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GROUNDING INFORMATIVE INDICATORS OF ADVANCE IN PHYSICAL EDUCATION AND MASS SPORTS

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Abstract

The authors considered disadvantages of modern Russian sports statistics and means for cross-reference of initial data. The requirements to informative indicators of advance in physical education and mass sports were worked out in order to meet the priorities of sports policy and to ensure errors control. The authors propounded general considerations for assessing the indicators of income and expenditure of physical education and mass sports as well as key points to be taken into account when assessing the prevalence of physical activity and the availability of sports infrastructure to the population. The authors used methods of descriptive statistics in order to find repeatable errors in evaluating target indicators of physical education and sports. Input data included official statistics on physical education and sports and alternative and free-source data of opinion polls. The analysis fulfilled made it possible to determine the key points to be taken into account when assessing the prevalence of physical activity and the availability of sports infrastructure to the population. Particularly, it is necessary to take into account the seasonal availability of sports facilities through the data on the overall annual capacity of objects in man-hours and to calculate the actual time spent by citizens for physical exercises at sport facilities.

Keywords: Physical education and sports, prevalence of physical activity and sports among population, sports infrastructure, sports statistics.

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1. Introduction

Russian sport statistics, as compared with that of European Union (Sport statistics, 2018), provide more diversified information, especially on the use sport infrastructure.

Statistic of physical education and mass sports obtained through the Form of Federal Statistical Observation 1-PhE (2019) describe in details the structure of population engaged in physical activity, sports related, employment, sport facilities and financing. Each municipality collects the data and transfers it to governing bodies in Russian region (constituents of Russian Federation). The latter pass the information obtained to the Sports Ministry. The Ministry uses these statistics to evaluate conditions for physical education and mass sports in Russian regions. It monitors statistics-based target indicators measuring socially significant results in physical education and mass sports.

However, true-to-life evaluation of physical education and mass sports in Russian regions cannot be prevented from inaccuracy end errors yet. The cause of errors lies not in the lack of statistical information, which is rather detailed, but in methodical disadvantages in collecting data and their interpretation.

Our aim was to consider these disadvantages and to work out measures for error control.

2. Problem Statement

Informative indicators of advance in physical education and mass sports must represent strategic priorities of the policy in this field. We thoroughly considered global priorities (Verzilin & Gorovykh, 2018a) and particular priorities of sports-related education (Verzilin & Gorovykh, 2018b). General approaches to cross-checking official statistical information with the aid of alternative data from social networks, from research queries databases and opinion polls were worked out by Verzilin, Volkov, (2016), and Verzilin, Gorovykh, Maximova, Sokolova, & Gokinaeva (2019).

We intent to work out informative indicators, on the one hand, corresponding to the priorities of physical education and mass sport and, on the other hand, meeting requirement of cross-checking and errors control.

3. Research Questions

According to the problem statement we can formulate the following research questions.

- Working out requirements to informative indicators of advance in physical education and mass sports.
- Analysis of disadvantages in current procedures for collecting and processing sports-related statistics.

Elaborating organizational and methodical improvements for the statistical support of policy making in physical education and mass sport.

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4. Purpose of the Study

Our purpose was to work out informative indicators of advance in physical education and mass sports and describe measure for error-free collecting statistical data to be used.

5. Research Methods

We used methods of descriptive statistics in order to find repeatable errors in evaluating target indicators of physical education and sports. Input data included official statistics on physical education and sports and alternative and free-source data of opinion polls.

6. Findings

Informative indicators of advance in physical education and mass sports are necessary for analyzing efficiency of sports policy, taking into account socially significant goals and the amount of resources attracted. These indicators should provide an objective comparison of management performance in various administrative-territorial entities and a retrospective analysis of performance in each entity. These considerations allow us to formulate the following requirements for the indicators.

1) The availability of the source data used to calculate the indicators and means for verification of these data.

2) Unambiguity of the procedures for collecting source data and calculating indicators.

3) Comparability of indicators over time.

4) The sufficiency of each indicator for the analysis of a given aspect of physical education and mass sports.

5) The sufficiency of the set of indicators for measuring socially significant results in the field of physical education and mass sports and the amount of resources used.

To fulfil the requirement 5) it is necessary to attract indicators that quantitatively characterize the achievement of socially significant goals of physical culture and mass sports, and these indicators themselves must meet the requirements 1) - 4).

We must consider two interrelated goals: increasing the prevalence of physical activity and sports among the population and improvement of the availability of sports infrastructure.

Strategic planning documents of the Russian Federation describe target indicators characterizing the prevalence of physical activity and sports. These indicators depend on the number of people systematically engaged in physical activity and sports in different groups of the population.

That differs from accounting in European sport statistics (Eurostat, 2018) calculating percentage of population aged 15 and more practising sport, fitness or recreational (leisure) physical activities at least once a week.

The Strategy for the Development of Physical Education and Sports in the Russian Federation for the Period up to 2020 (hereinafter the Strategy) (Decree of the Government of the Russian Federation, 2009) has defined the following target indicators:

- the proportion of citizens systematically engaged in physical activity and sports in the total population;

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- the proportion of schoolchildren and students systematically engaged in physical activity and sports in the total number of this category of population;
- the proportion of persons systematically engaged in physical activity and sports, with the volume of weekly physical activity not less than 6 hours.

In the subprogram “Development of physical culture and mass sport” of the state program of the Russian Federation “Development of physical education and sport” (hereinafter the State program) (Decree of the Government of the Russian Federation, 2014), the target indicators were adjusted. The first of the three indicators was defined for the main population from 3 to 79 years. Indicators for 3 age subgroups were added: children and youth aged 3-29 years; middle age (women aged 30–54 years, men aged 30–59 years); older age (women aged 55-79 years, men aged 60-79 years). The second indicator remained unchanged. The third indicator was excluded.

The meaning of the target indicators corresponds to the goal of increasing the prevalence of physical activity and sports among different groups of the population, but the current practice of calculating them in some subjects (constituent entities) of the Russian Federation does not meet the requirements 1) and 2).

Ministry of Sports of the Russian Federation (2019) determines that systematic physical activity and sports should take at least 3 hours a week.

The Order of Rosstat (2017) used a more precise wording: "The persons systematically engaged in physical culture and sports are individuals engaged in the chosen sport or general physical activity in an organized form of at least 3 total hours, provided 2 - 3 per week." (p. 30)

The Order of Rosstat did not take into account persons involved in independent activities.

The workload of sports facilities (in man-hours), along with the proportion of the population that is systematically engaged in physical activity and sports, characterizes the prevalence of physical activity and sports among the population. If we divide the workload of sports facilities by the number of people training in these sports facilities, we can determine the number of hours of training per year per person.

If we assume that it is necessary to spend at least 3 hours a week on systematic physical activity and sports, then the minimal number of hours for one practitioner should be not less than 156 hours per year. The average number of hours per systematically engaged should be greater than this value, since part of the workload accounts for engaged in occasionally, and many systematically engaged spend at sports facilities more than 3 hours per week. However, according to the federal statistical observation of 1-PhE, in many regions of the Russian Federation, the average number of hours per year per person in 2016 was less than the critical value of 156 hours (Table 1).

Table 01. The number of hours of training per year at sports facilities per person, systematically engaged in physical activity and sports in the subjects of the Russian Federation (according to 1-PhE for 2016)

Subjects of the Russian Federation	Hours per year for one systematically engaged
Astrakhan region	38
Tyva Republic	47
Voronezh region	62
Karachay-Cherkess Republic	77
Altai region	79
Chechen Republic	80

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Vladimir region	80
The Republic of Dagestan	93
Oryol Region	97
Leningrad region	99
Murmansk region	104
Samara Region	105
The Republic of Buryatia	108
Ulyanovsk region	109
St. Petersburg	111
Mari El Republic	122
Kostroma region	123
Nizhny Novgorod region	124
Kirov region	125
Kamchatka Krai	128
Pskov region	129
Primorsky Krai	133
Arkhangelsk region	135
Sverdlovsk region	139
Chukotka Autonomous region	143
Vologodskaya region	144
Kaluga region	144
Tambov Region	145
Rostov region	148
Perm region	150
Republic of Bashkortostan	150
Kaliningrad region	152

The Order of Rosstat (2019) significantly changed the approach to identifying people who are systematically engaged in physical activity and sports.

According to the new definition, the number of systematically engaged in physical activity and sports includes individuals engaged in a chosen sport or general physical activity, in the form of organized or independent activities, while keeping the exercise load (Table 2).

Table 02. Accounting engaged in physical activity and sports in 2019

Age group	Exercise load per week	Number of systematically engaged	% of the total number engaged	Age group in 1-PhE data
3 - 5	75 min	16 710 137	33%	3-14
6 - 15	90 min			
16 - 29	125 min	18 968 831	38%	15-29
30 - 59	115 min	12 575 549	25%	female to 54
60 - 90	90 min	1 900 887	4%	female from 55

An analysis of the table reveals that the average minimum number of exercises per week has been reduced from 180 minutes to less than 110 minutes.

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With data of Table 1 the change in the norm of exercise load is feasible, however, the verification of the data on the number of systematically engaged in the subjects of the Russian Federation, in accordance with requirement 1), becomes more complicated as the age categories for determining the norms and age categories of 1-PhE do not match.

The change in the definition of citizens who are systematically engaged in physical activity and sports makes it difficult to fulfill the requirement 3), which is associated with the need for a retrospective analysis of the indicators.

Accounting of engaged is carried out according to the logs of sections and groups. It remains unclear how it is supposed to take into account those who do exercises individually.

Since 1992, the Higher School of Economics has been conducting representative population surveys on various aspects of daily life. In the public domain there are data up to 2017 inclusive (National Research University Higher School of Economics and Demoscope, 2019).

In 2017, over 10 thousand people of all age groups from 39 subjects of the Russian Federation filled in the questionnaire. In particular, out of 2932 people of the middle age group, 73.5% answered that they do not do physical exercise at all, 10.1% answered that they do light physical exercise for a rest less than three times a week. The remaining 16.4% of respondents were engaged in physical activity more intensively (medium or high-intensive physical exercise less than three times a week and more frequent and intensive exercises).

For comparison, according to federal statistical data 1-PhE, 22% of citizens, in this age group were systematically engaged in physical culture and sports in 2017. If we assume that out of 10.1% of citizens doing light physical exercise, approximately half were engaged in physical activity systematically, as well as 16.4% of those who were more active, then the data would be comparable if individual exercises were accounted in 1-PhE. However, in 2017 only organized physical activity was taken into account. It should be noted that the survey results give lower estimates of the prevalence of systematic physical activity and sports in the middle-aged population than the data of the federal statistical observation 1-PhE.

It should be borne in mind that it is the middle-aged population group that has the greatest potential for increasing the proportion of people who are systematically engaged in physical activity and sports in the general population from 3 to 79 years old (Fig. 1). The middle-aged population group is the most numerous (43% of the total group versus 33% of the group of children and young people and 24% of the older group). At the same time, in the group of children and young people, including schoolchildren and students, according to 1-FK, in 2017, 80% of citizens were systematically engaged in physical activity and sports and the opportunities for a significant increase in the proportion of people involved are exhausted.

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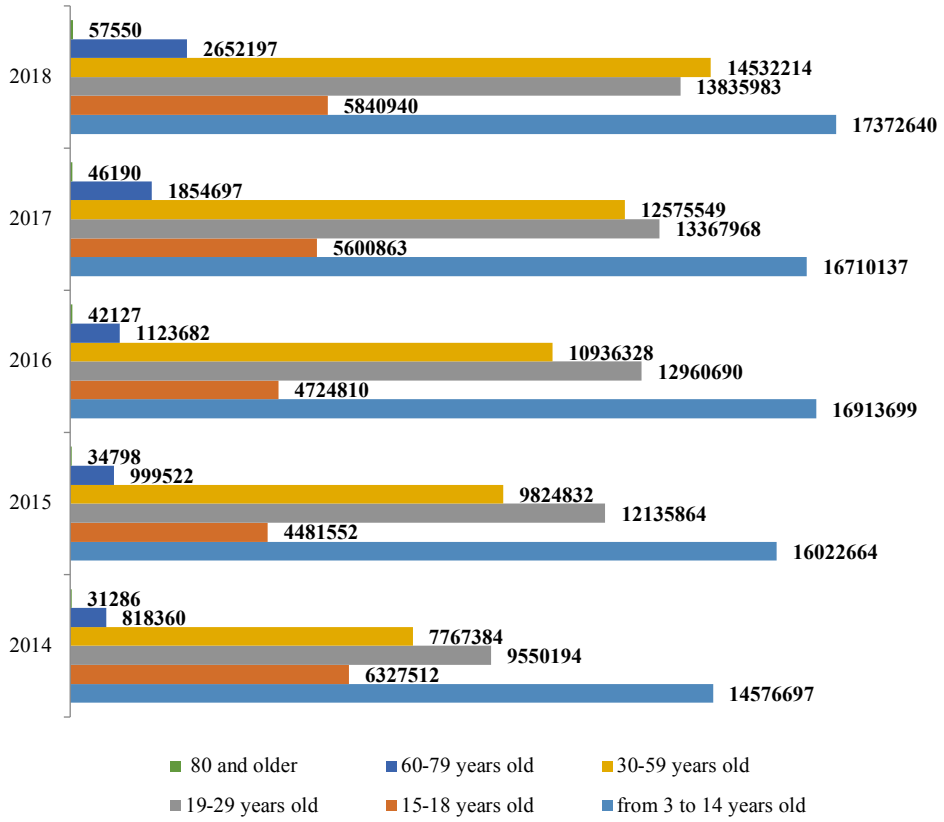

Figure 01. The distribution of people engaged in physical activity and sports by age

To assess the availability of sports infrastructure for the population, the Strategy and the State Program use the target indicator "Level of affordance of sports facilities to the population expressed as instantaneous capacity of sports facilities". The indicator values are estimated as a percentage of the standard value.

The current standard of instantaneous capacity of sports facilities was established by the Order of the Ministry of Sports (2018). It has been established that when determining the need in sports facilities for subjects of the Russian Federation, it is recommended to use the averaged standard instantaneous throughput rate - 122 people per 1000 population, calculated in order to solve the primary task: attracting by 2030 to systematic (3 hours per week and more) physical activity and sports the entire working-age population (under the age of 79 years) and children (from the age of 3 years).

Until 2012, the standard was 190 people per 1000 population (total population, without indicating the age group), established by the Decree of the Government of the Russian Federation (1999). We can expect a further reduction of the standard, since the norms of the systematical physical activity were reduced.

In contrast to the situation with a change in the method of registering citizens who are systematically engaged in physical activity and sports, a change in the standard does not prevent the retrospective analysis of indicators in accordance with requirement 3) We can directly use the data on the absolute instantaneous capacity of sports facilities, taking into account the distribution of sports facilities of the Russian Federation by types (Fig. 2).

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However, the instantaneous throughput indicators do not satisfy the requirement 4). They are not quite informative as the characteristics of the availability of sports infrastructure for the population, since they do not take into account the seasonal availability of sports facilities.

Comparing indicators of availability of sports infrastructure for the population (Table 3) we see that the growth of instantaneous capacity of sports facilities was not always accompanied by an increase of their actual overall capacity in man-hours, accounting duration of their work, and by an increase in their workload in man-hours.

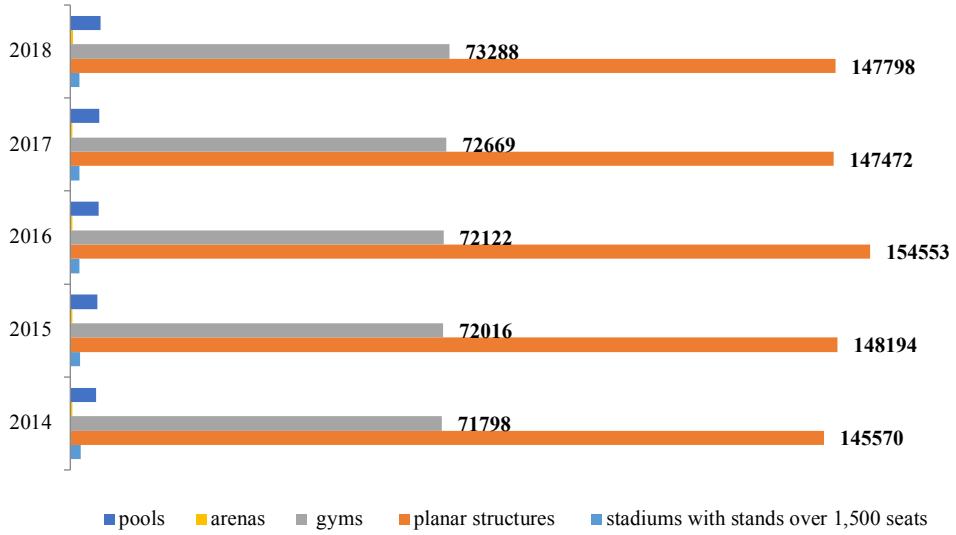

Figure 02. Distribution of sports facilities of the Russian Federation in the period from 2014 to 2018 according to their types

Table 03. Dynamics of indicators of sports infrastructure availability

Indicator	2012	2013	2014	2015	2016	2017
Instantaneous capacity, thousand people	6 823	6 987	7 370	7 735	7 907	8 310
Number of sports facilities, units	261 756	265 942	276 652	281 842	290 947	305 288
Number of systematically engaged, thousand people	32 237	35 315	39 071	43 499	46 701	50 155
Annual capacity, million man-hours	14 481	15 012	15 280	17 868	17 656	16 352
Annual workload, million man-hours	7 480	7 622	7 823	9 666	8 944	8 892
Load factor	51,7%	50,8%	51,2%	54,1%	50,7%	54,4%

Since 2017, in accordance with the Order of Rosstat (2017) the federal statistical observation 1-PhE includes data on objects of urban and recreational infrastructure adapted for physical activity and sports as a kind of sports facilities (Figure 3)

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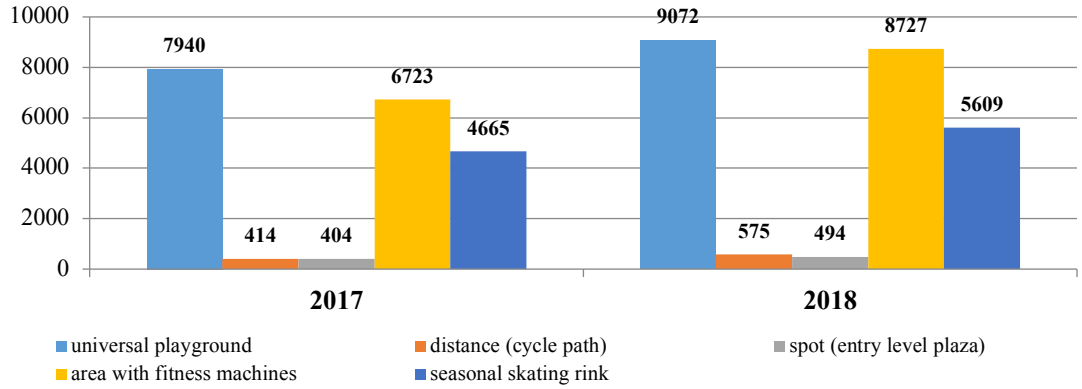

Figure 03. The number of objects of urban sports recreational infrastructure for 2017 and 2018 (Ministry of Sports, 2019)

The development and accounting of such objects are important for two reasons. First, in the medium term, the development of these objects, taking into account their popularity with the population and relatively small necessary expenses, provides the most effective increase in the availability of the sports infrastructure. Secondly, at these facilities, there are best conditions for individual exercises and for recording individual activities.

Therefore, it is necessary to determine the capacity and workload of urban and recreational infrastructure facilities adapted for physical activity and sports. Currently, in the form of the federal statistical observation 1-PhE, it is not envisaged to take into account the capacity and workload of such objects, only their instantaneous throughput is recorded.

Assessing the indicators of income and expenditure of physical education and mass sports should be guided by the following general considerations.

The data in the section “Financing physical education and sports” of 1-PhE form includes expenses of organizations (educational institutions, enterprises and organizations that have created conditions for physical activity and sports) not controlled by bodies of administration in the field of physical education and sports. At the same time not all the funds spent on the development of the sport infrastructure are taken into account in the form 1-PhE.

Therefore, the use of 1-PhE data on the financing of physical education and sports is not appropriate. These data are not consistent with the information contained in the consolidated budgets of constituent entities of the Russian Federation and the federal budget.

We recommend to use the following data of section 11 "Physical education and sport" of the annual form 428 "Report on the execution of the consolidated budget of the constituent entity of the Russian Federation and the budget of the territorial state extra-budgetary fund." For most subjects of the Russian Federation, the form is in open access (for example, in St. Petersburg, form 428 is included in the Reporting of the St. Petersburg finance committee, 2019). The form 428 includes data on the itemized expenditures of the budget of the subject of the Russian Federation and the budgets of municipalities.

To calculate future cash flows in the subjects of the Russian Federation, when estimating the recoupment of expenses for the development of sports facilities, it is necessary to use discount rates to recalculate future incomes and expenses in the current period prices.

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The procedure for calculating discount rates is typically been determined by a order of the finance committee of the government of a subject of the Russian Federation. Usually discount rates depend on indicative rates of internal and external borrowing. Examples of methods are contained in the orders of the Finance Committee of St. Petersburg (Decree of the Finance Committee of St. Petersburg, 2008a, 2008b).

When performing a retrospective analysis of income and expenditure of physical education and mass sports, it is necessary to use the deflators of Rosstat (Deflator indices, 2019).

7. Conclusion

The analysis fulfilled made it possible to determine the following key points to be taken into account when assessing the prevalence of physical activity and the availability of sports infrastructure to the population:

- the target group of the population with the greatest potential for increasing the number of those who are systematically engaged in physical activity and sports is the group of middle-aged citizens;
- target sports facilities, the development of which ensures the most effective increase in the availability of sports infrastructure are urban and recreational infrastructure facilities adapted for physical activity and sports;
- it is necessary to take into account the seasonal availability of sports facilities through the data on the overall annual capacity of objects in man-hours;
- it is necessary to take into account the actual time spent by citizens for physical exercises with the aid of the data on the workload of sports facilities;
- it is necessary to estimate the number of citizens who are independently involved in physical activity and sports and the duration of such activities, including exercises at city and recreational infrastructure;
- it is necessary to assess the capacity and workload of urban and recreational infrastructure facilities adapted for physical activity and sports.

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