RISK MANAGEMENT IN PUBLIC PRIVATE PARTNERSHIP PROJECTS IN HEALTH CARE: APPLICATION OF CURRENT APPROACH AND ITS IMPROVEMENT

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ABSTRACT

The present article investigates the risk management in public private partnership (PPP) projects. This study reviews and highlights the drawbacks and limitations of the current approach towards the process PPP and finally proposes the strategies and solutions to overcome them. The author proposes to make the concept of risks in PPP projects more precise in order to manage these risks. Due to this reason, the paper presents series of criteria which allow identifying events that can be definitely regarded as risks from the huge number of events affecting PPP project. It is also justified in the article that implementation of risk classification based on the objective and justified classification criteria is preferable than in the absence of these criteria. In this respect, three classification criteria are offered and based on them the author creates her own classification of risks in PPP projects. Besides, not only general risks but also specific risks inherent in PPP projects in health care and actions to mitigate these risks are identified and described. The author shows her findings on the case of PPP projects in health care in St. Petersburg, Russia.

Keywords: Public-Private Partnership, Risk Management, Medical Risks.

INTRODUCTION

Public-private partnership refers to forms of cooperation between public authorities and the world of business, which aims at ensuring the funding, construction, renovation, management or maintenance of infrastructure or the provision of a service (Commission, 2004). In many countries, PPP is a popular mechanism for the establishment and operation of social, transport and engineering infrastructure. This is explained by several advantages of PPP. One of them is the transfer of risks of the PPP project from the public sector to the private party, as opposed to public procurement, when public sector bears all the risks of the project. "Adequate risk allocation is essential to reducing project costs and to ensuring the successful implementation of the project. Conversely, an inappropriate allocation of project risks may compromise the project's financial viability or hinder its efficient management, thus increasing the cost at which the service is provided" (UNCITRAL, 2001). However, risk allocation is not the only significant mechanism. Balanced allocation of risks should be preceded by their identification and assessment and succeeded by their efficient prevention and mitigation. All of these actions are interrelated and form a risk management process, which therefore is a very important factor for the success of PPP projects. This highlights the relevance of a deep theoretical and practical

study of risk management process in PPP projects. In particular, the author believes that it is necessary to resolve the following issues:

1. Does the existing understanding of risks, their classification and description give a complete picture of risks in PPP Projects?
2. Does the process of risk management cover all possible adverse events and does it protect the PPP project and its participants from the unsuccessful outcome?
3. How and what could be improved?

These are quite difficult questions and search for the answers to them is the goal of this article. This goal determines the structure of the article. First, we present the current approach to risk management in PPP projects and some of its flaws. Second, we provide literature review on the concept and types of risks in PPP projects, which is the theoretical basis for our research. It is followed by the search and description of criteria in order to define the concept of risks and classify them. It enables to distinguish a new type of risks-specific medical risks which become the subject of the further study. We continue the paper by giving a brief background of PPP development and PPP experience in Russia and St. Petersburg. Furthermore, we describe main parameters of PPP projects in health care, which are planned to be implemented in St. Petersburg. Finally, third, we present the list of risks that are inherent in PPP projects in health care and their description using the author's risk classification. Also we present several measures for mitigation and prevention of identified medical risks.

RESEARCH METHODOLOGY

Current Approach to Risk Management in PPP Projects: Overview and Flaws

Currently, the prevalent approach to risk management in PPP projects consists of the following stages (Akintoye, Beck & Hardcastle, 2008):

1. Risk identification: a process of identifying all the risks relevant to the project, either during its construction or operation phase;
2. Risk assessment: determining the likelihood of them at serialization of identified risks and the magnitude of their consequences if they do materialize;
3. Risk allocation: allocating the responsibility for dealing with the consequences of each risk to one of the parties to the PPP agreement or agreeing to deal with the risk through a specified mechanism which may involve the risk sharing;
4. Risk mitigation: an attempt to reduce the likelihood of the risk occurrence and the degree of its consequences for the risk-taker; and
5. Risk monitoring and reviewing: monitoring and reviewing the identified risks and managing new risks as the PPP project develops and its environment changes. This process continues during the life cycle of the PPP contract (Guidance, 2011; Victoria, 2001).

Some time ago, this approach was considered as being comprehensive. But the review of the research literature and expert discussions, guidelines, PPP databases and the analysis of risk matrices have made evident series of shortcomings of this approach, including:

1. Ambiguity of views on the concept of risks in PPP projects, their description and classification,
2. Absence of the structured methodology of risk identification in PPP projects,
3. Disregard to the specific risks,
4. Insufficient description of measures aimed at preventing and minimizing negative effects of risks.

Primarily, it is necessary to solve the problem of the definition of risk, which, as we see it, has two aspects.

First, not all of those researchers writing about risks explain what they include in this concept. As a result, without defining the subject of the conversation, many experts argue on risks and their management, including not always the same, coinciding, meaning in this concept (Hodge, 2004; Loosemore, 2007).

Second, there is a discrepancy in understanding the term "risk". For instance, "risk is defined as the chance of an event occurring which would cause actual project circumstances to differ from those assumed when forecasting project benefit and costs" (Furnell, 2000). It follows that the term "risk" is applied generally to all events, both negative and positive, that alter initial parameters of the PPP project.

In our opinion, such a broad interpretation of the term risk causes confusion and does not correspond to the ultimate goal of risk management-to prevent risks and minimize their consequences. Therefore, we propose not to define risks of PPP projects as all the potential events that may occur in the implementation of PPP. We believe that risk management (identification, assessment, allocation, mitigation of risks) is needed for only those events that negatively affect the PPP project (for example, those that can lead to financial losses and additional costs for participants of the PPP project, lost revenue, as well as delays in the PPP project) which impede the achievement of the desired general results. Although successful events during the PPP project (for example, unscheduled revenues for participants or reduction of the duration of construction) may influence the project, it will not be a problem for project participants and should not be the subject of efforts to manage them. Such understanding of risks in PPP projects is generally consistent with the following statement: "a risk is defined as any factor, event or influence that threatens the successful completion of a project in terms of time, cost or quality" (Hodge & Greve, 2007). Agreeing with this, we think that it is necessary to complement this chain of objects (time, cost, quality) being under threat by the goals of the PPP project.

It is impossible to leave another fact without mentioning. The majority of studies contain the description of financial, legal, political, environmental, social, construction and commercial risks only, that is, those that may arise in each PPP project (Delmon, 2017; Kabashkin, 2010; Vassallo & Gallego, 2005). That is true, but PPP projects have many other features, therefore, there are much more risks in PPP projects in real life. These risks also require special attention and a thorough analysis using different research methods. The following example is very illustrative. It is well known that one of the features of PPP projects is a complicated two-stage procedure for selecting the private partner by conducting pre-qualification and setting requirements for the experience of PPP projects' financing, qualification of the private partner in a certain area, experience of similar projects implementation, etc. At the same time, events associated with changes in the structure of the project company (private partner) may occur during the implementation of the PPP project and as a result the private partner will not satisfy these requirements. It could negatively affect the PPP project. A similar case is described in the Legislative Guide on Privately Financed Infrastructure Projects prepared by the United Nations Commission on International Trade Law: "The contracting authority may be concerned that the original members of the bidding consortium maintain their commitment to the project throughout its duration and that effective control over the project company will not be transferred to entities unknown to the contracting authority… Contracting authorities are therefore concerned that, if the concessionaire's shareholders are entirely free to transfer their investment in a given project,

there will be no assurance as to who will actually be delivering the relevant services" (UNCITRAL, 2001). In our opinion, this situation is a risk for the PPP project, which can be summarized in the risk matrix as follows (Table 1):

Table 1
RISK MATRIX

Risk	Description of risk	Negative consequences of risk	Risk allocation	Measures of risk mitigation
Risk of changes in the structure of the private partner	Possible sale, transfer or other disposition of rights for the share of capital of the private partner (SPV) by its initial founders	Decrease of quality, failure to achieve goals of the PPP project	Private partner	1) Establishment of limitations for such changes in the structure of the private partner (SPV) in PPP agreement for a particular period of time;
				2) Execution of such changes only with the consent of the public partner;
				3) Sale, pledging or other disposition of rights for the share of capital is possible only to the qualified successor (an entity meeting the requirements for the participants of the contest for the right to conclude a PPP agreement)

Continuing to examine this question, we found that in several Russian regional laws on PPP it is possible to conclude a trilateral agreement on PPP with participation of the third party-a legal entity, which is owned by the public partner. Due to this situation, the following risk becomes crucial (Table 2):

Table 2
RISK MATRIX

Risk	Description of risk	Negative consequences of risk	Risk allocation	Measures of risk mitigation
Risk of changes in the structure of the third party to the PPP agreement	Possible privatization, sale or other partial or complete loss of a public partner's control of the third party	Failure to comply with the PPP agreement, failure to achieve goals of the PPP project	Public partner	Establishment of the prohibition in the PPP agreement to take such actions by the public partner without the consent of the private partner, excluding cases when these actions are required by the federal legislation

Despite the obvious importance, these risks are not described in the literature on PPP. Perhaps, it is so because these risks represent an abstract category since there are no practical examples of their materialization. However, these risks can move from the category of imaginary risks to the category of real risks in actual PPP projects; it will be shown later in this article.

RESULTS AND DISCUSSION

The Classification of Risks in PPP Projects

Here we would like to concentrate on another important issue in the current approach to risk management in PPP projects-the lack of precise classification of risks in PPP projects.

The theoretical significance of this classification is that its implementation allows getting a better understanding of risks by comparing their similarities and differences. The practical value of this classification is that it facilitates the selection of the party in a PPP project which could successfully manage risk, as well as the choice of measures aimed at prevention of risks in PPP projects or minimization of their negative impact.

What do we mean when we say about the absence of the precise classification? The fact is that one cannot find more than three sources, which would contain the same classification of risks in PPP projects, with an explanation of their division into respective types (Table 3).

Table 3
RISKS OF PPP PROJECTS IDENTIFIED IN THE LITERATURE

Risk	International sources				Russian sources						Total number of citations for a certain risk
	The Guide to Guidance (Guidance, 2011)	Delmon (2017)	Guidelines for Successful Public (Hodge & Greve, 2007)	Risk Management (Management, 2008)	Ke et al. (2011) (Ke, Wang, Chan & Cheung, 2011)	Varnavskiy et al. (Varnavskiy, 2010)	Mataev (2012) (Mataev, 2011)	Kabashkin (2010) (Kabashkin, 2010)	Ryabushchenko, 2011	Seleznev et al. (Seleznev, 2014)	
Political risks	√	√	√	√	√	√	√	√	√	√	**10**
Financial risks		√		√	√	√		√	√	√	**7**
Law/legal risks	√	√		√	√	√		√		√	**7**
Operation risks		√		√			√	√	√	√	**6**
Currency exchange risks/foreign exchange risks		√	√			√	√	√	√		**6**
Construction risks		√	√	√			√			√	**5**
Commercial risks	√			√		√	√	√			**5**
Regulatory risks		√	√				√				**3**
Social risks		√						√		√	**3**
Economic risks						√	√			√	**3**
Market risks				√			√			√	**3**
Demand risks		√			√						**2**

Inflation risks					√				√		**2**
Environmental risks		√	√								**2**
Commissioning risk				√						√	**2**
Site risk				√						√	**2**
Design risks				√						√	**2**
Network and interface risk				√				√			**2**
Force majeure risks						√				√	**2**
Completion risks		√									**1**
Contractual risks			√								**1**
Archeological risks			√								**1**
Latent defects risk			√								**1**
Public acceptance risk			√								**1**
Sponsor risks				√							**1**
Industrial relations risks				√							**1**
Interest rate change risks					√						**1**
Subjective evaluation risks					√						**1**
Corruption risks					√						**1**
Government's reliability					√						**1**
Poor political decision making					√						**1**
Government's intervention					√						**1**
Asset ownership risks				√							**1**
Technical risks						√					**1**
Administrative and management risks							√				**1**
Risks of deficiency of raw materials							√				**1**
Tariff risks							√				**1**
External risks								√			**1**
Internal risks								√			**1**
Retrospective risks								√			**1**
Flowing risks								√			**1**
Perspective risks								√			**1**
Dynamic risks								√			**1**
Investment risks								√			**1**
Deflationary risks									√		**1**
Natural risks									√		**1**
Risk sales										√	**1**
Strategic risks										√	**1**
Total number of risks	**3**	**11**	**9**	**14**	**12**	**8**	**11**	**15**	**7**	**14**	

The only type of risks which is unanimously identified in the literature is political risks. There is almost full unanimity with respect to financial, legal, operational, commercial, construction risks. In relation to the majority of risks a unified position is absent. An important observation is that several risks are listed by experts separately, although they can be included into other types of risks. For example, currency exchange risk is closely related to financial risks, the latent defects risk-to the construction risks and the risk of corruption-to the political risks, etc. This testifies that the existing risk classifications are not systematic and have no methodological basis. This flaw should be eliminated.

The Search of Classification Criteria and the Classification of Risks in PPP Projects

The author agrees in general with the list of risks proposed in the international and Russian sources mentioned above. It is necessary to mention that in most cases risk classification is carried out without explicitly defined classification criteria. However, risk classification is always associated with the search of grounds for the division of risks, i.e. the choice of classification criteria. This is so because in the absence of such criteria the developed list of risks cannot provide a full and true picture of risks.

The author's vision is that the classification of risks in PPP projects should be carried out on the basis of the following criteria:

Sphere of risk emergence, this criterion allows to allocate all the risks in the following types: financial risks (risk of changes in interest rates, currency exchange risk, inflation risk, risk of not receiving the project funding, risk of failure to reach the financial close, etc.), legal risks (risk of changes in legislation, risk of unavailability of judicial protection, regulatory risk, etc.), political risks (risk of changes in the political situation or government structure, risk of strikes and riots, nationalization risk, risk of corruption, etc.), environmental and social risks (risk of harm to the environment, risk of strikes and unrest, etc.), design risks (risk of design errors, risk of non-compliance of the object with specified technical and economic indicators, risk of delays in obtaining licenses, permits and approvals, etc.), construction risks (completion risk, risk of poor quality construction, archaeological risk, site risk, risk of materials availability, risk of latent defects, etc.), operation risks (risk of the deficit of qualified employees managers, risk of failure to provide services or risk of provision of poor-quality services, demand risk, tariff risk, etc.).

Stage of the PPP project, which, depending on the PPP model, can be design, construction, operation and transfer of the object. Here it is necessary to point out that there is an opinion in the expert literature that the life cycle of a PPP project, in addition to these stages, includes the planning of PPP project, the PPP project definition, procurement, which are covered by risk management (Partnerships, 2005). In our opinion, it is not indisputable since risk allocation between the public partner and the private partner is the essential part of the risk management process. But what kind of risk allocation can we speak about at the stage of tender procedures when the private partner is not yet selected?

So, this criterion allows to allocate risks into the following types: risks at the design stage (risk of design errors, risk of non-compliance of the object with specified technical and economic indicators, risk of delays in obtaining licenses, permits and approvals, etc.), risks at the construction stage (completion risk, risk of poor quality construction, archaeological risk, site risk, risk of materials availability, risk of latent defect, etc.), risks at the operation stage (risk of the deficit of qualified employees managers, risk of failure to provide services or risk of provision of poor-quality services, demand risk, tariff risk, etc.), risks at the transfer stage (risk of the poor condition of the object which does not allow to continue operation, risk of no-return of the object, risk of no-transfer of documents or technology), risks at any stage of the PPP project (risk of the increased cost of the object of PPP, risk of changes in the political situation or government structure, risk of strikes and unrest, risk of changes in legislation, nationalization risk, risk of harm to the environment, etc.).

Sector of the PPP Project, Each PPP project is unique and has features which are inherent only in it. Therefore, risks of PPP projects also have an individual character. However, the analysis of PPP projects and risk matrices shows that many of them are united by the private partner's field of activities and attribution of the object of the PPP agreement to a specific area.

For example, in many PPP projects in the field of roads, events that may have a negative impact on the project are as follows: decrease of road safety, entailing the imposition of additional fines or decrease of the availability payment. Other similar examples are the case of termination of selective waste collection for PPP projects in the field of waste management or the case of competition between the domestic airlines (for the airport) with other airlines or the transport availability to and from the airport for PPP projects in the field of airports. Obviously, all the events mentioned above cannot have a negative impact on PPP projects in the health care.

At the same time, specific risks for PPP projects in the field of health care would be risks associated with the features of medical activities of the private partner which have a cause effect to the treatment of patients and provision of different services for them.

Depending on the area of medical activities of the private partner these risks may be, for example, diagnostic (risk of incorrect diagnosis, risk of unreliable medical information, etc.); curative (surgical treatment risks, risks of interaction between doctors and succession of medical care, risks of pharmacotherapy, risk of complications and adverse medical reactions); associated with the hospital stay (fall, occurrence of additional diseases). Another part of the specific medical risks is associated with supplementary processes (risk of lack of the necessary medicines, power or water outages); risks associated with the catering of patients (low-quality food, delay, food poisoning); cleaning of hospitals (poor quality cleaning, occurrence of nosocomial infections) and others.

Thus, this criterion allows to identify general risks that may arise in any PPP project (construction, financial, operational, legal, political, social and other risks), regardless of the field of its implementation and the specific risks inherent in PPP projects depending on the object of the PPP project and the sector in which it is implemented (specific road, specific aviation, specific utilities, medical risks, etc.). In this paper only specific medical risks are considered.

It should be noted that this paper is not the first in which it is proposed to allocate risks in two similar groups. A similar classification has been already encountered: general risks and projects risks (Loosemore, 2007) or general/country risks and specific project risks (UNIDO, 1996). However, these studies offer only risk classification, but the list of risks and description of risks are absent. We intend to fill in this gap, because of at least two reasons.

It is clear that the specific risks arise mainly at the operation stage (certainly, not only at this stage) because they are determined by the features of the activities implemented by the private partner and features of the object of the PPP agreement. Note that this is the longest stage of the PPP project. Therefore, specific risks will accompany the PPP project most of the time of the PPP project implementation. Moreover, the majority of PPP projects are focused on the operational stage, where the need for the provision of public services to the population is met. It also emphasizes the importance of identification, description and analysis of these risks.

Risk Management of PPP Projects in Health Care (The Case of St. Petersburg, Russia)

PPP Projects in Health Care in St. Petersburg

For this study, we selected three PPP project in the health sector:

1. PPP Project of reconstruction and operation of the Perinatal Center (hereinafter-PPP Project “Perinatal Center”),
2. PPP Projects of construction and operation of the Diagnostic Center and the Center of General Practitioners (hereinafter-PPP Project “Diagnostic and GP Centers”),
3. PPP Projects of construction and maintenance of Medical Treatment and Rehabilitation Center (hereinafter-PPP Project “Rehabilitation Center”).

Bidding documents have been already prepared for holding tender procedures. In accordance with the documents, these projects are characterized by the following key parameters and conditions.

The implementation of the PPP Project "Perinatal Center" will be based on the concession agreement, in accordance with the Federal Law on Concessions using the BTO (Build-Transfer-Operate) model, concession.

Parties to the Concession Agreement-Grantor/St. Petersburg and Concessioner

Project goals-the achievement of the highest level of quality and availability of medical care, improving the level of service in optimal conditions of staying of visitors and patients Perinatal Center, the application of advanced technologies of reproductive medicine and genetic diagnostics, the using of private funding in the health sector.

Object of the concession agreement-Perinatal Center.

Term-28 years

Ownership relations-the Grantor assumes the ownership rights for the Prenatal Center. The Grantor is obliged to provide the Concessionaire with the ownership and operation rights of Prenatal Center for the duration of the concession agreement.

Rights and liabilities-the Concessionaire will carry out the reconstruction of the Perinatal Center and provide medical care to the population, specialized high-tech medical care for the treatment of infertility using reproductive technologies through the system of Compulsory Medical Insurance as well as through fee-paying services.

St. Petersburg will provide the Concessionaire with land and buildings for the reconstruction of the Perinatal Center and will carry out payments to the concessionaire to finance part of its costs of reconstruction and operation of the Perinatal Center in the form of capital grants and availability payment.

The implementation of the PPP Project "Diagnostic and GP Centers" will be based on the PPP agreement in accordance with the St. Petersburg Law on PPP using the BOOT (Build-Own-Operate-Transfer) model.

Parties to the PPP agreement-Public partner/St. Petersburg and Private partner.

Project goals and objectives-creation of Diagnostic and GP Centers with high-functional characteristics; improving the efficiency of capital expenditure (CAPEX) and operating costs of creating the medical infrastructure by increasing the quality and accessibility of health services; reduction of the short-term burden on the budget of St. Petersburg; uninterrupted and high-quality medical care to the population.

Object of the PPP agreement-Diagnostic and GP Centers, including: Diagnostic Center and GP Center.

Term-30 years

Ownership relations-the Private partner assumes the ownership rights for the Diagnostic Center during the term of the PPP agreement. Upon expiration of the PPP agreement, the Diagnostic Center will become the property of St. Petersburg. St. Petersburg assumes the ownership rights for the GP Center. St. Petersburg is obliged to provide the Private Partners with GP Center ownership and operation rights for the duration of the PPP agreement.

Rights and liabilities-the Private partner will perform construction of the Diagnostic Center and reparation of the GP Center and will supply them with medical and non-medical equipment. The Private partner will also have to carry out medical care. In addition, the Private partner is obliged to carry out maintenance, modernization of the Diagnostic and GP Centers. Upon termination of the PPP agreement, the Private partner will have to transfer land, the Diagnostic and GP Centers back to St. Petersburg in technical condition that ensures the possibility of further use of the Diagnostic and GP Centers for 5 years.

St. Petersburg will provide the Private partner land for the construction of the Diagnostic Center and provide the Private partner with the building for reparation and placement of the GP Center. In addition, St. Petersburg will transfer payments to the Private partner associated with the reimbursement of costs for the construction of the Diagnostic Center, including the cost of paying interests and the body of debt (in case of debt financing), as well as costs for liability insurance paid by the Private partner, costs for the renovation of medical equipment, additional costs for the provision of medical care due to the lack of funds from health insurance companies in the first six months of operation of the Diagnostic and GP Centers.

The implementation of the PPP Project "Rehabilitation Center" will be based on the PPP agreement in accordance with the St. Petersburg Law on PPP using the BFMT (Build-Finance-Maintain-Transfer) model.

Parties to the PPP agreement-St. Petersburg/Public partner, St. Petersburg State Budgetary Health Organization "City Hospital № 40" (hereinafter-Hospital) and Private partner.

Project goals and objectives-Creation of medical rehabilitation and engineering infrastructure with high-functional characteristics.

Object of the PPP agreement-Rehabilitation Center.

Term-10.5 years

Ownership relations-the Private partner assumes the ownership rights for the Rehabilitation Center over the term of the PPP agreement. Upon expiration of the PPP agreement, the Rehabilitation Center will become the property of St. Petersburg.

Rights and liabilities-the Private partner will perform the construction of the Rehabilitation Center and supply it with medical and non-medical equipment. However, the Hospital, not the Private partner, will provide medical rehabilitation services to the population. Responsibilities of the Private partner will include technical maintenance and reparation of the Rehabilitation Center, as well as ensuring the availability and operability of medical and non-medical equipment. Upon termination of the PPP agreement, the Private partner will have to transfer back to St. Petersburg land and the Rehabilitation Center in the technical condition that ensures the possibility of further use of the Rehabilitation Center for 5 years.

The obligations of the Hospital include the use of the Rehabilitation Center to provide medical services, as well as making payments to the Private partner for the technical maintenance and reparation of the Rehabilitation Center.

St. Petersburg will provide the Private partner with land for the construction of the Rehabilitation Center. St. Petersburg will also have the obligation to ensure the availability of financial resources of the Hospital in order to fulfill its obligations to make payments to the Private partner.

The analysis of PPP frameworks, tender documentation and other project documents, legal conditions (legislation, organizational model of PPP projects), financial conditions (pricing policies and tariffs of the Compulsory Medical Insurance Fund, current and future expenditures

of the budget of St. Petersburg for the construction and operation of healthcare facilities, amount of subsidies and guarantees to healthcare organizations, financial models of PPP projects), economic and social conditions of the PPP projects in St. Petersburg (demand and supply in the provision of medical services in the area of obstetrics and gynecology, primary medical care and rehabilitation, level of competition between public and private medical organizations, availability of health care services, level of depreciation of health care infrastructure and medical equipment), as well as standards of health care and operation of health care facilities that will be obligatory for private partners in the operation of the objects of PPP agreements, revealed the following risks.

In the PPP project "Perinatal Center" 68 events that can have a negative impact on the PPP project in terms of time, cost and quality of service and achievement of the Project goals are identified. In the PPP Project "Diagnostic and GP Centers" 80 risks are identified, while in the PPP Project "Rehabilitation Center" 59 risks are identified.

The use of the classification criteria proposed in this article shows the following distribution of risks into different types in PPP projects in the health care in St. Petersburg (Figures 1, Figure 2 and Figure 3):

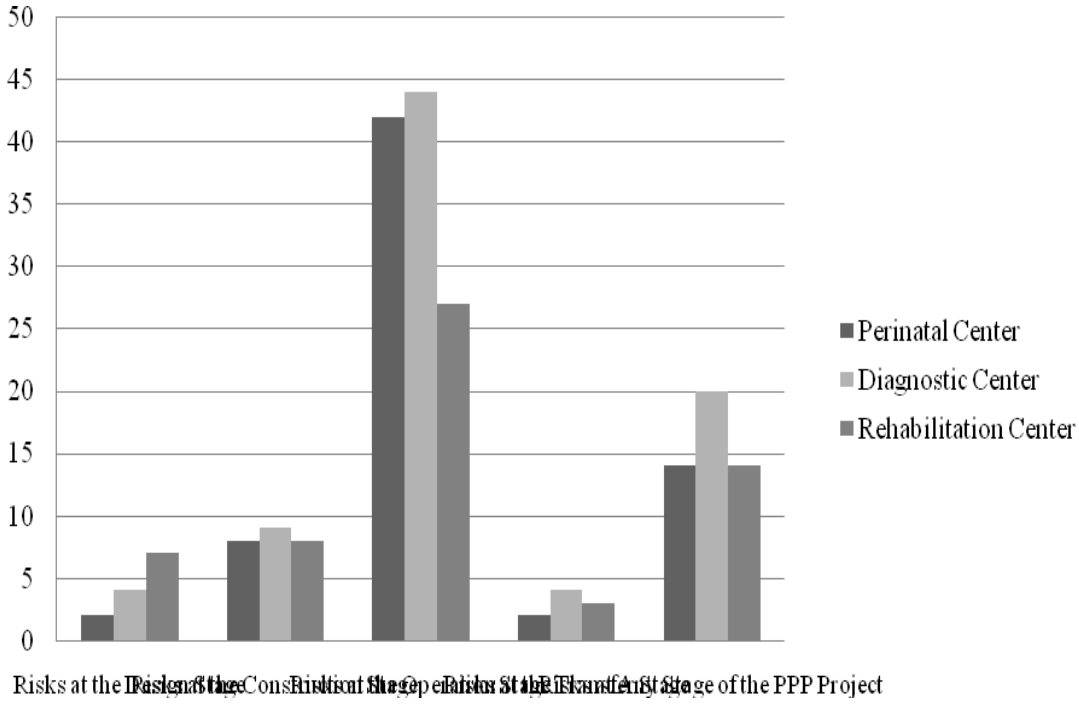

Figure 1
RISK CLASSIFICATION BASED ON THE SPHERE OF RISK EMERGENCE

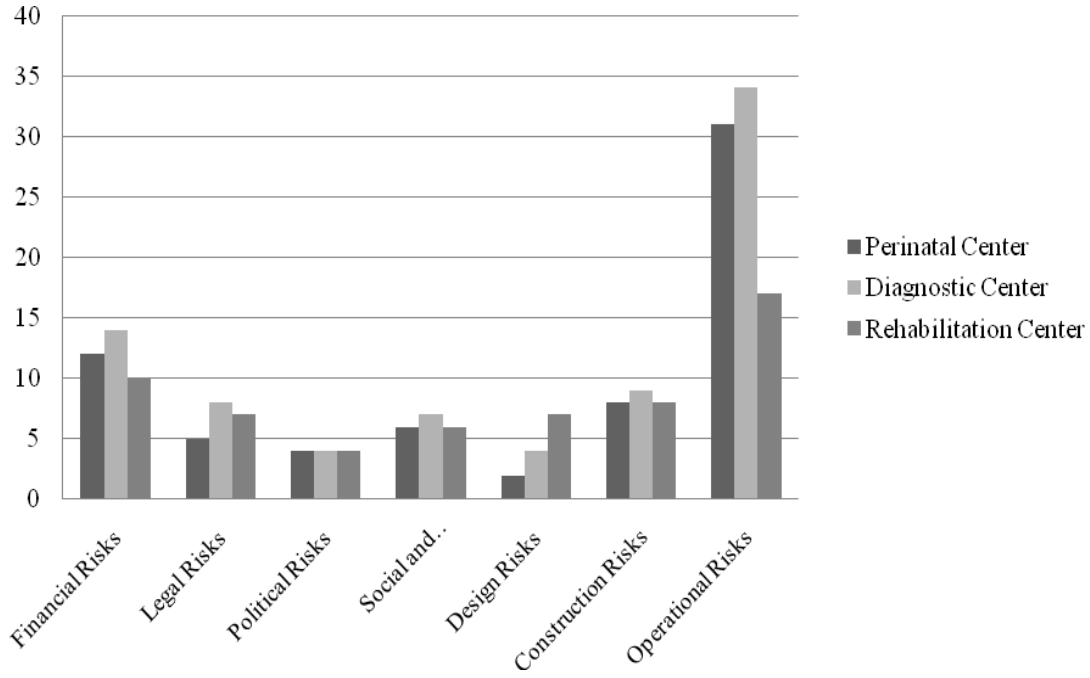

Figure 2
RISK CLASSIFICATION BASED ON THE STAGE OF A PPP PROJECT

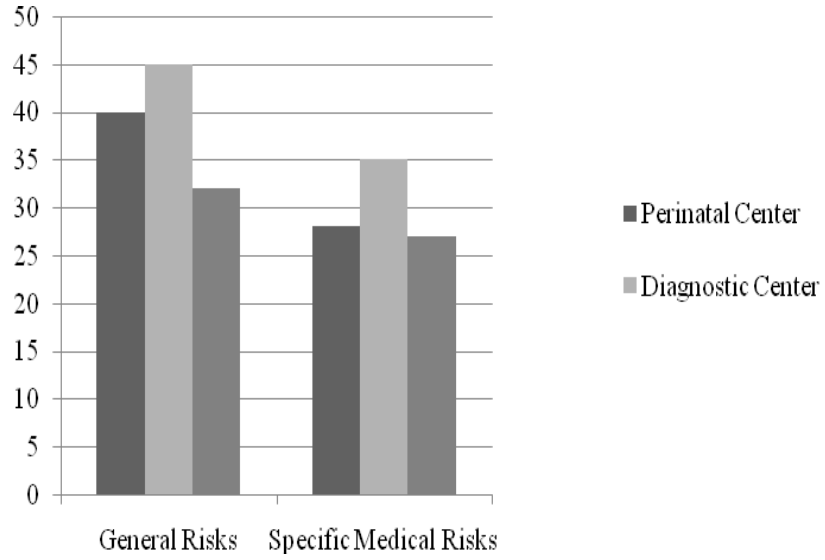

Figure 3
RISK CLASSIFICATION BASED ON THE SECTOROFTHE PPP PROJECT

Risk Management for the Case of Specific Medical Risks in PPP Projects

Identification of risks which are inherent in PPP projects in health care, the so-called medical risks, is to be followed by their description.

In the PPP Project "Perinatal Center" the main medical risks are the following:

1. In Russia, as in many other countries, medical activities may be carried out only on the basis of the medical license which is regulated by the Federal Law "On Licensing of Certain Types of Activities". This medical license can be withdrawn or suspended by the decision of the licensing authority or judicial body. Accordingly, in case of the violation of legal requirements by the Concessionaire the possibility of the withdrawal of the medical license arises. This event may have a negative impact on the PPP project; for example, it can lead to the delay in the operation and provision of medical care or full impossibility of the PPP Project implementation. This fact allows us identify it as a risk of termination or withdrawal of medical license.
2. In Russia, the right to get free health care is implemented both in public and private health care organizations. Still, the compensation for the provision of free health care services is paid to private medical companies from the Compulsory Medical Insurance Fund. However, only those private medical companies which are included in the System of Medical Insurance (hereinafter-SMI) have the right to provide health care services to the population. In order to be included in the SMI a medical company should send a notification and respective documents stipulated by the legislation to the Territorial Health Insurance Fund by September 1 of the year preceding the year in which the medical company intends to carry out Compulsory Medical Insurance activities. Due to the fact that the Concessionaire will provide more than 75% of services within the Compulsory Medical Insurance framework, its inclusion to the SMI is extremely important. Thus, it is possible to classify this event as a risk of non-inclusion of the perinatal center to the SMI. The materialization of this event will cause the reduction of financial resources of the PPP project, inability of payments to the Concessionaire from the Compulsory Medical Insurance Fund and, as a consequence, increase of the burden on the budget of Grantor.
3. Another risk associated with the provision of free health care services is the risk of change of SMI's tariffs. In other words, a possible reduction of SMI's tariffs will be a difficulty for the Concessionaire in performing its responsibilities. For example, in case of insufficient funding, medical care will be provided in a smaller volume or of inadequate quality.
4. As for the provision of paid medical services by the Concessionaire (25% of all medical services provided within the project), there exists a risk of the prohibition of paid medical services provision. This can be interpreted as a possible change of the situation in the form of the prohibition of paid medical services provision for medical companies working in the SMI system and providing free medical care. Deprivation of the Concessionaire of such source of income as a direct payment of the population will lead to the increase in public expenditures in the form of budget subsidies to cover the operational costs of the Concessionaire.
5. Another negative event for the PPP Project "Perinatal Center" is the outbreak of the nosocomial infections. They represent critical situations in operation of hospitals, including perinatal centers. The nosocomial infection is one of the most frequent complications during hospitalization, an infectious disease that affects the patient of the hospital. The outbreak of nosocomial infection entails the immediate closing of the hospital or one of its departments for a period which is needed to eliminate the infection. This event can be considered as an epidemiological risk. Its materialization can lead to the interruption of the Perinatal Center activities. According to the financial model of the project, part of the availability payment is paid to the Concessionaire only when the uninterrupted functioning of the Perinatal Center and the provision of medical services is ensured. Thus, this risk is crucial for the PPP project.
6. A risk of the infliction of harm to the health of patients is the likelihood of poor medical services provision or medical errors, i.e. failure to comply with the standards of medical services provision by the medical personnel, for instance, using untested or unproven therapies.
7. A risk of patients' confidentiality violations is the likelihood of disclosure of confidential medical information (medical secrecy), including the fact that the patient applied for health care services, patient's state of health, his diagnosis, other information received during his examination and treatment. The materialization of this event can result in the dismissal of the guilty medical personnel, interruption of the Perinatal Center activities or other negative consequences for the Concessionaire.

The majority of the risks mentioned above may also arise in the PPP Project "Diagnostic and GP Centers". Additional medical risks of this project are related to the location of the object of this PPP Project and specialization of the doctors (general practitioners) involved in the medical activities of the Diagnostic and GP Centers.

The fact is that medical care provided by general practitioners (family doctors) has a short history in modern Russia. Currently, in St. Petersburg there is a deficit of general practitioners. Also not all the medical universities in Russia have specialized educational and training programs for general practitioners. Thus, major risks of this Project are the following:

1. A risk of the deficit of qualified medical staff is the likelihood that difficulties occur in the recruitment process (either hiring may take long time or specialized educational programs for general practitioners may be closed). The occurrence of these events can cause the inability of the Private partner to fulfill its obligations and increase of waiting time for receiving medical care for patients.
2. The PPP Project "Diagnostic and GP Centers" is planned to be implemented in the residential area of 220 hectares which is being actively constructed now. By the end of 2016 this residential area will include 130 houses (1,400,000 square meters) with more than 68 thousands of dwellers, by 2020-around 76 thousands. Due to this fact, a risk of non-compliance of Diagnostic and GP Centers with the required volume of health care services is crucial in this PPP Project. This risk can be interpreted as a likelihood of the increase of the quantity of patients and additional needs for medical care. Its cause is the active housing development and its consequence can be the failure to provide medical care.

The majority of the medical risks mentioned above are missing in the PPP Project "Rehabilitation Center". This is due to the fact that the Private partner does not provide medical services to the population. Operation which is performed by the Private partners is equal to the maintenance of the Rehabilitation Center without medical care provision. Due to this, the following risks are relevant for this Project.

1. A risk of the early obsolescence of the medical technologies. The level of medicine is improving every year and the treatment process requires new medical equipment. This risk is associated with the inability of the initial technological solutions to correspond to the changed requirements of the treatment process. The materialization of this risk can decrease the quality of the provided medical services.
2. A risk of non-functioning of medical equipment for the Rehabilitation Center is the likelihood of delayed or incomplete provision of medical equipment and non-medical services (maintenance). As a consequence, it can lead to the impossibility of patient treatment.
3. A risk of the illegal use of the medical equipment is the likelihood of the displacement of medical equipment from the Rehabilitation Center to other buildings of the Hospital which is not controlled by the Private partner. Thus, the Private partner will not be responsible for timely maintenance of high quality.
4. A risk of the improper technical condition of the Rehabilitation Center when transferring back to the Public partner is the likelihood that the Rehabilitation Center will be transferred to St. Petersburg in the depreciated (deteriorated) condition. The materialization of this event will not allow St. Petersburg and the Hospital to operate the Rehabilitation Center and will result in the additional public expenditures of the city budget for the reparation of the Center.
5. One of the features of this PPP Projects is that it is based on the trilateral PPP agreement; the parties to this agreement are St. Petersburg, the Private partner and the Hospital. The Hospital is a state budgetary organization whose owner is St. Petersburg. According to the Russian legislation, the owner has the right to reorganize (through mergers, acquisitions, etc.) and even close it down. Any of these events may lead to the impossibility of further implementation of the PPP project since the Hospital has the critical function in the Project-to provide medical services to the population and payments to the Private partners. Thus, a risk of changes in the structure of the Hospital is crucial for this PPP Project. An efficient measure to mitigate this risk is the establishment of the prohibition in the PPP agreement to take such actions by Public partner without the consent of the Private partner, excluding cases when these actions are required by the federal legislation. Another measure is the establishment of conditions to replace the Hospital by the other state

budgetary medical organization which could be able to exercise the rights and liabilities of the Hospital (with the consent of the Private partner).

We propose to use both general and specific instruments of risk mitigation in order to minimize other risks of the PPP projects mentioned above and other PPP projects in the field of health care where these risks may arise.

General instruments of risk mitigation are well described in the literature. These instruments include, for instance, the detailed regulation of rights and liabilities of the parties, all key issues in the PPP agreement and other contracts. Agreements and contracts are well-established instruments used for the mitigation of specific (technical and operation) risks. Such documents, aside from PPP and concession agreements, include future purchase agreements, shipping agreements, construction contracts, contractor agreements, service and maintenance contracts, etc. For the complicated PPP projects, more specific and diverse types of agreements are usually used. Another group of instruments of risk mitigation is insurance. Major types of risks of PPP projects that could be insured are the risk of accidental loss of the object, liability risk, etc. Such instrument as hedging can be used to mitigate financial risks. Moreover, the public partner can support the project by the budget subsidies, government guarantees or tax allowances (Delmon, 2017; Frisari, Hervé-Mignucci, Micale & Mazza, 2013). An efficient way to cover the consequences of risks is the creation of a contingency savings fund.

It is important to mention that these instruments are the basis for the development of measures for risk mitigation but not the exhaustive list of the measures. Due to this fact, the elaboration of each individual risk and development of specific measures are important.

We would propose the following measures. To mitigate the effects of the risk of the prohibition of paid medical services provision we propose to include in the PPP agreement the right of the private partner to provide paid services in the same volume but through another entity (for instance, its subsidiary) or the right to rent out the part of the object of the PPP agreement instead of providing medical services. One of the measures to minimize the consequences of the risk of the infliction of harm to the health of patients is to offer liability insurance for medical personnel. Measures that can mitigate the risk of patients' confidentiality violations are the timely detection and prevention of unauthorized access to confidential information, permanent control to ensure the level of protection of confidential information, record of persons with an access to confidential information. Several measures are identified to prevent the risk of non-compliance of the object of the PPP agreement with the required volume of health care services: a preliminary detailed study of the scope and quality of services and the possibility to change the PPP agreement if the significant increase in the volume of health care services takes place. Another efficient measure could be the establishment of temporary restrictions in issuing construction permits for the area of the PPP project implementation by the public partner. To prevent and minimize the risk of the early obsolescence of the medical technologies it is proposed to conduct a thorough expertise of project documentation and equipment supplied. The private partner should conduct an independent analysis of the market at appropriate time intervals and report to the public partner about new types of equipment, their efficiency and cost. To mitigate the risk of the improper technical condition of the object of the PPP agreement when transferring back to the public partner it is possible to conduct regular audits of the technical condition of the object by the independent engineer for the timely detection of defects and sending to the private partner the requirements for their elimination within the prescribed period of time. Other efficient measure is a regular reporting by the private partner on the condition of the object of the PPP agreement during its operation (for example,

every 6 months) and the presentation of periodic reports on LEED certification by the private partner.

CONCLUSION

This paper's key argument is that it is necessary to use both objective and justified criteria to define the concept of risks in PPP projects and establish their classification. This allows defining the concept of risks in order to manage these risks better and to systematize the classification of risks in PPP projects. Another outcome of this paper is the identified groups of risks inherent in PPP projects in health care.

Currently PPP is considered not just as a mechanism of addressing national infrastructure problems, but also as one of the best ways of implementing and therefore achieving Sustainable Development Goals (Development, 2012), which will be approved at the 70th session of the General Assembly of the United Nations and will become a reference point for all UN member states. Thereby, UN member states will be required to undertake actions for substantial expansion and development of PPP practices at the national level. It is assumed that international PPP Standards, including the PPP Standard in Health Policy, developed by the UN Economic Commission for Europe will render considerable assistance in the development of PPP. Each PPP Standard will include, inter alia, the matrix of risk allocation and further recommendations. Thus, the theoretical elaboration of the medical risks (description, classification as well as the proposed measures of risk mitigation) presented here may have practical applications, which highlights the practical contribution of this study.

Future research of risks in PPP projects could concentrate on different sectors of the economy, including roads, airports, communal infrastructure, schools, smart cities, water and energy, which may contribute to the increased sustainability and viability of PPP projects.

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REFERENCES

Akintoye, A., Beck, M. & Hardcastle, C. (2008). *Public-private partnerships: Managing risks and opportunities*. John Wiley & Sons.

Commission, E. (2004). *Green paper on public-private partnerships and community law on public contracts and concessions.* EC-COM-327: (Brussels).

Delmon, J. (2017). *Public-private partnership projects in infrastructure: An essential guide for policy makers*. Cambridge University Press.

Development, U.C.O.S. (2012). *Outcome document 'The future we want'*.

Furnell, C. (2000). *Risk identification and risk allocation in project finance transactions*. Faculty of Law, University of Melbourne.

Guidance, T.G.T. (2011). *How to prepare, procure and deliver PPP*. European PPP Expertise Centre of European Investment Bank.

Hodge, G.A. (2004). *Risks in public-private partnerships: Shifting, sharing or shirking? Asia pacific journal of Public administration*, *26*(2), 155-179.

Hodge, G.A. & Greve, C. (2007). Public-private partnerships: An international performance review. *Public administration review*, *67*(3), 545-558.

Initiative, C.P., Frisari, G., Hervé-Mignucci, M., Micale, V. & Mazza, F. (2013). *Risk gaps: A map of risk mitigation instruments for clean investments*.

Kabashkin, V. (2010). *Public-private partnership: International experience and Russian prospects*. M: LLC, IIC.

Ke, Y., Wang, S., Chan, A.P. & Cheung, E. (2011). Understanding the risks in China's PPP projects: Ranking of their probability and consequence. *Engineering, Construction and Architectural Management*, *18*(5), 481-496.

Management, R. (2008). *PPP guidance material supporting document*. Queensland Government, Department of Infrastructure and Planning.

Mataev, T. (2011). Prospects of development of public-private partnership in the Republic of Kazakhstan. *Journal of Russian Entrepreneurship*, *12*(12), 187-192.

Ng, A. & Loosemore, M. (2007). Risk allocation in the private provision of public infrastructure. *International Journal of Project Management*, *25*(1), 66-76.

Partnerships, B. (2005). *An introduction to risk management in a public private partnership*. Partnerships British Columbia.

Seleznev, P., Tkachenko, M., Dolgov, A., Borschevsky, G. & Shabayev, R. (2014). *Guidelines for the development of the institutional environment in PPPs in the Russian regions*. PPP for Development Centre.

UNCITRAL (2001). *Legislative guide in privately financed infrastructure projects*. United Nations Publications. New York.

UNIDO (1996). *Guidelines for infrastructure development through BOT projects*. United Nations Development Organization, Vienna.

Varnavskiy, V., Klimenko, A. & Korolev, V. (2010). *Public-private partnerships: Theory and practice*. Moscow: Higher School of Economics Publications.

Vassallo, J. & Gallego, J. (2005). Risk sharing in the new public works concession law in Spain. *Transportation Research Record: Journal of the Transportation Research Board*, 1-8.

Victoria, P. (2001). *Practitioners guide department of treasury and finance*. Department of Treasury and Finance Publications, Melbourne Victoria.