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## The Determinants of the Development of Russian Assistive Technologies Market: Analysis of Experts' Interviews

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### Abstract

Not all people with disabilities are provided with assistive technologies and devices (ATD) they need. The Russian researchers appeal to the development of assistive technologies, however, focus only on one specific social objective of ATD provision or on engineering, economic and production aspects of the problem. This study identifies the key determinants of the development of the assistive technologies market in Russia and trends over the next 10–15 years. We conducted a qualitative study using a grounded theory based on open and axial coding procedure. We collected data using semi-structured interviews with 12 experts recruited through snowball sampling with multiple entry points. The results show that the focus on the development of individual rehabilitation programs, individual fitting of devices, the increasing demand for measures of medical and social support for people with disabilities create conditions for the growth of demand for ATD. Changes in the paying capacity of the population, the rules of budget financing, as well as the population's attitude towards the inclusion of people with disabilities in everyday activities, the labor market, education will also cause changes in demand for ATD.

### Keywords

Assistive Technologies and Devices, Technical Aids of Rehabilitation, People with Disabilities, Russian Markets, Disabilities, Technological Advances, Social Inclusion, Semi-Structured Interviews, Grounded Theory Methodology, Social Policy

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## The Determinants of the Development of Russian Assistive Technologies Market: Analysis of Experts' Interviews

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*Not all people with disabilities are provided with assistive technologies and devices (ATD) they need. The Russian researchers appeal to the development of assistive technologies, however, focus only on one specific social objective of ATD provision or on engineering, economic and production aspects of the problem. This study identifies the key determinants of the development of the assistive technologies market in Russia and trends over the next 10–15 years. We conducted a qualitative study using a grounded theory based on open and axial coding procedure. We collected data using semi-structured interviews with 12 experts recruited through snowball sampling with multiple entry points. The results show that the focus on the development of individual rehabilitation programs, individual fitting of devices, the increasing demand for measures of medical and social support for people with disabilities create conditions for the growth of demand for ATD. Changes in the paying capacity of the population, the rules of budget financing, as well as the population's attitude towards the inclusion of people with disabilities in everyday activities, the labor market, education will also cause changes in demand for ATD. Keywords: Assistive Technologies and Devices, Technical Aids of Rehabilitation, People with Disabilities, Russian Markets, Disabilities, Technological Advances, Social Inclusion, Semi-Structured Interviews, Grounded Theory Methodology, Social Policy*

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However, while for some individuals technological solutions (including electronic and digital ones) is a way to free up personal time or a type of leisure time, for others it is a way of maintaining personal functional capacities and independence in everyday life. Assistive technologies and devices (ATD) or technical aids of rehabilitation (TAR) help people with disabilities, for example, wheelchairs and prostheses facilitate movement, hearing aids, proofreaders and devices for vision correction facilitate communication. The development of technologies helps involve certain groups in public life and integrate them socially. According to the National Standard of the Russian Federation which came into force in 2016 there is a variety of existing and promising assistive technologies and devices in the market that includes about 980 items of assistive products for people with disabilities (*GOST R ISO 9999-2014*, 2016). The assistive products in this standard are classified according to their functions, for example, assistive devices for personal medical treatment (self-treatment), assistive devices for training skills and assistive devices for personal mobility (self-movement). A subclass of assistive devices usually describes the special function of these assistive devices, for example, "wheelchairs with electric drive", which is included in the broad class "assistive devices for personal mobility (self-movement)."

People with disability status are not the only, but the core group in need of ATD. As recipients of state social policy programs, they are eligible for assistance in the provision of technical aids that help partially or fully overcome their disabilities. Therefore, it is impossible to discuss ATD outside the context of disability.

In the year 2012 the Convention on the rights of people with disabilities was ratified by Russia, it states the need to ensure access to ATD. According to the Federal State Statistics Service, on January 1, 2017 in the Russian Federation 11.93 million people had a disability. The number of individual programs of rehabilitation and habilitation (IPRH) containing the TAR needs of people with disabilities, is about 40% of the total number of such programs, and about 73,4 billion rubles of public expenditure 2013–2015 (Accounts Chamber of the Russian Federation, 2016). During this period, the costs of providing people with disabilities with TAR increased on average by more than 3,000 rubles per person while these costs varied by region from 9,000 to 65,000 rubles in the year 2015. In other words, these figures signify a rise in budget spending and high regional differentiation in this sphere as ATDs are not fully financed from federal budget. Therefore, there are some inequalities among beneficiaries from different regions with varying levels of prosperity.

However, against the background of these raising sums, it is especially important to note that not all people with disabilities are included in the lists of beneficiaries and are provided with TAR.

Because of privacy protection and the inconsistency of information on the status of people with disabilities available from public bodies (for example, the Social Insurance Fund or the Bureau of Medical-Social Expertise)<sup>1</sup>, researchers use surveys for data collection. For example, according to the Sample Selective Monitoring Survey of the Quality and Accessibility of Services in the Areas of Education, Health and Social Services, Employment Promotion (2015), the number of persons in need of ATD is higher than the number of the actual recipients, 51.1% of all those recognized as people with disabilities (61.7% among those with disabilities of group I<sup>2</sup>).

In this regard a number of questions arise. Why is the demand unsatisfied? Is this the result of organizational and procedural errors or lack of funds (in the treasury or among the population)? Given that the ATD market is not limited to government purchases and is larger than what the official statistics show, does the state acts as the main agent determining the development of the ATD market in Russia? What contributes to the development of this market, and what is slowing it down?

Despite the economic nature of these issues, it is also relevant to analyze the social context, since it is a market of technological solutions that provide for people with disabilities and their families the opportunity to become involved in socio-economic processes.

This issue has gained the attention of social scientists, but Russian researchers usually turn to the topic of the development of ATD in two contexts: when it comes to introducing new devices promoting inclusion in education (Arhipova & Sergeeva, 2015; Samarina, Zimin, Kistrina, Lokteeva, & Musholt, 2015) and the labor market (Shoshmin & Besstrashnova, 2014) or in relation to the theme of technological breakthroughs and know-hows (Karpov & Ronzhin, 2014). Obviously, the first group has more to do with social policy and sociological research, however, it focuses only on one specific goal of ATD provision (for example, increasing the

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<sup>1</sup>The single comprehensive source of statistical information in Russia did not exist at the time of the survey. Since the year 2017 the state information system "Federal Register of People with Disabilities" (Retrieved from <https://sfri.ru/>) has been enforced, the full use of information from the register for providing state services to people with disabilities is scheduled to begin in the year 2018.

<sup>2</sup>In the Russian practice of assessment of the severity of persistent violations of the human body functions caused by diseases, consequences of traumas or the defects, there are 4 degrees (groups): I group — persistent minor violations of the functions of the human body in the range from 10 to 30%; II group — moderate persistent violations of the functions of the human body in the range from 40 to 60%; III group — resistant functional disorders of the human body in the range from 70 to 80%; IV group — persistent significant functional disorders of the human body in the range from 90 to 100%.

number of students involved in inclusive education or the share of those employed among the people with disabilities), while the social significance of ATD is much wider. Researchers of technology typically omit the social aspect, concentrating exclusively on the engineering and economic aspects of the problem (discussing, as a rule, devices designed to compensate for only one category of restrictions—for example, hearing, vision impairments).

There is a wide range of research dealing with the integration of people with disabilities into society, but to a large extent with an emphasis on ethical issues, the social acceptance of people with disabilities, and social policies in relation to persons with disabilities in forms of support measures and programs (Iarskaia-Smirnova, Romanov, & Yarskaya, 2015; Rasell & Iarskaia-Smirnova, 2014). In this case, the issue of technological progress remains uncovered.

In this paper, we study the ATD market through the analysis of experts' interviews (with public associations of people with disabilities, manufacturers of ATD, specialized civil servant, researcher and policy maker) in relation to the demographic, social and economic factors which determine the development of the ATD market, and which in the long run can be transformed by new technologies. For example, there is reason to believe that a more accessible physical environment for people with disabilities greatly increases the numbers of those who are ready for inclusion in education or the labor market. The proposed approach compensates for the lack of a comprehensive study of the Russian ATD market, and for the first time indicates options for its development in the short and medium term. Under the determinants in this study, we investigate the combination of the main trends and factors influencing the development of the ATD market.

Section 1 contains the literature review covering the determinants of the development of global ATD market, which then is adapted to design the study on situation in Russia. On the basis of global research agenda in this sphere we tried not only to find an evidence of its relevance for the local context in order to close the gap of such studies in our country, but also to highlight and explain the specific systemic aspects of the market functioning in accordance with distinctive local determinants as well as with global trends, like population ageing, etc. The section also presents the concept of Porter's "five forces" which we use as a theoretical framework to evaluate the influence of different determinants of the market development in the context of interaction among the main market agents. Section 2 describes the empirical data, which includes semi-structured interviews with experts in the Russian ATD market. Section 3 interprets the data with the chosen theoretical framework, taking into account the idea of complex interaction of diverse trends. Section 4 discusses which determinants have the greatest impact on the current and future state of the ATD market in Russia as well as in many other countries where the state plays the key role in functioning of this market. This particular characteristics of the studied ATD market and recommendations we proposed make the results of the study highly practical for those researchers and policy makers who are interested in the ways of compensating of the bureaucratic inefficiencies in social policy and markets regulation.

### **Theoretical Framework: Determinants of the Development of the ATD Market in the Scope of Multidisciplinary Research and Porter's Five Forces Model**

ATD are the object of research in numerous scientific works in various fields — from medicine to sociology and applied psychology. Taking into consideration the experience of international organizations and scientific institutions, this study looks at the five key groups of trends determining the development of the ATD market: demographic, economic, political, social and infrastructural.

The most important group of trends is *demographic* related to aging and increased life expectancy (Khosravi & Ghapanchi, 2016; Sugihara, Fujinami, Phaal, & Ikawa, 2015; World Health Organization, 2013).

Population aging is an increase in the number of elderly people in the population due to a growth in life expectancy. In the year 2015, one in eight people in the world were over 60 years old, by the year 2030 this is forecast to be one in six and by the year 2050 one in five (United Nations, Department of Economic and Social Affairs Population Division, 2015). People with disabilities and elderly people are the main consumers of ATD (Tebbutt et al., 2016). Contemporary assistive technologies can help elderly people lead an independent life much longer and make medical and other services accessible by means of mobile equipment and continuous monitoring (Dünnebeil, Sunyaev, Blohm, Leimeister, & Krcmar, 2012; Hawley-Hague, Boulton, Hall, Pfeiffer, & Todd, 2014; Khosravi & Ghapanchi, 2016).

Another important trend is the decrease in infant mortality rates. Improved modern perinatal medicine means there has been a growth in the number of successful pregnancies which were threatened with miscarriage or complications. Many children with serious intrauterine and prenatal illnesses have survived (Lorenz, Wooliever, Jetton, & Paneth, 1998). These result in increasing rates of children with disabilities in developed countries.

*Economic* determinants, as well as demographic ones, are very important due to their influence on ATD consumption and production (World Health Organization, 2013). From the supply side, key problems include special expenses in research and production, volumes and conditions of state subsidies, customs taxes, the availability of less expensive analogues in the market (World Health Organization, 2013). High prices in the ATD market hinder their wider use by the elderly and people with disabilities (Ahn, Beamish, & Goss, 2008; Kang et al., 2010; Lee, 2013). In other words, the issue of financial accessibility is a key problem.

The dependence of ATD consumption on the number of social workers and the cost of services in comparison to the devices is seen as the confluence of the *political* and *economic* groups of determinants. The disproportion between the comparatively low expenditure on salary and subsidies to people providing care services and the high cost of ATD (especially in the field of robotics) leads to the economic removal of expensive modern ATD from the care market (Organisation for Economic Co-operation and Development, 2012). Social workers' lack of knowledge and their inability to work with ATD create one of the barriers to a more active take-up of devices while caring for people with disabilities (Sugihara et al., 2015; World Health Organization, 2013). Bureaucratization and the inflexibility of state policy in providing ATD and approving the register of technical aids of rehabilitation subsidized by the government and offered to people with disabilities negatively affects the development of this sphere (Henschke, 2012; World Health Organization, 2013).

Among the key *social* determinants of the development of the ATD market is access to education and the labor market, the participation of elderly people and persons with restricted abilities in social and cultural life. According to WHO assessments, education level and the interest in education of people with disabilities will increase (World Health Organization, 2013), resulting in growing demand for ATD. Individual knowledge of how to use ATD (including mobile devices, tablets and wearable technologies) in order to lessen or eliminate functional restrictions, sensor, cognitive or movement disabilities, allows those individuals to participate more easily and autonomously in society, including in education, occupation, and leisure activities (Blažun, Saranto, Kokol, & Vošner, 2012; Sullivan & Sahasrabudhe, 2017). Thus, the development of the ATD industry will significantly lessen the inequalities and barriers faced by people with disabilities. It also can help include the people with disabilities in all spheres of life (Tebbutt et al., 2016).

*Infrastructural* determinants have received less attention in the literature (Jette & Field, 2007). Environmental inaccessibility is another important barrier to the integration of people with disabilities into society. Here we mean public places, organizations and public transport, places of accommodation, not adapted to the people with disabilities. Such determinants as

accessibility (physical and financial) of the relevant state institutions and ATD services centers also play a vital role (World Health Organization, 2013).

Based on these findings we organized the guide for interviews with experts, starting with the discussion of influence of demographic and infrastructural trends, then moving to political and economic factors and ending with the social ones (Appendix A).

In our opinion, such listing of the main determinants of the development of the ATD market and their influence should be further contextualized in relation to the interaction among the market's main agents. This will allow to form a deep understanding of the problem and get much more meaningful findings in terms of forces of the market development.

For this purpose, we used Porter's five forces analysis model (Porter, 1980), representing the market situation or industry rivalry as the interconnection of threat of new entrants, bargaining power of buyers / consumers, threat of substitutes and bargaining power of suppliers. Porter's model is most often used by economists and serves as a tool to represent a competitive situation and to build a promotion strategy for individual players. However, this concept has also been applied to describe the socio-economic development of market trends, for example, in the tourism services market (Andriotis, 2004; Benson & Henderson, 2011), educational services (Kang & Park, 2017; Ronquillo, 2012), medical care (O'Hara, Nophale, O'Hara, Marra, & Spiegel, 2017; Pines, 2006) or home care industry (Breedveld, Meijboom, & de Roo, 2006). In such studies, attention is paid not only to the competitive struggle per se, but also to the social effects that arise in the process of balancing the five forces. This conceptual scheme depicts the market situation and, in our view, is also suitable for describing the strength of various determinants. In addition, we think that the use of Porter's model for the analysis of the Russian ATD market is useful as the specific nature of its functioning is determined mainly by the unique disposition of forces (including active roles of the state and public organizations).

Consequently, presenting the results of the analysis using this theoretical framework allowed us to describe in more details the current situation in the Russian ATD market and the prospects for its development in the future. In accordance with the described theoretical model, we start our analysis with the evaluation of buyers' market power concerning the distribution of ATDs to final consumers and also relating to ATD purchasing. During this analysis we illustrated the influence of political and economic determinants as well as the effects of social inclusion of people with disabilities as an indicator of the infrastructural determinants action. Then we moved in our study to the analysis of the bargaining power of suppliers also touching upon political and technological factors. After viewing two main sides of the market we analyse the threat of substitute products and the threat of new entrants, which allowed to make conclusions about the nature of industry rivalry.

## **Method**

### **Research Team**

Our research team consisted of three people. All members of the research team were professional sociologists. The head of the research project (Pishnyak A. I.), is a Ph.D. in Higher School of Economics, Moscow, she works as a lecturer at the Department of Sociology, more than 15 years involves in sociological research covering the topics of social policy of the country, including socio-economic behavior of the population and social support. During the project, the other two participants were receiving master's degrees, and already had extensive research experience, including in the field of qualitative methodology. Khabirova E. E. is a junior research fellow at the Higher School of Economics, her interests lie in the field of science, technology and innovation studies with particular focus on the social aspects of the

processes. Goriainova A. R. is a junior research fellow at the Institute for Social Policy in Higher School of Economics, as well as a graduate student at the Department of Sociology. Goriainova A. R. studies topics related to the situation of vulnerable categories of the population, including children with disabilities. The topic of her dissertation is devoted to the study of inclusive education, the barriers and resources faced by children with disabilities in secondary school. In addition, the graduate student in his research projects combines quantitative and qualitative research methodology (Goriainova A. R. was in the research team project dedicated to this direction).

### **Research Participants**

Our research question was to identify trends and factors that affect the development of the market (including supply and demand forces and their interdependencies) of assistive technologies and devices (technical rehabilitation means) in the Russian Federation. Our research was of exploratory nature. We aimed to form a sample of specialists with deep knowledge of the research subject, who are able to assess the state of the Russian ATD market and indicate the trends in its development in the coming decades. Therefore, the target group of the study included adults, whom we could designate as experts in the topic of the Russian ATD market. We interviewed 1 woman and 11 men. Their age ranged from 35 to 65 years. The study included four men working in public associations. Three of them work in the all-Russian societies of people with disabilities (these participants have different disabilities and use various technical means of rehabilitation). One of these participants also belongs to a public organization and at the same time works in a company that produces special means for the disabled. These four participants are directly involved in work with people with disabilities who have a need for assistive technologies and devices and means of rehabilitation. Another four experts work in companies that produce assistive devices, rehabilitation equipment for people with disabilities (manufacturers of ATD) and products. Another informant was a woman working at the State Bureau of Medical-Social Expertise who work with registration of official status of people with disabilities who have rights for public social support. Another expert was a researcher dealing with the topic of demography and disability of the Russian population. The study involved another man, who is a policy maker, dealing with issues related to social support of persons with disabilities.

We conducted the research in accordance with the project calendar. We had limited duration of the study, around 1.5 months, because of the cycle of conducting research and project funding. For the search for informants we used snowball sampling with multiple entry points, recommended by research contract specifier — policy maker from the Federal Ministry of Labour and Social Protection. Given the low accessibility of the informants, and the specifics of the topic, we conducted data collection using individual in-depth semi-structured interviews using guides with a basic part and an additional part specially prepared for conversations with specific experts. We tried to collect interviews until we reached the theoretical "saturation". However, due to the fact that access to the group of interest was limited to a time frame (data collection took place within October-November 2015), as well as the possible diversity of opinions of other experts that we had not attracted, we have to admit certain limitations of gathered data which hardly shows a complete picture of what is happening in this area (see the analysis of the limitations of the research in the Discussion section of the paper).

### **Methodology**

From the earliest stages of the study, there was no empirical evidence about the determinants of the Russian ATD market, and one of the first tasks was to select the relevant method to collect information. In order to study a loosely formalized and forward-looking



subject (the determinants of future market changes), researchers can turn to the analysis of the opinion of the professionals working in this area. These professionals (experts) can fill the lack of or inconsistency of other sources of information with their knowledge, intuition, experience of solving similar problems, and their reliance on industry-specific tacit knowledge (Flick, 2009; Ivanchenko, & Leontief, 2006; Van Audenhove, 2007).

In fact, the only appropriate option in this context was semi-structured interviews with experts — obtaining information from people who are well informed about the market situation and able to present it in all its complexity. We chose a qualitative approach, as due to expected interconnectedness of the market forces we needed effective instruments to gather the understanding of the situation from the different participants' points of view. Moreover, as we stated above, there is limited scientific analysis of the Russian ATD market, so we have almost no basis for a coherent quantitative survey design.

In this study, we used a grounded theory to analyse the interviews, which is a unique sociological version of the study with a qualitative design, the results of which supply the scientist with a theoretical model (Strauss & Corbin 1994). The coding process shows how researchers select, separate, and sort data to begin their analytical explanation (Charmaz, 2006). We coded the interview transcripts according to dimensions of development of the assistive technologies market using the open and axial coding. Open coding is the first step in analyzing qualitative data. In the process of such coding, we identified categories that have distinctive features, which can be studied as sub-categories. The next step is axial coding, during which we have enlarged the categories (see Table 1). As a result, through coding that we used to construct a grounded theory, we gain a deeper understanding of how the assistive technology market functions.

Table 1. An Example of Selected Categories in the Coding Process of Interview Transcripts

Categories	Codes
Social determinants (social inclusion)	Changing social attitudes on the positive side Increasing demand for education by persons with disabilities Increase in the number of persons with disabilities wishing to enter the labour market Changes in leisure practices of people with disabilities Changes in lifestyle and consumer behavior of the population as a whole

In this qualitative study, the interview with open-ended questions has its own specific features. It is semi-formalized and semi-structured, which implies the presence of certain topics, blocks of questions that we asked informants, but during the conversation we could change the order of questions (which happened during the interview). Before the interview, the informants were aware of the topic and purpose of the study. The informants had the opportunity to get acquainted in advance with the blocks of the interview guide. We did this specifically so that experts, if necessary, could prepare the materials with which they work, or for example, collect some information from their staff relevant to the topic under study. We conducted almost all interviews with informants at their place of work, in several cases we invited experts to come to our university.

We developed the guide on the basis of the results of the analysis of previous research on the ATD market (guide for interview is attached in Appendix A). The guide contained

questions associated with the identified groups of determinants — demographic, economic, political, social, technological, and infrastructural — but gave the experts the opportunity to identify additional factors. We formulated the questions to identify the determinants of the development of ATD market and to present through which agents, according to the Porter's forces model, they affect, or will affect, the Russian ATD market.

Due to the fact that we have studied and searched for the determinants of the development of the ATD market, we do not fully assert the representativeness of the data and transfer the results to the entire population. Since we believe that the involvement of other experts can adjust the possible list of identified important determinants.

### **Ethical Issue**

We informed the informants about the purpose of the study. They also had the opportunity to refuse to participate in the conversation if they wish. In other words, informants voluntarily participated in the study in accordance with the principle of informed consent. An important aspect was the explanation of the research tasks to informants, as well as their permission to record the conversation on a voice recording. Due to the fact that the personal information about the informants was confidential, the informants decided themselves whether they agreed to the indication of their data in the transcript.

### **Main Discoveries: Determinants of the Development of the Russian ATD Market Using Porter's Five Forces Model**

The Russian ATD market has great potential and it is characterized by constantly increasing demand. According to our experts, the number of people with disabilities seeking technical aids of rehabilitation has been increasing steadily over the last 10 years. Participant 3 said: “and the need is constantly increasing and increasing. We have an increasing number of disabled people who are recognized with those disabilities that require compensation at the expense of technical means, so this trend is growing”. This is associated with an increase in the number of persons with disabilities and an expansion of the coverage of those who need ATD due to their increasing awareness of such opportunities, and to the emergence of new or alternative options in the ATD market. The experts predicted that this trend will continue for 10–15 years. Participants stated:

I am one hundred percent sure that the dynamics [of people who need ATD] will only increase. But it is not increasing in the bad sense of the word that there will be more disabled people and the state will bear the burden. There will simply be more people who will understand that they need an assistive device at this stage of life in connection with the development of technologies (Participant 2).

There are a lot of people who need technical means of rehabilitation, and their number is not decreasing. All the same, the need for technical means of rehabilitation does not decrease. It is growing and will continue to grow (Participant 4).

This was the only conclusion concerning transformations associated with all five forces of Porter's model; changing the positions of consumers, suppliers and manufacturers of new and alternative products that, at first glance, cannot affect the nature of market competition. However, such a conclusion would be premature. Let us examine the situation in detail,

referring successively to each of the five forces and describing the determinants of the Russian ATD market.

### **Analysis of the Bargaining Power of Buyers/Consumers**

Buyers (those who choose ATDs and pay for them) in the vast majority of cases are not the final consumers but are federal and regional state organizations (the Social Insurance Fund, Ministry of Labor and Social Protection). Thus, the biggest buyer of all kinds of devices are the consolidated state agents. The choice of agent is shown in the Registers of the devices, provided to persons with disabilities from the state budget. Accordingly, its purchasing power is seriously restricted by budgets, which change annually.

Due to the complexity of the objectives of these market agents, analysis of their position we made in our study in two directions: 1) ATD distribution to final consumers, and 2) ATD procurement.

### **Buyers Market Power Concerning the Distribution of ATDs to Final Consumers**

**Political determinants.** These define the conditions and procedures to provide persons with ATD. Informants told that nowadays demand for ATD is satisfied in three ways:

1. Supply from the state budget to only those persons with disabilities who have received an individual program of rehabilitation and habilitation, specifying the needs of the person with a disability included in the federal register of rehabilitation activities, technical aids of rehabilitation and services given to people with disabilities (The Russian government decree, held 30.12.2005 №2347–p).

2. TAR acquired by people with disabilities on their own, with partial subsequent financial compensation.

There is a mechanism, there is the development of an individual program of rehabilitation, where the specialist fits all the necessary technical means of rehabilitation. After that, after receiving the person goes and either buys it himself, and then receives compensation, or receives the necessary technical means in specialized centers (Participant 2).

3. TAR fully acquired by people with disabilities on their own. This is, our experts say, the smallest share of the total volume (approximately 21–23% of the total market volume (Ministry of industry and trade of the Russia, 2017)).

The first method of provision of ATD, and part of the strategic priorities of state policy, a number of interviewed experts pointed out, means that rehabilitation and assistive devices should be aimed at people of active working age. Participant 4 stated, “While evaluating subjective needs — who needs technical devices more — I would say, people at active working age [...] I wish they were provided with all technical aids of rehabilitation to be professionally self-fulfilled.”).

This point of view is reflected even in the position of representative of the State Bureau of Medical and Social Expertise we interviewed. She described the determinants taken into consideration by that state body about the supply of modern technical devices to a person with a disability. Participant 7 stated:

A similar prosthesis could be given not only to this young man, but also to a retired person of 60 years old. But nobody will give him this prosthesis.

Nobody. Because they do not see any economic benefit. He is not going to use it to go to work.

This example shows how the problem of priority in the supply to specific groups of people with disabilities is reflected in state policy. It is important to understand that this way of ATD supply, as provided by the state budget, dominates now. It is connected with the fact that families with people with disabilities and those who need technical aids of rehabilitation, as a rule, have low income and limited possibilities of employment. Participant 1 explained: “While the salary is small, they will not be able to independently purchase technical means of rehabilitation. Naturally, well-being can uniquely affect the ability to acquire on their own.”

These key aspects make up economic obstacles for people with disabilities to buy assistive devices on their own.

In general, the interview data are similar to the sample surveys results. According to Complex Observation of Living Conditions of Population (Rosstat, 2016), year 2014, the share of people with an average income below the minimum subsistence level is about 12–14% among people with disabilities of groups I and II, and 17% among people with disabilities of group III. Among people with disabilities of group III there is also a bigger segment of those whose income ranges from 1.0 to 1.5 MSL (almost 29%).

Trends in people with disabilities labor market participation serve as a source of information about their self-sufficiency and independence from social assistance. We consider this subject in the context of the social inclusion of people with disabilities. During the interviews, we also tried to find out whether it is possible to change demand for ATD by transforming the attitudes of people to disability inclusion in leisure activities, the labor market and education. Despite people with disabilities in Russia forming a stigmatized group (see Rasell & Iarskaia-Smirnova, 2013), people without disabilities recently started reacting quietly at people with restricted abilities using assistive technologies and devices. However, our informants stated that the general population still needs to be taught tolerance towards persons with restricted abilities. Participant 3 explained:

We, unfortunately, have people little adapted to perceive people with disabilities simply as usually people walking alongside through life. It doesn't happen. Our children (those who are brought up in families) are not prepared to perceive a sick person as an object of constant help and attention.

Besides, our informants stated that the state and society must help people with disabilities feel comfortable while using ATD. Participant 5 said: “Many people, especially those who have a minor restriction of hearing, don't feel comfortable wearing a hearing-aid. Well, they can hear something wrong, understand something wrong, but they feel more comfortable saying that they haven't heard.”

Experts expect an increase in the number of people with disabilities willing to start work, with changes in attitudes, although this change is expected to be slow as few employers are ready to hire people with disabilities.

You have to talk to them [employers] for a very long time. You must show them the people with disabilities who are able to do something using TAR, that they are not just crying for a salary as dead wood, but really doing something (Participant 4).

It was also emphasized, that people with disabilities can be involved in the labor market more actively. TAR are necessary for people with disabilities to join the labor market, so that they

can start paying taxes and become less dependent on state assistance. The informants said that the state must boost the employment of people with disabilities, which will increase effective demand for ATD. Participant 2 stated:

A person is given an assistive device to get equal opportunities and rights, to work as other people do, and pay taxes as other people do. We invest in a person with a disability. With understanding that it is the person's life, the government invests in a person with a disability so that he pays taxes — that is the only aim.

However, state policy sometimes does not motivate them to do it, on top of the existing barriers and long-lasting prejudices.

There are stereotypes, and even some people even think that people who are deaf can't drive. Our ideology is supposed to break bans, but everything was banned. And now that tendency is still alive, that is to say, we always have to overcome barriers. (Participant 5)

Now experts say that employment stimulation policy is generally imitative and formal, and sometimes is a disincentive both for the person with a disability and the employer. The positions offered are mostly low-paid, so people with disabilities do not want to work. Participant 2 said:

There is a retiring pension with regional premium. We call it Luzhkov's premium. A person receives a pension of 15,000 rubles in Moscow. He finds a job with a salary of 17,000. His pension decreases from 15,000 to 3,000. Is he interested in work? You can guess the answer. Does the state do its best to motivate a person to work, to pay taxes?

In the 10-15 years, we should expect further changes in points of view on disabled employment. Hypothetically, it could also influence demand for ATD among citizens of active working age.

If a person starts working among ordinary people, he will be using a hearing-aid all the time. That many people use assistive devices from time to time or never use them means the more inclusion there is in employment, the more assistive devices will be used all the time, will be in demand (Participant 2).

People with disabilities and their families express a positive attitude to getting education. This also can stimulate demand for TAR. As for inclusive education, informants suggest it might not be a wholly good thing. Informants also note that, despite the positive shift in people's attitudes towards people with disabilities, parents do not want their children to study together with children with disabilities. They add that even children with disabilities and their parents can be psychologically unprepared to be getting education with children without disabilities.

Nowadays, while they are trying to introduce this awful inclusion system and close special schools, it will lead to nothing good. Thank God, in Moscow there are still these schools left — as autonomous structural sub-divisions with their own administration. But in the rest of Russia they are just lumped together. Children who are deaf with children who are blind, and they are all sent to mainstream schools. What is the result? There is no result. That is why inclusion

should be done sensibly. Meanwhile, special education as a base, as experience, as study, as a resource should be kept (Participant 2).

In fact, not all parents want their child to study next to a person with disability. For example, there are other categories of children, for example, mentally retarded children, and not everyone can study with them, because purely psychological barriers arise there (Participant 2).

From the point of view of experts, the state is making steps towards a policy of stimulating inclusive education, however, at this time there are barriers that prevent the implementation of inclusion in schools.

Today, our schools are not adapted enough for disabled people to be there. That's why when people with disabilities go to regular schools, they go through a lot of ... trouble, that's putting it mildly. Sometimes teachers do not want to work with such children, because the costs for them must be very large. These children should be dealt with (Participant 3).

At the same time, according to the participant 6, the population needs to be told more about disabled people and about inclusive education: "The only thing that is needed is massive promotion of this all, that there are such opportunities, there are such programs, there are things related to inclusive education."

Therefore, inclusive education policies should be implemented gradually, in stages, rather than by closing some schools and merging with others. The expert says that participants of the educational process are not ready, so this should be taken into account:

But all we want is to break, and breaking is not building, and now let's send all the children who are deaf and blind to a secondary school, even though they are not ready, and we are not ready, that is, we can not do it forcibly. That is, it all needs to be done gradually... Well, so we are not against inclusion, but we need to do everything in stages with the mind, and not by closing schools (Participant 5).

However, encouraging school inclusion will increase the demand for assistive devices for children.

In the context of the supply of assistive technologies, it is important both to provide people with disabilities social inclusion and to evaluate the degree of accessibility for them — this is revealed in infrastructural determinants. In the sphere of social support for people with disabilities, not only individual targeted necessary help is important, but also the creation of a comfortable environment. Experts state the degree of accessibility of accommodation and the city environment as determinants of the need for assistive devices.

In other words, we are already thinking globally about making everything available everywhere. Here is such a word as universal design, that is, just everything. That is, and where to go, the tableau is hanging, the next step is such and such, an announcement... That's what I wanted to show you, in particular, we requested that the cultural objects have been adapted for people with disabilities, then suggested how to do it in museums. Well, that is, there are audio guides for people who are blind, which convey the speech that is around,

that is, you are in a certain room, there are such and such pictures (Participant 5).

Both the devices and the leisure environment are becoming more diverse, that is, the availability of new and new leisure destinations – yes, indeed. And due to the availability of technical means of rehabilitation, the availability and expansion of the range of leisure activities will increase even more (Participant 1).

There have been numerous improvements in the realization of the state program “Accessible environment”, providing a friendly environment to people with disabilities in cities and subtitling TV shows for the hearing impaired, presenting tickertapes in public places. Participant 12 said: “Well, Moscow has visibly changed. Actually, the number of barriers has decreased. But the problem is.... Have you noticed more people with disabilities in the streets? No.”

Nevertheless, not all city infrastructure, schools, or work places have been fitted with wheelchair ramps and lifts. Most blocks of flats do not have facilities for people with disabilities.

There is no place to keep wheelchairs in Khrushchev’s buildings [common 5-storey apartment buildings, without lifts]. Some people leave them under the stairs at the entrance. But neighbors can get annoyed. Some people keep their wheelchair in the garage instead of a car. Everything should be solved together, and there is also the problem of giving affordable housing to person with a disability (Participant 12).

These and other issues should be taken into account while developing targeted social support and care for people with disabilities. The factor of closeness and accessibility to necessary services and the accessibility of ATD and their maintenance as well, is rather important. Some experts speak about potential improvement in this context.

The Ministry of Labor is working on a program up to year 2030 called “Accessible environment”. One of their priorities is developing a Bureau of Medical Social Expertise. The inaccessibility of the Bureau is also an infrastructural problem which must be solved. That is to say, physical specialists with medical-social expertise should be accessible. It’s clear, that there are programs when specialists go out for visit, but they can’t cover everybody (Participant 6).

There is also a proposal to strengthen social services with new subdivisions which will evaluate environment accessibility for people with disabilities and their need in equipping houses with various technical aids (a doorbell alarm device or a water/gas turning off alarm device and so on). Participant 5 stated:

Maybe, in the long run it will be necessary to start a guidance service within the Ministry of Labor. It will have its own center. It will be like they say now: let’s evaluate the accessibility of the living environment for the hearing impaired.

Having considered the key determinants of the development of the Russian ATD market in the context of *buyers’ market power in respect to distribution TAR to final consumers*, we

will touch upon the main drawbacks of this market organization. This analysis is of great importance because the specific criteria and the order of providing social assistance within budget, human resources and other restrictions, can cause a number of unfavorable tendencies.

The procedures for providing ATD are strictly regulated, but incomprehensible to final consumers. It was discovered that one of the main barriers is that people with disabilities are ill informed on current supply of ATD and the necessity to register the status of a person with a disability.

The information barrier, unfortunately, is also a big problem in the awareness of the population in the presence of a particular algorithm of actions. People don't know, especially in the regions. Here he had an operation... And the doctors don't tell them, because the doctors aren't notified either (Participant 1).

This information is not tailored by any agent working with the population, including medical workers. This lack of information results in refusals to register for the IPRH, which is necessary to receive ATD, because “rehabilitation” is misunderstood.

If he now agrees and takes a rehabilitation program (the one we have developed for him), he always believes (due to his naivety, to put it mildly, or due to a misunderstanding, or lack of information), he believes that if this is rehabilitation, then the disability group will not be given, will not be given in the future, and they refuse the rehabilitation program... And patients are never told about rehabilitation... not scared, not explained to them (Participant 3).

In other words, some people with disabilities are afraid of losing their disability status or group if they agree to rehabilitation.

Here we have an opportunity to make reference to the secondary data of quantitative surveys, conducted by Rosstat, and note that the IPRH is registered by 38% of people with disabilities, yet nearly 75% of people with disabilities who needed an ATD are fully provided with TAR (Rosstat, 2015). Meanwhile, 65% of people with disabilities, having TAR first of all people with disabilities of groups II and III, bought the devices on their own. Meanwhile, almost half of people with disabilities needing TAR do not have IPRH treatment recommendations (including the fact that their program has not been developed yet).

In the context of the disability work system, informants discussed the competency level of employers from the Bureau of Medical and Social Expertise, responsible for registering disability status and composing IPRH. They claim they are lacking in deep knowledge on technical peculiarities of different rehabilitation aids and miscomprehension of the opportunities and conditions of their use by persons with various health restrictions. Evaluations, included IPRH, are not always done by specialists.

IPRH, as a rule, is formal and has nothing in common with real rehabilitation. How it is fulfilled in practice is never really checked. Only the TAR provision is registered, but it is not connected with the rehabilitation itself (Participant 8).

A person is given a hearing-aid and informed that he doesn't need a translator. "Why?" — "Because you've got a device". That is not correct. I mean, when a person with a disability is given something, something else is taken away. They say, "It is enough for you." It is absolutely the wrong approach" (Participant 2).



Quite often not only employers from the Bureau of Medical and Social Expertise, but medical workers as well are not well acquainted with the TAR available. Participant 8 said:

As a rule, in the case of uncorrectable eyesight they tell the patients that nothing can be done, except rehabilitation. It is necessary to include basic study on the special correction of restricted eyesight and the rehabilitation of people with disabilities in professional development and an up-grading program for ophthalmologists.

These problems decrease the efficiency of the system and prevent people with disabilities from being independent and being included in society. That is why these problems demand urgent attention.

### **Buyers/Consumers Bargaining Power Analysis Relating to ATD Purchasing**

Conditions for structural assistance between suppliers, buyers and consumers are confirmed by law, and the most influential are state agents who purchase and distribute ATD:

Actually, there is no market now, because we mean market when, while purchasing, final consumer interests are taken into consideration. [...] Now there is no evaluation like that. We have a consumer, who is not involved in making purchasing decisions. Those who pay, make the decisions. [...] What is in the state contracts, that is done. Links with the market, with the final consumers have been lost. (Participant 8).

So our informant stated that the Russian ATD market is highly regulated not only in the distribution of devices to final consumers, but also in the purchasing of ATD.

However, the state does not support an innovation policy, and is inflexible in its decisions. Informants consider this a serious problem. For example, there is a list of devices that can be purchased by the state. Informants said that new ATD are very difficult to include in the existing TAR Register. Participant 10 outlines: “The state guarantees assistive devices in accordance with the Federal List of TAR, but the obligations are limited by the budget, so it is problematic to include new, innovative TAR in the List.”, and participant 4 says: “It is very difficult to make changes to this list. That is almost impossible. Moreover, if we try to make these changes, we may not even succeed.” In fact, administrative regulations deprive specialists from the Bureau of Medical and Social Expertise of the chance to offer any substitutes to people with disabilities. Budget restrictions and the absence of opportunity to enhance free medical aid for the people with disabilities delays the provision of rehabilitation aids<sup>3</sup>, the attempt to save money by purchasing devices by tender (which often results in bad quality) and the low salary of specialists from the Bureau of Medical and Social Expertise, badly affects service quality. Participant 1 stated: “The Social Insurance Fund holds [a competition] in regions, a tender is given. And mediators (the so-called suppliers of these devices) intrude there. [...] Companies with good products leave. Those who don’t have good quality products win.” And participant 3 said, “competition is good, struggle with corruption is very good, but not here.”

We conclude that state agents purchasing and distributing ATD are the controllers who define which products will be available for consumers, and which technologies will be in

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<sup>3</sup> Which is confirmed by the result of the control measures of the accounting chamber, see (Accounts Chamber of the Russian Federation, 2016).

demand and promoted, and consequently, will develop the market in general. In connection with that, state policy and state budget opportunities are the main political and economic determinates of the development of the ATD market in the next 10–15 years.

The final consumer is given less market power, than state buyers, and influence the development of the market less than the state.

### **Analysis of the Bargaining Power of Suppliers**

Another important group of players on the current market are domestic and foreign manufacturers and distributors of ATD. These are federal state prosthetic and orthopedic enterprises of the Russian Ministry of Labor (71 enterprises) and small and medium-sized businesses (about 200 enterprises) (Ministry of industry and trade of the Russia, 2017).

The total volume of domestic production of rehabilitation products in Russia in the year 2015 was 11.8 billion rubles (Ministry of industry and trade of the Russia, 2017). However, 60% of the market was accounted for by imported goods. The total imports of rehabilitation-oriented goods in Russia in the year 2015 including the segment of architectural and planning adaptations (ramps, etc.) was estimated at 17.7 billion rubles (Ministry of industry and trade of the Russia, 2017).

The most influential player in the ATD market is currently the government. It is the largest purchaser of products who, using the determination of the budget of the state support of the market—economic determinants—establishes the conditions for the activity of producers and suppliers of ATD. However, as noted by the informant, the financing of purchases from the state budget is stable, but for various reasons, there are periods when it increases or decreases:

You know, the situation with the financing of the industry is developing unevenly. There are years when there is an increase in funding. We can say that there are periods, as suggested, before the elections, when there are some factors that draw attention to our industry. Sometimes the funding is stable for quite long periods. Once it falls in real terms, adjusted for inflation (Participant 8).

This factor complicates the process of planning production and procurement in this field. When producers face irregular payments over the year, it negatively affects the recipients of assistive technologies (for example, delays occur in the transmission of the TAR to the end user). Participant 8 said:

The bulk of our funding falls on the fourth quarter, sometimes in the third quarter but the first half of the year, in general, remains without adequate funding for various, mostly for organizational reasons. The Ministry of Finance may delay the transfer or state customers are too slow to prepare to the competitive procedures.

The expert does not consider that in the near future there will be significant procedural or legislative changes that will ensure the inflow of investments into the ATD industry and will allow manufacturers and suppliers to feel the change in his role and exercise their market power in a different way.

To improve investment conditions, some specific improvements to public procurement processes or the creation of other methods of communication with the end user must definitely be made so that there would be sustainable demand,

reliable demand for a long period, which would be interesting for the investor (Participant 8).

Changes in ATD production technologies are potentially a source of significant market changes. A comfortable solution can increase the demand for the devices and in the future reduce the cost of production and increase supply. New technological solutions can contribute not only to improving the quality of life of persons with disabilities, but also to make education, employment and leisure activities more accessible for people with disabilities. However, to assess the impact of this determinant automatically, according to experts, is not possible. Technological solutions are dependent on the political vector; in the absence of a request for an extension of the supply and an individual approach by the regulator, investments in technological changes (both in the development of new and the adoption of existing solutions) remain economically unattractive. The cost reduction in the current circumstances may result in deterioration in the quality and functionality of the product, since the prices of assistive devices in Russia are lower than in foreign countries.

You can't strive for cheapness, because it kills innovation. If we take any device (a TV, a telephone), you will notice that the cost of generally good devices does not change over time, but they are getting better and better (Participant 2).

When a competition is held for the purchase of any [TAR], there is a technical task written, and always wins a cheap one. It's not always right, it's not always good. For our people with disabilities, cheap is not good. The person with disability needs it to be very high quality. A person with disability needs it – he doesn't care whether it's cheap or not, because he gets it for free - a person with disability needs it to be very convenient in life (Participant 3).

In the next 10–15 years, according to experts, one should not expect that the production of rehabilitation devices will become cheaper. In particular, this is due to new challenges that will require new technological solutions. Nowadays there is demand for development of the ATD for children, which is significantly inferior to the senior segment in Russia. Participant 6 said:

Now we see that there will be an emphasis on children. For adults, there are, more or less, a medical database, there is, more or less, an understanding of the history of providing the adult population with current means of rehabilitation, absorbent underwear, and diapers. The proportion of children is very small. And children probably will need some new innovative products.

Thus, ATD manufacturers and suppliers have much less influence in comparison with the state authorities. It is expected that in the future the role of political determinants (whether it is the policy of import substitution, support of domestic producers, normative regulation of ATD production and sales or the development of the sector of high-tech assistive technologies) will not weaken. Nevertheless, political decisions will be certainly associated with economic ones — obviously, the innovation vector will require a substantial increase in public funding.

### **Analysis of the Threat of Substitute Products**

The issue of the economic efficiency of the replacement of traditional services for social services due to the wide distribution of ATD, which is widely considered abroad, has not yet

received any significant discussion among Russian experts. In the future, the ratio of the expenses for wages and payments to individuals providing care for a person with a disability, on the one hand, and the cost of ATD, on the other hand, will determine the trajectory of the development of this market on a par with other determinants. And here again we have to mention substantial budget limits and lack of effective demand— economic determinants—as restrictions for expanding the range of rehabilitation equipment in the Russian market.

For consumers of ATD a significant disadvantage of the current system, according to the interviews, is the lack of individualized choice of assistive devices.

Let's say that it is necessary to choose the right technical means of rehabilitation, so that it is individual, because now in most cases it is not individual. Now one of the evidences that the system is unfortunately product-oriented and not patient-oriented is the number of diapers that are purchased for the disabled who suffer from incontinence... but diapers are not an assistive product or a means of technical rehabilitation for the disabled. It is the protection of the bed. And why are there so many of them? Because they are cheap and simple (Participant 6).

An individualized selection of ATD becomes possible for persons with disabilities who self-purchase assistive devices. There is also the option of reimbursement from the state. However, according to expert:

In our country, a person with disability is not even able to do this, because, first of all, compensation is not one hundred percent, and at best, as a result of such dumping tenders, the price of compensation is equal to the cost of the tender. This is another negative factor that affects the patient's purchasing power – the fact that compensation becomes scanty due to this (Participant 1).

So this compensation is much lower than the retail cost of the device because its size is based on the purchase prices determined as the result of competition. The share of those who are able to purchase the technical aids of rehabilitation, according to experts, is extremely low. Under the conditions of the centralized public procurement of standardized devices, persons with disabilities often receive devices that they do not use. Thus, instead of the targeted assistance there is a formal approach leading to inefficient expenditure of funds.

It means, [a technical aids of rehabilitation] can lie on the shelf, can be used for hammering nails, maybe, for doing something else. Needed or not, as we are used to hearing, “I will take it”. If I am a part of the individual rehabilitation program, I'll take a "speaking" book and put it aside or give it to my grandson— let him listen to an audiobook or some music (Participant 4).

When the standardization of products is high, for example, if national standards are approved or international ATD standards are fully recognized, it is easier to switch between suppliers, and this change within one group of highly standardized devices does not involve additional costs. In such circumstances, suppliers have to differentiate their products and offer additional benefits compared with the universal standard in their group of ATD.

Some experts consider that the marked deficiency in the system of selecting technical aids of rehabilitation can be resolved by a transition to a new mechanism of issuing personal certificates for assistive devices to people with disabilities (a political decision).

And if he had a choice, a certificate, a certain cost that allows him to turn to any manufacturer that sells here at certain points. There are certain points that the state can monitor. In any case, there will be no increase in the cost of these points, no fraud. The person came specifically, everyone is included in the database, a national register, and they receive a certificate and choose for themselves (Participant 1).

The introduction of personal certificates will help to maintain competition, and the person with disability will decide where to get the service and which of the offered devices they need (Participant 10).

Thus with this certificate a recipient could go to any supplier whose products are more suitable for them. However, according to some experts, a number of companies that can offer the possibility of an individual choice of technical aids of rehabilitation, may increase the cost of their products because the cost of switching to devices from other vendors will go up for the purchaser.

Therefore, the incorporation of individual needs and characteristics of those persons with disabilities who are in need of ATD must be specified in compliance with the relevant standard for purchased products. Then it will be possible to make individualized choices of technical aids of rehabilitation without a loss of interchangeability and compatibility of devices produced by different companies. This will encourage the adaptation of universal standards, and the prospect of the substitutes will have a real impact on the market situation.

### **Analysis of the Threat of New Entrants**

As it is already noted, the market for assistive devices features imported and domestic products. Experts attribute the hypothetical possibility of the emergence of new players with the change of import conditions (if procedures are simplified, there will be more companies willing to import foreign goods) or with the adjustment of the policy in relation to domestic production. This is again a question associated with the state policy of economic decisions, i.e., the political and economic determinants.

Some experts believe that it is in the interest of the state to set high duties on the import of assistive devices to give impetus to the development of the domestic TAR, others insist that there should be a reduction of customs duties, as imported components are used in the development of the Russian assistive devices. Participant 1 said: “This year we’ve been able to agree on zero VAT import tax and customs duties. (...) Because technical aids of rehabilitation for stoma patients were imported with VAT and customs duty until recently. Sometimes the tax reached 45 %.”

Without high-quality imported components, manufacturers of assistive technologies in Russia cannot work. Therefore, experts note that the reduction in taxes on production and import duties will have a positive impact on the ATD proposal in the next 10–15 years.

Informants admit that Russian producers at this stage are unable to compete with imported products in quality, but innovations in ATD production technologies and the production technologies of their components can potentially be a source of the market transformation. Participant 1 outlined:

In order to produce quality products on the level of foreign counterparts, a lot of investment is needed—millions of dollars. The government is unlikely to find the money for this. If they invest, then the question is when it is going pay off. Where should the manufacturer get the money to purchase materials, which are again mostly manufactured overseas? The components that make up a particular

model of this or that technical aids of rehabilitation for medical patients, are not made in Russia.

In connection with the issue of product standardization, detailed requirements, the harmonization of national and global standards and the regulation of international trade is becoming more important. In particular, for essential differences in requirements for ATD, users can lose access to products of certain manufacturers, and producers lose access to necessary and inexpensive materials and components. Thus, this issue is linked with the diversification of the market.

The high specification of requirements for purchased products can protect end consumers from the proliferation of substandard ATD from companies which receive benefits only at a price under the current procurement procedure. In addition, the introduction of universal standards for ATD will make this market more attractive for new businesses and companies receiving an objective picture of possible barriers and prospects for selling their products on the Russian market. As state agencies are the only buyers in regional markets, the emergence of new players on the supply side may also result from regular events at which representatives of the companies could present their products, to convince the decision makers to procure their devices to increase the effectiveness of rehabilitation measures.

### **Analysis of the Nature of Industry Rivalry**

According to the interviewed experts, ATD suppliers currently compete not on quality but on price, which largely determines the outcome of public procurement procedures: “Now the most negative factor, in my opinion, is the lack of healthy competition, since the only goal of public procurement is cheapness.” (Participant 2). So high-quality products, produced by domestic manufactures and leading foreign companies cannot withstand such competition, losing out to cheaper devices.

Market procedures are not always considered fair and transparent, and may be perceived as collusion with unqualified suppliers:

And these intermediaries, the so-called suppliers of these products, start to get involved and try to win this tender by reducing the cost. They don't even think about anything, they just sit there like a computer game and push a button until one of them crashes... As a rule, companies with good products that really have a good rehabilitation quality are eliminated, but only those that do not have it, which can be bought at a bargain price, win (Participant 1).

This situation, according to experts, seriously hampers the development of the Russian assistive technologies market and must undergo drastic changes in the near future. The possibility of individual choice of ATD and ensuing service (preventive maintenance, training, etc.) can become a competitive advantage for suppliers.

It is now appropriate to recall public organizations which act as intermediaries between the state, consumers and suppliers of ATD. Participant 2 said: “We are working in this direction as a public organization. We are committed to ensuring people with disabilities the need for IPR and other things” and participant 1 outlines: “In our public organization, this happens all the time. We defend the rights of patients in providing them with the proper technical means of rehabilitation that they need for individual medical indicators.”

Thus, defending the rights of persons with disabilities, the largest NGOs in their public activities emphasize the problem of the provision of quality rehabilitation equipment required to comply with the UN Convention among other things.

## Discussion

The ATD market, like any other market, has specific features which are due to, among other things, the disposition of the agents. The determinants of the development of market, in our view, should be described in the context of the analysis of the interaction of these agents. Therefore, we use Porter's five forces model and introduce the main determinants of the Russian market of assistive technologies in the context of actions of buyers (those who make decisions to choose these or those ATD and pay for them), suppliers and consumers.

In the light of the initial limit of available information on subject matter, the unique data collected in this study enabled us to identify key factors and trends in the development of the ATD market in Russia, and to determine problematic areas that need to be further explored. The application of the five forces approach to the analysis of socio-economic development trends of this specific market represents another contribution of this study.

Focusing attention on the major determinants of the development of the Russian ATD market — demographic, economic, political, social, technological and infrastructural — and analyzing the existing trends in the context of the positions of key players, allowed us to get an idea about the prospects of the market and to sketch a map of possible changes.

Increasing demand for medical-social support of persons with disabilities due to the ongoing increase in the size of senior population and the proportion of those having multiple chronic diseases and/or disabilities, and an increase in the number of children with disabilities due to reductions in child mortality are global demographic trends and they create conditions for the growth of demand for ATD. Thus, among those who need assistive devices, persons with disabilities compose the majority, but due to the increase in the proportion of persons of the oldest retirement age in the group of elderly and the proportion of children, these groups will play a more prominent role in the overall growing number of consumers of the Russian ATD market.

Meanwhile, the number of persons with disabilities may depend on many factors, but statistics do not predict the number of this population, as experts make a forecast based on the analysis of current trends mainly in demography and medicine.

The change in solvency of the population, the rules of state budget financing, taxation and the payment of fees also have an impact on the situation, but depending on the direction of public policy, they can contribute to the realization of different scenarios of development of ATD market. Since the government took the course on partial co-financing of ATD by the population (this is the most likely scenario), the role of income of the population (the economic determinant) in the context of the development of the market of assistive technologies is expected to grow.

Another change in demand for ATD can be caused by the attitudes of the population regarding the inclusion of persons with disabilities in everyday occupations, the labor market and education. At the expert level the number of those wishing to receive education and to work among people with special health issues is expected to increase, however, it should be recognized that in this matter the influence of state policy is also large.

In general, today we can say that in Russia the request of the state and society (including individuals with disabilities) to integrate the people with disabilities into society is leading to the formation of requirements of a barrier-free environment. The development of collective ATD, adapting the physical space (ramps, etc.) will increase demand also for individual ATD.

Analysis of the actions of different groups of agents in the market of ATD highlights the role of public organizations involved in the purchase and distribution of rehabilitation equipment. Today, in Russia, they act not only as virtually the only source of funding for procurement, but they also determine which products and, consequently, which level of rehabilitation technologies will be available to end-users.

Along with that, experts note that the criterion for effective rehabilitation is not just providing people with disabilities with assistive devices, but the degree of elimination of the restrictions in the implementation of rehabilitation activities. However, the current system of rehabilitation is not fully organized around the existing obstacles in different activities of life of individuals. A focus on the development of individual programs, individual choice and training practices for persons with severe disabilities, carried out by the specialized non-state rehabilitation centers under contracts with the social security services is the preferred version of the evolution of the support system for people with disabilities, or the alternative scenario of universal unification would result in significant changes in the ATD market.

Although our research focus is primarily on the Russian market, the applied theoretical framework and acquired results are of wider application to social policy and other spheres of developing countries, where researchers and policy makers are interested in the ways of compensating of the bureaucratic inefficiencies in social policy and markets regulation.

One of the limitations of our study is the geographical factor. We interviewed those informants who work in Moscow, while the situation in the regions may differ from the Moscow context, as they may indicate other barriers in the market. Another limitation can be connected with the fact that the demand side of the market — typical final consumers of ATD — were not among our informants (except for ones who consume ATD and at the same time actively take part in the market development in another roles in public associations). Understanding of their situation we gathered indirectly through the interviews with representatives of public associations of people with disabilities and specialized civil servant who work with people who need ATD and certainly know their problems and possibilities, but at the same time have their own focus of attention in this sphere. In order to overcome this interpretation problem we tried at least to cross-validate the versions of different informants about the demand side of the market, so in the results section there are only conventional positions on the questions asked. These two aspects could become the directions for the development of the research in the future.

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## Appendix A

### Shortened guide interview with experts

- In your opinion, are there reliable sources of data in our country on the number of people with disabilities, the number of those who need assistive technologies and devices?
- What you can say about the dynamics of the share of people with disabilities in need of assistive devices in Russia? How has it changed over the past decade?
- Please tell us about the barriers to obtaining an assistive device for a person with disability?
- According to research, not all people with disabilities apply for an individual rehabilitation program (IPR). In your opinion, is this the case? What are the reasons?
- Please tell us how do you assess the state regulation of the market of assistive technologies and devices in Russia? In your opinion, are there incentives for the development of assistive devices in Russia? And to ensure the competition of producers?
- Let's talk now about the economic factors influencing the supply and demand in the Russian market of assistive devices.
- In your opinion, at present there are technological prerequisites for the production of assistive devices to become cheaper (reduced cost)? Can we expect that the production of assistive devices will be easier?
- Let us now discuss whether the demand for assistive devices can change by shifting the attitudes of persons with and without disabilities and their families towards the inclusion of persons with disabilities in everyday practices.
- European experts note that for some countries, environmental problems (for example, toxic emissions) are a significant cause of disability. In your opinion, is this problem relevant for Russia?
- During the conversation, we mentioned various factors influencing the assistive technology market in Russia. What do you think are the most important? What mainly determines the situation today?

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