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ORIGINAL

ANALYSIS OF THE CONTINUITY OF BRAZILIAN SWIMMERS IN THE BOLSA-ATLETA PROGRAM

ANÁLISIS DE LA CONTINUIDAD DE LOS NADADORES BRASILEÑOS EN EL PROGRAMA BOLSA-ATLETA

ANÁLISE DA CONTINUIDADE DOS NADADORES BRASILEIROS NO PROGRAMA BOLSA ATLETA

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ABSTRACT

The objective of this study was to identify, from the Bolsa-Atleta Program developed by the Brazilian government, if the swimmers who received financial incentives in the base categories presented continuity in sports practice up to the highest categories of the program. The studied period was between 2005

and 2017; including 2,308 grants and 1,017 athletes. All the athletes selected belonged to the swimming modality. The continuity of the athletes in receiving scholarships showed significant differences in the respective categories of the program (p<0,001; ε^2=0,15). Significant differences were found for the grants between the base and international categories, with a strong effect size (p<0,001*;* r=0,91). Finally, it can be concluded that the investment directed to the base categories does not represent the continuity of the athletes in sports development.

KEYWORDS: Public Policies; Public Funding, Government; Resource Management; Water Sports.

RESUMEN

El presente estudio tuvo por objetivo identificar, a partir del Programa Bolsa-Atleta desarrollado por el gobierno brasileño, si los nadadores que reciben incentivo financiero en las categorías de base, presentaron continuidad en la práctica deportiva hasta las categorías más altas del programa. Se estableció un recorte temporal de 2005 y 2017; siendo el número total de la muestra de 2.308 becas y de 1.017 atletas. Asimismo, todos los atletas seleccionados pertenecían a la modalidad de natación. La continuidad de los atletas en la recepción de becas presentó diferencias significativas en las respectivas categorías del programa (p<0,001; ε^2=0,15). Se observaron diferencias significativas entre las becas de las categorías base e internacional, con un tamaño de efecto grande (p<0,001; r=0,91). Finalmente, se puede afirmar que la inversión dirigida a las categorías de base no representa, de manera inexorable, la continuidad de los atletas en el desarrollo deportivo.

PALABRAS CLAVE*:* Políticas Públicas; Financiamiento Público; Gestión de Recursos; Deportes Acuáticos.

INTRODUCTION

The presence of the sports phenomenon on the political agenda of countries occurs for several reasons: aspects related to health and the promotion of healthy lifestyles (Hernández-Álvarez, Velázquez-Buendía, Martínez-Gorroño & Díaz del Cueto, 2010); the promotion, organization and management of sports activities (Gimeno, Garzo, Velasco, Sáenz & Gutiérrez, 2017); or even, the capacity to promote national identity in a nation (Green & Oakley, 2001; Houlihan & Green, 2008).

Several studies have been developed based on a comparison between nations, in order to identify the respective sports systems of the countries (De Bosscher, De Knop, Van Bottenburg & Shibli, 2006; De Bosscher, Bingham, Shibli, Van Bottengurg & De Knop, 2008; De Bosscher, De Knop, Van Bottenburg, Shibli & Bingham, 2009; Digel, 2002; Green & Oakley, 2001). Such comparisons were made considering the possibility of nations learning from each other (Houlihan

& Green, 2008), which have characterized the existence of increasingly homogeneous sports systems (Green & Oakley, 2001).

It can be seen in the respective studies that governments and sports organizations have increased spending directed to sports performance (Seguí-Urbaneja et al., 2020; Leiva Arcas, Sánchez Pato & Martínez, Em prensa; De Bosscher, De Knop, Van Bottenburg & Shibli, 2006; De Bosscher, Bingham, et al. 2008; De Bosscher, De Knop, Van Bottenburg, Shibli & Bingham, 2009; Digel, 2002; Green & Oakley, 2001). According to Leiva Arcas, Sánchez Pato & Martínez (in press), the rationalization of investments can even increase the chances of obtaining significant sports results.

Therefore, financial investment represents an important contextual factor related to the training of athletes. In governments whose sports development occurs from the partnership between public and private funding, this targeting of resources for sport occurs from the formulation, implementation and evaluation of public sports policies.

In another order of ideas, the financial factor is not the only determinant for athlete training; other factors also intervene in this process. As well as, the relative effect of age, gender, anthropometric and physiological factors, psychological skills and motivational orientations, personality traits, place of birth, social aspects, the volume of sport-specific training, the influence of early specialization, in addition to the specific characteristics of the swimming modality, such as, for example, the high cost necessary to practice in the country and the need for sports infrastructure (Martínez de Ojeda, Puente-Maxera & Méndez-Giménez, in press; Caetano, Sentone, López-Gil, Caetano & Cavichiolli; 2020; Seguí-Urbaneja, et al., 2020; Sentone, López-Gil, Caetano & Cavichiolli, 2019; Barker-Ruchti et al., 2018; Blázquez & Feu, 2012; Côté & Hancock, 2016; Rees et al., 2016).

However, the financial structure is decisive in a sport performance system (Digel, 2002), and can be considered as an input factor for the whole process in the search for good results, supporting the efficiency and effectiveness of the other influential factors in the sports training process (De Bosscher, De Knop, Van Bottenburg & Shibli, 2006; De Bosscher, Bingham, et al. 2008; De Bosscher, De Knop, Van Bottenburg, Shibli & Bingham, 2009).

In the study of Hollings, Mallett & Hume (2014), it is evident that some athletes have social demands competing with sport (for example: family, job, focus on academic life, search for another career, etc.) and, such demands - together with the lack of support in the sports career - end up influencing them so that they do not level up to the international category.

In many government organizations, athlete development management takes place through the strategic distribution of funds for sports that can return investment through sporting results (Barker-Ruchti et al., 2018). Although the base athletes are able to present significant sporting results, the process of formulating a sports public policy should preserve the developmental benefits of

the sport, safeguarding the needs of the athletes, contributing to increase participation and maintenance of future performance, that is, to prevent the targeting of resources from being guided by short-term goals (Côté & Hancock, 2016; Bosscher, Shibli & Weber, 2019). For Barker-Ruchti et al. (2018), even though the targeting of public resources for athletes has become increasingly broad, it does not guarantee the development of athletes in the long term (Hollings, Mallett & Hume, 2014; Huxlei, O'Connor & Bennie, 2018). In addition, the relationship between elite sport and base sport has been discussed continuously in the literature (Seguí-Urbaneja et al., 2020).

Such theoretical background presented several intervening aspects in the allocation of resources (Barker-Ruchti et al., 2018; Côté & Hancock, 2016; Feiler et al., 2018; Murray, 2009; Rees et al., 2016; Wicker et al., 2012). However, it was not possible to identify studies aimed at identifying whether the financial investment directed to the base categories represents, or not, the guarantee of continuity of athletes in the sports development in the country. Thus, at the same time that a research gap related to the theme was observed, we can perceive the importance of developing research that analyzes the continuity of athletes in financial incentive programs.

OBJECTIVES

The purpose of this study was to identify, based on the example of a sports public policy (in this case, Brazil's own), if the swimmers who received financial support in the initial categories, called base categories, presented continuity in sports practice until the highest categories of the program (international and Olympic).

The study is justified so that it is possible to rethink and question the way in which public policies for the transfer of resources have been taking place and if these represent a long-term development of athletes.

MATERIAL AND METHODS

STUDY DESIGN AND SAMPLE

The research consists of an ex post facto descriptive study, therefore, aimed to report a certain event using comparative and correlational methods for analysis (Kothari, 2004).

The sample was made up of Brazilian athletes participating in the Bolsa-Atleta Program between the years 2005 and 2017 in the swimming modality. This study had the approval of the Ethics Committee of the Universidade Federal do Paraná (UFPR) (CAAE nº 88770618.4.0000.0102).

The total number in the sample was 2,308 grants and 1,017 athletes, 57.62% male (n=586) and 42.38% female (n=431). The following categories of the Bolsa-Atleta program were analyzed: base categories (base and student, n=669), national (n=1285), international (n=277) and Olympic (n=77).

PROCEDURES

The Bolsa-Atleta Program was created in 2004 and aims to financially assist Brazilian athletes who have presented significant results in the year prior to the request for granting (Brasil, 2020). The documentary information related to the program was collected through lists of granted athletes released by the federal government and published in the Official Gazette of the Union (Diário Oficial da União, 2020). The study period was from 2005 to 2017. The year 2005, for being the first year of grant, and the year 2017 for being the last year with data available at the time of the survey (Inteligência Esportiva, 2018).

Data were tabulated with the respective categories and groups: year of grant (n=13; 2005 to 2017), athlete (n=1,017), gender (n=2; women and men), grant category (n=4; base, national, international, Olympic), annual grant value (n=4; $1,116 USD, $2,784 USD, $5,556 USD, $9,312 USD), monthly grant value (n=4; $93 USD, $232 USD, $463 USD, $776 USD), continuity (n=9; 1 year to 9). The frequency of receiving grants in the studied period was considered as continuity.

For the analysis of the distribution of grants, we selected the swimmers who received grants in the base categories (base and student). Subsequently, it was identified which of these athletes progressed in categories in the program. In addition to the progressive analysis, the inverse analysis was also carried out, that is: which athletes received grants in the Olympic and International categories and among them, those who received the benefit in lower categories of the program. The inverse process (back analysis) is justified by identifying which athletes received only the highest categories of the Bolsa-Atleta program, without having previously received lower categories.

DATA ANALYSIS

After tabulation of the data in the IBM SPSS Statistics software, statistical analyses were run related to the continuity of athletes granted in the years 2005 to 2017.

At first, the Kolmogorov-Smirnov test was applied to check the normality of the data. In order to check for an association between the variables and to compare the differences existing in the samples, the following statistical tests were performed: Kruskal-Wallis *H test*, Mann-Whitney *U test*, in addition to post hoc analyses with pairwise comparisons and Bonferroni correction. Finally, to enhance the discussion and avoid possible interference of sample size on the results, the magnitude of the effect was calculated using *epsilon-squared* (ε^2) (Kelley, 1935; Tomczak, Tomczak, 2014) and Rosenthal's *r* (Rosenthal, 1991); with the interpretation suggested by Cohen (1988).

All the analyses were carried out by the SPSS software in its version 24 for Windows and Microsoft Excel 2016; keeping the level of statistical significance at $p<0.050$.

RESULTS

From the analysis of the distribution of the data, it was verified that the assumption of normality was not comply for the continuity, category of grant, and annual and monthly values in the modality of swimming between the years 2005 and 2017 ($p<0.05$).

Since 2005, its first year in force, the Bolsa-Atleta program has provided grants for athletes of different modalities, collective and individual. The distribution of the total number of grants to swimming athletes between 2005 and 2017 was 2,308 grants, subdivided among the different categories, being: 669 base grants (323 in the base category and 346 in the student category), 1,285 national grants, 277 international grants and 77 Olympic grants. Figure 1 shows the number of grants per grant year.

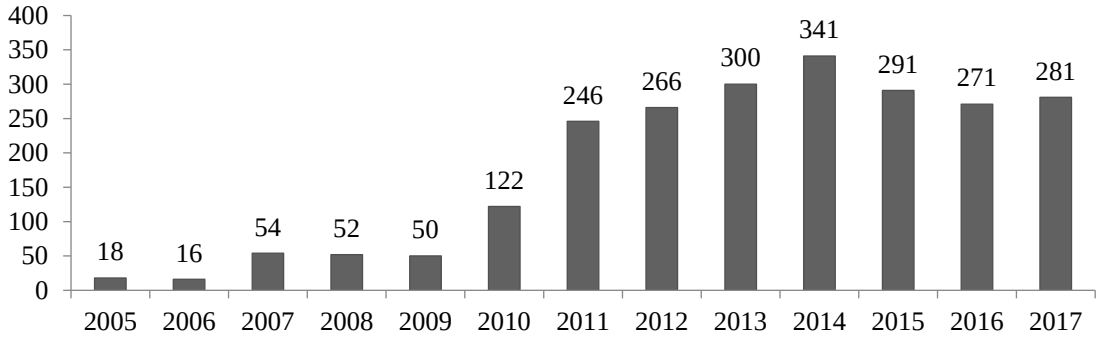

Figure 1. Number of grants for swimming between 2005 and 2017.

In the swimming modality, there was two different moments related to the number of grants. The first, between the years 2005 to 2009, in which 2007 was the year with the highest number of grants (54). The second period included the years 2010 to 2017, where the number of grants increased significantly.

On the other hand, the largest difference was between 2009 and 2010. In 2009, a total of 50 grants were granted. This number increased to 122 athletes in 2010, representing an increase of 144% (n=72). From 2010 to 2011, this increase was 102% (n=124), and the number of recipients reached its maximum number in 2014, with 341 athletes benefited by the program. Below, Figure 2 illustrates the number of grants per category and per year in the swimming modality.

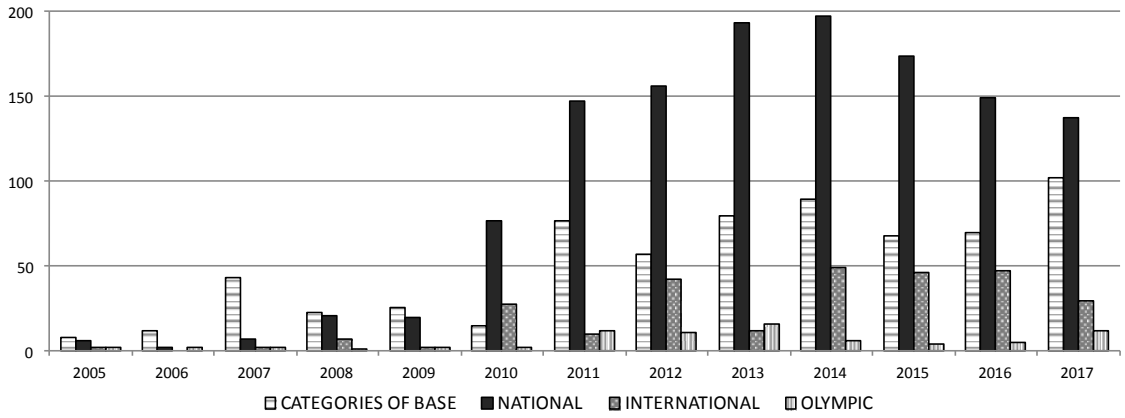

Figure 2. Number of grants for swimming between 2005 and 2017 per category and year.

It is possible to observe that until 2009, the number of athletes included in the base categories was higher than the number of athletes in the national category, which, in turn, was higher than that of international level, and so on. This pattern in the distribution of grants changed from 2010, when there was an increase in the grants for athletes in the national category.

According to the total number of recipients between 2005 and 2017, only 12% (n=122) of the athletes received grants for more than three years (Table 1), consecutive or not.

Table. Continuity in receiving the benefit and number of athletes.

Continuity	Number of athletes
1 year (46.5%)	473
2 years (20.5%)	208
3 years (12%)	122
4 years (10%)	102
5 years (5.7%)	58
6 years (2.9%)	30
7 years (1.9%)	19
8 years (0.3%)	3
9 years (0.2%)	2
Total	1.017

Between 2005 and 2017, most athletes received the incentive for only one year (n=473). The following figure shows the possible differences between the categories of grants according to the continuity in receiving the benefit.

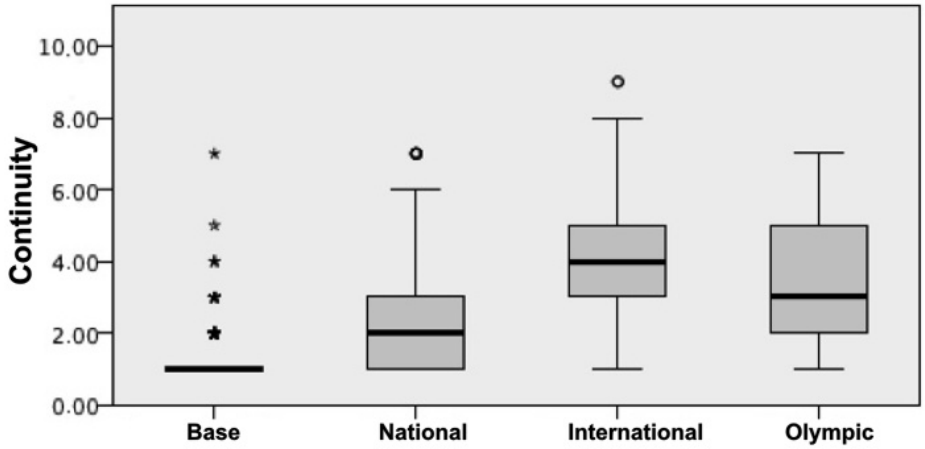

Figure 3. Differences between categories according to continuity, using the Kruskal-Wallis test for independent samples.

The test evidenced differences in continuity distribution between categories of the program (p<0.001). In addition, to identify the magnitude of the effect of these differences in general, we calculated the epsilon-squared (Kelley, 1935; Tomczak & Tomczak, 2014); being the effect moderate (ε^2=0.15).

Subsequently, post hoc analyses with pairwise comparisons were performed using the Mann-Whitney *U* test (with Bonferroni correction for significance values). In the same way, Rosenthal's *r* (Rosenthal, 1991) was calculated in the categories with significant differences, to test the size of their effect (Table 2). It is possible to observe the strongest effect (r=0.91) between the grants of base categories and the international ones, characterizing the existence of differences between the continuity in these categories.

Table 2. Post hoc analyses with pairwise comparisons between the different categories.

Category 1 - Category 2	*U*	*z*	*p**	*r*
Base - National	-221.216	-11.105	<0.001	0.58
Base - Olympic	-401.359	-8.625	<0.001	0.45
Base - International	-465.271	-17.543	<0.001	0.91
National - Olympic	-180.143	-0.549	<0.001	0.03
National - International	-244.6055	-9.788	<0.001	0.51
Olympic - International	63.912	1.307	1.000	0.07

* Significance adjusted by Bonferroni correction.

On the other hand, Table 3 lists the number of athletes who had leveled up from the base category to the higher categories. Likewise, the number of athletes who returned from the Olympic category to the lower categories is indicated.

Table 3. Analysis of progression and regress of the different grants.

Athletes progression	Athletes (n)
Base categories	324
Base categories + national	157
Base categories + national + international	54
No gradual progression from base categories	13
Athletes regress	**Athletes (n)**
Olympic	17
Olympic + international	6
Olympic + international + national	7
No gradual regress from the Olympic category	4
All categories	3

It is noticed that only three swimmers received funding in all categories of grants, that is, they were funded by the Brazilian government in all categories (base categories, national, international and Olympic). Another point that draws attention is that 58.8% (n=324) of those receiving base grants had only this grant, with no progression for the other categories.

On the other hand, about 41.19% (n=227) of the recipients presented progression in the grants, being 28.49% (n=157) for the national category, 9.80% (n=54) for the international category, 0.54% (n=3) for the Olympic category. Another 2.35% (n=13) showed progression, however, in a non-gradual way, that is, without presenting a constant logic, failing to receive, for example, the national category grant and migrating directly to the international category grant.

In general, only 5.30% (n=54) of the total athletes granted in these 13 years showed progression from the base category grants to the international grant, and only 0.29% (n=3) progressed from the base to the Olympic grants, that is, for every 100 athletes granted, only five reached the international category and for every 330 athletes, only one reached the Olympic category.

Of the total of 37 swimmers who were granted the Olympic grant between 2005 and 2017, about 45.9% (n=17) received only this grant. On the other hand, 16.2% (n=6) fell from the Olympic grant to the international grant; 18.9% (n=7) from Olympic to international and, subsequently, national; 8.10% (n=3) went back to the base categories, going through all the categories; and, finally, another 10.81% (n=4) showed a regress in two, three or four categories, however, without being a gradual return.

DISCUSSION

From 2005 to 2017, it was possible to observe a significant increase in the evolution of the benefit, pointing to a scenario of increased investment in the swimming modality - in the specific case, through the Bolsa-Atleta Program. The identification of the constant evolution of the financial volume of benefits ($ 47,568 in 2005 and $ 773,664 in 2017) highlights the importance of analyzing

the continuity of the swimmers granted in this period, seeking to identify if in fact, athletes who receive the incentive in the base categories, continue to receive the incentive in later years, which would characterize an effective monitoring in the training of high-performance athletes in the country.

The observed data corroborate several authors (Hollings, Mallett & Hume, 2014; Huxlei, O'Connor & Bennie, 2018; Rees et al., 2016), about the fact that many sports talent identification systems use early competitive success as the main criterion in the selection for a sports development program, even though there is evidence at all levels of performance that youth sports success does not significantly predict long-term success (Hollings, Mallett & Hume, 2014; Huxlei, O'Connor & Bennie, 2018; Rees et al., 2016).

Considering that the program analyzed in the present study starts from the results obtained by the athletes for granting the financial benefit, we can perceive that, in the absence of renewal or progression in incentives, the sports results may have been reduced, or, simply, ceased to exist.

Financial support is often of fundamental importance for non-professional athletes to remain in the sport (Wicker et al., 2012), however, from the data, it is possible to confirm the notes of De Bosscher & De Rycke (2017), about the possibility of a potential athlete being left out of receiving financial incentives when these are based exclusively on sports results. Moreover, the data corroborate Seguí-Urbaneja et al. (2020) by demonstrating that the base categories are not always directly related to the higher categories.

Some studies show that the formation and selection of sports talents is a slow process, approximately eight to 12 years to obtain relevant results (Hastie et al., 2013; Rees et al., 2016; Vieira & Vieira, 2001). According to Côté & Hancock (2016), sports policy makers need to restructure youth sports programs, aiming to balance policies that maximize the developmental benefits of sport. For the authors, the challenging task of those responsible for formulating policies and administrators of sports programs for young people is to meet the multiple needs of participants, positively impacting the participation rate, future performance and personal development of athletes (Côté & Hancock, 2016).

According to Rees et al. (2016), most talent identification systems in sport use junior performance and early competitive success as the main selection criteria in a sports development program. Based on the evidence, the authors recommend that policymakers should recognize that early athlete support programs are not the only way to develop talent, so this should be a priority for future research. Regarding the researched Brazilian program, studies indicate that it would be wrong to state that the benefit alone is responsible for the improvement in athlete performance (Guimarães, 2009, Dias et al., 2016; Moraes e Silva, Mezzadri, de Souza & de Souza, 2015; Ordonhes et al., 2016); regarding that the program should be thought from long-term planning and not as a cause and effect policy.

According to the swimmers who progressed from the base grants to the international grants, 14 athletes participated in world championships between 2015 and 2017, the main international competition in the sport. Regarding the swimmers who progressed from the base categories to the Olympic category, the three athletes participated in World, Pan American, South American and Olympic games.

In the list of winners between 2005 and 2017, there are some athletes who are part of the current Brazilian swimming team. Thus, among the 17 who received only the Olympic grant, we found 10 athletes belonging to the team (58%). As for the athletes that progressed from the base category to the international category, we observed that out of the 54, 10 are part of the Brazilian team (18.51%).

The significant results observed for the swimmers of higher categories that did not receive the grant in previous categories raise doubt about the way public funds are distributed in Brazil, having immediate and short term results as a central requirement; since based on them, exclusively, may be unable to guarantee the athlete future progression, considering that there are other important factors for the formation of an athlete (Blázquez & Feu, 2012; Barker-Ruchti et al., 2018; Côté & Hancock, 2016; Rees et al., 2016).

From the data analysis, it is possible to make approximations with the notes of Barker-Ruchti et al. (2018) and ask questions about targeting public resources to the sports base and the implementation of such policies, leading to rethinking whether the way the transfer of funds occurs is ideal for training athletes in the country.

Thus, it is proposed that the targeting of financial resources should be carried out in a manner directed to specific aspects related to sports training, that is, allocating sports materials and equipment, travel expenses, training and high-level competitions, among others. In this way, the specificities of each modality can be considered.

From the observed results, it can be seen that there is still no sports management model that considers sport as a political element that needs to be considered in the short, medium and long term; it is necessary to consider long-term planning (Saretta et al., 2015). The actions, benefits and incentives are often immediate, so there is a need for a government proposal to encourage sports aimed at a process of qualifying athletes and developing modalities that do not end up in the background.

The fact that this study analyzes the athletes covered by a sports financing policy (Bolsa-Atleta program) in only one modality (swimming) characterizes the limitation of the research. In this sense, we recommend carrying out other research related to sports policies aimed at athletes, contributing to the formulation and application of public policies in several international spheres. In addition, the analysis of other individual sports modalities would be interesting,

in order to be able to compare with the results observed in the sample now chosen.

CONCLUSIONS

The present study aimed to identify whether Brazilian swimmers who received financial incentives in the base categories presented continuity in sports up to the highest funding categories of the program: international and Olympic.

It can be seen that public funding made in the base categories did not guarantee the swimmers' permanence in the sport. It was also possible to identify athletes who presented good results in higher categories of the program without necessarily appearing on the list of initial recipients. The observed data lead us to question where these athletes were in previous years and whether they were granted with other incentives (public, private or other maintenance, such as family financing).

From our findings, it can be questioned whether the way the transfer of funds occurs is ideal for training swimmers in the country in question. Although it was possible to observe more prominent investments in swimming from the year 2010, it is proposed a decentralization of resources thought for the long term, considering a process of qualification of swimmers and the specificities of the modality in question, aiming to target the resources more effectively.

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