) the government requested the Bank to rather focus its attention and resources on analytical support to design a HIV/AIDS response strategy to obtain the GF financing. In addition, there was the failure to reach agreement on certain activities, which materialized at a late stage of project preparation. Therefore, the main lesson emphasizes the critical importance of strong government ownership, its early involvement in the design of the project, and commitment to results.

54. **The Bank has a long history of supporting PHC development, training and establishment of ICT in the health sector, and system enhancements in quality management.** Infrastructure projects that modernize health facilities date back to at least the 1960s. The use of ICT for health policy decision making, health providers' performance assessment, and the IHMISs are all policy areas for which a deep knowledge base has been developed within the framework of the Bank's investment operations and analytical undertakings. The design of the proposed project is well informed by the lessons learned under related activities.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

55. **Central level.** As the central government's agency responsible for the development of health policy, the MoH will have overall responsibility for implementing the proposed project. In this capacity, the MoH will: (a) maintain a strategic link between the implementation of health sector reforms and effective delivery of the project; (b) coordinate project activities implemented at the national and subnational levels to make sure they are aligned with the PDO; (c) liaise with the Ministry of Finance and other key government agencies to enable smooth project execution; (d) coordinate monitoring and reporting under the project, sending regular reports to the Bank on progress achieved in the indicators of the Results Framework; (e) monitor project expenditures and costs; (f) ensure that the Project Operations Manual (POM) is followed and updated as may be necessary during implementation; and (g) prepare and distribute consolidated progress reports

and the final report to the Bank and relevant government agencies. To assist the MoH in fulfilling these requirements, the government will establish a PMU consisting of a core team of experts (fiduciary, safeguards—environmental and social aspects—monitoring and evaluation (M&E), and technical) upon effectiveness. An Inter-sectoral Project Preparation Working Group (WG) is already on board. This WG will become a Steering Committee upon effectiveness to provide overall guidance in key areas of the proposed project during implementation. The composition of the Steering Committee will also be expanded to include representatives from key MoH departments, civil society organizations (CSOs), development partners (WHO, UNICEF, etc.), to create a platform for higher level policy dialogue in the sector.

56. The MoH will delegate the responsibility for managing day-to-day preparation and implementation of the proposed project, including overall fiduciary responsibilities to the PMU located in the RSPC MT. The PMU will be headed by a project director who, with other core experts, will be an independent consultant selected competitively and agreed upon by the MoH. The project director will be in charge of day-to-day supervision of project performance, and his level of seniority and powers need to be aligned as those of head of department. The PMU consultants will provide technical support under the project and will ensure compliance with Bank requirements for procurement, reporting, auditing, and monitoring of the project.

57. Technical expertise and responsibility for project technical implementation will be as follows: (a) RSPC MT for Component 1 (IT and clinical support tool); (b) BelMapo for Component 2 (medical education); and (c) RCMC for Component 3 (neonatal care).

58. **Subnational level.** Local administrations will have primary responsibility for the implementation of Component 1 (e-Health) at the subnational level. The health departments will lead the execution of the activities implemented at the subnational level. In implementation, they will be supported by the central PMU and technical expertise as may be needed. The health departments will involve different departments, as needed, to ensure effective management of the activities.

59. BelMapo will take the lead role in providing advisory and methodological support to medical universities and colleges in the country, including in the establishment of GP departments supported by Component 2 (medical education). This approach will help ensure a smooth and unified approach in the establishment of GP departments and in GP training to improve skills and competencies of PHC providers in the provision of a broad range of health services.

60. The implementation of Component 3 (neonatal care) will be overseen by the administration of the RCMC and administrative/clinical staff of the Department of Neonatal Care. They will provide advice on the functional layout of the new department and set of biomedical equipment and medical furniture to be procured. In implementation, they will be supported by technical experts (architect and biomedical engineer) as may be needed.

B. Results Monitoring and Evaluation

61. **The PDO level and intermediate results indicators will be monitored using the following data collection instruments:** (a) regular surveys and data collection processes; (b) administrative data; and (c) monitoring reports prepared by the PMU.

62. **The PMU will carry out the day-to-day coordination of M&E activities.** It will bring together the core members of the Steering Committee to monitor the project's objectives and results and communicate with the Bank according to the frequency of reports described in Annex 1. Organizations subordinate to the MoH—including the BelMapo and RSPC MT—will be responsible for the provision of timely and accurate information required for monitoring the project objectives and results achieved under their respective components.

63. **The proposed project envisions beneficiary participation in project monitoring activities.** Local administrations will be responsible for collecting performance data and one staff and/or consultant may be assigned to provide data on a number of results indicators from the general Results Framework list relevant to their area, but including those related to citizen engagement and those disaggregated by gender. Data will flow to the central PMU M&E consultant who will coordinate timely collection, ensure accuracy of information, and provide necessary reports to the Bank.

64. Lastly, project support to e-Health and M&E will contribute to improving the quality and reliability of the information and intelligence obtained regularly by the health departments at the subnational level and the MoH. Planned household and facility surveys will be financed under Component 4 of the project to complement routine M&E data collection process.

C. Sustainability

65. **The sustainability of the proposed project will be determined by two factors.** First, the government's ownership of this project and other activities implemented under the current CPS and, second, the fiscal sustainability and cost-effectiveness of project activities. The former is derived from the project's support for the government's demonstrated commitment to the establishment of e-Health and implementation of the national program on the automatization of the health sector. Meanwhile, the health services quality improvement activities—particularly the support for health professionals' skills development and improvement of medical education—reflect government priorities that are aimed at the modernization of the country's health sector in line with accepted global practices. The latter factor—on fiscal sustainability—will derive from increased cost-effectiveness of the integrated information system, which will save resources over time due to: (a) reduction in medical costs by reducing overlapping drug administration and examination; (b) reduction of medical costs by reducing the days of hospitalization and hospital visits; and (c) saving on labor costs by improving efficiency. Furthermore, fiscal sustainability will be obtained from the opportunities for revenue generation through simulation training facilities rental and public course offerings.

V. KEY RISKS

A. Overall Risk Rating and Explanation of Key Risks

66. The overall risk of not achieving the PDO is Substantial as a number of areas are judged to have 'substantial' risks, including political and governance, macroeconomic, technical design of project, institutional capacity for implementation and sustainability, fiduciary, and stakeholders.

67. **Political and governance.** Possible changes in management at the MoH and other key relevant institutions may affect the government's commitment to introduce changes to health care delivery, particularly with regard to amendments of legislations pertaining to e-Health. Lines of roles and responsibilities may not be as defined as it should be among the various actors, both horizontally (between institutions) and vertically (between administrative levels). The Bank team will work closely with middle-level authorities who are usually not affected by management and leadership changes and constitute the institutional memory of the MoH and the regions. Further, capacity building, e-Health, and project monitoring planned under project components are meant to improve governance. The preparation of a POM will be key in defining the roles and responsibilities of all actors as well as the project modus operandi, particularly in view of the limited knowledge of the implementing agencies in the Bank's procedures. A POM, satisfactory to the Bank, should be ready by effectiveness.

68. **Macroeconomic.** The country is experiencing an economic recession. Though macroeconomic adjustments are being made to control the negative impact of the recession, the health sector remains challenged in key areas of inefficiency, including in capital expenditures, particularly at the regional level. The proposed project, through its support of eHealth development, will address to a large extent poor performance and gaps in efficiency at state-owned health facilities, including reducing diagnostic services duplication and unnecessary patients' referrals between levels of care. The project will further improve training for health professionals using advanced simulation technologies and modern e-Health solutions, which will not only help improve health outcomes for the Belarussian population, but potentially further increase the use of health care services by patients from other countries. Furthermore, it is expected that improvement in medical education will attract prospective international medical students to attend Belarussian medical universities and colleges.

69. **Technical Design of Project or Program.** Given that there was no prior analytical work done on the sector and this is the first Health project the Bank supported in Belarus, there is a risk that the technical design of the project may not be implemented according to what is envisioned. To mitigate this risk, the Bank will include in its supervision team a cadre of experts on e-health, simulation training and neonatal care, who will give hands-on guidance to MOH and the PMU.

70. **Institutional capacity for implementation and sustainability and fiduciary.** The capacity of the implementing agency (MoH), including other key institutions (BelMapo and the RSPC MT), is low with regard to experience in implementing similar investment projects in partnership with the Bank or other international donors. This risk will be partially mitigated by the oversight role designated to core members of the Steering Committee, which will be tasked

with overseeing the implementation of project activities related to the rehabilitation of the simulation center and skill labs under Component 2. To further mitigate potential risks on IT procurement planned under Component 1 and given the recognized challenges and track record of this type of procurement globally, the PMU procurement staff will receive regular assistance and training by Bank IT procurement expert during project preparation and implementation. In addition, standard bidding documents and procedures, including well-defined technical specifications agreed with Bank experts will be used for all large procurement. Due consideration will also be given to packaging and qualifications required to maximize competition. Prior review thresholds will be lowered compare to other countries that have Bank's experiences and knowledge of its procedures. Overall, consideration will also being given on assigning component coordinators within the PMU to ensure timely technical implementation of the respective components and subcomponents.

71. **Stakeholders.** Health reforms are a strategic priority of the government. However, there is always a risk that the government's priorities may change, including avoidance of difficult choices and selected regions may prove reluctant or unable to implement the reforms because of changes in government or other reasons. Engaging all local authorities in the reform process is also a challenge. In addition, patients and the public at large may not understand the benefits of sharing electronically private medical information among health care institutions, which is foreseen under Component 1 (e-Health). New e-Health solutions will ensure more qualified health care services to the society. It will allow seamless information exchange between all levels of health care and virtual communities where all stakeholders can freely share and exchange information according to medical consumer choices. In addition, it will provide more reliable information for effective health policy development and improved health care system transparency. For these reasons, it will be critical to inform health care providers and the public early on to get buy-in on the change process. Broad communication on the changes can already be launched as part of the amendments of legal regulations aimed at ensuring data privacy and security measures, making the legal power of digital documents equal to paper-based documents and ensuring appropriateness of digital data exchange in health care.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analysis

72. The economic analysis of the proposed project takes into account several economic aspects. These include cost-effectiveness and cost-benefit considerations, efficiency issues, equity considerations, and recurrent costs and their budgetary implications. Each aspect is summarized briefly here with a complete discussion presented in annex 5.

73. The proposed project will support a wide range of health interventions, with different cost-effectiveness and cost-benefit implications. The project component decision-making tools in e-Health will lead to better management of cardiovascular disease, respiratory illness, and diabetes. Generally, all have favorable cost-effectiveness ratios relative to other alternatives.

74. Due to the high value attached to living longer, healthier lives, the literature also indicates that these services offer favorable cost-benefit ratios. The costs and benefits of the project have been estimated over 2017–2030. The project is expected to save over 22,000 disability-adjusted

life years (DALYs) during the project period and around 177,000 DALYs until 2030. The project will derive the majority of its economic value from the DALYs averted as well as some cost savings due to more efficient health system operations brought about by e-Health. The base scenario which assumes low inflation, high DALY discount rate, and relatively modest GDP growth results in a net present value (NPV) of US$323 million and an internal rate of return (IRR) of 47.5 percent.

75. Various sensitivity analyses were conducted. The NPV and IRR analyses were quite sensitive to the value of a DALY (ranging from 1 to 3 times per capita GDP), which raises the rate of return nearly threefold. In contrast, the IRR was only a little sensitive to the discount rate for the DALYs and not very sensitive to the deflator (inflation) rate or to the discount rate for the DALYs averted. Various scenarios were estimated to ascertain that there is no major risk of overestimation of returns. Conservative estimates on the DALY reductions were used—for example, the overall reduction in the DALYs from cardiovascular disease, the leading cause of death, is estimated at only about 4.48 percent, whereas U.S. interventions (prevention, specifically tobacco control), blood pressure management, and case management in hospitals have reduced cardiovascular disease mortality by over 25 percent in the last two decades. Even when the value of the DALYs averted were halved, the IRR of the project remained viable at 49.3 percent. Alternative scenarios and their effect on the project's economic performance are presented in the sensitivity analysis (see Annex 5).

76. The project offers some efficiency gains through the optimization of processes of the PHC network through e-Health. The decision processes will help in the management of cardiovascular disease and diabetes through primary care, which can reduce the burden on hospitals.

77. With regard to equity considerations, the project is cognizant that there is a risk that project benefits may accrue unequally to Minsk compared to other regions in the country, particularly since the BelMapo Simulation Center and the neonatal care center are located in Minsk. For the e-Health component, the areas that will be chosen for the initial rollout will be relatively disadvantaged areas such as those affected by the Chernobyl incident.

78. The proposed project's components include capital investments that imply ongoing recurrent costs even after the project's completion. The current crisis economic environment is challenging. However, when the estimated post-project recurrent costs are analyzed alongside the projected GDP and health expenditure, they do not represent a serious burden on the health budget going forward.

B. Technical

79. **The development objective will be achieved through a sound project design, which balances investments in infrastructure with health systems strengthening.** The proposed project will help the government to consolidate the health care system network optimization efforts by focusing on improving the quality of health care services and ensuring access to equal health care opportunities. The project design is informed by a long track record of similar interventions financed by the Bank in other countries in the world, whose lessons are applied to

design the mix of activities appropriate for Belarus. The proposed activities are designed keeping in mind the relevant international standards and the borrower's needs and capacities.

C. Financial Management

80. **The FM risk is assessed as Substantial due to the following factors:** (a) no experience of the proposed implementing agency, RSPC MT/MoH, in implementing Bank-financed projects; (b) relative complexity of the project with various types of activities to be financed from loan funds, including an IT/e-Health component; and (c) several beneficiaries participating in the technical implementation of the project, and thus a need for effective division of responsibilities and internal controls in the project (even though it is expected that fiduciary functions will be centralized with the RSPC MT/PMU only).

81. **The initial assessment of the project FM arrangements** took place in February 2016 and was updated in April 2016. It concluded that the minimum World Bank requirements will be met after the agreed actions, mentioned below, are completed. It is expected that the involvement of the part-time FM consultant currently supporting RSPC MT on the FM and disbursement aspects during the preparation phase will be expanded to a full-time position financed from the loan upon effectiveness. An account/disbursement specialist will also be hired by effectiveness and financed from the loan. Additionally, RSPC MT will have one or two of its accountants dedicated to specific areas of FM for the project. The FM and disbursement procedures, including internal controls to be put in place for project implementation, will be described in the POM. A POM will be approved in its final form as a condition of effectiveness.

82. RSPC MT will be in charge of the FM and disbursement functions for the entire project. It will keep detailed project records, prepare periodic reports, and will be in charge of disbursements and financial audits. The PMU will submit quarterly Interim Financial Reports (IFRs) to the World Bank, and annual audits of the project financial statements will be carried out. The existing accounting system of RSPC MT (1-C) will be used to keep project records; however, the system will be modified to fully meet the project needs before the start of implementation. The contract for adapting the 1-C accounting software will be signed no later than ninety (90) days after project effectiveness and will therefore constitute a dated covenant of the project legal agreement.

83. **Disbursement.** The proceeds of the IBRD loan will be disbursed in accordance with traditional disbursement procedures of the Bank, such as advances, direct payments, special commitments, and reimbursement accompanied by appropriate supporting documentation (summary sheets with records and/or statement of expenditures in accordance with the procedures described in the Bank's Disbursement Guidelines). The minimum application size for direct payment, reimbursement, and special commitment will be specified in the Disbursement Letter. The borrower will open a separate designated account in U.S. dollars in a commercial bank acceptable to the Bank and agreed with the Ministry of Finance to cover the loan's shares of eligible project expenditures. Further, an account in Belarussian ruble for payments in Belarussian ruble will be opened in the same commercial bank.

D. Procurement

84. **All procurement activities under the project will be implemented by the RSPC MT in accordance with the World Bank's** "Guidelines: Procurement of Goods, Works and Non-consulting Services Under IBRD Loans and IDA Credits and Grants" dated January 2011 and revised as of July, 2014 (Procurement Guidelines); and "Guidelines: Selection and Employment of Consultants Under IBRD Loans and IDA Credits and Grants by World Bank Borrowers" dated January 2011 and revised as of July 2014 (Consultant Guidelines), and the provisions stipulated in the Legal Agreement and POM. A General Procurement Notice (GPN) will be published on the Bank's external website and the UN Development Business website once the bidding documents are ready.

85. **Procurement capacity assessment of the RSPC MT was conducted in April 2016.** As for procurement responsibility, given that the MoH is new to implementing Bank-financed projects, additional capacity building efforts and implementation support to the MoH will be provided during preparation and at the beginning of implementation. The procurement function for the project will be centralized (that is, bidding document, evaluation reports, and contract awards) and will be done by a single designated organization/PMU (RSPC MT) for the whole project. The staffing of the PMU shall comprises three procurement specialists of the RSPC MT who have experience with World Bank procurement guidelines, International Competitive Bidding and working knowledge of English. They will handle the workload associated with procuring goods, works and services for all components of the projects. Additionally, one of the procurement specialist needs to have ICT procurement experience. Currently one procurement specialist has been hired as part of the RSPC MT.

86. **There is a potential risk of delays in the implementation of the procurements, especially for the first set of civil works contracts and the procurement of IT and medical equipment.** In addition, in civil works contracts, there is a risk of cost overruns due to variation orders and claims. There may also be limited competition if contracts for several facilities are launched at the same time, their size and value are not significant, and they are scattered geographically. To mitigate the procurement risks, the RSPC MT will implement measures agreed with the Bank which will include, among others: (a) preparing bidding documents for the first year of project implementation for Components 1, 2, and 3 ahead of effectiveness; (b) organizing business outreach by the PMU for the private sector on future business opportunities under the project before launching first bidding procedures to enhance competition; (c) hiring a three full-time procurement specialists experienced in Bank procurement rules and procedures, one procurement specialist shall have ICT procurement experience; (d) participating in various procurement training and workshops provided by the Bank and/or external training providers; and (e) preparing procurement progress reports during project implementation.

87. **The Bank will closely supervise the project, including carrying out regular reviews of the procurement arrangements, and provide timely technical assistance (TA) to strengthen the PMU's procurement capacity** for conformity with the Loan Agreement, the proposed implementation program, and the disbursement schedule. The Bank's prior review thresholds will be provided in the agreed Procurement Plan. The remaining procurement procedures will be subject, on a random basis, to the Bank's ex post review. One in 15 contracts will be subject to ex post review. More detailed findings of the assessment, the proposed

procurement arrangements, and measures to address the identified risks are presented in Annex 3. A draft Procurement Plan covering the first 18 months of project implementation is also presented in Annex 3.

E. Social (including Safeguards)

88. **Involuntary resettlement.** Civil works planned under Component 1 (rehabilitation of regional offices), Component 2 (BelMapo, medical universities and colleges), and Component 3 (RCMC) will be carried out on land owned by the entities and within their current premises, therefore, the Bank's OP 4.12 on Involuntary Resettlement will not have to be triggered. Construction and rehabilitation on these sites will not require any land acquisition or physical resettlement, and will not obstruct private economic activities.

89. **Beneficiary feedback.** Beneficiary feedback will be collected as part of two components. First, as part of the implementation of subcomponent 1.1 (Integrated Health Management Information Systems): RSPC MT, which will be responsible for overall coordination of e-Health system, will administer periodic surveys to assess patients satisfaction with the implementation of the e-Health system in participating health facilities. The surveys will target patients who have received service as part of the e-Health system (e.g., e-prescriptions, e-referrals, patient portal, e-certificate, etc.), and will inquire on the patients' experience with the new system. The surveys will solicit feedback on needs, problems, and requests for improvement. The survey will be periodically distributed to patients in participating health facilities and will also be available on the "Patient Portal" that will be created as part of this subcomponent, so that all portal visitors will be able to respond to the surveys based on the user experience. The results of both offline and online surveys will be aggregated on a quarterly basis to inform on the activities of RSPC MT as part of subcomponent 1.1. Results will also be posted on the "Patient Portal".

90. As part of Component 2, BelMapo will regularly distribute surveys to beneficiaries, who will undertake trainings at the new simulation center. These surveys will consist of two separate questionnaires: (a) Technical Effectiveness: a questionnaire containing technical questions that will be distributed to beneficiaries before and after each training at the simulation center to track whether their technical knowledge improves as a result of the training; and (b) Satisfaction: a questionnaire that tracks beneficiary satisfaction with the quality of services (training) offered by BelMapo will be distributed after each training at the simulation center. The feedback will be communicated back to training participants, and will inform the structure and contents of future trainings. Dedicated indicators in the Results Framework will monitor the results of both surveys (satisfaction percentage for female and male respondents). The same approach will be used for training offered by the medical universities and colleges.

91. **Gender.** The project is likely to have positive gender impacts. It will generally improve the quality of health services provided to both men and women, and will also have significant benefits for the female beneficiaries of the RCMC and its intensive neonatal care services. The Belarussian health system offers a range of maternity-related services and protections. Around 98 percent of women in early pregnancy are registered at the obstetrics and gynecology department. The percentage of births attended by skilled health staff is 100 percent.[6] The

[6] World Bank. 2012. *Gender Statistics*.

maternal mortality ratio declined from 33 in 1990 to 4 in 2015, which is better than the EU average.[7] Measures have also been taken to increase maternity benefits, childhood allowances, and financial support for young and large families. While still low, fertility rate increased to 1.6 births per woman facilitated by the development of a nationwide system for reproductive health protection and adoption of the National Program of Demographic Security.[8] Contraceptive prevalence rate increased to 63.1 percent in 2012 from 50 percent in 2005, which is higher when compared with countries at the same income level.[9] Adolescent fertility is 20.1 births per 1,000 women of 15-19 years old, which is close to the Europe and Central Asia average but nearly double that of the EU.[10] Maternity leave for (employed) women is adequate in duration at 126 calendar days fully paid by the government. But the child care leave benefit for three years is excessive and hurts women's career opportunities.

92. However, despite these positive developments and arrangements, the state of neonatal care facilities in the country is not optimal, and existing facilities require renewal. Further, education and training on reproductive health could be improved in the country. The project will therefore include the following gender-focused activities: (a) Beneficiary satisfaction surveys under subcomponent 1.1 and component 2. These surveys will allow to identify any gender gaps related to the usage of the e-Health system and participation in trainings. The findings of the surveys will be analyzed by RSPC MT (for subcomponent 1.1), and BelMAPO/medical universities and colleges (for Component 2). Activities to reduce any emerging gender gaps will be immediately undertaken (for instance, female training participants may prefer more flexible training timings in order to attend to childcare duties). (b) Constructing and equipping a room dedicated to nursing and breast milk pumping as part of the reconstruction of the intensive neonatal care department: this activity will significantly improve the wellbeing of women whose newborns are treated at the Center and encourage breastfeeding. (c) Offering trainings on reproductive health for men and women as part of the simulation center curricula at BelMapo. An opportunity to improve skills related to sexual and reproductive health is important for both male and female participants, but awareness of such matters is often insufficient. Such trainings are therefore likely to positively contribute to gender conditions in the country. And (d) Undertaking outreach activities to increase female participation in trainings at the new simulation center and skill labs to further strengthen the professional skills of female doctors and nurses. The increase in the number of female participants will be tracked by BelMapo, medical universities and colleges throughout the implementation of the project.

93. Gender-focused indicators in the Results Framework will include: (a) Disaggregation by gender of the data collected as part of the beneficiary satisfaction surveys (satisfaction percentage for female and male respondents); (b) Construction of the nursing and breast milk pumping room; (c) Number of trainings on reproductive health offered by BelMapo in the new simulation center and by medical universities and colleges at the new skills labs; and (d) Number of health care specialists trained at the BelMapo's new simulation center (disaggregated by gender).

[7] Ibid.
[8] World Bank. 2013. *Gender Statistics.*
[9] World Bank. 2012. *Gender Statistics*.

[10] World Bank. 2014. *Gender Statistics*.

F. Environment (including Safeguards)

94. **The proposed project will support the construction and rehabilitation of facilities.** Works planned under the project will involve rehabilitation of regional offices for housing IT-related infrastructure (Component 1), construction of a two- or three-storied building for the new simulation center at BelMapo and renovation of the research laboratory of BelMapo, and renovation works at 4 medical universities and 17 colleges for skill labs (Component 2), and construction of a new section of medical premises at the RCMC (Component 3). Environmental risks of these activities are expected to be modest and limited to the construction sites and to the period of construction works. Based on the safeguards policy and given the expected nature of the works, OP/BP 4.01 Environmental Assessment is triggered and the proposed project is classified as Category B. The Client has prepared the project-level Environmental Management Framework (EMF). While specific sites have been broadly identified (i.e. within the boundaries of the BelMapo and RCMC), no environmental and design surveys have been done and the information available to the team at the time of appraisal is not sufficient for preparation of the site-specific EMPs. For renovation works at the regional offices (for housing IT equipment), medical universities and colleges (for housing skill labs) - EMP Checklists (annex to EMF) will be used.

95. Preparation of the preliminary design for construction of the new building to house the simulation center at BelMapo has not yet started. There are existing premises of administrative building, storage facilities and garages of BelMapo at the location designated for simulation center. All the functions of the above premises are important for day-to-day operation of BelMapo and should be taken into account during the design of the new building for simulation center. Depending on functional diversity of premises and their spatial requirements, the draft layout of the new building, associated engineering infrastructure (i.e. electricity, water and heat supply, etc.) and the construction site around it will be developed. Preparation of the design will include site-specific environmental impact assessment (EIA), which will be prepared prior to the preparation of the site-specific EMP.

96. The initial architectural design for the new section of medical premises at the RCMC was prepared by BELGOSPROEKT[11] in 2013. According to this design, the new premise will be a four-storied building with total square of 6.269 square meters. The associated facilities will include electrical transformer sub-station, sewage pumping station, and diesel-generator. The initial architectural design will be reviewed and revised in order to optimize the functions and spatial dimensions of medical premises and the location of the premises and associated facilities within the territory of the RCMC broadly. The EIA for construction of new building at RCMC will be done during the preparation of the detailed design. Based on this EIA, a site-specific EMP will be prepared.

97. The potential negative impacts are perceived to be relatively minor and can be readily mitigated with standard procedures and existing operational practices followed in Belarus. The EMF was disclosed (in Russian) on the website of the MoH and in the Bank's InfoShop and public consultations were organized. The final version of the EMF was disclosed on the website of the MoH (in Russian) and at the Bank's InfoShop (in English) before completion of project

[11] BELGOSPROEKT – Belarus State Design Institute - http://www.belgos.by/

appraisal. Site-specific EMPs for activities at BelMapo and RCMC will be disclosed and consulted upon at a later stage (after project start).

G. Other Safeguards Policies Triggered

98. Some sub-projects (i.e. minor renovation works) will be implemented in historic buildings. Therefore, OP/BP 4.11 "Physical Cultural Resources" is triggered. However, these buildings are being currently used as functioning premises (classes, laboratories, etc.) of medical universities and colleges. Given the scope of works on renovation and limited scale of potential impacts, the historic and cultural value of these buildings will not be affected as a result of project activities. Belarus legislation and regulations are sufficient to protect the cultural values. The regulations on works in historic buildings will be applied and special permits for such works will be received from the Ministry of Culture.

H. Other Safeguards Policies Triggered

99. Not applicable.

I. World Bank Grievance Redress

100. Communities and individuals who believe that they are adversely affected by a Bank-supported project may submit complaints to existing project-level grievance redress mechanisms or the Bank's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed to address project-related concerns. Project-affected communities and individuals may submit their complaint to the Bank's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of Bank non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the Bank's attention and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the Bank's corporate GRS, visit http://www.worldbank.org/GRS. For information on how to submit complaints to the Bank Inspection Panel, visit www.inspectionpanel.org.

Annex 1: Results Framework and Monitoring

BELARUS: Health System Modernization Project

Results Framework

Project Development Objectives

PDO Statement

The project development objective is to contribute to improving selected aspects of the quality of health care delivery in the Republic of Belarus.

These results are at	Project Level

Project Development Objective Indicators

		Cumulative Target Values				
Indicator Name	Baseline	YR1	YR2	YR3	YR4	End Target
1. Percentage of selected health facilities (PHC centers/ambulatories, polyclinics, hospitals, and diagnostic centers) that can electronically exchange patient summaries	0%		20%	40%	80%	100%
2. Number of oblasts using e-prescription (cumulative)	1	1	1	3	4	7
3. Percentage of trained PHC doctors in clinical skills at BelMapo Simulation Training Center and at Medical Universities skills labs according to standards (emergency services among others)-cumulative	0%	0%	0%	10%	30%	50%
4. Percentage increase in survival rate of newborns at the Intensive Neonatal Department of the RCMC	78%			82%		86%
5. Percentage of diabetes patients who received A1C blood sugar test once a year	30%			50%		80%

Intermediate Results Indicators

Indicator Name		Cumulative Target Values				
	Baseline (2016)	YR1	YR2	YR3	YR4	End Target (2021)
1. Establishment of CHIS implementation unit at the RSPC MT and fully functional	0		1	1	1	1
2. Percentage of PHC doctors in selected health facilities using clinical decision making tools	0	0	0%	20%	60%	100%
3. Percentage of PHC doctors in selected health facilities receiving patients' summaries from specialists after hospital discharge (report on all relevant health information sent from specialists to PHC)	0	0	20%	40%	80%	100%
4. Central database operational	0			1		1
5. Increase in patients' satisfaction with e-prescription	1%			20%		70%
6. Number of health care specialists trained in emergency medical care at BelMapo, including using simulation equipment (cumulative) (disaggregated by gender)	0	1500	3000	4500	6000	7500
7. BelMapo Simulation Center constructed and equipped	0	0	0	0	1	1
8. Clinical skill labs in (a) Medical Universities; and (b) Colleges rehabilitated and equipped			a) 2; b) 7	a) 2; b) 10		a) 4; b) 17
9. Training modules for core specialties at BelMapo new Simulation Center developed and approved by MoH (GP, ER, surgery, obstetrics-gynecology, dentistry, anesthesiology, neonatal)	0	3 developed	3 approved 4 developed	7 developed and approved		7 approved and implemented
10. Reduction in average length of stay of infants at the Intensive Neonatal Department (days)	11.5			11		10
11. Neonatal department constructed and equipped	0			1		1
12. Clinical decision making tool on quality of neonatal care developed and used	0		1 developed	1 approved and used		1
13. Percentage of training participants in training institutions: BelMapo new Simulation Center, medical universities, and medical colleges satisfied with the	0 (on the three types of	0	0	60% of all participants		80% of all participants

technical effectiveness and quality of the training	institutions)					
14. Construction of a nursing and breast milk pumping room in the new neonatal department (y/n);	No			Yes	Yes	Yes
15. Number of departments in each of training institutions (BelMapo, medical universities and medical colleges) offering trainings on reproductive health	2			20		All departments
16. Grievances registered related to delivery of project benefits addressed (%)	0.00	0.00	0.00	100	100	100

Indicator Description

Project Development Objective Indicators

Indicator Name	Description (indicator definition and so on)	Frequency	Data Source / Methodology	Responsibility for Data Collection
1. Percentage of selected health facilities (PHC centers/ambulatories, polyclinics, hospitals, and diagnostic centers) that can electronically exchange patient summaries	Numerator: number of selected health facilities in project areas able to transmit and retrieve patient summaries (medical reports with results of lab. tests, images, and so on) to and from CHIS (central database) Denominator: number of selected health facilities in oblasts and Rayons, and Minsk City covered by Project interventions under Component 1	Annually	Progress report from RSPC MT	PMU
2. Number of oblasts using e-prescription	Number of oblasts and Minsk City. E-prescription central service is established for health care institutions and pharmacies in the oblast. (Baseline refers to Minsk City)	Annually	Progress report from RSPC MT on connected facilities to e-prescription central service; also validated on a sample size based on field visits of the Bank and PMU of facilities	PMU
3. Percentage of trained PHC doctors in clinical skills at BelMapo Simulation Center	Numerator: number of PHC doctors who received clinical skills training at BelMapo Simulation Center and at Medical Universities	Semi-Annually	Progress report from RSPC MT and training institutions	PMU, BelMapo, medical universities

and at Medical Universities skills labs according to standards (cumulative)	skills labs according to standardized curriculum approved by MoH Denominator: total number of PHC doctors, who should pass training at BelMapo and medical universities to become a GP during the reporting year			
4. Percentage increase in survival rate of newborns at the Intensive Neonatal Department of the RCMC	Numerator: Number of newborns with low birth weight (between 500 and 1500 grams) surviving (within first 28 days) Denominator: Total number of newborns with low birth weight (between 500 and 1500 grams) hospitalized at the Department	Annually	Progress Report from RCMC	PMU, RCMC
5. Percentage of diabetes patients who received A1C blood sugar test once a year	Numerator: Number of diabetes patients who received a A1C blood sugar test once a year Denominator: Total number of diabetes patients	Annually	Diabetes Registry Reports	MoH

Intermediate Results Indicators

Indicator Name	Description (indicator definition and so on)	Frequency	Data Source / Methodology	Responsibility for Data Collection
1. Establishment of CHIS implementation unit at the RSPC MT and fully functional	MoH Order to define mandate and staffing of Department on e-Health at the RSPC MT	Once	MoH Order	MoH
2. Percentage of PHC doctors in selected health facilities using clinical decision making tools	Numerator: Number of PHC doctors using clinical decision making tools Denominator: Total number of PHC doctors in selected health facilities	Annually	Progress report	PMU
3. Percentage of PHC doctors in selected health facilities receiving patients' summaries from specialists after hospital discharge (report on all relevant health information sent from specialists to PHC)	Numerator: Number of PHC doctors receiving patients' summaries from specialists Denominator: Total number of PHC doctors in selected health facilities	Annually	Progress report	PMU

4. Central database operational	Central database functional	Once	Progress report	PMU
5. Increase in patients' satisfaction with e-prescription	Numerator: Percentage of satisfied patients Denominator: Total number of respondents	Mid-term review and end of Project	Survey (2)	PMU
6. Number of health care specialists trained in emergency medical care at BelMapo, including using simulation equipment (cumulative) (disaggregated by gender)	Number of male and female health care specialists trained at BelMapo in emergency medical care	Annually	Progress report	BelMapo
7. BelMapo Simulation Center constructed and equipped	Construction and equipping of BelMapo Simulation Center	Annually	Progress report	PMU
8. Clinical skill labs in (a) Medical Universities; and (b) Colleges rehabilitated and equipped	Number of medical universities and colleges rehabilitated and equipped	Annually	Progress report	PMU
9. Training modules for core specialties at BelMapo new Simulation Center developed and approved by MoH (GP, ER, surgery, obstetric-gynecology, dentistry, neonatal, anesthesiology)	Number of training modules for core specialties at BelMapo new Simulation Center developed and approved by MoH	Annually	Progress report	MoH
10. Reduction in average length of stay of infants at the Intensive Neonatal Department (days)	Average length of stay of infants	Annually	Progress report	MoH
11. Neonatal department constructed and equipped		Annually	Progress report	PMU
12. Clinical decision making tool on quality of neonatal care developed and used	Number of clinical decision making tool on quality of neonatal care developed and used	Annually	Progress report	PMU
13. Percentage of training participants in training	Numerator: Percentage of satisfied participants Denominator: Total number of respondents	Annually	Survey	BelMapo

institutions: BelMapo Simulation Center, medical universities and medical colleges satisfied with the technical effectiveness and quality of the training				
14. Construction of a nursing and breast milk pumping room in the new neonatal department (y/n);		Once	Progress report	PMU
15. Number of departments in each training institution (BelMapo, medical universities, medical colleges) offering trainings on reproductive health		Annually	Progress report	BelMapo
16. Grievances registered related to delivery of project benefits addressed (%)	This indicator measures the transparency and accountability mechanisms established by the project so the target beneficiaries have trust in the process and are willing to participate, and feel that their grievances are attended to promptly by MoH and subordinate institutions related to Project activities.	Annual	Progress report from PMU	MoH/BelMapo/Intensive Neonatal Department of RCMC/medical universities and medical colleges

Annex 2: Detailed Project Description

BELARUS: Health System Modernization Project

Component 1: Establishment of e-Health and Clinical Decision-support Systems (estimated at US$65.2 million equivalent)

Background

1. Like many of its neighboring countries, Belarus has prioritized the development of an integrated e-Health system as a way to improve health service delivery to the population. To improve quality of care and better manage health care delivery, information must be readily available to all health care workers and citizens who need it, so that they can make the best possible decisions. Paper-based format makes it difficult to access information. The e-Health system can improve quality of care through a variety of means including the following:

- Reducing delays or duplication of services due to medical records not being accessible between different sites
- Collecting information about performance of different providers, polyclinics, and hospitals, and holding them accountable for achieving the best results for quality of care
- Reminding health care providers of what the latest clinical best practices are for the use of drugs, tests, or other services
- Reducing medical errors due to issues such as illegible handwriting
- Keeping patients informed about their care so that they can be engaged in their decision making

2. The imperative for improving quality through e-Health is great, given a number of health trends in the population. Although Belarus has had successes in improving infant mortality and maternal health, it struggled in a number of other areas, including the following:

- A life expectancy of 72 years (2011), significantly lower than its European peers[12]
- The highest rate of cardiovascular mortality in Europe, with relatively little improvement in the past two decades compared to other countries[13]
- A high prevalence of diabetes in the population (6.5 percent in 2015)[14]
- One of the highest rates of alcohol consumption[15]

[12] www.euro.who.int/en/countries/belarus/data-and-statistics.
[13] www.oxfordjournals.org/our_journals/eurheartj/press_releases/freepdf/prpaper.pdf.
[14] www.idf.org/membership/eur/belarus.
[15] http://www.who.int/substance_abuse/publications/en/belarus.pdf

3. Belarus has already initiated activities aimed at trying to measure the quality of health care for chronic diseases and prevention. According to the MoH Order No. 732, it is currently adopting indicators including the following:

- For diabetes: Percentage of diabetes patients with hemoglobin A1c[16] done at least once in the past year
- For hypertension: Percentage of hypertension patients at their target level of blood pressure
- For prevention: Percentage of immunization, pap screening, and cancers detected at an early stage

4. The government is also interested in using indicators of quality to incorporate into financial incentives for physicians (which at present account for about 20 percent of the total remuneration).

5. Considerable efforts have been made to develop e-Health solutions in the country. EMRs exist in most of the ambulatory and hospital centers in Minsk and in some regions such as Vitebsk, Grodno, Mogilev, and Brest. The main EMR providers are local medical IT companies such as MAPSOFT Republican Scientific Practical Center for Medical Technologies, B-Soft Laboratory (Б- Софт Лаборатория), Unified Institute of Problems in Informatics at the National Academy of Science in Belarus , and Softgarantservice (Софтгарантсервис) in Minsk, Information systems in Brest and Vitebsk Oblast Diagnostic Center in Vitebsk. An e-prescribing pilot project is also underway in Minsk. A number of these solutions have been developed using local expertise in software development, which is a good sign of future success.

6. However, the analysis of the current situation shows that different health care organizations use different computer programs which often lack interoperability. This hinders the implementation of cross-institutional patient care pathways because information about the diagnostic and treatment procedures made in one institution is not available in others. This also creates barriers for adoption of complex solutions based on unified standards for information exchange. The analysis also reveals that decision-supports and tools to support quality require significantly greater investment. For example, indicators collected currently under the MoH Order No.732 are collected manually, often through chart reviews which are both time consuming and subject to errors. Basic decision-supports, such as reminders to physicians of potential drug interactions, remain to be developed.

7. Given the above described issues, Component 1 of the project will aim to support the government of Belarus to:

(a) **establish an integrated nationwide health information system** based on available digital information; and

[16] The A1c test is a blood test that provides information about a person's average levels of blood glucose, also called blood sugar, over the past 3 months. The A1c test is sometimes called the hemoglobin A1c, HbA1c, or glycohemoglobin test. The A1c test is the primary test used for diabetes management and diabetes research. (NIH).

(b) **develop a framework CDSS for quality improvement** which will ensure effective and up-to-date use of medical information for each citizen and consequently guarantee high-quality health and health care services to the society.

8. Component 1 consists of two subcomponents, which are described below.

Subcomponent 1.1: Integrated Health Management Information System

9. A new e-Health solution will ensure more qualified health care services to the society. It will allow seamless information exchange between all levels of health care and virtual communities where all stakeholders can freely share and exchange information according to medical consumer choices. In addition, it will provide more reliable information for effective health policy development and improve health care system transparency.

10. Specifically, Subcomponent 1.1 will support the integration of health and medical information by:

- developing a CHIS at the RSPC MT for medical data exchange, including document registry and archive;
- establishing robust and effective medical information exchange procedures and governance where responsibilities of every health care institution are clearly described and defined;
- updating currently used EMRs in hospitals and policlinics to create standardized medical documents and exchange standardized documents with the CHIS;
- creating new centralized e-Health services (e-prescription, statistical module to analyze a wide variety of quality indicators, and so on);
- developing health care data and data exchange standards; and
- updating the legal environment to ensure patient privacy and data security.

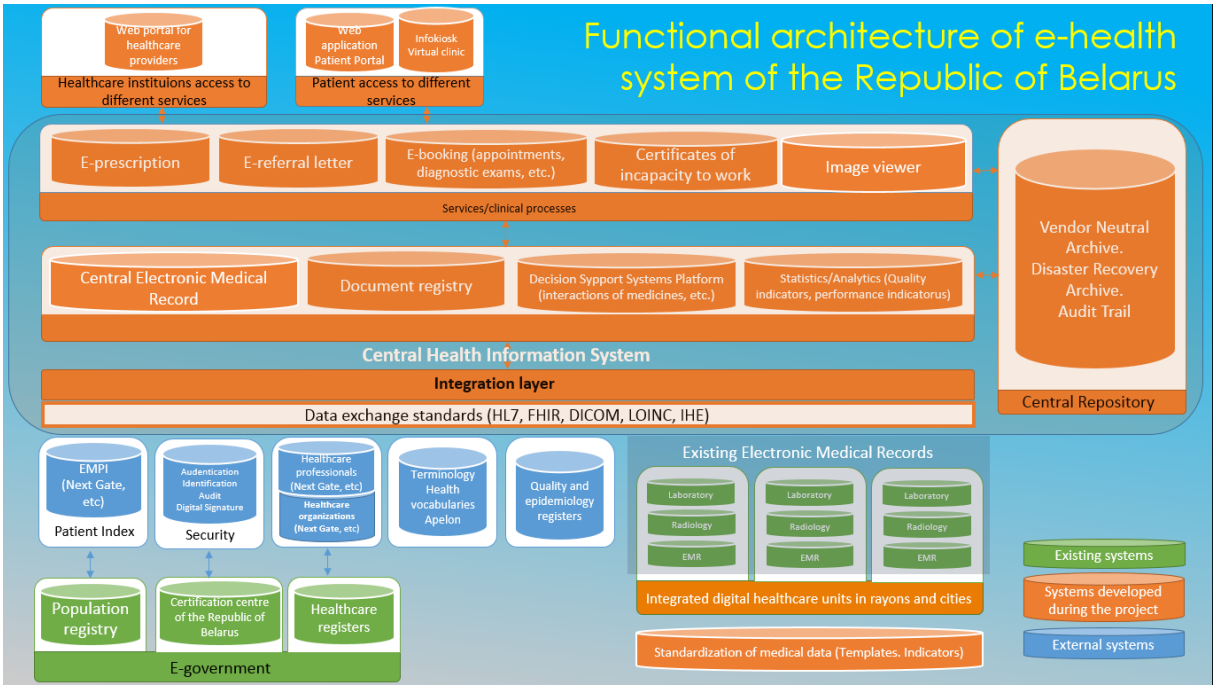
11. This subcomponent will address several aspects of e-Health as mentioned in the following paragraphs.

12. **Functional architecture.** The nationwide health information system will be built on two layers:

(a) Layer 1: The CHIS, which will consist of a health information database and software with application and service functionalities

(b) Layer 2: Integrated digital health care units in rayons and cities, which will use common EMRs for PHC (including policlinics, dispensers, and so on) and diagnostic centers and hospitals

Figure 2.1. Proposed Functional Architecture of e-Health System for Belarus [17]



13. Digital health and medical data will be collected and entered into the EMRs by health care professionals on the site of data generation—in the physician's or nurse's office, hospital wards, diagnostic departments, operating theaters, and so on. Digital data collection (primary use of data) in a structured and standardized way is the foundation for the secondary use of data—reuse of data during and following patient visits or by other health care professionals, creation of automatic reports and analyses, use of digital decision-support systems, development of e-services, and so on.

14. The current system allows high access to EMRs in hospitals, policlinics, primary care centers, and diagnostic centers. The EMRs developed in recent years have taken advantage of

[17] **HL7: Health Level Seven**--International standards developing organization dedicated to providing a comprehensive framework and related standards for the exchange, integration, sharing, and retrieval of electronic health information that supports clinical practice and the management, delivery and evaluation of health services. The aim is to provide a framework (and related standards) for the exchange, integration, sharing, and retrieval of electronic health information. http://www.hl7.org/index.cfm ; **FHIR: Fast Healthcare Interoperability Resources** is the latest standard to be developed under HL7 organization; **DICOM: Digital Imaging and Communications in Medicine**-- The DICOM Standards Committee exists to create and maintain international standards for communication of biomedical diagnostic and therapeutic information in disciplines that use digital images and associated data. The goals of DICOM are to achieve compatibility and to improve workflow efficiency between imaging systems and other information systems in healthcare environments worldwide. DICOM is a cooperative standard. http://dicom.nema.org/; **LOINC: Logical Observation Identifiers Names and Codes**-- A common terminology for laboratory and clinical observations. LOINC provides universal codes and names that provide the global lingua franca for identifying tests and observations. https://loinc.org/; and **IHE: Integrating the Healthcare Enterprise**-- IHE promotes the coordinated use of established standards such as DICOM and HL7 to address specific clinical needs in support of optimal patient care. Systems developed in accordance with IHE communicate with one another better, are easier to implement, and enable care providers to use information more effectively. IHE improves healthcare by providing specifications, tools and services for interoperability. http://www.ihe.net/

new web technology and have adequate functions and design for primary use of patient data. Also several health care institutions are already connected to the high-speed ICT network. The high level of automatization in health care applies particularly to Minsk and some other bigger cities. Despite this advanced digital environment for patient data collection, the EMRs use common data exchange standards occasionally, which do not allow data exchange between health care institutions. This leads to duplication of exams and procedures and fragmented care pathways between primary care, diagnostic centers, and hospitals. Also, automatic generation of health care quality and performance reports are not possible as they are prepared manually in the vast majority of cases. Central administrative registries, such as health care professionals and institutions registries, are managed centrally but lack in digitalization. After digitalization, those registries will act as data sources for the CHIS or other, nonmedical information systems.

15. To ensure maximal patient data integrity, availability, and confidentiality under the planned e-Health system, all patient data at particular rayons or city levels will be managed by one integrated EMR system. The EMR system will be using the same database, software, and applications for all health care institutions. This functional entity is referred to as a rayon or city integrated digital health care unit. Virtual integration of different health care institutions in the oblast (region) of the patient's residence will allow data sharing between primary care and hospitals and avoid duplication of data and procedures. It will also allow the collection of health care quality and performance indicators, which in turn will enable the creation of automated reports and initiate preventive or process reengineering measures, as may be needed.

16. During the e-Health system development phase, the EMRs, at the integrated digital health care units, will be developed to provide users with digital templates and structures, allowing them to collect information on key indicators related to the patient's health status in a standardized manner. The EMRs will also include data from integrated laboratory and diagnostic equipment and images from the digital Picture Archiving and Communication System (PACS). Reports/EMRs will then be transmitted to and from the CHIS and shared with other health care units. This approach should contribute to data analysis and feed decision-support algorithms.

17. The CHIS is a health care data management software and data repository (Vendor Neutral Archive [VNA]) which is connected to local integrated digital health care units through a secure Internet-based integration layer and is connected to analytical and decision-support applications and e-services. The CHIS will also include a patient portal to provide citizens with secure access to their health care data and different e-services. While managing and archiving defined selection of standardized medical documents and structured data provided by health care units, the CHIS has a document registry to indicate location and format of medical images stored in the local PACS. The architecture is not looking to generate a nationwide PACS but to create an image registry, according to the International Integrating the Health Care Enterprise - Cross-enterprise Document Sharing standard profile.

18. **Governance and management** of e-Health system will be developed and implemented at the central and subnational levels as explained in the following paragraphs.

19. **Central level.** Large-scale implementation of e-Health is multidisciplinary. Belarus has decided to complete a very ambitious plan to bring health care to a new level with the help of ICT. Cooperation between different organizations and specialized institutions will require high

user acceptance and demands for automatization. Analysis of current structures that can be involved in e-Health system design and implementation revealed that the appropriate organization to lead Component 1 would be the RSPC MT. The RSPC MT will be responsible for overall coordination of e-Health system implementation. Responsibilities will be divided between two departments: (a) an existing department to continue current IT activities (develop networks, servers, connectivity, and so on) and (b) a new department (which will be established) to focus on e-Health system design (indicators, decision support, quality improvement, and change management). Both departments will report to the head of the e-Health implementation unit of the RSPC MT. The rationale for selecting the RSPC MT is that the existing charter of this center already includes IT implementation in health care, analysis of health indicators, and so on. The RSPC MT has competence in deploying nationwide e-services (for example, e-prescription pilot) and aggregating and analyzing digital data.

20. Staffing of the new department on e-Health system design at the RSPC MT will consist of: (a) a working group consisting of local advisors and practicing physicians (to provide user perspective); (b) quality indicator experts—specialists with analytical capacity (for example, statistical analysis and database query); (c) a working group with expertise on medical coding standards, data exchange standards, and so on; (d) experts to develop CDSS; (e) experts on quality management and process improvement to develop the most efficient workflows for collecting data, IT system use, decision-making tools, and regulatory changes; (f) experts on web design and graphic user interface; and (g) a project management team.

21. The head of the RSPC MT will work in close collaboration with oblasts' health departments. The RSPC MT will be responsible for the design, development, and implementation of the CHIS.

22. **Subnational level.** The establishment of integrated digital health care units at the rayon and city levels will be the responsibility of the health department of each oblast and the city of Minsk in cooperation with the RSPC MT. The RSPC MT and health departments at the oblast level and the city of Minsk will develop a strategic plan to form these units at the rayon and city levels, decide on the rayons and cities where the CHIS testing will be implemented, specify functionalities and final setup of the units, prepare an implementation plan, and conduct training of health care professionals at the selected rayons and cities.

23. More specifically, the RSPC MT and health departments at the oblast level and the city of Minsk will create a list of health care facilities in Minsk City and in the 6 Oblasts, which will be designated as the digital health care units (hubs). This list covers all health care facilities of the Republic of Belarus that will be part of the digitalization and integration to the CHIS. The list will specify the current status of IT infrastructure and necessary investments for each health care facility to be ready for their integration to the CHIS. Based on this information, the RSPC MT will establish the list of hubs in each region that would be included in the project. The list of hubs will be presented to the MoH for approval and/or for adjustments, if needed. Health facilities in rayons of the Minsk Oblast will be provided with 100 percent of EMRs integrated to the CHIS, and health facilities in other rayons will be covered up to 70 percent at the Oblast level, and up to 40 percent at the Rayon level.

24. The health department of each oblast and the city of Minsk will appoint at least two specialists who will be responsible for the implementation of the e-Health system in the selected rayons and cities. Appointed specialists will be designated as the focal points between the RSPC MT and health care facilities. They will also participate in developing the CHIS and selecting quality indicators to help analyze current health status at the rayon and city levels.

Technical Architecture

Central Health Information System

25. Subcomponent 1.1 will support the CHIS with the following:

- Central EMR software
- Document registry software to manage standardized documents transmitted to and from digital health care units' EMRs. This software will be built on the Integrating the Health Care Enterprise - Cross-enterprise Document Sharing document sharing standard profile. It will receive a standardized document from providers and parses the document into data units that are stored in the CHIS data repository. It will also provide customers with documents containing the stored data in case of document query. Customers and users of these documents will be the different health care units' EMRs, health departments of oblasts, the MoH, other authorized persons, and citizens using the patient portal.
- The VNA for data management and storage
- Disaster Recovery Archive
- Document retrieving and viewing application software to develop standardized documents from the data retrieved from the VNA in case of query from the customers or users
- Statistics and analytical module with separate database and presentation software
- Central viewer software for viewing medical images stored in the PACSs at local centers. The software will be used by the digital health care units in selected rayons or cities. The central viewer software will be integrated with patient document registry to receive a link pointing to the PACS where images are stored.
- Security servers for access management and authentication of users, including storage of audit trails
- Integration software to provide a secure internet-based data exchange between organizations, including public and private health facilities, the MoH, other health management agencies, and so on. As all data exchange is conducted over public internet, the data will be encrypted. The goal of the integration software is to improve the availability of databases without endangering their confidentiality and

integrity. The system shall ensure sufficient security to allow inquiries to be made to databases and ensure the security of responses received.

26. Application layer of the CHIS will include, but not be limited to, the following e-services software:

- e-prescription software
- exchange of medical data and files between health care institutions
- e-referral
- radiology image exchange (PACS)
- patient portal, that is, citizen's online access to his/her medical data
- e-laboratory, that is, exchange of lab test results
- e-certificate on incapacity to work and so on.

27. The CHIS will use the services of the Republican Center for Data Processing and will be connected with local digital health care units through fiber optic medical network, wherever available. Both centralized investments are already regulated by government decisions and initial installation works have started. Building of nationwide high-speed fiber optic network for health care was ordered by the MoH and is expected to be deployed during 2016–2018.

28. For the time being, 120 health care organizations in the city of Minsk are connected to the high-speed ICT network. The network is expected to be fully operational at the end of the first half of 2016. The engineering of Brest and Minsk oblasts' network has also started. The National Data Center will be established using the public-private partnership financing model in 2016–2018 according to the program 'Development of Digital Information-based Economy and Society, 2016–2020'. The Ministry of Communication is in charge of the project on 'Development of Republican Center for Data Processing'. The first deliverable under this project is expected in the second quarter of 2016. The MoH will have the opportunity to use the services of the Republican Center for Data Processing starting from 2017.

29. Subnational ICT systems for health departments of oblasts and the city of Minsk will consist of the following:

- Hardware and network capacity (personal computer, local server, high-speed Internet access, and so on) for the office
- Application software to retrieve and present analytical data and quality indicators from the CHIS
- Software for sharing reports and templates with rayons and cities.

30. **Integrated digital health care units in rayons and cities.** It is expected that the total number of health care units in rayons and cities would be 110. The following units are included: (a) republican centers - 20; (b) oblast centers - 27; (c) rayon centers - 43; and (d) centers in city of Minsk - 20.

31. Each unit will be provided with one universal EMR for PHC (including policlinics, dispensers, and so on), diagnostic centers, and hospitals. EMRs will be selected through a public procurement process which is conducted by the health department of each oblast or the city of Minsk, in cooperation with the RSPC MT and the MoH. Given the constrained implementation period and resources, the component will finance the testing and implementation of the e-Health system for a total of about 78 units out of the 110 locations.

32. **Hardware and software for health care units in rayons and cities.** This subcomponent will finance the following:

- EMR software for PHC (including policlinics, dispensers, and so on), hospitals, and diagnostic centers. The number of software will depend on the results of tenders.

- Integration software to integrate EMRs with diagnostic software (PACS, laboratory information system, and so on).

- Establishment of necessary amount of data centers to store and exchange health care data from and between different health care institutions at the rayon and oblast levels. Provision of data centers with adequate hardware (servers, switches, server rooms, and so on) and licenses (Microsoft, Sybase, and so on).

- Hardware. Provision of hospitals, diagnostic centers, policlinics, PHC centers, and pharmacies with the necessary amount of computers, tablets, and printers.

33. As mentioned, Belarus has already made substantial investments in health care IT, including development of EMRs and providing health care institutions with hardware and high-speed ICT network. Therefore, the needed investments do not correspond directly to the number of health care units where the e-Health system is implemented and tested. The main providers of EMR software and other information systems for hospitals, diagnostic centers, policlinics, or primary care physicians in Belarus are currently in the IT market.

34. It is expected that each integrated digital health care unit (or several units under one provider) will be served by one ICT provider under a “turn-key” arrangement, i.e. provision of all ICT tools and services necessary for digital data collection, exchange, and maintenance. This includes computers and other hardware, software for general use and for EMR, network (software and hardware), and maintenance contract (including help desk).

35. **Standardization.** The aim of standardization is to enable different health care institutions to exchange defined set of documents between each other, the MoH, and other agencies. Standardization of health data is also a prerequisite to develop new e-Health services and applications and to develop digital and automatized reports.

36. Development of standards for health and medical data and data sharing will be based on existing common international standards in the health sector (such as HL7_v3, FHIR, HL7 CDA) and will include:

(a) common digital medical document exchange standards and standard profiles (HL7, DICOM, LOINC, IHE, and so on);

(b) a common patient identifier based initially on the specific medical identification number and in future, a national ID code;

(c) a common standard for digital medical documents (HL7 CDA);

(d) a common coding scheme for digitally encoding diagnoses, health care services, providers, facilities, and possibly, a hundred other such data items; and

(e) a Dictionary of Medical Standards, Classifications, and Terminologies (vocabularies) that contains the precise definitions of common terms used across the health sector.

37. To support the management and dissemination of these standards, a data standard management system will be developed and deployed so that the standards and vocabularies will be stored, published, and regularly updated in one place, and shared publicly by all service providers and applications. For example, there will be one authoritative Diagnoses Table (based on the International Classification of Diseases-10), one Provider Table (listing all caregivers who are authorized to make health decisions), one Facility Table (listing all health facilities in the country), and so on.

38. Centralized and coordinated publication and management of standards and vocabularies will thereby: (a) facilitate the exchange of data across the health sector for clinical care, statistical analysis, financial analysis, epidemiological research, and many other purposes; (b) speed up information flows; (c) eliminate considerable ‘double-work’ especially in data entry; (d) enhance comparability of utilization and quality statistics; and (e) provide a firm foundation for the development of new e-Health and mobile health services and applications.

39. Work on developing the health care data and data exchange standards has already begun at the RSPC MT in the context of development and piloting of e-prescription in Minsk. This includes familiarization with the FHIR (HL7) standard and use of digital database for medicines based on Anatomical Therapeutic Chemical (ATC) coding.

Legal Issues

40. For the successful implementation of a nationwide Health Information System in Belarus several legal issues should be analyzed and necessary changes made accordingly. The following areas will be elaborated by the existing central implementation unit at the RSPC MT before large-scale investment and a number of questions will need to be addressed in the Regulatory Framework:

- **Ownership of health data.** Who owns the health data collected and archived by health care providers? Do citizens have the right to view those data? Do citizens have the right to have a copy of their own health data? Are similar regimes applied to all health care providers or are there differences between of them—for example, psychiatry, communicable diseases, and so on?

- **Data management regulations.** Do patients have the right to close their own health data from health care professionals? Do health care professionals have the right to close patient data from the patient? In the implementation of the CHIS, the opt-in and opt-out concept should be discussed and settled.

- **Access rights.** Who is entitled to see patients' files? Is this regulated by the legal acts? What measures will be adopted when violation of data privacy is recognized. Does one health care institution have the right to query a patient's medical data from another health care institution without the written consent of the patient?

- **Data integrity.** What types of medical documents are compulsory in health care institutions? Are the documents standardized? When is the document considered completed?

- **Document archiving.** Is there a policy for document archiving? How long should the digital documents be available? Is there a difference between outpatient and inpatient documents? What about medical images, for example, x-rays?

- **Validity of digital documents.** Belarus has legislation regulating the validity of digital signatures. Will digitally approved or signed documents archived in the CHIS be equally valid as paper documents?

41. There are several legislative regulations in place that support implementation of a nationwide e-Health system. Below is the list of available regulations:

- Law of the Republic of Belarus No. 455-З dated November 10, 2008, 'On information, informatization, and information safety'

- Law of the Republic of Belarus No. 113-З dated December 28, 2009, 'On electronic document and electronic digital signature'

- Resolution of the President of Belarus No. 531 dated December 2013, 'On some issues of informatization'

- Resolution of the President of Belarus No. 46 dated January 23, 2014, 'On use of telecommunication technologies by state bodies and other state organizations'

- Order of the Cabinet of Ministers of the Republic of Belarus No. 509 dated May 31, 2012, 'On electronic services provided by republican institution "National Center of electronic services" to state bodies, other organizations and citizens on free of charge basis, and some measures on organization of electronic services delivery'

- Resolution of the Cabinet of Ministers of the Republic of Belarus No. 375 dated May 15, 2013, 'On approval of technical regulation of Republic of Belarus "Information technologies, means for information security, information safety" (TP 2013/027/BY)'

- Order of Operational-Analytical Center at the President of Belarus No. 26 dated March 28, 2014 'On approval of provision on foundation for use of republican platform by state bodies and organizations, which operates on the basis of clouds technologies'

- Order of Operational-Analytical Center at the President of Belarus No. 62 dated August 30, 2013 'On some issues of technical and cryptographic security of information'

- Strategy on development of informatization in the Republic of Belarus for 2016–2022, state program 'Development of digital information-based economy and society for 2016–2020'.

42. The Republic of Belarus is in the process of adjusting its current legal environment to support e-health implementation; it can therefore and to some extent benefit from the legal regulations adopted in the EU. In general, the EU follows subsidiarity principle in health care service provision which means that health care provision is regulated and organized at the EU member state level. However, there are no directives regulating health care provision directly. This has left decision making about legal regulations to each particular EU member state. EU legislation regulating e-health services consists of multiple directives and legal documents. Besides EU directives, there are additional legislative documents like the EU Communication on Telemedicine; however, these have no legal power.

43. EU Directives on the Processing of Personal Data and the Protection of Privacy in the Electronic Communication Sector specify a number of specific requirements relating to confidentiality and security that telemedicine and all other interactive on-line services have to meet in order to safeguard individuals' rights. These acts also provide requirements for providers of electronic communication services over public communication networks to ensure confidentiality of communications and security of their networks.

44. Regarding the harmonization of technical interoperability, the EU Directive on Technical Standards and Regulations establishes a procedure that imposes an obligation on Member States to notify the Commission and each other of all draft technical regulations concerning products and information society services, including telemedicine, before they are adopted by national laws.

45. The directive on electronic commerce defines rules for the provision of telemedicine services both within and between Member States. For tele-radiology services, the service offered by a professional must comply with the rules of the Member State of origin. This applies to tele-radiology services between the health care providers, radiology groups and/or private radiologists, which follows the country of origin principle.

46. The legal relations between the patient and health care provider are governed by national and EU legislation. Considering diagnostic services or treatment, the patient has almost always an insurance relationship with a local health care provider in the Member States. Consequently, issues of medical errors or other conflicts are elaborated according to the Member State's jurisdiction. This does not change when telemedicine is practiced within the EU. In the case of a conflict the patient can sue the local health care provider, and if the local provider sees that the medical error is caused by a telemedicine provider, it can sue the telemedicine provider. The responsibilities of both parties are usually fixed in the telemedicine service contract. If the telemedicine provider resides outside the EU, the above-mentioned principles do not apply unless contractually fixed.

Training

47. Study tours to be acquainted with e-Health setup and conferences will be arranged for the central implementation unit (RSPC MT) and oblast health departments' designated staff. The following trainings will also be organized:

- Oblast and rayon level: Several training sessions for quality managers
- Training of promotion of health care quality for oblast teams on quality/monitoring/reporting of rayons
- Training of promotion of health care quality to rayon and city teams on quality/monitoring/reporting of facilities
- General training on decision-support system and quality indicators (RSPC MT, oblast, rayons)
- Training on use of new applications for health care professionals (1,000 planned participants).

Evaluation

48. It is important to evaluate several aspects and functionalities of e-Health given its multiyear and large-scale scope. It is recommended that at least three different types of indicators be included. First, progress of development and implementation of software and hardware. Second, the development of medical data standards and necessary amendments of laws and bylaws. Third, evaluation of the uptake of new e-services by health care professionals and citizens.

49. Indicators to evaluate software and hardware development, standardization, and legal aspects include:

(a) percentage of selected health facilities (PHC centers/ambulatories, polyclinics, hospitals, and diagnostic centers) that can electronically exchange patient summaries;

(b) establishment of a fully functional CHIS implementation unit at the RSPC MT;

(c) number of digital health care units (hubs) established at selected oblasts, Minsk City, and rayons; and

(d) number of defined health care digital data standards and standard documents adopted by the MoH.

50. A more ambitious level of evaluation will be to look for improvements in the actual uptake and use of e-Health services. E-prescription service implementation will be evaluated according to the achieved functionality in a particular oblast or the Minsk City. E-prescription central service has to be established and functional for health care institutions and pharmacies in the oblast to start digital prescribing and dispensing. This is the most important single factor that allows digital health care units and pharmacies to start using e-prescription. Indicators to evaluate uptake of the EMR and use of new e-Health services will be :

(a) percentage of PHC doctors in project areas using EMRs in their practice;

(b) percentage of PHC doctors in project areas using clinical decision-making tools;

(c) percentage of PHC doctors in project areas receiving patients' summaries from specialists after hospital discharge (report on all relevant health information sent from specialists to PHC); and

(d) number of health care professionals trained on utilization of EMRs and the CHIS.

51. Overall, this subcomponent will finance: (a) civil works for rehabilitation of regional offices (oblast level) for housing IT-related infrastructure; (b) advisory support for the design of the e-Health system, standardization of health care digital data and data exchange protocols, standardization and customization of business processes, implementation of digital decision-support tools based on clinical protocols, and improvement of laws, regulations, institutions, and instructions for health information protection; (c) hardware and software; (d) training of health providers on the cooperation of e-Health system; (e) beneficiaries satisfaction survey; and (f) study tours.

Subcomponent 1.2: Clinical Decision-support Systems for Quality Improvement

52. This subcomponent involves using the IT infrastructure described above to improve quality of health care and improve the rate of adoption of evidence-based clinical practices. The IT system will be used to collect data on quality indicators, provide real-time feedback to health care providers at all levels, and identify problems that need to be addressed. The CDSS will provide reminders or alerts to providers to help them remember what drugs, tests, or other services they should order in which situations. This is essential, given that the clinical practice guidelines for medical care are now so complex that it is near impossible for anyone to remember every task that should be executed in every situation. Lastly, the IT system can improve efficiency and reduce waste of time and resources for both providers and patients through tools such as improved patient scheduling to reduce wait times and cancellations.

Specific Outputs to be developed:

(a) Indicator development and selection

53. This involves a number of steps—first, local clinical leaders should identify which high-priority diseases should be selected for quality measurement. Then, there should be a review of international indicators already being used and develop new indicators where there are gaps and select a final list of indicators. There will also need to be the development of technical definitions (for example, of numerators, denominators, inclusion and exclusion criteria, and so on).

(b) Development of standardized data entry templates

54. In order to facilitate the calculation of quality indicators, necessary information should be submitted on an ongoing basis in a standardized format. For example, to calculate the percent of patients with hypertension who have blood pressure under control, there should be a standard template for collecting information about current diseases (for example, hypertension) and physical measures (for example, blood pressure measurements). If this information is recorded in free text or in nonstandardized formats, then calculation of these indicators will be either impossible or noncomparable between sites. Standardized templates are also essential to allow comparable data from different sites to be stored in the CHIS and then, used to exchange information between different sites.

55. This subcomponent will fund the development of a series of templates, which can include the following:

- Patient demographics and data identification
- List of current medical diagnoses, allergies, and family medical history
- Standard visit utilization data (diagnoses, procedures and services provided, appointment date/time, time of arrival and departure)
- Past surgeries
- Lifestyle—smoking, drug use, diet, exercise, and so on
- Physical measurements (BP, weight, height, and so on)
- Immunization records
- Drug prescriptions
- Disease-specific templates to monitor progress
- Flow sheet/checklist for diabetes; coronary artery disease; congestive heart failure; asthma; chronic obstructive pulmonary disease; mental health/depression; and

tuberculosis management including current symptoms/functional capacity, drug adherence, review of recommended services and lifestyle

- Standard prenatal record
- Well-baby standard record
- Pain scale for chronic pain
- Hospital discharge abstracts and summaries.

(c) Development of coding standards

56. Belarus is already using International Statistical Classification of Diseases version 10 (ICD-10) for coding of diseases in all health sectors. Other coding standards can be developed or adopted for classifying different types of procedures, measuring functional status, and describing differences in the severity of a particular case, for case-mix adjustment. Standards will also be needed for variable names, categories for variables, and data entry formats for the standardized templates described above.

(d) Development of standard reports on quality for providers

57. Ideally, the new decision support should be designed to report real-time information to health care providers on the quality of care. Reports on each quality indicator should be generated based on data in the CHIS and made available, including:

- comparisons between each oblast, rayon, polyclinic, and individual medical doctor;
- 'run charts' showing changes over time for each indicator (that is, indicator on Y axis, time on X axis), available by each oblast, rayon, polyclinic, and individual MD; and
- 'recall lists' for each individual physician or polyclinic—identifying, for each patient which tests, services, or follow-up visits are 'overdue'.

(e) Development of patient-friendly reports, summarizing all key information

58. Engaging patients in their own care is an essential component of any national quality improvement strategy. The e-Health system could be used to create patient-friendly reports summarizing care plans with all key information such as a list of diagnoses; drugs, reason for drugs, and how to take medication; goals for disease control and lifestyle modification; current test results; and desired frequency of follow-up.

(f) Development and/or purchase of CDSS

59. As noted previously, decision-supports include checklists, reminders, alerts, or automatic default orders, which remind providers on what to do in different clinical situations. The

functionality and number of different CDSS' will be specified during the preparation phase. The following list describes specific tools which can be developed under this subcomponent:

- Warnings of drug interactions, drug dose too low or too high, or need for dose adjustment (for example, renal failure)

- Warnings of contraindications (for example, for allergies and other comorbidities such as renal failure, liver failure, and so on)

- Reminders of evidence-based practices to implement (for example, reminding the doctor to prescribe a statin and a beta-blocker if a patient has coronary artery disease)

- Appropriateness criteria for expensive tests (for example, asking the doctor if the patient has certain symptoms which warrant a test such as Computed Tomography or Magnetic Resonance Imaging

- Updating the list of the patient's current diagnoses (for example, when a patient develops a new disease like diabetes, the IT system can remind the doctor to add diabetes to the list of diagnoses if he/she has forgotten to and the patient has obvious indications of diabetes such as abnormal lab test results).

- Development of tools for managing utilization of services

60. The IT system can be designed to track key information needed to use health care resources more efficiently. This can include the following:

- Monitoring scheduling and peak demand for appointments

- Monitoring wait times for appointments, wait times within clinic as a measure of service quality

- Tracking GPs providing minor procedures/services which can be transferred to GPs and tracking specialists' use of these services which should be done by GPs

- Tracking GP referral rates to specialists (adjusted for case-mix)

- Development of optimal process flows for use of decision-support tools.

61. The development of the templates described above will require extensive field testing to identify the best possible workflow. It will be important to identify which types of staff need to enter which types of data and in what order. The desired process should maximize opportunities for task-shifting (that is, moving tasks from specialists to therapists, from therapists to nurses, or from nurses to administrative staff). The desired process should also aim to minimize duplicate data entry and make each aspect of data entry as user-friendly as possible.

62. Existing regulations and orders may dictate current workflows and documentation requirements. As new data templates and data standards are implemented, old regulations may need to be updated to avoid duplicate data entry or other tasks.

Implementation Arrangements

63. As noted already, the RSPC MT should be the lead organization for overseeing the IT agenda. Existing staff are focusing on technical aspects of IT (network development, establishing servers, and connectivity) and should be incorporated into a department for technical IT implementation. It is proposed that a second department of the RSPC MT should be established, focusing on promotion of quality improvement.

64. The rationale for placing this second department in the RSPC MT is because the existing charter of the RSPC MT already includes IT implementation in health care as well as analysis of health indicators, maintenance of sector-wide classifiers, and maintenance of medical statistics reflecting key indicators of the performance of health care agencies. Furthermore, the center already has competence in deploying nationwide e-services (for example, e-prescription), aggregating and analyzing digital data.

Resources Required

Staff Required for Second Department

65. It is anticipated that the following types of staff will be required:

(a) MD leaders with current practical experience

This should include at least one specialist and one GP or therapist. These leaders should be responsible for establishing working groups of providers and identifying local physician advisors as needed.

(b) Statistical analysts, database query analysts

66. Staff will be needed to design and maintain statistical analyses, including

- calculating indicators from data stored on a set of relational databases, using database query tools (for example, Standard Query Language);
- calculation of statistically significant differences between different sites; and
- monitoring of trends over time, and identification of when an improvement is statistically significant (for example, using techniques like statistical process control).

(c) Creation of coding standards group

67. The coding standards group should develop standards for diagnostic, therapeutic, and surgical procedures as noted above. This can be done either by procuring existing tools, adapting

them for local use, or developing their own standards if appropriate international standards do not exist. The teams should also adopt standards for data exchange (for example, HL7). Other tasks include the following:

- Develop and implement protocols and activities for monitoring quality of coding
- Support coding questions from the field
- Standardize data entry templates (as described above)
- Carry out training across the country on how to code properly.

(d) Creation of decision-support design group

68. This group will be responsible for the design of decision-support tools as described above. It is anticipated that there will be decision-support tools that will be embedded in EMRs themselves, and hence, the group will set vendor requirements for EMR companies that wish to compete for contracts with each rayon. The group will also develop a national decision-support tool accessible to all providers.

(e) Process improvement/quality management personnel

69. Process improvement experts are highly essential for achieving the intended results and for a user-friendly design. These individuals will be responsible for mapping out the steps involved in the use of each decision-support tool and help identify the ideal, most efficient workflow. They can ask questions such as ‘when the tool should be used; is there duplicate data entry; does decision support require a minimum of mouse clicks; which staff should enter which data in what order; and so on’.

70. At present, workflow within clinic may be dictated by the MoH Order. One role of these staff will be to identify whether some orders may need to be modified to improve efficiency and to advocate their modification.

(f) User interface design/web design/graphic design expertise

71. Individuals in this group will ensure that data screens are visually appealing, easy to navigate, and highlight information that is high priority.

(g) Project management

72. A dedicated manager will organize the complex set of interrelated tasks proposed under this component as well as identify staff for hire, develop job descriptions, and decide if some functions should be contracted out.

Training of Staff

73. This subcomponent can finance TA to train staff in each of the above roles, including indicator development, statistical analysis, coding systems, decision support, and process improvement/workflow optimization.

Procurement of Tools

74. Software and tools will need to be procured, including the following:

- Statistical software (for example, SAS, Stata), to measure statistically significant differences between sites
- Database query software (for example, SQL) for calculating indicators
- Statistical process control software to track changes and statistically significant improvements over time
- Case-mix adjustment algorithms to control for differences in the severity and complexity of cases between different organizations
- Geographic mapping software to highlight geographic variations in practice.

Evaluation

75. It is recommended that there be a survey of user satisfaction done through an independent survey of physicians, managers, quality personnel at project start-up and at each year end. This will ensure that providers can feel confident giving results to an external body. Specific indicators based on international surveys such as the Commonwealth Fund[18] can be used, such as

- percentage of medical doctors with EMR in their practice;
- percentage of medical doctors who get prompts about drug interactions or dose problems; and
- percentage of MDs with multifunctional decision support (at least two of the following: order entry—generating patient information, generating panel information, and other decision-supports).

76. It will be important to track other measures of both the user-friendliness of decision-support tools and their actual use. Some indicators could be gathered from the IT system itself, such as 'mouse-click count' and 'time' measures for providers to get to certain types of information. The IT system can also look at web track to monitor use of decision-support tools and quality reports.

[18] https://healthit.ahrq.gov/sites/default/files/docs/survey/the-commonwealth-fund-2012-international-survey-of-primary-care-doctors.pdf.

77. The most ambitious level of evaluation will be to look for improvements in actual clinical quality indicators. Within a multiyear initiative such as this one, there is a good likelihood it will be possible to detect improvements in certain types of clinical process indicators, such as percentage of patients who have had certain tests or follow-ups done within the recommended frequency (for example, for diabetes, the percent who had a A1c blood sugar test done at least once every six months). Certain decision-supports (for example, the recall list for overdue patients described above) can be very effective in improving this type of indicator. The percent of patients receiving certain recommended services (for example, a particular drug for diabetes or heart disease) can also potentially improve with the course of the project. Outcome measures (for example, percentage of patients with blood pressure, hemoglobin A1c, cholesterol, and symptoms in control) are more difficult to influence and may require more time. It will be important to track these measures as part of the evaluation, but recognizing that tangible results may not be visible until after the initial five-year phase.

78. Overall, this subcomponent will finance: (a) advisory support on quality indicators and practice tool development—development of tools, customization and field testing, clarification of roles and responsibilities; (b) training of clinical staff in selected regions on the use of clinical practice tools; (c) advisory support for incorporation of the flow sheets and practice tools into the EMR; (d) advisory support for the creation of Quality Monitoring Framework, including dashboards for each clinic in selected regions allowing decision makers to monitor a limited number of high-level indicators; and (e) publishing reports with established benchmarks to highlight differences in quality between different institutions and identifying the highest performers who should be emulated.

Component 2: Improvement of Clinical Competencies of Health Care Providers in Noncommunicable Disease Management (estimated at US$46.2 million equivalent)

Background

79. Belarus has also indicated an interest in expanding the skill labs and simulation center for training at all levels, including undergraduate and postgraduate, and retraining or continuing education for practicing physicians. Clinical sites students and physicians learn skills from basic procedures like venipuncture or catheterization to more advanced situations such as cardiac emergencies and traumas in available centers at universities and at the BelMapo. The intent of such labs and centers is to continue the shift toward practice-based skills training rather than theoretical knowledge; shorten the time for training; allowing providers to experience higher volumes of rarer or complex cases; and creating a safer environment for training where skills are learned on a mannequin/simulator first before working with real patients.

80. The intent for improving medical training capacity in the country is in line with the strategic goal of reorienting the PHC toward more cost-efficient system of general practice. This was driven by the need to cover the population with more qualified health care providers (physicians and assistants to doctors) capable of providing a wide range of preventive and treatment services at the PHC and possessing skills and competencies for better performance. Following the Order of the MoH No. 98 of May 25, 1992 ‘on preparation for introduction of the services of GPs in the Republic of Belarus;’ the MoH developed a comprehensive plan for the

organization of GP training and approved protocols (standards) of examination and treatment of patients within the general practice.

81. The government's policy on reorganization of the GP training is oriented toward eliminating the major drawbacks of the medical education in the past, such as reliance on didactic training and insufficient clinical practice to acquire skills and competencies in handling emergency conditions as well as management of chronic NCDs. The medium-term plan for training of the GP is to complete the retraining of all the PHC providers in the next five years. The total number of physicians to be retrained is about 6,000 while the total number of nurses to be retrained is yet to be defined.

82. The Belarus health care professional training landscape is spread between 17 medical colleges responsible for training nurses, physicians' assistants, dental technologists, pharmacy technicians, and laboratory assistants. Four state medical universities are responsible for training undergraduate medical, dental, and pharmacy students. In addition to these statewide institutions, the BelMapo located in Minsk is responsible for advanced training and retraining of doctors and other health professionals as well as scientific research.

83. The objective of this component is to support GP training and improve skills and competencies of health providers in the provision of a broad range of health services conforming to international best standards. The improvement of clinical training capacity will be done through the following measures:

- Establishing a single leadership governance model for all skills and simulation center with representation from academy, university, and college levels.
- Developing new facilities or renovation of existing ones designed to accommodate modern health care education for a broad range of specialties.
- Upgrading capital skills and simulation equipment fleet across all university and college sites and addressing all curriculum and specialties.
- Developing in situ programs in partnership with hospitals to promote inter-professional education and continue the quality and safety mission of the MoH.
- Developing satellite sites in hospitals to allow increased access after-hours for deliberate practice opportunities for trainees.
- Adopting an anatomical and animal part model for improved realism and long-term cost efficiency.
- Considering opportunities for revenue generation through facilities rental and public course offerings.
- Organizing group learning study tours for front line simulation center technical staff.

84. The following important aspects would require consideration during implementation:

Governance Model

85. The statewide governance model for skills and simulation programs will include representation from academy, university, and college levels which will be responsible for the development and maintenance of curricular standards and standardization across the state facilities. It should look to establish links with partners in hospitals, industry, and other relevant community organizations to help further the goals of improving modern educational opportunities for health care professionals.

Infrastructure and Equipment Capacity

86. Renovation or new build of skills and simulation centers will include renovation of state medical colleges and universities to develop infrastructure designed for skills and simulation education and a new building of center at BelMapo to accommodate advanced training for postgraduate trainees. This should include provisions for mixed fidelity environments including mannequin-based platforms, virtual reality simulators, standardized patient encounters, and procedural skills training. There is an obvious need for modernizing capital skills and simulation equipment fleet. The current equipment is also insufficient to address the current capacity of learners. A thorough needs assessment will be conducted to determine the type and specifications of mannequin-based simulators, part-task trainers, virtual reality simulators, surgical instrumentation, and medical devices. Coordination through the proposed governance model should address distribution of capital resources based on facility and learner capacities. Maintenance of the skills and simulation centers' fleets of equipment should be addressed by either trained biomedical engineering staff or through the procurement of maintenance contracts with individual vendors.

Creation of In Situ Programs

87. This will aim at partnering with state hospital sites and facilitating in situ education programs to promote inter-professional education between practicing physicians, nurses, and allied health professionals. These efforts will not only maintain competencies for the health care professionals involved but also add value to the overall Belarussian health care system through improved quality and patient safety.

88. Adopting an anatomical and or animal part specimen model for training will be achieved through the development of facilities that can accommodate the specific logistics of 'wet lab' materials and can employ staff with the specific skill set to maintain such specimens. Health and safety concerns for staff and learners must be taken in to account such as proper ventilation, cleaning, and sterilization of medical and surgical instrumentation. The benefits of using this model from procedural skills training include improved realism and significant cost savings over the long-term versus synthetic procedural skills trainers.

Revenue Generation

89. The value of highly modernized education training facilities can provide significant revenue generation with a targeted marketing strategy. Because of the substantial investments in the design and build of these facilities, they should not be left dormant for reasons of low capacity of internal learners or subscribing to use only during traditional business hours.

Maintaining the commitment to the primary stakeholders usually leaves evenings and weekends available for external revenue opportunities. Primary targets for external clients include military, police, fire, and paramedic sectors.

Staff Training

90. Operating sophisticated high-tech skill labs and simulation center will require development of skill labs and simulation center for front line technical staff. The following areas of training will be addressed:

- 6th fidelity-level mannequin-based software
- General maintenance of procedural skills models
- Capture and playback software
- Anatomical and animal part specimen handling
- Moulage training.

Standardization

91. The aim of standardization in the area of simulation education equipment and capture and playback software is to enable different sites (including colleges, universities, and academy) to exchange technical expertise gained through experience and study tours.

92. This component will finance (a) advisory support to review the curriculum and development of unified standards for training of GPs as well as specialists; (b) advisory support for the development of a certification program for verifying student/trainees' skills; (c) skill labs for all four universities and 17 secondary colleges in Belarus; (d) simulation equipment for a high-tech simulation center at BelMapo; (e) skill labs equipment for medical universities and colleges; (f) advisory support to faculties at universities for the establishment of GP departments; (g) training of trainers; (h) civil works to house high-tech simulation center in BelMapo and skill labs at universities and colleges; (i) software to program different cases for trainees' review; (j) study tours (including conferences, workshops); and (k) beneficiary surveys.

93. It is expected that investments in infrastructure, capital equipment, and operations knowledge will result in improved quality of health care through better training of health care professionals. The decision-making structure such as Training Program Coordination Committee (TPCC) will be established for facilities that deliver hands-on education. It will have representation from 17 medical colleges, 4 medical universities, and the academy. The TPCC will ensure coordination and harmonization of training programs at all medical training institutions.

Component 3: Modernization of Neonatal Care at the Republican Center of Mother and Child (RCMC) (estimated at US$11.6 million equivalent)

Background

94. Belarus has achieved considerable improvements in infant and child mortality. Meanwhile, the neonatal mortality accounts for the majority of child mortality in the country. The government has made further efforts to improve quality of neonatal care provision in line with international best standards. The current system of neonatal care provision involves secondary-level departments at maternity hospitals in the regions (oblasts) and tertiary-level neonatal department at the RCMC. The RCMC has a long and advance tradition in managing the most complex cases delivered from different regions of the country, including areas affected by the Chernobyl catastrophe 30 years ago. It annually treats about 14,000 patients, out of which 12,000 are from the regions. The neonatal department of the RCMC currently has 30 beds and the annual number of newborns treated is about 1,000. The range of health care services includes resuscitation of newborns with low birth weight (1000–1500 g) and extremely low birth weight (500–1000 g), treatment of retinopathy, surgical correction of congenital abnormalities, and so on. The center also provides methodological and capacity improvement support to regional health care facilities with established neonatal departments. However, the center lacks appropriate infrastructure and equipment capacity. The poor infrastructure, limited space, absence of central ventilation system, outdated medical equipment, nonadequate operating room, and so on, makes the work of the department extremely difficult, creates favorable environment for hospital infection, hinders orchestrating of intensive care, and therefore, creating obstacles for management of extremely complex care. Lack of appropriate conditions and equipment at operating room lowers the survival rate in those cases when the newborns need immediate surgery and cannot be transported to other specialized surgical hospitals.

95. The objective of this component is to support the modernization of the neonatal department at the RCMC in line with international best practice. This will include infrastructure, equipment, and medical staff capacity improvement and advancement of quality improvement measures through use of ICT-enabled quality monitoring tools. The expected results are an increase in the number of successfully treated newborns with complications; significant reduction in hospital infection rate; decrease in average length of stay at the department; increase in the number of surgeries performed at the department; and upgraded skills and knowledge of clinical staff.

96. The component will finance: (a) civil works; (b) provision of medical equipment and furniture; (c) provision of telemedicine and simulation equipment, and didactic material; (d) training of medical personnel; (e) study tours; and (f) TA to develop the quality improvement tools and procedures.

Outputs

97. It is expected that the modernization of the neonatal department, the creation of appropriate infrastructure conditions, the provision of modern biomedical equipment, the upgrading of skills of personnel as well as the adoption of up-to-date clinical protocols and quality improvement tools will contribute to reducing hospital infection cases, reducing death

rate at the department, and having a long-term impact of reducing disability rate among children born with low and extremely low birth rates.

Governance

98. The administration of the center and designated staff at the neonatal department will be responsible for the component implementation. They will liaise with the RSPC MT responsible for logistics, including procurement of civil works, equipment, and so on. The United Nations Children's Fund (UNICEF) will provide advisory support to the neonatal department on the issues of quality improvement, supportive supervision, and quality monitoring.

Component 4: Project Management, Monitoring and Evaluation (estimated at US$2 million)

99. The objective of this component is to support the PMU at the national level, which will be responsible for day-to-day project implementation (fiduciary, safeguards), and technical advisory support for Components 1, 2, and 3. This component will also finance financial audits and will sponsor complementary data collection and analytical activities for monitoring results (that is, citizen/beneficiary engagement indicators, and so on). Information and data collection from the RSPC MT will be complemented through evidence-based data on specific areas and ad hoc household and facility surveys. In addition, the component will sponsor learning events to educate and promote better use of evidence for policy.

Annex 3: Implementation Arrangements

BELARUS: Health System Modernization Program

Project Institutional and Implementation Arrangements

Project Administration Mechanisms

1. The MoH, as the overarching authority in the health sector, would be responsible for implementation and oversight of the proposed Project. The MoH would develop, steer, coordinate, implement, and monitor Project activities. Other entities involved in Project implementation would include MoH-subordinated institutions, notably: the RSPC MT for component 1, the Belarussian Medical Academy of Post-Graduate Education (BelMapo) for component 2, and the RCMC for component 3. In addition, the health departments of the local administration would lead the activities implemented at the sub-national level (in selected oblasts and in Minsk city).

2. The Deputy Minister of the MoH in charge for the Project would be entrusted with overall strategic oversight of the Project. Day-to-day supervision and coordination of Project activities within the MoH would be the responsibility of a PMU headed by a Project Director and located at the RSPC MT to be established **by effectiveness**. The PMU would consist of a core team of experts (fiduciary, safeguards, M&E, and technical) to ensure day-to-day management.[19] The Inter-sectoral Project Preparation Working Group (WG), which is already on board, will be transformed by ministerial order to a Steering Committee with assigned dual responsibility to (i) provide overall guidance on key areas of the proposed project during implementation; and (ii) lead health policy dialogue. The Steering Committee, as a platform for higher level policy dialogue for the sector, will comprise of additional stakeholders, including: Heads of all MoH departments, representatives of CSOs, and development partners (WHO, UNICEF, etc.). The core members of the WG (to become a Steering Committee) will meet at least once a month to discuss project implementation progress while the extended Steering Committee will meet at a minimum bi-annually to discuss strategic policy issues and agree on areas of support to ensure coordination and complementarity.

3. Procurement and FM functions would be fulfilled by local full-time consultants with, preferably, experience in World Bank procedures and or externally-financed projects. At the same time, efforts to build such capacity within the MoH during Project implementation would be included in the respective terms of reference of these consultants.

4. The Project Director would directly report to the Deputy Minister in charge on all matters pertaining to the project and she or he would, in turn, report to the Minister of Health and initiate the consideration of the most important issues raised by the Steering Committee. The

[19] The Steering Committee would emanate from the Inter-sectoral Project Preparation Working Group established by MoH's order No. 167a of October 30, 2015. In addition to the PMU core team members, there could be specialists in critical areas of the health system who could be recruited on a short-term basis and or as may be needed: IT/e-Health, public health, health service delivery and health care quality, medical education and human resources for health, training coordinator, safeguards, communication/citizen engagement, office manager, administrative personnel, translators.

responsibility for ensuring the appropriate fulfillment of fiduciary functions (procurement and FM) would be entrusted to the Deputy Minister supervising the respective functions within the MoH. Final accountability for the Project within the MoH would rest with three individuals: the Minister, the Deputy Minister in charge, and the Project Director.

5. The MoH, through the Steering Committee, would provide sectoral policy oversight, stewardship of the project, and working-level coordination with concerned government agencies and regional authorities. The MoH officials represented in the Steering Committee would be jointly and separately responsible for project components and subcomponents falling into their areas of responsibility. Representatives of other institutions, government agencies and key experts would be invited to join the Steering Committee as needed. The Steering Committee would be led by the Deputy Minister of the MoH in charge and meet as needed but its core members would meet no less than on a monthly basis to review implementation progress and take decisions on issues considered. While not working full time on project implementation, these officials would remain fully accountable for implementation progress for their respective component/subcomponents. The table below presents areas of responsibility and involvement of key institutions during project implementation.

Table 3.1. Distribution of Responsibilities by Project Components

Project Components	Strategy/Oversight/Steering Functions	Implementation Functions
At sector level	Minister of Health/Deputy Minister of Health in charge	Steering Committee comprising key stakeholders (i.e., heads of MoH departments), including representatives of CSOs, development partners (WHO, UNICEF, etc.) to lead health care policy and reforms. The Steering Committee will meet at a minimum bi-annually to discuss progress of reforms and agree on areas of support to ensure coordination and complementarity.
At Project level	Deputy Minister of Health in charge of the Project (MoH)	Core members of the Steering Committee: all heads of MoH Departments, representatives of other key ministries (Economy, Education, Communications), Project Director (PMU), relevant expertise as may be needed. To meet at a minimum on a monthly basis.
Component 1. Establishment of e-Health and clinical decision support systems		
Subcomponent 1.1 Integrated Health Information System	RSPC MT	e-Health WG; PMU (component coordinator and expertise); Legal Department of MoH; health departments (oblast level), Ministry of Communication
Subcomponent 1.2 Clinical decision support system for quality improvement	RSPC MT	e-Health WG; PMU (component coordinator and expertise); health departments (oblast level); rayons hospitals and PHC facilities

Project Components	Strategy/Oversight/Steering Functions	Implementation Functions
Component 2. Improvement of clinical competencies of health care providers in NCD management		
Provision of skill labs to medical universities and colleges, and creation of simulation center in BelMapo	BelMapo and WG	Core members of Steering Committee; PMU (component coordinator and or expertise); TPCC with representation of medical universities and colleges; BelMapo
Component 3. Modernization of Neonatal care at the RCMC		
Modernization of neonatal care	RCMC	Core members of Steering Committee; PMU (component coordinator and or expertise); Head of the neonatal department at the RCMC
Component 4. Project management, monitoring and evaluation, and communications strategy		
Project Management	RSPC MT/PMU	PMU Director, FM Specialist, Procurement Specialist, M&E specialist, component coordinators, and short term key expertise as may be required

6. Given the heavy routine work load of the core members of the Steering Committee, full-time project implementation and management would be carried out by the PMU. Meetings to be chaired by the Deputy Minister of the MoH in charge will be organized by the PMU with the core members to review and coordinate implementation of the project. In addition, the Project Director would report on a weekly basis to the Deputy Minister in charge on overall implementation progress and issues of importance. All reporting and oversight relationships would be summarized in a POM to be ready **by effectiveness**.

7. The core members of the Steering Committee responsible for project implementation, being core MoH staff, would be financed by the Government of Belarus through regular salaries, with an adjustment in their work program to allow sufficient time for project-related tasks. These arrangements are considered optimal given the high work load of MoH staff and the need for additional staff to manage administrative, fiduciary, logistical, and some technical tasks, and to ensure coordination. Such arrangements do not represent a traditional Project Implementation Unit approach, since PMU consultants will not have decision-making authority and would be hired solely to facilitate the day-to-day management of project implementation. In addition, since the project represents an integral part of the government's health sector reforms, the responsibilities of MoH staff under the project would be essentially the same as their responsibilities for implementation of reforms in the health sector.

8. The RSPC MT would be both one of the beneficiaries and the implementing entity for Component 1 in addition to being responsible for the smooth implementation of the entire project (supported by the PMU). As the beneficiary, it will receive TA, goods, training, and operational support, while as the implementing entity, it would be involved in the design and implementation of mechanisms, tools, and processes envisaged under the project. Operationally, the Project Director of the PMU located under the hospice of the RSPC MT would be one of the core members of the MoH Steering Committee.

9. BelMapo would have the objectives of improving the medical education standards, clinical protocols, and standards for control over quality and accessibility of health services. BelMapo would function as a self-regulated organization able to take decisions and to develop, implement, monitor and evaluate regulations in specified areas. BelMapo, with support from the PMU, would liaise with medical universities and colleges benefitting from the proposed Project under Component 2. Under the Project, BelMapo would benefit from organizational and methodological support, TA, goods (simulation center and skill labs), and capacity building.

10. The RCMC Neonatal Department would take the lead role in the process leading to the modernization of its neonatal care Department and would liaise with the PMU on fiduciary areas for Component 3.

11. Other MoH-subordinated institutions could potentially be involved in the technical implementation of Project activities. The Project would not finance recurrent costs of these institutions, except for the incremental costs related to the functioning of the PMU; rather, the institutions would be engaged in the provision of various specific services corresponding to their technical competence areas. Such institutions and their functions/competencies are listed in the following table.

Table 3.2. Key Institutions Potentially Involved in Project Implementation

Institution Name	Key Institution Competence Area and Functions
Component 1. Establishment of e-Health and clinical decision support systems	
RSPC MT (e-Health Working Group)	Development of e-Health standards for government's adoption, participation in implementation of best practices in Health Information Management, introduction of international classifiers and terminologies (ICPC, SNOMED [Systematized Nomenclature of Medicine], and so on), and participation in the development of the testing of e-Health services in selected cities or oblasts. as a pilot institution in implementing new tools in medical education (educational programs, accreditation standards, innovation technologies, and so on), and introduction of EBM and HTA into medical education and clinical practice
Health Departments at Oblast Level	Coordination of integrated information systems development and implementation at the oblast level (including Minsk City) and in health facilities
Health facilities	Participation in the testing of e-Health services in health facilities of selected cities and oblasts.
Component 2. Improvement of clinical competencies of health care providers in NCD management	
Belarussian Medical Academy of Post-Graduate Education (BelMapo)	Implementation of independent assessment of knowledge and practical skills of medical graduates and health professionals, coordination of continuous professional development, including teaching delivery at the simulation center and oversight at skill labs at medical universities and colleges, including certification; provision of advisory support and methodological support to medical universities and colleges for the establishment of GP departments.

Institution Name	Key Institution Competence Area and Functions
Medical Universities (4) and colleges (17)	Technical and methodological support to development, revision, quality assessment, implementation, and implementation monitoring of Clinical Practice Guidelines (CPGs), methodological support to the integration of PHC and Public Health (through implementation and monitoring of new CPGs at PHC level, and introduction of international ICPC service classifier); involvement in the re-training of practicing physicians and nurses to become GP and assistant doctors.
TPCC	TPCC to be established for facilities that deliver hands on education with representation from the 17 medical colleges, 4 Medical Universities and Academy. Ensure coordination and harmonization of training programs at all medical training institutions.
Steering Committee	Participation in development, implementation, and monitoring of inter-sectoral strategies in public health on health promotion issues
Component 3. Modernization of neonatal care at RCMC	
RCMC (neonatal department)	Participation in development, revision, quality assessment, implementation, and implementation monitoring of Clinical Practice Guidelines (CPGs); monitoring of neonatal surgery medical care provision standards development and implementation

12. Health departments of local administrations of selected oblasts and Minsk city, would support implementation of project activities at the sub-national level. These would include, but not be limited to, physical investments such as small-scale renovation works in existing health facilities and regional offices, communications campaigns at the sub-national level, training, and so on.

Financial Management, Disbursements and Procurement

Financial Management

13. The FM arrangements will meet the minimum requirements after the agreed actions, as summarized below, are completed. The FM assessment focused on the assessment of the existing capacity of RSPC MT, building on its current experience of implementation of Global Fund grants. Given that RSPC MT is new in implementing World Bank-financed projects, additional capacity building effort and implementation support to RSPC MT would be provided prior to project start up. The FM and disbursement functions in this project will be the sole responsibility of RSPC MT and its PMU, and none of the other entities involved in technical aspects will be involved in the flow of funds mechanism.

14. ***Staffing.*** Staff of the accounting department of RSPC MT have experience in accounting and reporting under requirements of local legislation, including accounting and reporting under National Accounting Standards. The part-time FM consultant that is supporting RSPC MT during the project preparation phase will be hired on a full time basis after effectiveness and will be financed from project funds. An accountant./disbursement specialist will also be hired. Additionally, one or two accountants of RSPC MT will be appointed and be responsible for

certain areas of FM for the project. Specific roles and responsibilities of the RSPC MT staff and the FM consultant will need to be detailed in the project POM.

15. ***Accounting and reporting.*** Existing accounting software 1-C will be used for project accounting and reporting purposes. Project records will be maintained in a separate set of accounts that are segregated from the other records maintained at RSPC MT. The available 1-C software is acceptable, and its further modifications to fully suit the project needs will be made, specifically to allow recording US$ equivalents of payments as well as allow automatic preparation of reports, both IFRs and SOEs. The accounting system will be modified within 90 days from effectiveness (dated covenant). The PMU will prepare and submit consolidated quarterly IFRs after end of each calendar quarter, based on the agreed sample format, starting from the quarter in which the first project disbursements occur.

16. ***Auditing.*** Project financial statements will be audited annually by independent auditors acceptable to the Bank, and will cover the entire project, including all components. Such audits will be carried out under requirements of International Standards on Auditing, and will be due within six months after end of each fiscal year. Annual audits of the entity financial statements of RSPC MT will not be required. Project audit reports and financial statements will be publically disclosed by RSPC MT and by the World Bank within two months of their submission.

17. ***Internal controls.*** An additional area of focus of the assessment are the procedures and internal controls for the coordination between RSPC MT (in charge of fiduciary functions) and the other organizations that would be involved in project implementation. Internal controls will include segregation of duties between responsible staff, authorizations of payment documents, verification of goods delivered, periodic reconciliations of records, etc. Effectiveness of internal controls will be reviewed during FM monitoring visits, and auditors will be required to report on any deficiencies in the internal control operations. The POM will be approved by effectiveness (*condition of effectiveness*), detailing the functions of the FM staff involved in project implementation, as well as providing a full description of the internal controls and procedures.

Disbursements

18. Bank funds would be disbursed under the Bank's transactional procedures including direct payments from the loan account, issuance of Special Commitments and disbursements through the Designated Account (DA).

19. The Designated Account will be opened and managed at a commercial bank acceptable to the World Bank. The maximum allocation for the Designated Account would be established in the Disbursement Letter. The frequency of reporting eligible expenditures paid from the Designated Account would be on a monthly basis, supported by necessary documentation as stated in the Disbursement Letter and along with the DA bank statement and a reconciliation of the DA bank statement. Further, an account in BYR for payments in BYR would be opened in the same commercial bank.

Procurement

20. Procurement of goods, works, and non-consulting services for the proposed Project would be carried out in accordance with the World Bank's "Guidelines: Procurement of Goods,

Works and Non-Consulting Services under IBRD Loans and IDA Credits and Grants by World Bank Borrowers," dated January 2011 and revised on July 1, 2014 (Procurement Guidelines); and procurement of consultant services will be carried out in accordance with the World Bank's "Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits and Grants by World Bank Borrowers," dated January 2011 and revised on July 1, 2014 (Consultant Guidelines), and the provisions stipulated in the Loan Agreement. The Bank's "Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants," dated October 15, 2006, and revised in January 2011 (Anti-Corruption Guidelines) would apply to this Project. A General Procurement Notice will be published on the Bank's external website and the UN Development Business website after the bidding documents are ready. The implementation arrangements will be described in the Project Operational Manual (POM) which will be prepared by the Implementing Agency and submitted for the Bank's review and approval. The following section describes the procurement implementation arrangements to be agreed with the borrower.

Procurement Capacity and Risk Assessment

21. A Procurement Capacity and Risk Assessment of the project's implementing agency (RSPC MT) was carried out in April 2016. The PMU will be directly responsible for the day-to-day implementation of all the activities under the Project. The PMU will be in charge of the entire procurement process, including planning, preparation of bidding documents, evaluation of bids, award of contracts, and contract management. The PMU will coordinate all procurement processes, however the respective entities (BelMapo and RCMC) will be in charge of preparing terms of reference or technical specifications for their assignments including quality check and approval of consultants' work. The PMU's procurement function will be additionally strengthened by a Procurement Specialist, who will be hired under the project, including management of tenders in accordance with World Bank rules and procedures.

22. The key issues and risks concerning procurement for implementation of the project include: (a) potential risk of delays in the implementation of the first set of works contracts, including procurement of medical and IT equipment; (b) costs overruns due to claims and variation orders; and (c) low competition.

23. Given the findings of the assessment as presented above the procurement risk for the proposed project is rated as **substantial**. The following measures and actions have been identified to mitigate the identified procurement-related risks:

Table 3.3. Mitigation Actions

	Mitigation Measure	Responsible Party	Deadline
1	Prepare a detailed Procurement Plan for the first 18 months of the implementation of the project	RSPC MT	Appraisal (no later than May 2016)
2	Organize a business outreach for potential bidders or consultants before launching the first bidding procedures	RSPC MT	Upon Board Approval (no later than November 2016)

	Mitigation Measure	Responsible Party	Deadline
3	Finalize preparation of the bidding documents for the most critical packages of works and goods for the first year of Project implementation of Component 1	RSPC MT	No later than December 1, 2016
4	Hire three Procurement Consultants, one with ICT Procurement experience	RSPC MT	Implementation
5	Bank's ICT procurement specialist to work closely with PMU and organize procurement refresher training events for project staff whenever required during project implementation	Bank	Recurrent
6	Preparation of procurement progress reports by the Borrower during Project implementation	RSPC MT	Implementation

Procurement Implementation Arrangements

24. **Procurement of Works.** The project would include rehabilitation, reconstruction and upgrading of facilities across Belarus. Large value civil works are not envisaged, however, if any contracts are above US$ 10 million, the Bank's latest Standard Bidding Documents (SBD) Procurement of Works would be used. For individual contracts below US$ 10 million, the most recent Standard Bidding Documents (SBD) Procurement of Small Works would be used. International Competitive Biddings (ICBs) shall be conducted for all contracts above US$ 5 million per contract. For contracts below US$ 5 million per contract, the same SBD for Procurement of Small Works may be used or a sample Bidding Documents for National Competitive Bidding (NCB). For contracts below US$ 5 million, NCB procedure will apply, instead of ICB. Shopping procedure may be used for very small value civil works contracts estimated to cost not more than US$ 200,000 per contract.

25. **Procurement of Goods and Non-consulting Services.** The project will involve procurement of medical and IT equipment. The most recent version of the Bank's Standard Bidding Documents (SBD) for Goods shall be used for all ICB above US$ 1 million per contract. The Bank's sample Bidding Documents for Goods under NCB may be used for contracts below US$1 million while shopping procedure may be used for goods estimated to cost up to the equivalent of US$100,000 per contract. SBD for Goods may be used for *ICT related procurement,* such as general purpose hardware and off-the-shelve software (without customization). *Single Stage Supply and Installation of Information Systems SBD:* This SBD will be used if a procurement package combines critical goods and services elements, sophisticated hardware requiring an informed performance comparison and special training requirements, a dominating value of the software packages, extra installation and support requirements for these, software design, large-scale adaptation and/or development, requirements for the supplier to continue to operate the equipment after installation, for contracts requiring pricing for both investment and recurrent costs (life-cycle).

26. Logistical services for training and workshops related to TA shall be procured as non-consulting services.

27. **Selection of Consultants.** The consultant services under the Project would include inter alia: (a) construction design services under Components 1, 2, and 3; (b) TA and various studies

and surveys as may be required under all components. Short-list may comprise entirely national consultants for assignments estimated to cost US$ 300,000 per contract.

28. **Procurement Plan and Procurement Thresholds.** A Procurement Plan for the first 18 months of the project that also provides a basis for the procurement methods and thresholds has been agreed between the Bank and the client during negotiations. This plan will be published on the Bank's external website before Board approval. The Procurement Plan would be updated at least annually or as required to reflect actual project implementation needs. Procurement under the project would include the following categories: Works, Goods and Non-Consulting and Consulting Services. The applicable thresholds for procurement methods and Bank prior review are included in the procurement plan and presented in the following Table 3.4.

Project Procurement Plan

Table 3.4. Procurement Plan with Methods and Bank Prior Review

Ref. No	Contract Description	Estimated cost USD	Proc. method[20]	Review by Bank (Prior/ Post)
Investment Costs				
OE0.1	*Project Management Unit*			
OE0.1.1	PCU staff Fees	635,295	QCBS	Prior
OE0.1.2	Loan Audit	134,000	CQS	Prior
OE0.1.3	Training/seminars/workshops	455,000	CQS	Prior
OE0.1.4	Studies and Surveys	356,250	Shopping	Post
OE0.1.5	Office Equipment	20,000	Shopping	Post
	Sub-Total Component 0.1	***1,600,545***		
OE0.2	*Project Management Unit*			
OE0.2.1	In-country travel	91,955	Shopping	Post
OE0.2.2	FM software upgrade	15,000	Shopping	Prior
OE0.2.3	Front-end Fee	312,500		
	Sub-Total Component 0.2	***419,455***		
Component no. 1				
OE1				
OE1.1	Yearly subscription of medical standards coding, etc.	12,000	Shopping	Post
	Sub-Total Component 1	***12,000***		
Component no. 2				
OE2				
OE2.1	Yearly subscription of medical standards coding, etc.	12,000	Shopping	Post
	Sub-Total Component 2	***12,000***		
Component no. 3				

[20] ICB: International Competitive Bidding; DC: Direct Contracting; QCBS: Quality and Cost Based Selection; QBS: Quality Based Selection; FBS: Fixed Budget Selection; LCS: Least Cost Selection; CQS: Consultant's Qualifications Selection; SSS: Single (or Sole) Source Selection; IC: Individual Consultant Selection procedure; NA: Not applicable.

Ref. No	Contract Description	Estimated cost USD	Proc. method[20]	Review by Bank (Prior/ Post)
OE3				
OE3.2	Yearly subscription of medical standards coding, etc.	12,000	Shopping	Post
	Sub-Total Component 3	***12,000***		
	Total Operating expenses	***2,056,000***		
B. Consultants' services				
Component no. 1				
CS1	***Establishment of E-health***			
CS 1.1.	***Foreign***			
CS 1.1.1	***Terminology, Coding & Standardization***	**528,000**	OKC (QCBS)	Prior
	Development of coding standards	72,000		
	Design of decision support tools and reporting templates	72,000		
	Development of data exchange standards	72,000		
	Development of e-Health architecture	120,000		
	e-Health system design	120,000		
	Medical standardization advisor	72,000		
CS 1.1.2	***Security and data protection specialist***	**72,000**	IC	Post
CS 1.1.3	***Statistics and Clinical Processes***	**276,000**	CQS	Post
	Health care provider surveys	60,000		
	Design of statistical analysis	72,000		
	Quality indicators design and selection	72,000		
	Workflow process optimization	72,000		
	Sub-Total Component 1.1	**876,000**		
CS 1.2.	***Local***			
CS 1.2.1	Central Unit staffing (25)	1,064,000	IC	Post
CS 1.2.2	Central Unit Support Staffing (2)	33,300	IC	Post
CS 1.2.3	Legal legislations	31,200	IC	Post
	Sub-Total Component 1.2	**1,128,500**		
	Sub-Total Component 1	***2,004,500***		
Component no. 2				
CS2	***Improvement of Competencies of Health Care Providers in NCDs***			
CS 2.1.	***Foreign***			
CS 2.1.1	Architectural design: Belmapo, incl. research lab	36,000	IC	Post
CS 2.1.2	Development of Training Program for Belmapo	24,000	IC	Post
CS 2.1.3	Technical specification on medical equipment	6,000	IC	Post
CS 2.1.4	Development of checklist	24,000	IC	Post
	Sub-Total Component 2.1	**90,000**		

Ref. No	Contract Description	Estimated cost USD	Proc. method[20]	Review by Bank (Prior/ Post)
CS 2.2.	***Local***			
CS 2.2.1	Architectural firm: Belmapo (5% of construction costs)	150,000	CQS	Post
CS 2.2.2	Architectural firm for bill of quantities: Medical Universities and Colleges	150,000	CQS	Prior
CS 2.2.3	Technical supervision	9,000	CQS	Post
	Sub-Total Component 2.2	**309,000**		
	Sub-Total Component 2	***399,000***		
Component no. 3				
CS3	***Modernization of Mother and Child Hospital***			
CS 3.1.	***Foreign***			
CS 3.1.1	Architectural design	12,000	IC	Post
	Sub-Total Component 3.1	**12,000**		
CS 3.2.	***Local***			
CS 3.2.1	Technical supervision	3,000	IC	Post
CS 3.2.2	Architectural firm	5,000	IC	Post
	Sub-Total Component 3.2	**8,000**		
	Sub-Total Component 3	***20,000***		
	Total Services	***2,423,500***		
D. Civil Works				
Component no. 1				
CW1	*Establishment of E-health*			
CW1.1	Rehabilitation of Administrative Unit for e-Health and National Data Center, including server rooms	130,000	Shopping	Post
CW1.2	Rehabilitation of Oblast health dept. offices for Promotion of Healthcare quality (as may be needed)	140,000	Shopping	Post
	Sub-Total Component 1	***270,000***		
CW2	*Improvement of Competencies of Health Care Providers in NCDs*			
CW2.1	Construction Belmapo simulation center, incl. research lab	3,000,000	ICB	Post
CW2.2	Rehabilitation of Medical Universities (4) and of Medical Colleges (17)	1,700,000	ICB	Post
	Sub-Total Component 2	***4,700,000***		
CW3	*Modernization of Mother and Child Hospital*			
CW3.1	Construction of new premise	5,864,000	ICB	Prior
	Sub-Total Component 3	***5,864,000***		
	Total Civil Works	***10,834,000***		
C. Education				

Ref. No	Contract Description	Estimated cost USD	Proc. method[20]	Review by Bank (Prior/ Post)
Component no. 1				
ED-1	*Establishment of E-health*			
ED-1	*Training & Capacity Building*	**276,000**	ICB	Post
	Central unit and Oblast health dept.: study tour e-health set up and conferences	170,000		
	Training of quality managers (Oblasts and all rayons)	48,000		
	General training on decision support system and quality indicators (central, Oblast, Rayons)	18,000		
	Training on use of new applications for healthcare professionals (1000)	40,000		
	Sub-Total Component 1	***276,000***		
Component no. 2				
ED-2	*Improvement of Competencies of Health Care Providers in NCDs*			
ED-2.1	Central unit and Oblast health dept.: study tour e-health set up and conferences	24,000	Shopping	Post
ED-2.2	Training of quality managers (Oblasts and all rayons)	25,000	Shopping	Post
ED-2.3	General training on decision support system and quality indicators (central, Oblast, Rayons)	126,000	QCS	Post
ED-2.4	Training on use of new applications for healthcare professionals (1000)	210,000	QCS	Post
	Sub-Total Component 2	***385,000***		
ED-3	*Modernization of Mother and Child Hospital*			
ED-3.1	Staff training	50,000	**miscellaneous**	
ED-3.2	Study tours	35,000	**miscellaneous**	
	Sub-Total Component 3	***85,000***		
	Total Education	***746,000***		
D. Goods				
Component no. 1				
G.1	***Establishment of E-health***			
G1.1	Establishment RSPC MT (Office equipment,Servers & Network Equipment)	**197,000**	MKT (ICB)	Post
	Office equipment, including computers for central unit (30)	45,000		
	5 servers and hardware for storage for central unit	100,000		
	Network equipment	10,000		
	Computer for Oblast Health Dept. for Promotion of Healthcare quality (7)	42,000		
G1.4	Software platform: Central Health Information System (CHIS), including document registry (IHE-XDS)	8,500,000	MKT (ICB)	Prior

Ref. No	Contract Description	Estimated cost USD	Proc. method[20]	Review by Bank (Prior/ Post)
G1.5	Central EMR Software for Nationwide Health Information System (Patient Portal, Portal for Healthcare Organizations, Viewer software for medical images, etc.)	6,500,000	MKT (ICB)	Prior
G1.6	Rent of Hardware Access for Nationwide Health Information System in Data Centre	1,200,000	DC	Prior
G1.7	Rent of Broadband Access for Nationwide Health Information System in Data Centre	1,000,000	DC	Prior
G1.8	Decision support software for Nationwide Health Information System	1,150,000	MKT (ICB)	Prior
G1.9	Infrastructure for identification of healthcare professionals (Digital signature)	1,750,000	MKT (ICB)	Prior
G1.10	Statistical software for Nationwide Health Information System (Application software to retrieve and present analytical data and quality indicators from CHIS for Oblast Health Dept. for Promotion of Healthcare quality (7). Software for sharing reports and templates to rayons and cities.)	900,000	MKT (ICB)	Post
G1.11	Development of security system (software and hardware for CHIS and local centres)	3,000,000	MKT (ICB)	Prior
G1.12	Purchase of licenses of international medical coding/terminologies/nomenclatures	495,000	MKT (ICB)	Post
G1.13	Development of standardized and structured documents	900,000	MKT (ICB)	Post
G1.14	Completion and Upgrade of current EMR softwares to connect with CHIS (Minsk, Republican Centres)	3,000,000	MKT (ICB)	Prior
G1.15	Development and installation of EMR-s in integrated digital healthcare units in rayons and cities and Oblasts´. Computers, software, network (soft and hardware), maintenance (incl. help desk). Rayons of Minsk oblast will be provided 100% of EMR and integration with CHIS, other Oblasts´ rayons will be covered approx. oblast level up to 70%, rayon level - up to 40%	34,056,500	MKT (ICB)	Prior
	Sub-Total Component 1.1	**62,648,500**		
Component no. 2				
G2	***Improvement of Competencies of Health Care Providers in NCDs***			
G2.1	Simulation equipment: Belmapo, incl. research lab	16,000,000	MKT (ICB)	
G2.2	Skills labs equipment: Medical Universities (4)	16,921,228	MKT (ICB)	Prior

Ref. No	Contract Description	Estimated cost USD	Proc. method[20]	Review by Bank (Prior/ Post)
G2.3	Skills labs equipment: Medical Colleges (17)	5,481,200	MKT (ICB)	Prior
G2.4	Office equipment and furniture: Belmapo	250,000	MKT (ICB)	Post
G2.5	Office equipment and furniture: Medical Universities (4)	732,000	MKT (ICB)	Prior
G2.6	Office equipment and furniture: Medical Colleges (17)	1,277,572	MKT (ICB)	Prior
	Sub-Total Component 2	**40,662,000**		
Component no. 3				
G3	***Modernization of Mother and Child Hospital***			
G 3.1	Medical equipment	5,000,000	MKT (ICB)	Prior
G 3.2	Medical furniture	300,000	MKT (ICB)	Post
G 3.3	Office furniture et equipment	330,000	MKT (ICB)	Post
	Sub-Total Component 3	***5,630,000***		
	Total Goods	***108,940,500***		
	Total expenditure	***125,000,000***		

29. The Bank would review procurement arrangements as performed by the PMU. All procurements not subject to Bank prior review will receive Bank's ex post review, on a random basis and in accordance with the procedures set forth in appendix 1 of the Procurement and Consultant Guidelines. One in 15 contracts will be subject to the Bank's ex post review. The ex post review of procurement documents would normally be undertaken during the Bank's implementation support visits; the Bank reserves the right to request documents for any contract at any time.

Environmental and Social (including safeguards)

Environmental safeguards

30. Expected environmental impacts of the project are standard for medium-scale construction (i.e simulation center at BelMapo and new section of medical premises at the RCMC) and small-scale renovation at regional offices for housing IT equipment, medical universities and colleges (for housing skill labs), and is perceived as relatively minor which can be readily mitigated with standard procedures. The proposed Project is classified as Category B. Some sub-projects (i.e. minor renovation works) will be implemented in historic buildings and OP/BP 4.11 "Physical Cultural Resources" is triggered. These buildings are being currently used as functioning premises (classes, laboratories, etc.) of medical universities and colleges. Historic and cultural value of these buildings will not be affected as a result of project activities. Belarus legislation and regulations are sufficient to protect the cultural values. The regulations on works in historic buildings will be applied and special permits for such works will be received from the Ministry of Culture.

31. BelMapo is planning to locate the building of the new simulation center on the sites currently occupied by BelMapo's garages, warehouses and small administrative building and belonging to BelMapo. The initial concept of the simulation center suggests that the total square meter of the Center should be at least 1500 sq. m. The functional design of the simulation center is currently being developed; the design should also provide premises to house the equipment/vehicles and offices currently housed in the garages, warehouses and administrative building.

32. Medical premises at the RCMC. The RCMC historically faces various challenges associated with its old premises. Space of the existing premises is insufficient from the point of view of the volume of patient flow, sanitary conditions and functionality of the premises. The concept of the construction of new medical premises at the RCMC site was developed a few years ago and initial architectural design was prepared in 2013. The new premises will be a four-storied building with total superficies of 6.269 square meters. The associated facilities will include electrical transformer sub-station, sewage pumping station, and diesel-generator.

33. Skill labs at medical universities and colleges may require various small-scale works, depending on the current physical condition of the premises, adequacy of their existing spatial layout for the purposes of the skill labs and other factors. For example, Minsk State Medical University is currently constructing a new building (to be commissioned in 2017) where one floor - approx. 900 sq. m out of total 15 000 sq. m - would be fully designated for a skill lab and therefore no renovation is required in this case. In order to vacate the premises of its main building for establishing a skill lab, Minsk Medical College would have to move some of its classrooms (for dental technicians) to another location, where renovation may be needed and so on. Renovation of premises of medical universities and colleges will have minor local environmental impacts associated with this type of works. Sample EMP Checklist for small construction works will be used, if needed.

34. The Client has prepared the project-level Environmental Management Framework (EMF). While specific sites have been broadly identified (i.e. within the boundaries of the BelMapo and RCMC premises), no environmental and design surveys have been done and the information available to the team at the time of appraisal is not sufficient for the preparation of site-specific EMPs. For renovation works at the regional offices (for housing IT equipment), medical universities and colleges (for housing skill labs) - EMP Checklists (annex to EMF) will be used.

35. The Client does not have prior experience with safeguards policies of the World Bank. The PMU will be responsible for day-to-day project implementation, including compliance of the project activities with safeguards requirements. The PMU will have a designated safeguards specialist (this function may be implemented by construction engineer) to undertake regular on-site supervision checks of compliance with the requirements of environmental safeguards. This specialist will have skills and experience to handle supervision of safeguards and will be provided with necessary guidance from the Bank team on any emerging issues.

36. Pre-requisite for Project Appraisal. Environmental documentation for the Project – the EMF - was prepared by the Client, disclosed and public consultations organized prior to completion of Project appraisal.

Social (including Safeguards)

37. **Involuntary Resettlement.** Involuntary resettlement is not envisaged as part of the project. Civil works planned under Component 2 (BelMapo) and under Component 3 (RCMC) will be carried out on land owned by BelMapo and RCMC, respectively, and within their current premises, therefore, the Bank's OP 4.12 on Involuntary Resettlement will not have to be triggered. Construction on these sites will not require any land acquisition or physical resettlement, and will not obstruct private economic activities. Civil works that will be carried out under Component 1 (regional offices for housing IT-related infrastructure) and under Component 2 (skills labs at medical universities and colleges) are of rehabilitative nature. They will not require land acquisition or any other forms of resettlement.

38. **Beneficiary Feedback**. Beneficiary feedback will be collected as part of two components. First, as part of the implementation of subcomponent 1.1.: Integrated Health Management Information Systems: RSPC MT, which will be responsible for overall coordination of e-Health system, will administer periodic surveys to assess the satisfaction of patients with the implementation of the e-Health system in participating health facilities. The surveys will target patients who have received services as part of the e-Health system (e.g., e-prescriptions, e-referrals, patient portal, e-certificate, etc.), inquire regarding their experience with the new system, and solicit feedback on needs, problems, and requests for improvement. The survey will be periodically distributed to patients in participating health facilities, and will also be available on the "Patient Portal" that will be created as part of this subcomponent, so that all portal visitors will be able to respond to the surveys based on the user experience. The results of both offline and online surveys will be aggregated on a quarterly basis and will inform the activities of RSPC MT as part of subcomponent 1.1. They will also be posted on the "Patient Portal".

39. Second, as part of Component 2, BelMapo will regularly distribute surveys to beneficiaries, who will undertake trainings as part of the new Simulation Center. These surveys will consist of two separate questionnaires: (a) *Technical Effectiveness*: a survey containing technical questions that will be distributed to beneficiaries before and after each training in the Simulation Center in order to track whether their technical knowledge improves as a result of the training; and (b) *Satisfaction*: a survey that tracks beneficiary satisfaction with the quality of services provided by BelMapo will be distributed after each training at the Simulation Center. The feedback will be communicated back to training participants, and will inform the structure and contents of future trainings. Dedicated indicators in the Results Framework will monitor the results of both surveys (percent satisfaction from female and male respondents). This survey will also be implemented in the same format at the medical universities and colleges.

40. **Gender**. The project is likely to have positive gender impacts. It will generally improve the quality of health services provided to both men and women, and will also have a significant positive contribution to the female beneficiaries of the RCMC and its intensive neonatal care services. The Belarussian health system offers a range of maternity-related services and protections. About 98 percent of the women in early pregnancy get registered with the ob-gyn services. The percentage of births attended by skilled health staff is 100 percent (World Bank Gender Statistics 2012). The maternal mortality ratio declined from 33 in 1990 to 4 in 2015, which is better than the EU average (World Bank Gender Statistics, 2013). Measures have also

been taken to increase maternity benefits, childhood allowances, and financial support for young and large families. While still low, fertility rate increased to 1.6 births per woman facilitated by the development of the nationwide system for reproductive health protection and adoption of a National Program of Demographic Security (World Bank Gender Statistics, 2013). Contraceptive prevalence rate increased to 63.1 percent in 2012 from 50 percent in 2005 which is higher to the same income level countries (World Bank Gender Statistics, 2013). Adolescent fertility is 20.1 births per 1,000 women ages 15-19, which is close to the Europe and Central Asia average but nearly double that of the EU (World Bank Gender Statistics 2014). Maternity leave for (employed) women is adequate in length at 126 calendar days fully paid by the government. But the child care leave benefit for three years is excessive and hurts women's career opportunities.

41. However, despite these positive development and arrangements, the state of neonatal care facilities in the country is not optimal, and existing facilities require renewal. Further, education and training on reproductive health could be improved in the country. The project will therefore include the following gender-focused activities: (a) Beneficiary satisfaction surveys under subcomponent 1.1 and component 2. These surveys will allow to identify any gender gaps related to the usage of the e-Health system and participation in trainings. The findings of the surveys will be analyzed by RSPC MT (for subcomponent 1.1) and BelMapo (for component 2) and activities to reduce any emerging gender gaps will be immediately undertaken (for instance, female training participants may prefer more flexible training timings in order to attend to childcare duties). (b) Constructing and equipping a room dedicated to nursing and breast milk pumping as part of the reconstruction of the neonatal care center: this activity will significantly improve the wellbeing of women whose newborns are treated in the Intensive Neonatal Care Center and encourage breastfeeding. (c) Offering trainings on reproductive health for men and women as part of the simulation center curricula at BelMapo. An opportunity to improve skills related to sexual and reproductive health is important for both male and female participants, but awareness of such matters is often insufficient. Such trainings are therefore likely to positively contribute to gender conditions in the country. (d) Undertaking outreach activities to increase female participation in trainings in the new simulation center to further strengthen the professional skills of health care specialists. The increase in the number of female participants will be tracked by BelMAPO throughout the implementation of the project. The same will take place at the medical universities and colleges and training carried out at the skill labs.

42. Gender-focused indicators in the Results Framework will include: (a) Disaggregation by gender of the data collected as part of the beneficiary satisfaction surveys (percent satisfaction from female and male respondents); (b) Construction of the nursing and breast milk pumping room (y/n); (c) Number of trainings on reproductive health offered by BelMapo in the new Simulation Center; and (d) Number of doctors and nurses trained and certified at BelMapo new Simulation Center (disaggregated by gender). The last two indicators include skill labs training at medical universities and colleges.

Table 3.5: Focus of Operation and Citizen Engagement

Citizen Engagement Instrument	Focus of Operation and Citizen Engagement	Purpose/Approach
Beneficiary satisfaction survey	National	RSPC MT will distribute periodic surveys to all patients treated in hospitals and clinics that participate in the project to assess their satisfaction with the implementation of the e-Health system. The surveys will also be regularly available on the "Patient Portal" that will be created as part of Component 1.1. The surveys will target patients who have received service as part of the e-Health system (e.g., e-prescriptions, e-referrals, patient portal, e-certificate, etc.). The surveys will inquire regarding their experience with the new system, and elicit feedback on needs, problems, and requests for improvement. The results of both offline and online surveys will be aggregated on a quarterly basis and inform the activities of RSPC MT. An intermediate results indicator will measure the increase in patients' satisfaction with the e-prescription service.
	Sector	BelMapo will regularly distribute surveys to training participants in the BelMapo new Simulation Center, medical universities, and colleges. These surveys will consist of two separate questionnaires: (a) Technical Effectiveness: a survey containing technical questions that will be distributed to beneficiaries before and after each training to track whether their technical knowledge improves as a result of the training; and (b) Satisfaction: a survey that tracks beneficiary satisfaction with the quality of services provided by BelMapo will be distributed after each training. An intermediate results indicator will measure the increase in participant satisfaction with the trainings.
Grievance redress mechanism (GRM)	Project	Channel for citizen complaint. A project-level GRM will be launched to collect and respond to beneficiary grievances regarding project activities. Proactive efforts will be made to ensure women's awareness and use of the GRM. An intermediary results indicator will measure the percentage of grievances registered related to delivery of project benefits addressed.

Table 3.6: Focus of Operation and Gender

Gender Instrument	Focus of Operation and Gender	Purpose/Approach
Gender-focused construction activity	National	Constructing and equipping a room dedicated to nursing and breast milk pumping as part of the reconstruction of the neonatal care center. This activity will significantly improve the wellbeing of women whose newborns are treated at the Intensive Neonatal Care Department of the RCMC and encourage breastfeeding.
Building capacity on gender-related topics	Sector	Offering trainings on reproductive health for men and women by BelMapo. An opportunity to improve skills related to sexual and reproductive health is important for both male and female participants, but awareness of such matters is often insufficient. Such trainings are therefore likely to positively contribute to gender conditions in the country. An intermediate results indicator will measure the increase in the number of departments in each of training institutions (BelMapo, medical universities and medical colleges) offering trainings on reproductive health. BelMapo will also track the increase in the number of female training participants.
Beneficiary satisfaction survey (disaggregated by gender)	Sector/project	Beneficiary satisfaction surveys under Components 1.1 and 2. These surveys will allow to identify any gender gaps related to the usage of the e-Health system and participation in trainings. The findings of the surveys will be analyzed by RSPC MT (for Component 1.1) and BelMapo (for Component 2) and activities to reduce any emerging gender gaps will be immediately undertaken (for instance, female training participants may prefer more flexible training timings in order to attend to childcare duties). The results of the beneficiary satisfaction surveys will also be disaggregated by gender.

Monitoring & Evaluation

43. Data collection and analysis strategies would rely on the national statistics system as much as possible, and would be complemented with additional data collection instruments to fill the gaps, whenever necessary. Data would be collected at national and regional levels. The PDO level and intermediate results indicators would be monitored using the following data collection instruments:

(a) Regular surveys and data collection processes, such as the existing Republican monitoring exercise;

(b) Administrative data currently available in the health sector and the integrated e-Health to be developed under the proposed Project; and

(c) Monitoring reports prepared by the PMU.

44. The M&E function would be carried out by the PMU. One staff member would be assigned the responsibility for M&E of the Project, including coordinating the collection of information from the MoH and other implementing agencies and communicating these results to the World Bank according to the frequency of reports described in Annex 1. The selection of Project indicators was guided by the current state of data availability in the health sector and the reasonable expectations about the development of sector monitoring systems as a result of the proposed Project. Under the Project, the M&E capacity of the MoH and other implementing agencies (such as the RSPC MT) would be further developed to allow more effective sector management going forward.

45. The monitoring data would be reviewed by the WG during its periodic meetings in order to assess the likelihood of achieving the PDO and to take timely corrective measures as needed. The Project M&E data would also be used by the MoH in its analytical reports on the progress and impact of health sector reforms. To strengthen the long-term capacity of the MoH and its subordinate agencies in M&E, selected staff of the MoH, subordinate organizations, and PCU will receive necessary in-service and external training under the Project Management component. International TA could also be engaged, including for midterm and final evaluation of the Project.

46. **Data Sources.** To the extent possible, progress on results will be monitored using routine data sources, such as those available from the information systems and administrative records of the MoH, its subordinated agencies and other key agencies.

47. **Frequency of Reporting.** Data on most Project indicators will be reported on an annual basis. Quarterly progress reports will be prepared by the PCU and will include data on grievances and resolution to allow for timely corrective action. Evaluation of Project implementation will be done at the midterm review and prior to Project closing.

Role of Partners

48. Potential areas for collaboration are: neonatal services quality improvement and supportive supervision (UNICEF); policy dialogue on health service delivery improvement, and tobacco control policies (WHO); and citizen engagement and social accountability (EU).

Annex 4: Implementation Support Plan

BELARUS: Health System Modernization Project

Strategy and Approach for Implementation Support

1. The Bank team will support the implementation of the planned Project activities by the implementing agencies, provide technical advice necessary to facilitate achieving the PDO as well as ensure that risk mitigation measures are implemented. The Bank team will maintain constructive dialogue with the Project's major stakeholders throughout implementation to ensure provisions of quality advice and effective support to implement the Project.

2. The Bank team will undertake implementation support visits to review implementation progress and ensure needed institutional strengthening on a semi-annual, and, if needed, on a more frequent basis. Regular dialogue with the Government would facilitate early identification and overcoming of problems and obstacles that could delay implementation. Fiduciary and safeguards oversight would ensure compliancy with the Bank fiduciary and safeguards standards through the regular supervision of the Project's FM and procurement arrangements as well as safeguards aspects.

Implementation Support Plan

3. The implementation support plan identifies the level of technical, fiduciary, and safeguard supports required for successful Project implementation, including compliances with the Bank's corporate requirements (that is, citizen/beneficiary engagements, gender, redress mechanisms in place, and so on). It also includes organization of learning events to educate and promote better use of evidence for policy. The proposed implementation support is presented in the following table:

Time	Focus	Skills Needed	Resource Estimate	Partner Role
First twelve months	Technical and operational support: (a) improving e-Health and strengthening health management information systems; (b) strengthening medical education; (c) M&E; and (d) overall implementation	Lead Health Specialist (task team leader)	12 weeks	Participation in joint reviews
		Health Specialist	8 weeks	
		IT/e-Health Specialists	6 weeks	
		Sr. Operations Officer	5 weeks	
		Operations Officer	10 weeks	
		Infrastructure Specialist (architect/engineer)	2 weeks	
	FM support	FM Specialist	2 weeks	
	Procurement support	Procurement Specialist	2 weeks	
	Social Development support	Social Development Specialist	2 weeks	
	Environmental support	Environmental Specialist	1 week	

Time	Focus	Skills Needed	Resource Estimate	Partner Role
13th-60th months	Technical and operational support: (a) improving e-Health; (b) strengthening medical education; (c) M&E; and (d) overall implementation	Lead Health Specialist (task team leader) Health Economist IT/e-Health Specialists Health Specialist Sr. Operations Officer Operations Officer Infrastructure Specialist (architect/engineer)	10 weeks/year 8 weeks/year 6 weeks/year 8 weeks/year 1 week/year 2 weeks/year	Participation in joint reviews
	FM support	FM Specialist	2 weeks/year	
	Procurement support	Procurement Specialist	2 weeks/year	
	Social Development support	Social Development Specialist	2 weeks/year	
	Environmental support	Environmental Specialist	1 week/year	

Skills Mix Required

Skills Needed	Number of Staff Weeks	Number of Trips	Comments
Task Team Leader	12/year	2/year	
Health Specialist	8/year	2/year	
Health Economist	6/year	1/year	
Operations Officer	10/year	-	Locally based staff
Sr. Operations Officer	5/year	2/year	
Infrastructure Specialist	2/year	2/year	
Procurement Specialist	6/year	2/year	
FM Specialist	4/year	2/year	
Social Development Specialist	2/year	1/year	
Environmental Management Specialist	2/year	1/year	

Partners

Name	Institution/Country	Role
MoH	Republic of Belarus	Overall responsibility for project oversight and implementation

Name	Institution/Country	Role
PMU	Republic of Belarus	Daily project coordination, including fiduciary support for the project and preparation of progress reports.
Republican Technology and Research Center	Republic of Belarus	Design, quality control, monitoring, and implementation of Component 1
BelMapo	Republic of Belarus	Design, quality control, monitoring, and implementation of Component 2
RCMC with support from UNICEF	Republic of Belarus	Design, quality control, monitoring and implementation of Component 3
WHO	Republic of Belarus	Technical support for Component 2
EU	Republic of Belarus	Technical support for social inclusion (citizen engagement)

Annex 5: Economic Analysis

BELARUS: Health System Modernization Project

1. The economic aspects of the proposed Project cover many issues. This annex present the details of the following topics: (a) cost-effectiveness considerations—whether the project components are the most cost-effective according to literature; (b) cost-benefit considerations--based on the projected costs and expected quantifiable economic benefits; (c) efficiency considerations; (d) equity considerations; and (e) recurrent costs and budgetary implications.

2. The economic rationale for public spending in the health sector is varied. It is envisioned that the overall Project's activities could contribute to a healthier workforce which will eventually raise economic growth and productivity. The first component supports capacity building of public sector institutions, and strengthening of health systems delivery through e-Health. The first and second component supports priority activities that are pure "public goods," which are core responsibilities of Government – including strengthening of health information, monitoring, and quality improvements through better medical education and decision support systems. All entities involved and are direct recipients of in the Project activities are public sector organizations. As for the third component, equity considerations are cited as reasons for government intervention.

Cost-effectiveness Considerations

3. Cost-effectiveness analysis compares the relative costs and outcomes of various activities. This evidence can help identify "best buys" for achieving health improvements within a fixed budget. Using international literature on the cost-effectiveness of the different project component (Table X), it can be surmised that the proposed project is generally cost-effective. Aside from the cost-effectiveness of the project component itself, since Component 1 support decision making tools in e-Health, this will lead to better management of management of cardiovascular disease, respiratory illness, and diabetes all have generally very favorable cost-effectiveness ratios relative to other alternatives.

Table 5.1. Cost Effectiveness of Different Project Components

Condition, Type of Intervention, and Setting	Description of Intervention/Study	Results	Source
Component 1			
Hospital-Based Medical Management Information Technology	Economic evaluation comparing mean effectiveness of electronic medical ordering entry/medication administration record vs standard paper ordering for prevention of adverse events	Incremental costs for computerized physician order entry was US$15192 per adverse event averted	Wu RC, Laporte A, Ungar WJ. Cost-effectiveness of an electronic medication ordering and administration system in reducing adverse drug events. *J Eval Clin Pract* 2007;**13**:440–8 as quoted from

Condition, Type of Intervention, and Setting	Description of Intervention/Study	Results	Source
			Daria O'Reilly, Jean-Eric Tarride, Ron Goe ree, Cynthia Lokker, K Ann McKibbon. The economics of health information technology in medication management: a systematic review of economic evaluations. Journal of American Medical Informatics Association http://dx.doi.org/10.1136/amiajnl-2011-000310
Primary-care Based Medical Management Information Technology Computerized Decision Support System for management of asthma	Compare Computerized Decision Support System vs no Computerized Decision Support System in quality of life (using St George Respiratory Questionnaire), health care resources, medical visits, hospitalizations, asthma treatment, blood analysis, spirometry, chest radiographs.	From societal perspective, the Computerized Decision Support System was dominant. Form the payer perspective, the incremental cost effectiveness ratio was US$66.64 per percentage point reduction in St George Respiratory Questionnaire scale	Plaza V, Cobos A, Ignacio-Garcia JM, et al. Cost-effectiveness of an intervention based on the Global Initiative for Asthma (GINA) recommendations using a computerized CDSS: a physicians randomized trial. *Med Clin (Barc)* 2005;**124**:201–6 as quoted from Daria O'Reilly, Jean-Eric Tarride, Ron Goe ree, Cynthia Lokker, K Ann McKibbon. The economics of health information technology in medication management: a systematic review of economic evaluations. Journal of American Medical Informatics Association http://dx.doi.org/10.1136/amiajnl-2011-000310
Component 2			
Simulation training to	Compared medical students who practiced 2 hour intravenous	The progressive program that combines simulation modalities	Isaranuwatchai W., Brydges R., Carnahan

Condition, Type of Intervention, and Setting	Description of Intervention/Study	Results	Source
enhance learning	catherization skills training program: Low fidelity (virtual reality; High fidelity (mannequin); and Progressive (virtual reality, task trainer and mannequin simulator)	are most cost effective.	H., Backsten D., Dubrowski A. Comparing the cost-effectiveness of simulation modalities: a case study of peripheral intravenous catheterization training. Adv Health Sci Educ Theory Pract. 2014 May;19(2):219-32. doi: 10.1007/s10459-013-9464-6. Epub 2013 Jun 1.
Component 3			
Neonatal Intensive Care	Neonatal intensive care provided for infants born at: (a) 24-26 weeks (b) 27-29 weeks (c) 30-33 weeks	(a) US$1,200 (b) US$650 (c) US$240 US$ per DALY averted	Profit J, Lee D, Zupancic JA, Papile L, Gutierrez C, Goldie SJ, et al. (2010) Clinical Benefits, Costs, and Cost-Effectiveness of Neonatal Intensive Care in Mexico. PLoS Med 7(12): e1000379. doi:10.1371/journal.pmed.1000379

Cost-benefit Considerations

4. A cost-benefit analysis converts the health gains achieved by a project or intervention into monetary terms. Although this exercise be uncomfortable for some, it can be useful for policy purposes, and typically serves to underline the very high value attached to better health. The standard economic approach for quantifying the benefit of better health in monetary terms is based on the concept of the "value of statistical life" (or life-year). The estimated benefit of the project is the economic value of the lives saved and serious disability averted by the investments made in the project.

5. The basic framework involves projecting the epidemiological scenario in Belarus from 2016-2030 and then estimating how many disability-adjusted life years (DALYs) might be averted with the project. The projections made by WHO thus provide a useful counterfactual scenario of burden of disease in Belarus without the project.[21] The assumptions used in the cost-benefits analysis are listed below:[22]

[21] See http://www.who.int/healthinfo/global_burden_disease/projections2004/en/
[22] It should be noted that the base case assumed the most conservative scenario.

- **Basic discount rate**. Financial costs (Project investments and recurrent costs) and financial savings are discounted at 10 percent, to account for future inflation. A higher discount rate of 14 percent, the average inflation estimated for the 2016-2020 period[23] and 18 percent are also applied to verify the sensitivity of the results to this assumption.[24]

- **Discount rate of the monetary value of future health benefits**. The monetary value of the annual DALYs saved is discounted at 5 percent. A rate of 3 percent per guidelines from WHO and the Disease Control Priorities (DCP-2) Project[25] is used for the sensitivity analysis.

- **Period of time considered**. The cost-benefits of each intervention are calculated over the 2016-2030 period.

- **Population covered**. In general is assumed that all interventions will be implemented nationwide. Therefore, the interventions will affect health results for the entire population, abound 7.26 million people in 2013, or the efficiency level of all facilities. Population growth up to the year 2030 is based on UN population Projections (medium variant) as a whole.[26]

- Valuation **of DALYs** used a very simple rule. Each DALY saved is valued at per capita income (using a starting value of about US$8,278 for 2016). An upper, but still conservative estimate values each year of life as three times per capita income, as per the DCP2 and Copenhagen Consensus guideline.[27] It should be noted that studies of valuation of life in the US find a much higher ratio.

- **GDP growth.** A more conservative value of annual growth rate of 3 percent in real per capita GDP is used in the base case while the average growth rate from 1995-2017 of 4 percent is used in the sensitivity analysis.[28]

- **Project investment and recurrent costs.** The total financing of this Project is US$125 million in nominal terms, which would be disbursed over a period of five years. Given cross benefits across project components (see below), the entire project costs (and not simply the components which are expected to yield measurable benefits) are used in the cost-benefit analyses. Costs are discounted at 10 percent, with a higher range of 14 and 18 percent.

- **Aggregated and marginal benefits of the interventions.** In this project, interventions are integrated. For example, health benefits deriving from the adoption

[23] Source: IMF. World Economic Outlook, October 2015
https://www.imf.org/external/pubs/ft/weo/2015/02/pdf/text.pdf
[24] This is the average GDP deflator from 2015 to 2020 (WB database).
[25] See: http://www.dcp2.org/.
[26] Source: http://esa.un.org/unpd/wpp/Download/Standard/Population/
[27] See: Jamison D. Jha P. Bloom D. 2008. Copenhagen Consensus 2008 challenge paper: Diseases.
http://www.givewell.org/files/DWDA%202009/Stop%20TB/Copenhagen%20Consensus%20Paper-Diseases.pdf
[28] See World Development Indicators (2015).

of CDSS for quality improvement are coupled by the improvement in clinical competencies of providers Thus, caution is required in interpreting the incremental health gains (DALYs saved) derived by each subcomponent.

6. The overall results of the economic analyses, baseline scenario, are presented in X. In the baseline scenario each DALY saved is valued at per capita income, costs are discounted using a 10 percent inflation rate and DALYs are discounted at 5 percent discount rate. The IRR for the first 7 years of the project is 17.7 percent, which exceeds the 10 percent discount rate. In other words, the difference between the IRR and the discount rate ensures that the health interventions proposed by the Project are economically profitable. Given that most of the benefits accrue in the longer time horizon, the estimated IRR for the baseline scenario is 47.5 percent when valued until 2030.

Table 5.2. Project Costs, Benefits, and IRR

Year	Direct/Indirect Benefits in USD (2017 dollars)	Total costs (000) Real, 2017 terms	NPV
2017		2,494.00	(2,494.00)
2018	1,062.44	19,000.91	(17,938.47)
2019	5,903.19	42,579.34	(36,676.15)
2020	15,280.86	52,684.45	(37,403.59)
2021	38,343.57	36,862.24	1,481.33
2022	87,078.79	12,683.56	74,395.23
2023	100,333.06	11,289.48	89,043.58
2024	113,065.36	10,263.16	102,802.19
2025	125,289.78	9,330.15	115,959.64
2026	137,020.17	8,481.95	128,538.21
2027	148,270.04	7,710.87	140,559.18
2028	159,052.67	7,009.88	152,042.79
2029	169,381.04	6,372.62	163,008.42
2030	179,267.85	5,793.29	173,474.56
Total	1,279,348.80	232,555.88	1,046,792.92
NPV			323,377.58
IRR			47.5%
IRR (10 years)			41.4%
IRR (7 years)			17.7%

7. Various sensitivity analyses were conducted. NPV and IRR analyses were quite sensitive to the value of a DALY (ranging from 1 times to 3 times per capita GDP), which raises the rate of return nearly 3-fold. In contrast, the IRR was only somewhat sensitive to the discount rate for DALYs, GDP growth, and the deflator (inflation) rate. Various scenarios were estimated to ascertain that there is no major risk of overestimation of returns. Conservative estimates on DALY reductions were used--for example, the overall reduction in DALYs from cardiovascular disease, the leading cause of death, is estimated at only about 2.24 percent, whereas the US

interventions (prevention, specifically tobacco control), blood pressure management and case management in hospitals have reduced cardiovascular disease mortality by over 25 percent in the last two decades. Alternative scenarios and their effect on the Project's economic performance are presented Table X.

Table 5.3. Sensitivity Analyses of Results

Variable	**Total costs**	**Total benefits**	**Net benefits (1 DALY=1 times GDP/cap)**	**(Net benefits with high value-3 times GDP)**
Baseline scenario	*Using deflator rate of 10%, GDP growth of 3% and DALY discount rate of 5%*			
Values (in 000s)	379,436	1,949,996	1,046,793	3,495,440
NPV at 10% (in 000s)			323,378	733,760
IRR (2017-2030)			47.5%	103.7%
IRR(2017-2027)			41.4%	101.9%
IRR (2017-2024)			17.7%	88.3%
Scenario 1	*Using deflator rate of 10%, GDP growth of 3% and DALY discount rate of 3%*			
Values (in 000s)	379,436	1,949,996	1,290,317	4,226,011
NPV at 10% (in 000s)			401,567	879,409
IRR (2017-2030)			52.0%	110.2%
IRR(2017-2027)			46.1%	108.6%
IRR (2017-2024)			22.5%	95.2%
Scenario 2	*Using deflator rate of 14%, GDP growth of 3% and DALY discount rate of 3%*			
Values (in 000s)	*379,436*	1,949,996	1,311,746	4,247,441
NPV at 14% (in 000s)			267,671	499,448
IRR (2017-2030)			55.1%	115.1%
IRR(2017-2027)			49.6%	113.6%
IRR (2017-2024)			27.2%	101.0%
Scenario 3	*Using deflator rate of 18%, GDP growth of 3% and DALY discount rate of 3%*			
Values (in 000s)	*379,436*	1,949,996	1,328,985	4,264,679
NPV at 11% (in 000s)			181,697	291,652
IRR (2017-2030)			58.0%	119.7%
IRR(2017-2027)			52.9%	118.4%
IRR (2017-2024)			31.5%	106.4%
Scenario 4	*Using deflator rate of 10%, GDP growth of 4% and DALY discount rate of 5%*			
Values (in 000s)	*379,436*	2,226,986	1,222,456	4,009,508
NPV at 8% (in 000s)			381,757	839,385
IRR (2017-2030)			51.5%	110.1%
IRR(2017-2027)			45.7%	108.5%
IRR (2017-2024)			22.6%	95.4%
Scenario 5	*Using deflator rate of 14%, GDP of 4%, and DALY discount rate of 5%*			
Values (in 000s)	*379,436*	*2,226,986*	*1,242,247*	*4,029,299*
NPV at 11% (in			*254,714*	*477,797*

Variable	Total costs	Total benefits	Net benefits (1 DALY=1 times GDP/cap)	(Net benefits with high value-3 times GDP)
000s)				
IRR (2017-2030)			54.5%	115.0%
IRR(2017-2027)			49.2%	113.6%
IRR (2017-2024)			27.2%	101.2%
Scenario 6	*Using deflator rate of 18%, GDP of 4%, and DALY discount rate of 5%*			
Values (in 000s)	*379,436*	*2,226,986*	*1,258,342*	*4,045,394*
NPV at 11% (in 000s)			*173,103*	*279,647*
IRR (2017-2030)			57.5%	119.7%
IRR(2017-2027)			52.6%	118.4%
IRR (2017-2024)			31.5%	106.7%
Scenario 7	*Using deflator rate of 10%, GDP growth of 4% and DALY discount rate of 3%*			
Values (in 000s)	*387,436*	*2,226,986*	*1,501,899*	*4,847,840*
NPV at 11% (in 000s)			*470,966*	*1,005,561*
IRR (2017-2030)			*56.1%*	*116.9%*
IRR(2017-2027)			50.5%	115.3%
IRR (2017-2024)			27.5%	102.4%
Scenario 8	*Using deflator rate of 14%, GDP growth of 4% and DALY discount rate of 3%*			
Values (in 000s)	*387,436*	*2,226,986*	*1,521,691*	*4,867,631*
NPV at 11% (in 000s)			*313,750*	*569,781*
IRR (2017-2030)			*59.2%*	*121.8%*
IRR(2017-2027)			54.0%	120.5%
IRR (2017-2024)			32.1%	108.3%
Scenario 9	*Using deflator rate of 18%, GDP growth of 4% and DALY discount rate of 3%*			
Values (in 000s)	387,436.00	2,226,986	1,537,786	4,883,726
NPV at 11% (in 000s)			213,063	332,047
IRR (2017-2030)			62.2%	126.6%
IRR(2017-2027)			57.4%	125.3%
IRR (2017-2024)			36.4%	113.8%

Efficiency Considerations

8. The Project offers some efficiency gains, through the optimization of processes of the PHC network through e-Health. The decision processes would help in management of cardiovascular disease and diabetes through primary care which can reduce the burden on hospitals. The project's decision making processes might also make services more efficient, but it is difficult to disentangle the costs saved from these.

Equity Considerations

9. With regard to equity considerations, the project is cognizant that there is a risk that Project benefits may accrue unequally to Minsk compared to other regions in the country, particularly since Belmapo Simulation Center and the neonatal care center is located there. For the e-Health component, the areas that would be chosen for the initial rollout will be relatively disadvantaged areas such as those affected by the Chernobyl incident.

Budgetary Implications of Recurrent Costs

10. For fiscal year 2017, the budget for the MoH is estimated to be about US$3,569.7 million, excluding external financing. Assuming that the MoH's budget and spending remain roughly the same relative to GDP over the next five years, the Government would have a large enough budget to sustain the recurrent costs, which are estimated generously for the project.

Table 5.4. Fiscal Impact (in US$, millions)

FY	2017	2018	2019	2020	2021	2022	Total
Cost of project	2.5	20.9	51.5	70.1	54.0	20.4	219.4
MOH annual budget	3,569.7	3,663.0	3,758.7	3,856.9	3,957.5	4,060.7	
% of MOH annual budget	0.1%	0.6%	1.4%	1.8%	1.4%	0.5%	
Belarus GDP	80,147.0	82,551.4	85,027.9	87,578.7	90,206.1	92,912.3	
% of GDP	0.0%	0.0%	0.1%	0.1%	0.1%	0.0%	