International Road Race of São Silvestre: why don't brazilians win anymore and what do we need to do?

Corrida Internacional de São Silvestre: por que os brasileiros não vencem mais e o que precisamos fazer?

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ABSTRACT

Aim: To compare the Brazilian and foreign runners in the International Road Race of São Silvestre. Methods: Retrospective study that evaluated the results of 220 athletes of both genders that reached the top 10. The time of each race was converted in seconds to compare the performance. Results: After 11 editions of the International Road Race of São Silvestre only one Brazilian athlete won without any female victory. In the male 10 foreign athletes won (Kenya 5 x 5 Ethiopia) and all the females proved were won by foreign athletes (Kenya 9 x 2 Ethiopia). There was a difference when comparing the performance of foreign elite runners in the male (p<0.004) and female (p<0.001). Conclusion: Despite the large number of existing runners, the Brazilian elite does not develop the same level of performance to beat African athletes. To change this condition, it is necessary to change the strategy for preparing Brazilian athletes from the base of training athletes.

Keywords: performance, athletics, road race, training, exercise.

RESUMO

Objetivo: Comparar os corredores brasileiros e estrangeiros da Corrida Internacional de Estrada de São Silvestre. Métodos: Estudo retrospectivo que avaliou os resultados de 220 atletas de ambos os sexos que chegaram ao top 10. O tempo de cada prova foi convertido em segundos para comparação do desempenho. Resultados: Após 11 edições da Corrida Internacional de Estrada de São Silvestre apenas uma atleta brasileira venceu sem nenhuma vitória feminina. No masculino 10 atletas estrangeiros venceram (Quênia 5 x 5 Etiópia) e todas as provas femininas foram vencidas por atletas estrangeiros (Quênia 9 x 2 Etiópia). Houve diferença quando comparado o desempenho de corredores estrangeiros de elite no sexo masculino (p<0.004) e feminino (p<0.001). Conclusão: Apesar do grande número de corredores existentes, a elite brasileira não desenvolve o mesmo nível de desempenho para vencer os atletas africanos. Para mudar essa condição, é preciso mudar a estratégia de preparação dos atletas brasileiros a partir da base da formação de atletas.

Palavras-chave: desempenho, atletismo, corrida de estrada, treinamento, exercício.
1 INTRODUCTION

The International Road Race of São Silvestre (IRRSS) road race is the most important in Latin America\(^1\), which received its name for being held on December 31, Saint Silvestre's day according to Catholicism, created by journalist Cásper Líbero who was inspired by a French night race. Its first edition took place in 1925 where 60 athletes participated, and it was held at night. Over the years, the race became international in 1945, gained popularity and started to count on world athletics icons\(^2\). The 1953 edition had the participation of Emil Zatopek, providing at the event about 800 thousand spectators who took to the streets to follow the race and see the three-time Olympic champion. Over the years, other important athletes were present at IRRSS, among them the Olympic champions Vladimir Kutz and Jemima Jelagat, the marathon world record holders Paul Tergat, Ronaldo da Costa, Brigid Kosgei, the two-time New York marathon champion Marilson Gomes da Costa and Vandelei Cordeiro de Lima, decorated with Pierre de Coubertin medal, being one of the 4 athletes among all the Americas to receive this honor from the International Olympic Committee\(^2\).

The IRRSS started with a course of 8.8 km and changed the distance and courses over time. In 1991, the road race extended the distance from 12.6 to 15 km, starting in the morning, placing the event on the World Athletics international calendar, receiving the bronze classification. The race continues to be held on the last day of the year, today the IRRSS receives thousands of participants\(^3\). Today there are inspired races with the same name held in several cities in Portugal such as Lisbon and Porto\(^4\).

In Brazil, road racing is extremely popular with thousands of practitioners in the country, an amount that has grown a lot since the 1970s\(^5\). The country currently has numerous runners and sporting events throughout the country\(^6,7\) apparently with a greater participation of men\(^8\). In addition, Brazil produced runners that are part of the history of road racing like Ronaldo da Costa, who was once the world record holder for the marathon, Vanderlei Cordeiro de Lima, bronze medalist in the historic Olympics in Athens and Marilson Gomes dos Santos, two-time champion of the marathon in New York. For this reason, long-distance runners are expected to perform well in important events in the country and worldwide. Despite this, in recent years the most traditional race in Brazil has been won by African athletes, so much so that in 2020 it will complete 10 years of the last Brazilian winner, Marilson Gomes dos Santos, showing that the number of runners does not reflect on the performance of athletes from elite Brazilians\(^6\).
The African runners have dominated the road races\(^9\). Today, the record holders of the most traditional events such as 5 kilometer (km), 10 km, 15 km, half-marathon, and marathon are all Africans, mostly Kenyans and Ethiopians\(^{10}\), with a weak attempt by some athletes from the USA, UK and Japan trying to compete with Africans\(^6\).

In this sense, the aim is to compare the performance of Brazilian runners’ elite with the winning athletes in the 2009/2019 IRRSS editions.

2 METHODS

This is a retrospective study conducted using official results of Brazilian and international athletes that participate of the IRRSS between 2009/2019.

2.1 DATA OF THE ATHLETES WINNERS AND BEST BRAZILIAN PERFORMANCE IN THE INTERNATIONAL RACE OF SÃO SILVESTRE

It studied the results of 200 elite runners that participated in the IRRSS, the most traditional and important road race of South America. The data were obtained using the databases of the IRRSS by official website\(^3,10,11\). The most important results of the winners and the most important time and position of Brazilian athletes were collected. The survey was made only for male and female athletes competing in the elite group who reached the 10th place in the 2009/2019 editions of road races.

2.2 STATISTICAL ANALYSIS

The data were showed in hours, minutes, and seconds in the tables and graphics. For statistical comparison the times were converted in seconds, so the data normality analysis was done with the Kolmogorov-Smirnov test. The double comparisons were made with the Student T Test, and tests with three or more groups occurred with the analysis of variance (ANOVA). The proportion analysis was done with the Chi-Square test. All statistical tests were done with the software SigmaPlot 11.0, and the graphics were done in the Excel program. The significance adopted was \(p<0.05\).
3 RESULTS

Table 1. Features of the athletes winners and Brazilian athletes participants between 2009 and 2019

<table>
<thead>
<tr>
<th>ATHLETES</th>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winners</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>25.5 (± 4.01)</td>
<td>27.0 (± 4.47)</td>
</tr>
<tr>
<td>Time (hh:mm:ss)</td>
<td>00:44:16 (± 00:00:39)</td>
<td>00:50:42 (± 00:01:42)</td>
</tr>
<tr>
<td>Pace (km/min)</td>
<td>00:02:53 (± 00:00:02)</td>
<td>00:03:22 (± 00:00:06)</td>
</tr>
<tr>
<td>Best time (hh:mm:ss)</td>
<td>00:44:02</td>
<td>00:48:35</td>
</tr>
<tr>
<td>Best pace (km/min)</td>
<td>00:02:51</td>
<td>00:03:14</td>
</tr>
</tbody>
</table>

Best performance of Brazilian athletes

| Time (hh:mm:ss) | 00:44:16 (± 00:00:39) | 00:50:42 (± 00:01:42) |
| Pace (km/min) | 00:02:53 (± 00:00:02) | 00:03:22 (± 00:00:06) |
| Best time (hh:mm:ss) | 00:44:02 | 00:48:35 |
| Best pace (km/min) | 00:02:51 | 00:03:14 |

Legend: Data shown as mean and standard deviation. It was not difference when compared the data (p>0.05).

Table 2. Times of the winners and best time of Brazilian runners between 2009 and 2019

<table>
<thead>
<tr>
<th>Winners</th>
<th>Male</th>
<th>Country</th>
<th>Best time and position of Brazilian athletes</th>
<th>Female</th>
<th>Country</th>
<th>Best time and position of Brazilian athletes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>00:44:40</td>
<td>Kenya</td>
<td>00:45:31; 4th</td>
<td>00:52:28</td>
<td>Kenya</td>
<td>00:52:57; 3rd</td>
</tr>
<tr>
<td>2010</td>
<td>00:44:02</td>
<td>Brazil</td>
<td>00:44:02; 1st</td>
<td>00:50:19</td>
<td>Kenya</td>
<td>00:50:25; 2nd</td>
</tr>
<tr>
<td>2011</td>
<td>00:43:35</td>
<td>Ethiopia</td>
<td>00:44:53; 7th</td>
<td>00:48:48</td>
<td>Kenya</td>
<td>00:51:59; 6th</td>
</tr>
<tr>
<td>2012</td>
<td>00:44:03</td>
<td>Kenya</td>
<td>00:44:48; 4th</td>
<td>00:51:39</td>
<td>Kenya</td>
<td>00:54:09; 6th</td>
</tr>
<tr>
<td>2013</td>
<td>00:43:48</td>
<td>Kenya</td>
<td>00:45:50; 4th</td>
<td>00:51:58</td>
<td>Kenya</td>
<td>00:52:58; 6th</td>
</tr>
<tr>
<td>2014</td>
<td>00:45:04</td>
<td>Ethiopia</td>
<td>00:45:21; 5th</td>
<td>00:50:43</td>
<td>Ethiopia</td>
<td>00:53:18; 8th</td>
</tr>
<tr>
<td>2015</td>
<td>00:44:31</td>
<td>Kenya</td>
<td>00:44:58; 5th</td>
<td>00:54:01</td>
<td>Ethiopia</td>
<td>00:54:22; 4th</td>
</tr>
<tr>
<td>2016</td>
<td>00:44:53</td>
<td>Ethiopia</td>
<td>00:45:30; 4th</td>
<td>00:48:35</td>
<td>Kenya</td>
<td>00:54:01; 7th</td>
</tr>
<tr>
<td>2017</td>
<td>00:44:15</td>
<td>Ethiopia</td>
<td>*00:46:36; 11th</td>
<td>00:50:17</td>
<td>Kenya</td>
<td>00:54:06; 10th</td>
</tr>
<tr>
<td>2018</td>
<td>00:45:03</td>
<td>Ethiopia</td>
<td>00:46:38; 8th</td>
<td>00:50:02</td>
<td>Kenya</td>
<td>00:54:05; 8th</td>
</tr>
<tr>
<td>2019</td>
<td>00:42:59</td>
<td>Kenya</td>
<td>*00:46:32; 11th</td>
<td>00:48:54</td>
<td>Kenya</td>
<td>00:53:33; 7th</td>
</tr>
</tbody>
</table>

Legend: Data shown as mean and standard deviation. Times presented as hour, minute and second (hh:mm:ss).

The symbol * showed that the best position of Brazilian runner was observed after 10th position.

Table 1 showed the features of the elite runner’s male and female foreign and Brazilian runners. It was studied 220 elite runners, and it was not observed difference between age when compared gender and winners and Brazilian athletes (p>0.05).

Table 2 presents the times of the winner runners compared with the best time of Brazilian runners. In eleven editions, there is only a single Brazilian victory in 2010 in the men’s race with a time of 00:44:02. In addition, it was observed five victories of Kenyan and Ethiopian athletes. Moreover, in the female road race, there were 9 victories by Kenyan and 2 by Ethiopian athletes. There were more Brazilian female runners between the top 10 while in 2 events there were no Brazilian athletes in the top 10.

Figure 1 shows the growth in the number of participants from 2009 to 2019. There was an increase of 175% over the years. In 2009 there were 20,000 runners, and in 2019 it was observed a total of 35,000 runners. In addition, Figures 2 and 3 show the kinetics of the athletes’
performance in the top 10 positions between the 2009 to 2019 editions. Among male athletes, there was only one Brazilian victory and none among female athletes.

Additionally, the results of the present study showed a comparison of the times between the winning athletes compared to the best times of the Brazilian athletes who had the best positions in competitions in the editions from 2009 to 2019. The data show the kinetics of the pace of the winning athletes compared to the best pace of Brazilian male and female runners. The data shows that there is a difference when comparing the times of the race winners compared to the best times of the Brazilian male (p<0.004) and female athletes (p<0.001).

**Figure 1. Number of participants from 2009 to 2019**

Legend. Figure 1 shows the evolution in the total number of participating runners between the years 2009 to 2019. The data are raw and obtained from the website of the race itself.

**Figure 2. Performance of male runners**

Legend. Figure 2 shows the time kinetics of male race winners over the 2009 to 2019 editions.
Figure 3. Performance of female runners

Legend. Figure 3 shows the time kinetics of female race winners over the 2009 to 2019 editions.

Figure 4. Comparison of the time of the winner of the race with the best time of a Brazilian athlete in the same edition

Legend. Figure 4 shows the comparison of the winning athlete's time in each edition between 2009 and 2019 compared to the time of the best Brazilian athlete placed in the editions. The orange line represents the best time of Brazilian athletes in the respective editions. The blue line represents the time of the winning athletes in the respective editions. Graphs A and B show the performance of male and female athletes, respectively. Graph C shows the statistical difference when comparing the paces of the winning foreign athletes with the best time of the Brazilians. The symbol * shows statistical difference when comparing the Brazilian with Foreign athletes (p<0.05).
4 DISCUSSION

The present study showed that the elite Brazilian runners had the worst performance compared with the foreign elite that won the last eleven editions of mainly road races of Latin America, the IRRSS. There is only a unique Brazilian victory in 2010. After that, any Brazilian athlete won the race when compared male and female runners. The most important results were observed for Kenyan and Ethiopian runners for both genders that presented better performance compared with Brazilian athletes. It is important that the Brazilian elite runners change the training methods and receive more incentive from the Brazilian Athletic Committee (CBAt) and Olympic Brazilian Committee (COB) to provide better future results for Brazilian runners.

In Brazil, there are a lot of recreational runners and large number of roads races. Despite the large number of practitioners as shown in the Figure 1 only in the IRRSS, the country is unable to train outstanding elite athletes in endurance races so much that the Brazilian athlete runners did not present affect performance in long-distance running in the most important road races such as the major’s marathons. In this sense, the findings of the present study also showed that in the IRRSS the performance of male and female Brazilian elite runners were not efficient to win the most important road race of Latin America.

At last, eleven editions of IRRSS there was only a victory in 2010 by Marilson Gomes da Costa, and there was no between female Brazilian athletes (Table 1). The lack of victories in the IRRSS can be attributed to some hypotheses: i) invitation from the organization bringing exceptional African athletes who perform well in the most important races in the world; ii) the physiological superiority that Kenyan and Ethiopian athletes have when compared to other endurance athletes in the world; iii) the large number of athletes trained by East African countries specially Ethiopia and Kenya that dominate marathon and road race more shorts for a long-time. All hypotheses are discussed above.

Previous studies have been shown that in other traditional road races as well as Boston, New York, Berlin and London marathons as well as in the road races with shorter distances like 5 km, 10 km, and 15 km which is the distance from the IRRSS. The dominance of Kenyan and Ethiopian athletes has been observed in indoor and outdoor competitions in all mainly sporting events. For this, these athletes received invitations to participate in many important events such as the IRRSS, and they tend to win due to their better capacity in endurance road race.

In addition, the present study showed the difference of performance when comparing the foreign winners and the male (Figure 2) and female Brazilian athletes (Figure 3). The pace of winners was faster than the best Brazilian elite runners in both genders in each event of the
last eleven years with a difference of 4.93% (± 4.29) in male and 5.12% (± 3.38) in female compared with the winner pace (Figure 4). These findings are important because the study brings new information to the development of strategies of training Brazilian athletes to try to win the future's IRRSS as previously shown for marathons\textsuperscript{15}. Other studies showed that the athletes of East Africa present improvements in road races when compared with athletes of the other countries\textsuperscript{16,17}. Previously in the 80s the endurance run was won by European athletes\textsuperscript{18}; of the top 20 worldwide, 50% by European athletes, and only 30% by Africa runners. This has changed and today the percentage of African runners has jumped to 85%, 55% of whom are Kenyans. The Kenyans and Ethiopians have won many endurance middle and long-distance running world competitions (5Km, 10Km, and marathon)\textsuperscript{12}. So, the inferiority in the IRRSS is not something only for Brazilian athletes, but for everyone else in relation to Kenyans and Ethiopians runners.

The best performance of African athletes mainly from Kenya and Ethiopia in outdoor and indoor endurance running seems to be explained by some aspects as well as: i) Genetic, studies showed that mainly the Kenyans means have a vantage difference genetic by a polymorphism in mitochondrial DNA(mtDNA), that improve the aerobic capacity and results in the best performance in resistance sports as the long-distance running\textsuperscript{19}, although this theory is still controversial\textsuperscript{20}; ii) Biomechanical and metabolism factors, findings showed that Kenyan athletes have not only more efficient muscle, cardiovascular and ventilatory metabolic mechanisms\textsuperscript{21}, but also biomechanical aspects that make strides longer and faster by presenting longer calcaneal tendons\textsuperscript{22}, adding these metabolic and biomechanical conditions\textsuperscript{23}; iii) Social necessity, In East Africa many people in this region are very poor and understood that sport is a way to escape extreme poverty, economic factors also provide an additional motivation, if not a necessity, to succeed in distance running\textsuperscript{24}.

Finally, it is important to clarify that Brazil has an important history in long-distance running in the Olympic Games with Vandelei Cordeiro de Lima in 2000 and with the world record set by Ronaldo da Costa in 1998. To change the actual reality in the major's marathons and in the IRRSS is necessary more actions of CBAt and COB. Studies showed that there is a massive participation of people in road races, but this phenomenon is not reflected in results in the elite athlete runners\textsuperscript{6}. In this sense, the present study can collaborate pointing out some important actions that Brazilian committees need to adopt: i) encourage the creation of many athletics schools in Brazil, such as the miniature sports recommended by World Athletics, which would be a way to increase the amount of future good endurance athletes, this action exists, but it is insufficient and few young coaches have access; ii) make a greater exchange
with Brazilian and foreign coaches encouraging the creation of a true sports science academy according to the needs of Brazilian athletes, then trained technicians who understand the practice, the physiology of exercise and the most current forms of scientific research of the high performance in the sport. Brazil has many sports scientists recognized worldwide who are outside the actions implemented by CBA at and COB due to political issues; iii) Creation of regional actions to encourage the practice of running for young people as occurs with the IRRSS, which hosts an event called “São Silvestrinha”, a recreational race for this public that is held during the week of the IRRSS and serves as a stimulus for the new generations develop interest in sport25; iv) The Brazil has poverty and economic problems and millions of poor young people could be encouraged to try to change their lives through sport as in Kenya and Ethiopia, so creating opportunities is necessary for sport and social issues.

4.1 LIMITATIONS OF THE STUDY

The study was a retrospective that used the database of past sporting events. However, our findings showed the current problems in the athletics of Brazil that necessitated more investments and changes in the formation of young athletes that will be prepared to compete against the African runners.

4.2 PRACTICAL APPLICATION

There are no studies that evaluated the performance of Brazilian runners in the IRRSS. So, our findings can be used for athletic coaches to promote changes in the methods of training for long-distance runners. It showed the timeline and comparison of the paces of the best foreign athletes. This information is important to develop training and race day strategies, as previously showed15,17. In addition, the present study recommends to the CBA at and Olympic COB the need to implement new strategies to massify the practice of running among children and young people, taking them to professional sports and not only in adult life as recreational runners. In addition, it is very necessary to qualify Brazilian athletics coaches with the most recent evidence on endurance training. It is important to create a training school that integrates exercise physiology with practice as example the Nigh Performance Sports Center in São Paulo (“NAR”)26, where sports researchers can qualify technicians with scientific advances and technicians can teach practical knowledge to physiologists, as this does not happen in all Brazil, there are no integration centers and training main centers. This relationship is so fragile that recent systematic reviews on training for long-distance runners27-30 included a single Brazilian study31, which shows the fragility of science and the practical field in Brazilian sport. At last, the CBA
needs to transfer more financial resources to athletes. Due to lack of financial support, the greatest promise of the last ten years in street racing, Daniel F. Nascimento, best time among non-Africans (2:04:51) in the Seoul 2022 marathon, discusses a possibility of Chinese naturalization, so it is necessary to invest more in promising athletes.

5 CONCLUSION

It is necessary to change investment in science of sports, in athletes, coaches’ scientific update, creation of more sport scientific centers, and in the formation of a new generation of Brazilian endurance runners.
REFERENCES


