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Acknowledgement of Great Work

Sooner or later, good work is recognized. I am referring here to the excellent work of the CONMEBOL Medical Commission and the medical teams of Associations and clubs throughout the COVID-19 pandemic, the end of which now seems to be coming close. The excellent results of the health protocols and the intense vaccination campaign promoted by CONMEBOL were decisive in reaching a historic cooperation agreement with the United States Department of Health and Human Services. This agreement aims at the joint promotion of health and healthy habits, within the framework of sports events and with the participation of renowned figures.

This recognition is added to that achieved by the work of the CONMEBOL Medical Commission in the scientific and academic field, through the publication of an article in the Sports Medicine magazine.

However, the greatest recognition for the work against COVID-19 has undoubtedly been the trust of millions of South American fans, the support of Associations and clubs, the backing of sponsors and partner companies and the constructive relationship with authorities and public institutions in ten countries. This is what made it possible for our tournaments to continue without changes in format and without affecting their attractiveness and competitiveness.

As the last day of the pandemic approaches, it is essential not to let our guard down. Not in the sense of continuing to apply protocols or restrictions - those days are over - but rather to draw lessons from a uniquely complex and difficult time, with the idea that a new emergency - which hopefully will never come - will not take us off guard. We have learned so much more than we knew before.

The present publication is crucial to this task, which embodies the extraordinary work carried out during the COVID-19 pandemic.

Throughout this year, the joint work with UEFA has been enhanced through the organization of three joint competitions: the Finalissima (the match played in London between the Argentina and Italy national teams), the Intercontinental U20 (in Uruguay) and the Final Four Futsal (in Argentina). In each of these competitions, spaces for conversation and meetings were established between the anti-doping areas of both confederations, promoting joint work, and generating the exchange of knowledge and experience.

Fortunately, in the case of this CONMEBOL body, urgency never overshadowed or displaced what is important.

Thank you very much.

Alejandro Domínguez W-S
CONMEBOL President



Analysis Time

Although the pandemic has not been officially declared over, the year 2022 showed a drastic reduction in the number of COVID-19 cases worldwide. Virtually all existing restrictions were lifted and life in all areas, including sports, has been moving back towards normality. This is of course a relief for all of us. And it also allows us to take a calmer look at what happened in those most difficult months, when everything was uncertain, and confusion reigned.

For science - and for medical science in particular - the long-awaited moment of relief has arrived to take a closer look at the pandemic that Humanity has just gone through. In our case, it is up to us to draw the conclusions and lessons from an extremely difficult time that, let's hope it doesn't occur, might come back again in the future.

CONMEBOL is honored to have its health protocols studied in the most prestigious scientific circles. Sports Medicine, one of the most respected sports medicine journals in the world, has given a prominent place to an article dedicated to COVID 19's prevention protocols and CONMEBOL's vaccination campaign.

Top-tier science journals subject proposed articles to rigorous technical and scientific analysis and review before publication. Sports Medicine is published by the US company Springer Publishing, which specializes in academic books and journals based in Manhattan, New York.

The published work focuses on the CONMEBOL Copa América, one of the first international tournaments to restart in its original format since the start of the COVID-19 pandemic. The competing teams featured players from the leagues of more than 30 countries. The teams faced off in four Brazilian cities in June and July 2021, during a period of high virus transmission.

We are also pleased to report a 10% increase in targeted testing compared to the previous year, because of increased research and intelligence from CONMEBOL's Anti-Doping Unit, with continuous monitoring of players in all competitions, generating a monitoring system that allows us to identify players who have excelled in their teams and who could be a higher risk for committing an anti-doping violation. We have managed to collect a total of 2,927 samples which were safely transported to laboratories in Cologne - Germany and UCLA - Los Angeles USA.

There has been an 88% increase in the number of Therapeutic Use Exemption (TUE) applications received and managed, compared to 2021.

Finally, the Anti-Doping Unit has made an important commitment to research, investing in the storage of anti-doping samples for a period of 10 years, safeguarding 17.5% of the total number of Samples stored in the current year.

This CONMEBOL publication is a contribution to this necessary analysis. We hope that its content will help us in our work to achieve convergence between medical science and sport.

Thank you very much.

Dr. Osvaldo Pangrazio
President of the Medical Commission /
Director of the Anti-Doping Unit



An increasingly important task

As a former professional football player, I know very well that the years in which World Cups are played, such as 2022, are unique, very special. Calendars are tightened, competitions are adjusted, breaks and rests are compressed, and the athlete's physique is put under excessive strain. This affects both World Cup and non-World Cup players. In such circumstances, the work of the medical teams of clubs and Associations becomes even more crucial, as it is essential to take extreme care to avoid excessive wear and tear or even out-of-competition injuries.

The fact that we are emerging from a pandemic increases the importance of medical work. We need to move towards complete normalization, and on this path the guidance and orientation of medical professionals will be fundamental. The best ally of a coaching staff and a professional squad is the medical team, which provides scientific knowledge and planning criteria to protect the integrity of the players and maintain their competitiveness.

Regarding the Anti-Doping Unit, the percentage of cases of Adverse Analytical Findings (AAR) in CONMEBOL has remained at 0.1%, in relation to the total number of samples collected. This is the third year in a row, reflecting the tremendous work being done with the Anti-Doping Education Plan, reaching a total of 3,084 persons in 2022. Compared to the previous year, this figure represents an 88% increase in outreach to players and coaching staff through anti-doping education talks.

With the increase in women's competitions, 25% of all samples collected during the year are from female athletes, which we can understand as a response of the Anti-Doping Unit to the strong growth of women's football.

I am sure that the content of this magazine will be of great use to all of you, medical professionals working

in football. You make up a great team, in which there are no differences between clubs or countries. The experience of the tournaments in our continent, the work of the CONMEBOL Medical Commission, the statistics, and data, are at the service of all the Associations, because the most important objective is to contribute to improve South American football, making it more competitive.

Thank you very much.

Nery Pumpido
Assistant General Secretary Football /
Development Director



PART ONE

Medical Commission



End of the COVID-19 Pandemic in South American Football?

Evolution of the Medical Recommendation Protocols 2020 - 2022

Protocols of Medical Recommendations have been created with the objective of preventing the contagion and propagation of the COVID-19 virus, guaranteeing the health of all the participants of the tournaments organized by CONMEBOL, health care measures have been recommended and at the same time controls have been carried out by means of COVID-19 virus detection tests.

The Medical Recommendations protocols were specific guidelines, which were adapted according to the health reality of each host country, considering local health protocols, the duration of the event, and CONMEBOL Operations regulations.

2020

- CONMEBOL becomes the first civil organization in the world to undertake a vaccination that benefited thousands of families in the 10 countries.
- The CONMEBOL COVID-19 Commission is created.
- In September, the CONMEBOL Sudamericana and CONMEBOL Libertadores competitions are resumed under strict control of temperature, RT-PCR tests up to 72 hours before the match, mandatory use of masks.
- Constant medical monitoring is recommended for possible symptoms throughout the delegation and in turn.

2021

- Short tournaments are resumed, under a control of RT-PCR tests for COVID-19 detection, every 72 hours.
- Closed sanitary bubble for the entire delegation.

2022

- As of May, the testing plan for short tournaments suggested by CONMEBOL's COVID-19 Commission, which consists of performing RT-PCR tests, incorporating the ANTIGEN, for the detection of COVID-19, is moving forward.
- Monitoring of the complete vaccination schedule against COVID-19.
- The sanitary bubble is ended.
- In August, the Medical Experts of the CONMEBOL COVID-19 Commission, after analyzing the report of the COVID-19 protocols carried out before and during the official CONMEBOL competitions held in 2021 and 2022 and, after studying the WHO reports and other scientific publications, have concluded to exempt, from that moment on, the compulsory taking of RT-PCR and/or antigen samples for the detection of COVID-19, in CONMEBOL competitions, leaving it under decision and according to the corresponding need as indicated by the Club Doctor.
- The use of face masks is mandatory until October, in accordance with CONMEBOL's updated medical recommendations protocol.

Epidemiology COVID-19 in competitions 2020 - 2022

Evento	CONMEBOL Libertadores Femenina 2020	CONMEBOL Libertadores Futsal 2020	CONMEBOL Copa América 2021	CONMEBOL Fútbol Playa Eliminatorias Mundial	CONMEBOL Libertadores Femenina 2021	CONMEBOL Copa América Futsal 2022
Mes	mar - 21	may -21	jun - 21	jun - 21	nov - 21	ene - 22
POSITIVOS	9	11	1010	0	5	15
NEGATIVOS	2783	1089	27762	1373	4377	1011
POSITIVOS	0,3	1	3,5	0	0,1	1
NEGATIVOS	99,7	99	96,4	100	99,9	99
TOTAL	2.792	1.100	28.772	1.373	4382	1.026

CONMEBOL Libertadores Sub 20 2022	CONMEBOL Sub 17 Femenina 2022	CONMEBOL Sub 20 Femenina 2022	CONMEBOL Copa América Fútbol Playa 2022	CONMEBOL Libertadores Futsal Femenina 2022	CONMEBOL Copa América Femenina 2022
feb - 22	mar-22	abr - 22	may - 22	jun - 22	jul - 22
19	6	0	3	5	90
1932	2452	2617	1402	1010	4528
0,9	0,2	0	0,1	0,5	1,9
99,1	99,8	100	99,9	99,5	98,05
1.951	2.458	2.617	1.405	1.015	4.618

% positive for COVID-19 virus per Tournament



Covid-19 control was carried out in the following competitions organized by CONMEBOL and only among delegations, referees and CONMEBOL staff. The competitions developed during the year 2022 under this format were:

- CONMEBOL Copa América Futsal, January, in Asunción, Paraguay.
- CONMEBOL Libertadores Sub20, February, in Quito, Ecuador.
- CONMEBOL Sub17 Femenina, March, in Montevideo, Uruguay.
- CONMEBOL Sub20 Femenina, April, Viña del Mar, Chile.
- CONMEBOL Copa America Fútbol Playa, May, in Asuncion, Paraguay.
- CONMEBOL Libertadores Futsal, June, in Cochabamba, Bolivia.
- CONMEBOL Copa América Femenina, July, in Bucaramanga, Cali and Armenia, Colombia.

2022 Tournaments Conclusions

COVID-19 in official CONMEBOL competitions 2022

During the year 2022, the CONMEBOL protocol for Covid-19 was modified, changes that were adapted to the considerations of global health standards and respecting the standards of each country's health authority.

The public returned to the stadiums without any type of restriction; however, elementary safety standards were maintained.



A total of 15,090 tests for Covid-19 were performed in these competitions and 138 (0.9%) positive cases were detected, which are distributed differently according to the competitions. Figure 1 shows the tests performed in each competition and Figure 2 the absolute number of positive cases; the incidence varied from one event to another, although it was the Women's America

Cup where the percentage was higher, reaching 1.9% of positive cases, possibly due to the winter season. In Copa America Futsal the percentage of positive cases was 1%, in Copa Libertadores U20, 0.9%, Copa Libertadores Futsal the percentage was 0.5% and in the rest of the competitions the figures ranged between 0.1% and 0.2% (Figure 3).

Figure 1 - Covid-19 test carried out

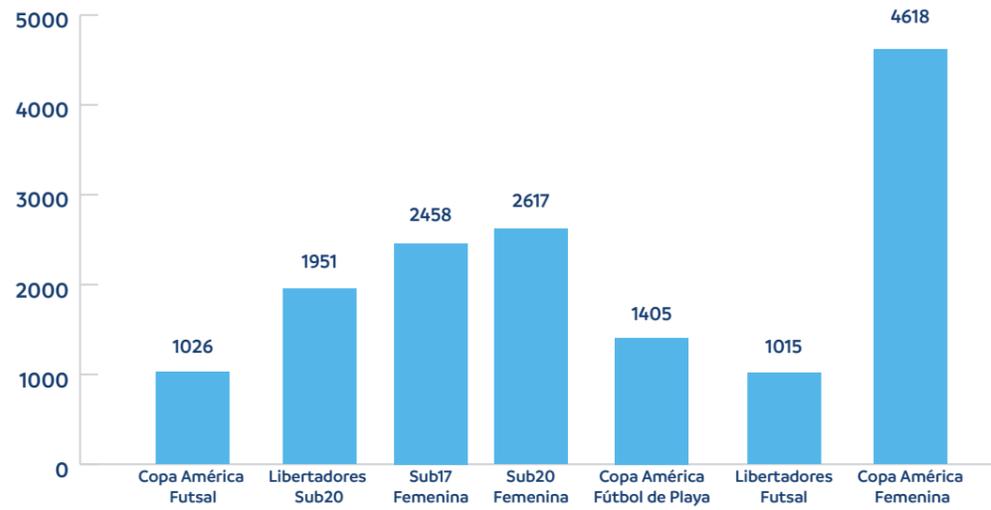


Figura 2 - Test Covid-19 Positive Cases

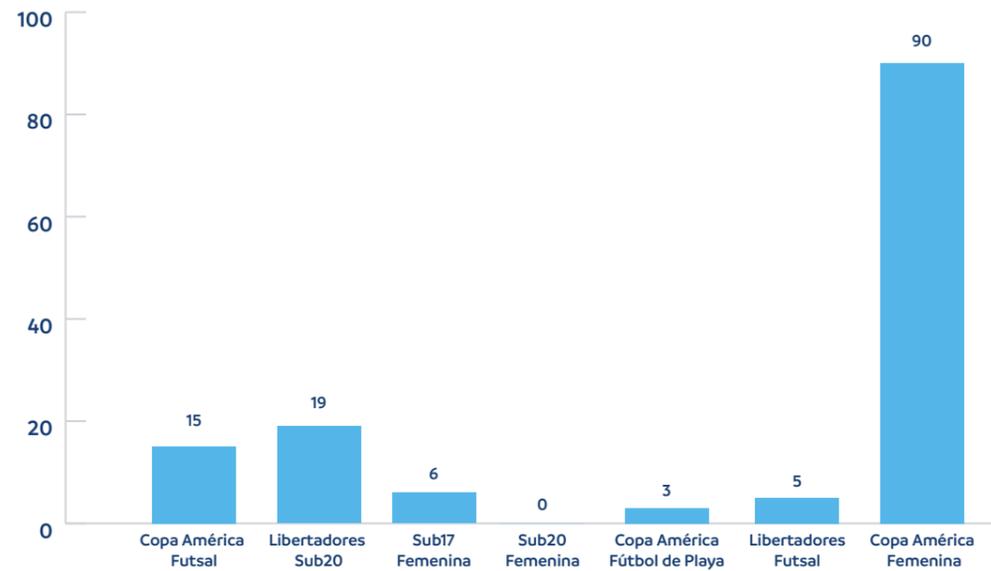
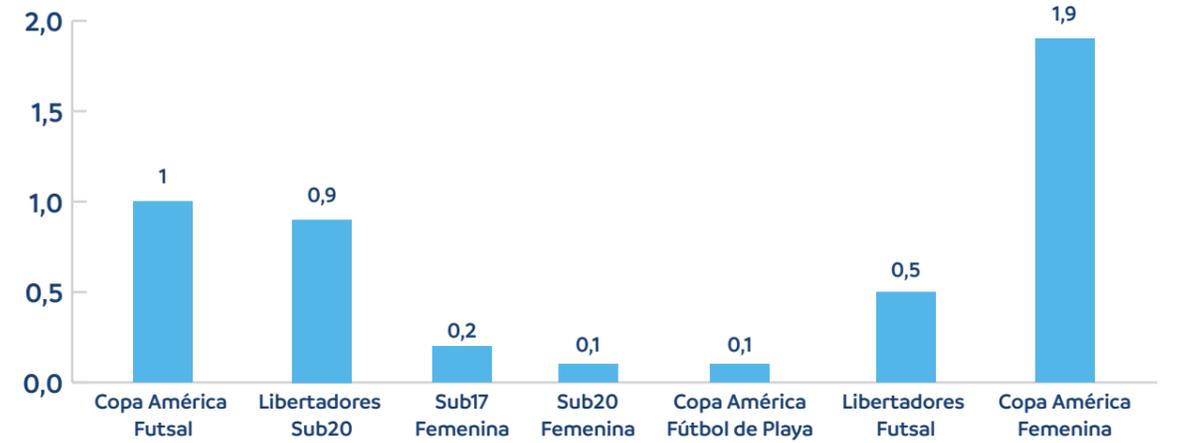


Figura 3 - Covid-19 test Percentage of positive cases



CONMEBOL committed to Public Health



CONMEBOL and the U.S. Department of Health and Human Services (HHS) signed a Memorandum of Understanding on Thursday, September 8, in Washington, D.C. to promote various public health initiatives, such as vaccination against COVID-19.

Regional impact

Doctor Osvaldo Pangrazio, president of CONMEBOL's Medical Commission, emphasized that the organization's measures during the worst of the pandemic were not limited only to tournaments. "Since the pandemic began, we have protected the entire South American football community, being cautious, intelligent and developing protocols that had a very high percentage of effectiveness."

Sports Medicine
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CURRENT OPINION



Safety of International Professional Sports Competitions During the COVID-19 Pandemic: The Association Football Experience

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Abstract

Major sporting events were suspended during the most acute phase of the COVID-19 pandemic. Competitions are resuming with enhanced hygiene protocols and altered mechanics. While risks for players and staff have been studied, the impact of large-scale tournaments on the communities that host them remains largely unstudied. CONMEBOL Copa América is one of the first wide-scale international tournaments to be conducted in its original format since the beginning of the COVID-19 pandemic. The tournament saw 10 national teams compete in four Brazilian cities during a period of heightened viral transmission. The analysis of over 28,000 compulsory PCR tests showed that positive cases did not lead to the uncontrolled spread of the disease among staff and players. More importantly, the data indicate that locally hired staff were not exposed to increased risk while working. The Copa América experience shows that international sporting competitions can be conducted safely even under unfavourable epidemiological situations.

Key Points

No uncontrolled spread of COVID-19 was detected in players or foreign and local staff during the CONMEBOL Copa América Association Football tournament conducted in four Brazilian cities in 2021.

Employment in Copa América did not increase risk to local contractors.

The Copa América experience shows that even in adverse epidemiological conditions, professional sporting competitions can be safe.

1 Introduction

Association Football, like most professional sports, has been affected by the COVID-19 pandemic [1–3]. Training and competition have resumed with risk abatement protocols in place and changes to the mechanics of the tournament in an attempt to minimise risk.

Contact sports have the hallmarks of increased risk; nevertheless, the evidence shows these risks can be managed [4]. Meyer et al. describe the reopening of the German Bundesliga during a period of reduced transmission of the virus [5]. The authors concluded that football can safely restart following strict testing and hygiene protocols as they found no evidence of uncontained spread among players and staff. Schumacher et al., in a similar study, analysed the Qatari professional football league. The authors observed infection rates consistent with those of the general population, noting that infections seem to originate through social contacts rather than during the match [6]. In a notable exception, Gualano et al. observed increased risk for players in São Paulo [7].

Notably, the risks posed to the communities that host these tournaments remain largely unstudied. In this work, we analyse CONMEBOL Copa América 2020, a continental-scale Association Football tournament organised by CONMEBOL (Confederación Sudamericana de Fútbol, Confederação Sul-Americana de Futebol). After being postponed

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at the onset of the COVID-19 pandemic, 10 national teams with players from over 30 countries came together in Brazil between June and July of 2021. CONMEBOL implemented comprehensive protocols to minimise risks to the community and the more than 700 staff involved. We show that the protocols were able to isolate the tournament from the unfavourable epidemiological conditions in Brazil. The data also suggest that large-scale tournaments can be conducted safely, in such a way that they do not increase the risk for host communities.

2 Methodological Aspects

2.1 Accreditation and Location

CONMEBOL accredited over 700 persons for Copa América: 250 players in 10 national teams, 210 managers and technical support staff for each team (hereafter referred to as delegations), 250 locally hired staff, and 40 referees and CONMEBOL international staff. Four cities were selected to host the tournament's 28 games. Brasilia and Rio de Janeiro each hosted eight matches, Goiânia seven and Cuiabá five. Cities hosting the tournament were located in federal states with rapidly accelerating contagion rates (Fig. 1).

Public attendance was not allowed except in the final match at the Estádio do Maracanã in Rio de Janeiro, with attendance limited to 10% of the available capacity (~7800 people). The mechanics of Copa América 2020 remained otherwise unchanged from its pre-pandemic tournaments (see electronic supplementary material, ESM 1).

2.2 Protocols and Testing Schedule

Three sanitary bubbles were created for groups travelling to Brazil. CONMEBOL international staff and referees were grouped into a common bubble for logistic purposes. Players and their corresponding delegations were kept in separate bubbles since delegations have intrinsically more contact with other bubbles. Importantly, players travelled from over 30 countries to play for their national teams, preventing earlier bubbling. Local staff were not included in the bubbling.

Signs displaying mandatory preventive measures were prominently displayed and hand sanitiser was made available throughout the stadiums. Foreign accredited personnel provided a negative RT-qPCR (real-time polymerase chain reaction) test before travel, and Brazilian regulators required a further RT-qPCR test within 48 h of arrival in the country.

CONMEBOL required RT-qPCR tests for all persons entering the stadiums at any point during the tournament. Samples had to be taken no more than 48 h before processing and all samples were processed in designated laboratories in each host city. Persons with positive test results were required to isolate in their provided accommodations for a minimum of 10 days and until symptom-free for 4 days. Local staff who tested positive were required to follow Brazilian state and federal requirements.

Testing data were collected from all tests after arrival in Brazil between June 13 and July 10, 2021; no follow-up studies were conducted after the end of the tournament. A total of 28,772 tests were performed, with an average of 1027.5 tests for each of the 28 matches. Sequences were obtained for 26 positive samples identifying P1, VOC

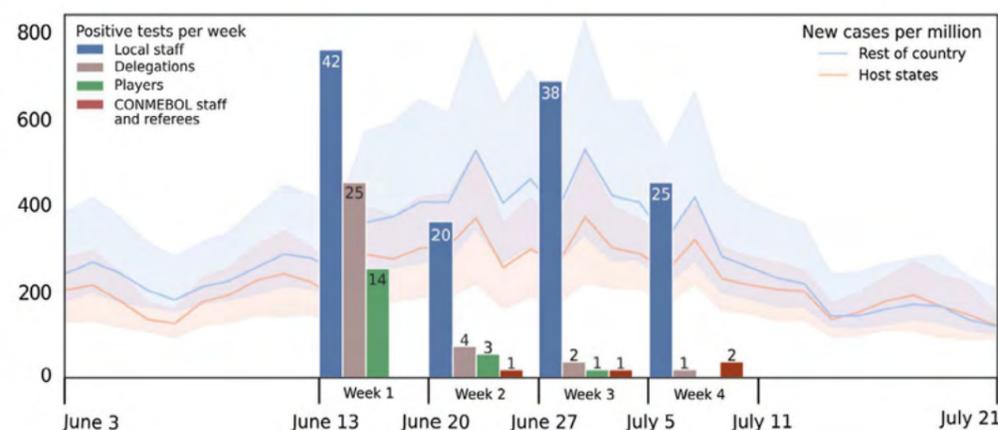


Fig. 1 Brazilian epidemiological scenario: The solid lines show the mean number of new COVID-19 cases per million, orange for host states and blue for all other states. Shaded areas represent the 95% confidence interval of cases per million on the corresponding date.

Copa América testing results: Bars represent the number of positive tests in the corresponding week of the tournament per group. Note that positive cases in the first week were likely to have originated prior to the start of the tournament

Gamma GR/501Y.V3 and B.1.621 (VOI) variants, predominant at the time in South America (see ESM 2).

3 Findings and Discussion

Cases grew rapidly in both host and non-host states during the first 2 weeks of competition, reaching 600 cases per million in parts of the country. This elevated rate continued during the remaining 2 weeks of the tournament (Fig. 1).

COVID's high rate of asymptomatic cases together with Copa América's compulsory testing prevented meaningful comparisons of incidence rates between the general population and the tournament (see ESM 3) [8–14]. Therefore, we analysed the number of positive tests within each group of accredited personnel.

Of the 179 positive tests reported during the tournament, we estimate that 98 were the product of exposure during Copa América. This estimate is based on the exclusion of positive tests reported during the first week of the tournament (see Fig. 1). Games during this first calendar week of the tournament were held 5 days apart, on June 13 and June 18. Considering the accuracy of Rt-qPCR early after exposure to the virus, it is reasonable to assume that positive cases detected during the first week are the product of contagion occurring prior to the beginning of Copa América (see ESM 4) [13, 15]. Importantly, the compulsory testing during Copa América prevented any infection occurring during the first week from remaining undetected during the second week of the tournament.

Cases in bubbles decreased during the tournament, showing protocols were effective in preventing uncontrolled spread. Considering the unfavourable local epidemiological scenario in Brazil, the bubbles were effective in isolating the tournament from the rest of the country (Fig. 1). Two cases were detected in the CONMEBOL staff and referees bubble during the final week. Protocols were followed and those affected were promptly isolated to avoid further spread.

To better understand the risks involved for local staff, and by extension the communities they live in, we analysed whether contagion in this group exceeded expectations (see ESM 3). Because direct comparison of incidence rates was not feasible due to Copa América's compulsory testing programme, we established a baseline for contagion based on seroprevalence studies conducted at the time in Brazil [9, 16]. Seroprevalence varied significantly with estimates for 2021 ranging from 17 to 35%, with large variations observed across the country [9, 17–21] (see ESM 4). The 83 positive cases detected from the second week of the tournament onwards represent 33.2% of local staff. This infection rate was comparable to the observed seroprevalence in Brazil at the time, suggesting that the risk for members of the local

staff was not in excess of what they were exposed to in the general population.

4 Conclusion

These data provide further insight into the COVID-19 related risks involved in professional competition. The data suggest that employment in Copa América did not increase the risk of infection for members of the locally hired staff. Furthermore, it shows that appropriate protocols can be effective in preventing infection among players and foreign staff during the tournament.

The CONMEBOL Copa América experience shows that even in adverse epidemiological conditions, thorough preparation, effective execution and compliance verification can allow professional sporting competitions to take place without undue risk of COVID-19 infection to staff and communities.

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Declarations

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Author contributions HC wrote the manuscript. FF and OP collected the data. HC and MG analysed the results. All authors read and approved the final manuscript.

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References

1. Carmody S, et al. When can professional sport recommence safely during the COVID-19 pandemic? Risk assessment and factors to consider. *Br J Sports Med.* 2020;54(16):946–8.

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2. McCloskey B, et al. Mass gathering events and reducing further global spread of COVID-19: a political and public health dilemma. *The Lancet*. 2020;395(10230):1096–9.
3. Schinke R, et al. Sport psychology services to high performance athletes during COVID-19. *Int J Sport Exerc Psychol*. 2020;18(3):269–72.
4. Wong AY-Y, et al. Impact of the COVID-19 pandemic on sports and exercise. *Asia-Pac J Sports Med Arthrosc Rehabil Technol*. 2020;22:39–44.
5. Meyer T, et al. Successful return to professional men's football (soccer) competition after the COVID-19 shutdown: a cohort study in the German Bundesliga. *Br J Sports Med*. 2021;55(1):62–6.
6. Schumacher YO, et al. Resuming professional football (soccer) during the COVID-19 pandemic in a country with high infection rates: a prospective cohort study. *Br J Sports Med*. 2021;55(19):1092–8.
7. Gualano B, Brito GM, Pinto AJ, et al. High SARS-CoV-2 infection rate after resuming professional football in São Paulo, Brazil. *Br J Sports Med*. 2022;56:1004–7.
8. McAloon C, et al. Incubation period of COVID-19: a rapid systematic review and meta-analysis of observational research. *BMJ Open*. 2020;10(8):e039652.
9. Middelburg RA, Rosendaal FR. COVID-19: How to make between-country comparisons. *Int J Infect Dis*. 2020;9:6. <https://doi.org/10.1016/j.ijid.2020.05.066>.
10. Hasell J, Mathieu E, Beltekian D, et al. A cross-country database of COVID-19 testing. *Sci Data*. 2020;7:345. <https://doi.org/10.1038/s41597-020-00688-8>.
11. Wu SL, Mertens AN, Crider YS, et al. Substantial underestimation of SARS-CoV-2 infection in the United States. *Nat Commun*. 2020;11:4507. <https://doi.org/10.1038/s41467-020-18272-4>.
12. Ma Q, Liu J, Liu Q, et al. Global percentage of asymptomatic SARS-CoV-2 infections among the tested population and individuals with confirmed COVID-19 diagnosis: a systematic review and meta-analysis. *JAMA Netw Open*. 2021;4(12): e2137257. <https://doi.org/10.1001/jamanetworkopen.2021.37257>.
13. Kucirka LM, et al. Variation in false-negative rate of reverse transcriptase polymerase chain reaction-based SARS-CoV-2 tests by time since exposure. *Ann Intern Med*. 2020;173(4):262–7. <https://doi.org/10.7326/M20-1495>.
14. Woloshin S, Patel N, Kesselheim AS. False negative tests for SARS-CoV-2 infection—challenges and implications. *N Engl J Med*. 2020;383(6): e38.
15. Zhang Z, et al. Insight into the practical performance of RT-PCR testing for SARS-CoV-2 using serological data: a cohort study. *Lancet Microbe*. 2021;2(2):e79–87.
16. Vial P, et al. Seroprevalence, spatial distribution, and social determinants of SARS-CoV-2 in three urban centers of Chile. *BMC Infect Dis*. 2022;22(1):1–16.
17. Hallal PC, et al. SARS-CoV-2 antibody prevalence in Brazil: results from two successive nationwide serological household surveys. *Lancet Glob Health*. 2020;8(11):e1390–8.
18. Silveira MF, et al. Population-based surveys of antibodies against SARS-CoV-2 in Southern Brazil. *Nat Med*. 2020;26(8):1196–9.
19. Ioannidis JPA. Infection fatality rate of COVID-19 inferred from seroprevalence data. *Bull World Health Organ*. 2021;99(1):19–33F. <https://doi.org/10.2471/BLT.20.265892>.
20. Barros AJD, et al. Population-level seropositivity trend for SARS-Cov-2 in Rio Grande do Sul, Brazil. *Rev Saúde Públ*. 2021;55:78.
21. Núñez-Zapata SF, et al. High seroprevalence for SARS-CoV-2 infection in South America, but still not enough for herd immunity. *Int J Infect Dis*. 2021;109:244–6.



Football injuries

Preamble

Epidemiology of injuries in official CONMEBOL competitions

It has been seven years since we started collecting information on injuries during official CONMEBOL competitions. Initially we started with the closed competitions, which were easier to monitor and easier to follow up on the players affected. Now, for

the first time, we include in this magazine two open competitions, the CONMEBOL Libertadores 2022 and the CONMEBOL Sudamericana 2022, both men's competitions, with a complete follow-up from the beginning to the end. At the same time, the injuries

suffered in the rest of the CONMEBOL competitions have been collected. It has been a delicate job that has required the participation of many people, and we would like to thank them for the effort and care with which they have worked.

scientific work it is required that the data are accurate and reliable and can be presented to the medical community and the world of sport who want and need access to them.

But we should not stop here. We know and have a lot of information on the frequency of lesions, the location and diagnosis of many of them. But there is a lack of better coordination and unified terminology. Sometimes, to properly diagnose a lesion requires waiting a few days so that the team physician can establish the exact diagnosis with a prognosis of the lesion, and it would be interesting to have some image of the lesion or other complementary tests that are considered. This will give a definitive value to our task, since it will be possible to make known, to publish, our experience in the world of sport.

CONMEBOL has a unique opportunity in the world of football to study injuries in a continent made up of only ten federations, with a strong football implantation, with a very strong and leading development of women's football and, in addition, it carries out many and varied competitions that are played at high altitude levels and in very varied climates.

Our objective for the new season is to continue to collect reliable data, using the same concepts and a new feature will be to follow the evolution of players who have been taken off the field for at least a week to be certain of the diagnosis and make a prognosis of the injuries suffered.

Handling data is done with respect and following all the rules established by the code of ethics and with the privacy required by international laws, nobody takes advantage of this information, but to do a

If we succeed, it will be one more proof that CONMEBOL "believes in great things", a true continuous training and a contribution to football medicine.

CONMEBOL 2022 official competitions, epidemiological summary of injuries

In addition to the CONMEBOL Sudamericana and CONMEBOL Libertadores, different football and futsal competitions were held during the year 2022. We summarise the epidemiology of injuries in each of these competitions.

CONMEBOL Copa America Futsal 2022

Held in Asunción, Paraguay, from 29 January to 6 February, collecting three injuries (Table 1).

Table 1 - CONMEBOL Copa America Futsal 2022 Injuries

Diagnosis	Location	Side
Muscle injury	Thigh: m. biceps femoris	Right
Sprain	Ankle	Left
Sprain	Knee: Medial Collateral Ligament	Right

CONMEBOL Libertadores Sub20

Held in Quito, Ecuador, from 5 to 20 February, 12 clubs participated and played 22 matches. We counted 20 injuries, 40% of which occurred in the thigh.

CONMEBOL Sub17 Femenina

Held between 1 and 19 March in Montevideo, Uruguay. 26 matches were played with 10 teams, and eight injuries were recorded (Table 2).

Table 2 - Injuries

Diagnosis	Location	Side
Sprain	Ankle	Left
Concussion with loss	Head	-
Strain	m. anterior rectus	Right
Dislocation	Elbow	Left
Fracture	Ulna and radius	Right
Contusion	Shoulder	Left
Contusion	Face	Right
Ruptured external meniscus	Knee	Right

CONMEBOL Sub20 Femenina

10 teams, started on 6 April and ended on 24 April, a 26-match competition in which 9 injuries were recorded (Table 3).

Table 3 - Injuries

Diagnosis	Location	Side
Muscle contracture	M. triceps suralis	Left
Fracture	Wrist	Left
Muscle injury	Thigh: m. quadriceps	Right
Arthralgia	Knee	Right
Trauma	Face: ocular	Right
Contusion	Elbow	Right
Contusion	Wrist	Left
Contusion	Ankle	Right
Contusion	Ankle	Right

CONMEBOL Libertadores Futsal

Held between 24 September and 2 October 2022, in Buenos Aires, Argentina, with 12 CONMEBOL clubs participating. Seven injuries were recorded in 32 matches, involving 252 players and coaching staff (Table 4).

Table 4 - CONMEBOL Libertadores futsal Injuries

Diagnosis	Location	Side
Sprain	Ankle	Left
Sprain	Ankle	Right
Sprain	Knee	Right
Dislocation	5th finger	Right
Fracture	Maxilla	-
Contusion	Leg	Right
Contusion	Wrist	Right

CONMEBOL Libertadores Femenina

Held in Quito from 13 to 28 October.
Women's CONMEBOL Libertadores summary (32 matches)

Table 5

	Total injuries	Severe injuries
	8	3
Injuries per game	0,25	0,1
Injuries per 1,000 minutes of play	2,8	1





**CONMEBOL Sudamericana 2022:
epidemiological summary of injuries**

For the first time, the CONMEBOL Medical Commission has monitored the entire CONMEBOL Sudamericana and CONMEBOL Libertadores 2022.

The system has allowed a follow-up of the matches during the different phases.

The final was played on 1 October 2022 in the city of Cordoba, Argentina, won by the Ecuadorian team Independiente del Valle, 2 - 0 against Sao Paulo FC.

A total of **69 injuries** were counted, six players were

removed from the field, three of whom were treated at the hospital.

There were 0.25 injuries per game or 2.85 injuries per 1,000 minutes played.

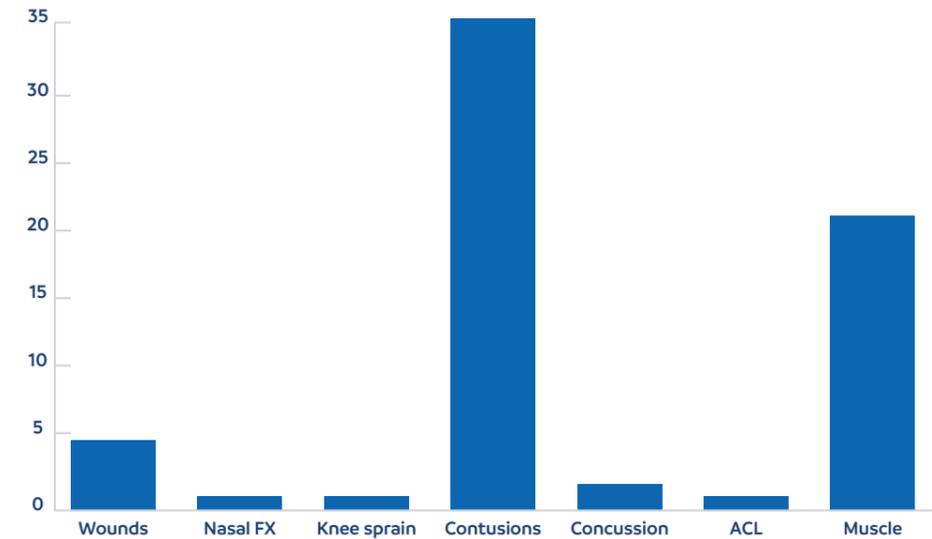
Serious injuries were 0.16 per game or 1.8 per 1,000 minutes played.

0.02 players were withdrawn per game or one player every 5 games or 0.25 players every 1,000 minutes of play, which represents one player every four games.

Location of injuries

The highest frequency of injuries occurred in the thigh (23) related to muscle injuries, followed by the head (16), foot and ankle (11), leg (8), trunk (5), knee (3), shoulder (2) and hip (1).

Figure 1 -Diagnosis of injuries

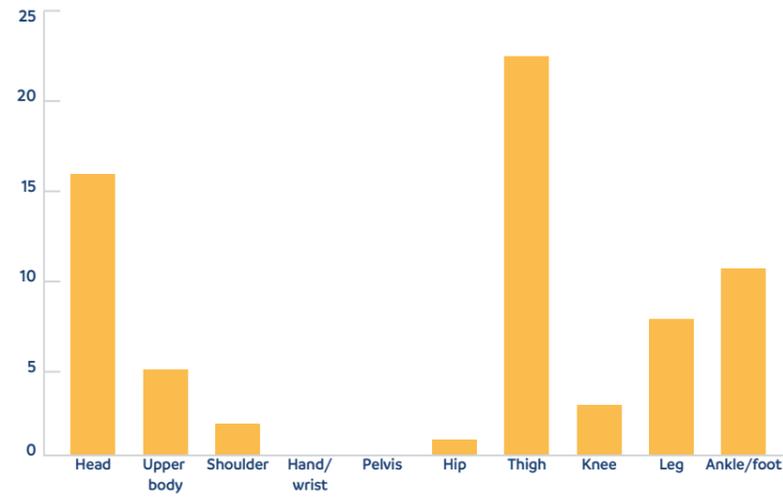


Diagnosis of injuries

There were 25 contusions, followed by 21 muscle injuries, ankle sprains (5), lacerating injuries (5), two concussions, one knee sprain, one ACL tear, one shoulder dislocation and one nasal bone fracture.

**CONMEBOL
Sudamericana
Report**

Figure 2 - Location of injuries



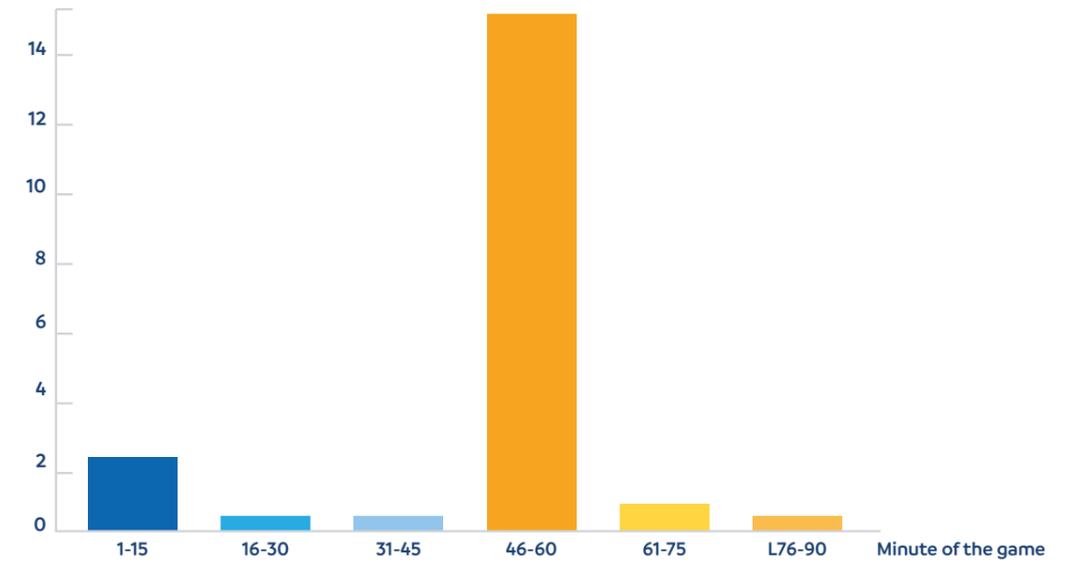
The two concussions were transported to the hospital.

Again, the most frequent injuries were the 23 muscle injuries that occurred in the thigh on 15 occasions and 4 in the leg, without identifying the other 4. The most affected muscles were the hamstrings (5 occasions), the abductor muscle (2), the adductor muscle and the anterior rectus muscle, and on 4 occasions the calf muscles. On thirteen occasions the injured muscle corresponded to the right side and on seven occasions to the left side.

Minute in which the injury occurred

31 injuries occurred in the first half and 31 in the second half

Figure 3 - Timing of the injury





CONMEBOL Libertadores Report

CONMEBOL Libertadores 202: summary of injury epidemiology

For the first time, it has been possible to track injuries in CONMEBOL Libertadores from the initial phase until the final played on October 29, 2022, in Guayaquil.

A total of 79 injuries were accounted for in the entire CONMEBOL Libertadores from the opening phase.

Six players were removed from the field and three had to be taken to a hospital.

Over the entire competition, 0.3 injuries per match were reported: 3.4 injuries per 1,000 minutes of play.

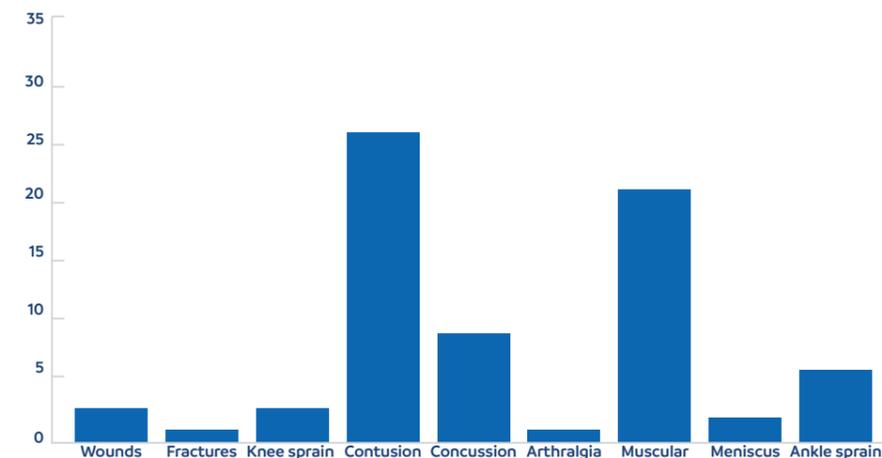
If we focus on the most serious injuries, there were 0.18 serious injuries per match or 2.1 serious injuries per 1,000 minutes of play.

0.25 players were removed from the field per 1,000 minutes of play or one player per 4,000 minutes.

Diagnosis of recorded injuries

Muscle injuries were the most frequent (27). The 27 muscle injuries were located in the unspecified thigh (7), hamstrings (5), quadriceps (1), biceps femoris (1), calf muscles (7) and soleus (1), adductor muscles (5). There were 22 on the right side and 10 on the left. Next in frequency were contusions (26), ankle sprains (6) and knee sprains (3), injuries (3), meniscal tears (2), a fracture and an unspecified "arthralgia".

Figure 1 - Diagnosis of injuries



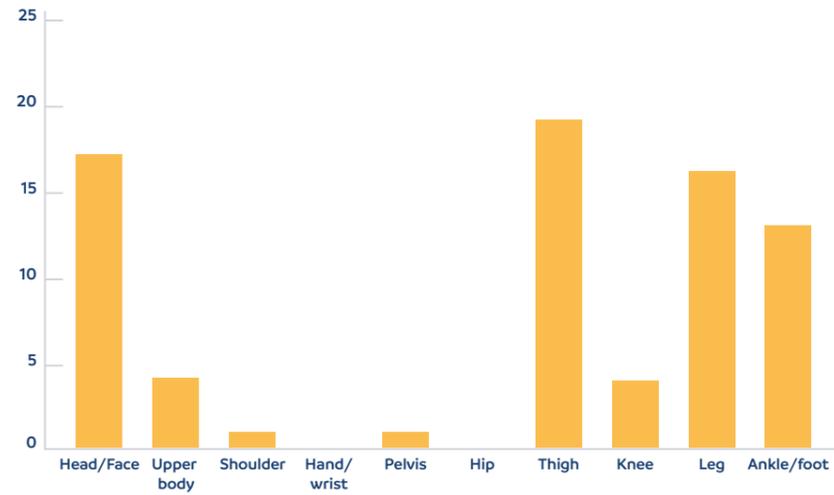
It should be noted that in the two competitions we found 9 concussions of varying degrees, three of which required transfer to the hospital.



Location of recorded lesions

The most frequent injuries were to the thigh (19), mostly muscle injuries, followed in frequency by injuries to the head and face (17), leg (16), ankle and foot (13), knee (5), trunk (4), and then shoulder and pelvis with one injury in each.

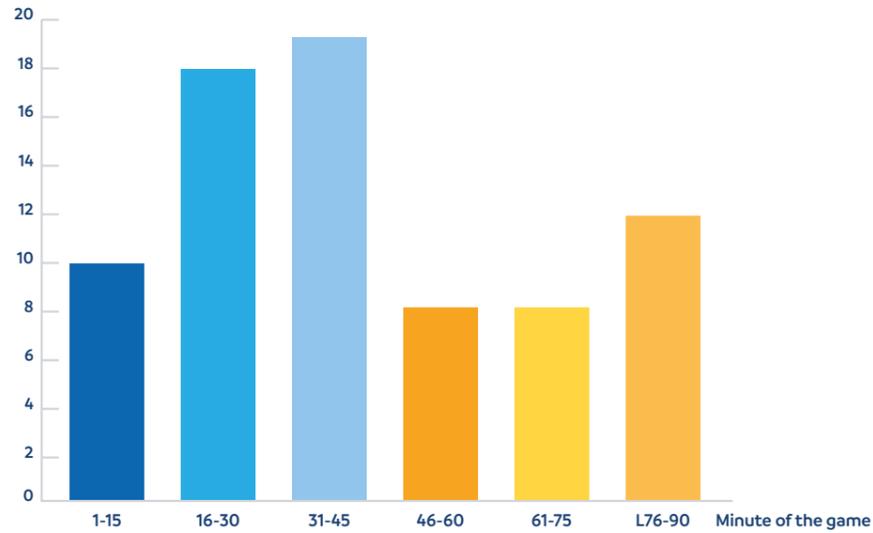
Figure 2 - Localization of injuries



Minute in which the injuries occurred

One injury occurred in the warm-up, 46 in the first half and 28 in the second half.

Figure 3 - Timing of the injury



Injuries in Women's Football

Injuries during CONMEBOL women's football competitions

There is an increasing number of women's football matches and competitions of all ages and with the equivalent specialities to men's football. During the year 2022 CONMEBOL has held several women's

championships and we present the injuries recorded overall, without distinguishing between the different championships held.

Diagnosis of recorded injuries

In the competitions evaluated, there was one concussion with loss of consciousness for 30 minutes, one heat stroke, one player reported blurred vision during the game, and another received an eye conjunctiva injury that had to be evaluated and treated by an ophthalmologist. Of note for their frequency were contusions (169), 44 concussions without loss of consciousness and two with loss of consciousness; 39 knee and ankle sprains; 29 muscle injuries; 6 facial traumatism and 6 cervical traumatism; 4 wounds, one of which was a bite wound; 2 ruptures of the external collateral ligament of the knee; two tendinitis; one rupture of the anterior cruciate ligament and one meniscal rupture and one disc impingement at the L4-L5 level. The two fractures were of the 5th metatarsal and another costal fracture.



Figure 1 - Diagnosis of injuries

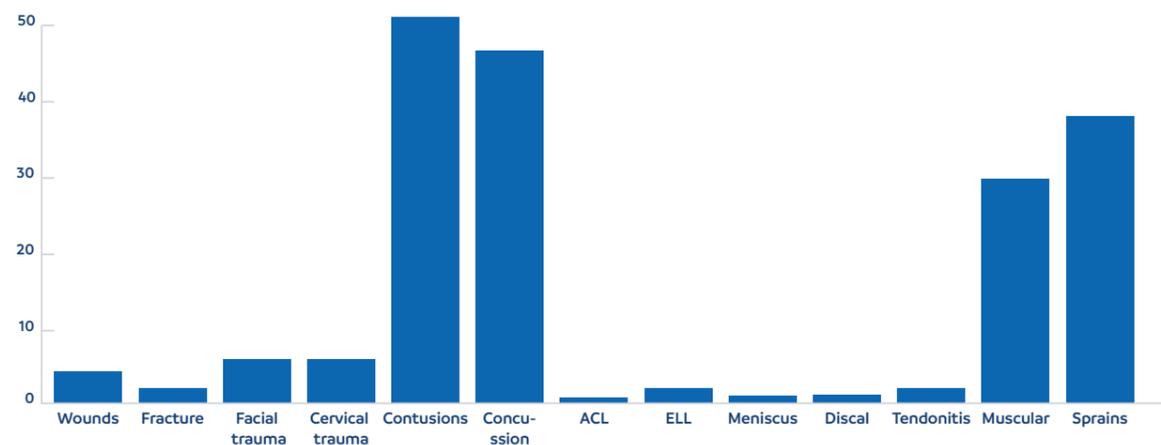


Table 6

Diagnosis of injuries CONMEBOL 2022 competitions	
Wounds	4
Contusion	176
Concussion with loss	2 (one of 30 min)
Concussion without	44
Sprain	39
Fractures	2
ECL	2
Meniscus	1
Disc impingement	1
ALC	1
Tendinitis	2
Facial trauma	6
Cervical trauma	6
Muscle injuries	29

Location of injuries

The location was 67 times on the head and face, of which blows or wounds to the mouth (2), ear (1), eye (1) and nose (1) were reported. In addition, we recorded 54 injuries to the trunk corresponding to 18 in the coastal region, 16 injuries in the lumbar region, 14 injuries in the abdomen and 6 injuries in the cervical region.

Also noted were 53 knee injuries, 46 ankle injuries, 34 leg injuries, 26 thigh injuries, 12-foot injuries, 8 shoulder injuries, 7 hand and wrist injuries, including 2 thumb injuries, 5 hip injuries, 2 elbow injuries and 1 forearm injury.

Figure 2 - Location of Injuries

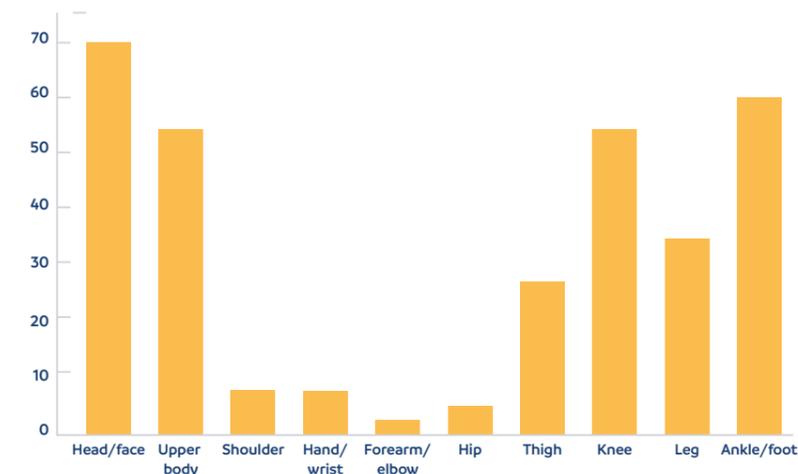


Table 7

CONMEBOL 2022 Women's Football Injury Location	
Trunk	54
Head / face	67
Shoulder	8
Elbow / forearm	3
Hand / wrist	7
Hip	5
Thigh	26
Knee	53
Leg	34
Ankle / foot	58

Women's football has a high number of injuries recorded, a high percentage are contusions, but there is also a high number of blows, with wounds to the face and head. It seems, we will continue to analyze it next season, a lower number of muscle injuries than in men's football, a higher number of sprains and a high number of contusions in the coastal region and abdomen.

Classification of muscle injuries in the field.

Muscle injuries, can we understand each other?



In competitive football, deciding on the field when faced with a muscle or tendon injury is difficult and is accompanied by strong external pressure. As soon as the player leaves the field, the time he will be absent, the seriousness of the injury and the treatment to be followed are considered. These injuries usually occur during competition, so the decision must be immediate and without technical assistance. Muscle injuries require a second examination, after a period, to make an accurate diagnosis and to know the evolution of the symptomatology.

Muscle injuries encounter another problem, the lack of a common language, following a proper and accurate classification of injuries, with a prognostic value and allowing the most appropriate treatment protocol to be followed.

Physical activity leads to a high number of muscle injuries, which in our registry account for 40% of all injuries and most of these are in the thigh. In a team of 25 players, an average of 15 muscle injuries occurs throughout the season, with an average absence

of 223 days, missing 148 training sessions and 37 competitive matches [1][2]. The importance of muscle injuries is even more evident when compared to anterior cruciate ligament (ACL) injuries, with one ACL tear occurring in a team every three seasons [3]. However, the diagnosis of a muscle injury is not always easy, prevention is not agreed upon, treatment is general, and few studies assess the most appropriate treatment for each injury.

There are many muscles and tendons and each one has its own characteristics, very different size and shape, and the same muscle has a different muscle mass depending on the sport and the athlete, which is why not all muscles and tendons should be lumped into the same box. Hence the need to establish common criteria, supported by a logical classification that allows us to speak the same language and follow a treatment protocol. The muscles most frequently affected are the biarticular muscles or those with a complex structure (adductor magnus), with eccentric contractions and type 2 muscle fibers, with rapid contraction. This explains why the most affected

muscles and muscle groups are the hamstrings and the biceps femoris [4][5], followed by the rectus femoris and the internal head of the gastrocnemius [4-7].

We have collected the terms how muscle injuries have been classified during CONMEBOL Sudamericana 2022 and CONMEBOL Libertadores 2022, both men's

competitions, noting that they have been very different and sometimes difficult to understand.

We have recorded 27 muscle injuries in CONMEBOL Libertadores and another 21 in CONMEBOL Sudamericana. Table 8 specifies how they have been classified and the number of times this has been done.

Table 8 - Terminology used in CONMEBOL Libertadores and CONMEBOL Sudamericana 2022 records

Term used	Frequency
Muscle cramp	
Thigh cramp	1
Muscle contracture	5
Adductor tear	
Hamstring tear	
Muscle tear	9
Muscle strain	4
Stretching	
Muscular fibrillation	
Hamstring	
Grade IIIA hamstring	
Muscle injury	11
Upper thigh injury	
Myalgia	4
Muscular	2
Hamstring muscle	
Fibrillar rupture	1
Muscle overload	2

We found a preponderance of the right side (35 cases) versus the left side (17 occasions). As can be seen in Table 1 there are all kinds of lesions and terms. Some are confusing, others difficult to diagnose in the field, such as "hamstring grade IIIA", "myalgia" which is muscle pain, in principle corresponds to all muscle injuries, sometimes the muscle is confused with the injury "hamstring muscle", "hamstring" or as "upper thigh injury". Within the pathologies there is also a variety of diagnoses from muscle ruptures, fibrillar

ruptures, through "cramps", "contracture", "tear", "strain", "stretching" or "overload". There is even talk of "muscle fibrillation", a term unrelated to muscle injuries.

It is difficult to know with a first inspection and on the court itself the degree and type of muscle injury, although it is possible to locate the injury and establish the degree of pain and functional impotence. For this reason, it is necessary to avoid imprecise terms ("distension" or "elongation" or "hypertonic muscle")

or popular terms (“the calves have pulled up”) which do not mean anything and do not help to make a prognosis. The same happens with the English word “muscle strain”, which would be like a deformation of the muscle, which is meaningless because one of the characteristics of the muscle and the tendon is precisely its elastic deformation; that is to say, it changes its length and width to return to its original state when the stresses cease.

The location has not always been clear either (Table 2). There are very well-defined muscles, but lesions of the “calf muscle”, “calf” or “soleus” are confused, with lesions of the thigh muscles being clearer, although on occasions “thigh” has been given as the location, it not being clear whether it is the extensor or flexor muscles of the knee or the adductor muscles. On one occasion “abductor muscle” is mentioned, a rare pathology that needs to be better specified.

Table 9 - Location of muscle injuries in CONMEBOL Libertadores and CONMEBOL Sudamericana 2022 records.

Muscle group or muscle	Frequency
Hamstrings	10
Gastronecnius	11
Hip abductor	
Adductor	6
Biceps femoris	2
Anterior rectus	
Thigh	18
Quadriceps	
Soleus	1

Classification of muscle injuries

At CONMEBOL we intend to include a simple classification that can be used and followed by all team doctors in South American football. Currently the Confederation’s official data collection sheet does not reflect such common occurrences as cramps or contusions and muscle lacerations are included in the overall injuries without specifying them. Neither is their initial severity established, nor do we know if the injury leads to the player’s withdrawal. For this reason, following the existing classifications, we have relied on those that separate the clinical part from the imaging to be performed later.

CONMEBOL records collect data obtained at the time of the player’s injury and help to suspect the type and severity of the injury. We present two classifications to subsequently evaluate the image, one for ultrasound and the other with MRI that support or rectify the diagnosis previously made on the field.

The British Athletics Muscle Injury Classification [8] [9] proposes 5 grades of muscle injury, from 0 to 4, based on MRI-diagnosed facts. Grades 1 to 4 are, in

turn, divided into three groups (a, b, c) according to the site and size of the injury (a = myofascial injury at the muscle-fascia junction in the muscle periphery; b = injury to the muscle belly or muscle-tendon junction without affecting the tendon structure, and c = tendon injury, always with a worse prognosis and a higher rate of re-rupture) [8]. The Anglo-Saxon numerical classification suffers from not presenting the characteristic of the injury, its size or a prognostic factor and does not consider lacerations caused by external agents, or injuries that are often confused with tears such as compartment syndromes or delayed onset muscle soreness (DOMS), a pathology closely related to overexertion and fatigue.

Maffulli et al., [10][11] proposed the ISMULT classification and consider functional injuries among which they distinguish: type 1A injury: caused by fatigue and changes in training protocols, surfaces or high intensity activities. Type 1B injury: caused by prolonged excess of eccentric contractions. Type 2A injury: usually associated with spinal alterations or misdiagnosed, as occurs in mild intervertebral injuries

which radiate the spinal nerve, altering the control of muscle tone of the injured muscle and, finally, a type 2B injury: produced by an imbalance in the control of the neuro-muscular systems. Structural lesions can be type 3A, a minimal partial lesion affecting one or more fascicles with a secondary bundle, or type 3B, a moderate partial lesion affecting at least one secondary bundle, with less than 50% of the surface area broken. Finally, type 4 injury is a sub-total rupture with more than 50% of the surface area ruptured or complete muscle rupture, including the muscle belly or the muscle-tendon junction. Structural lesions, according to their location, will be proximal (P), central (C) or distal (D).

Mueller-Wohlfahrt et al., [12] in the Munich Consensus for Muscle Injuries, recommend classifying structural

lesions into anatomical findings and include in their classification that functional alterations can be “with or without edema”. Edema as a single finding in both ultrasound and MRI usually means that there is no anatomical damage, or it is minimal and not visible with imaging methods. Isolated edema is related to muscle contracture or overload syndromes.

We need a classification that allows us to identify muscle-tendon injuries at the field level and we are inclined to divide the injuries according to their mechanism of production into direct or indirect and according to their pathology into structural, where there is a change in muscle morphology, or functional, where the function is altered without producing morphological changes.

Direct injuries:

Contusions: a blow from direct trauma against an opponent or a sporting tool (football ball, goal posts, fences, etc.) mild, moderate and severe, depending on the disability they produce. The player should be examined 24 hours after the accident for a new evaluation to see if the pain has diminished or disappeared, to avoid overestimating the injury.

Lacerations: caused by impact against a sharp surface. It can leave superficial or deep wounds that affect the muscle or tendon.

Indirect lesions, more frequent:

Structural: most structural injuries are indirect injuries, i.e., due to stretching, caused by a rapid force that elongates the muscle beyond its elasticity limits during a strong contraction (internal force). They are usually located at the myotendinous junction, which is the area of greatest weakness. Most indirect structural injuries are partial muscle ruptures. From the clinical point of view, they can be of two types [12]: small or partial and if they affect the tendon or muscle fascia they will have a worse prognosis.

Functional: these are the most frequent injuries (overload, cramps, fatigue...), 70% of all muscle injuries among football players, causing more than 50% of the days off work and when not properly treated they can turn into structural injuries.

Based on these concepts we propose the following classification.

Table 10 - Classification of muscular injuries proposed for CONMEBOL

Subgroup	Etiology	Diagnosis	Location	Withdrawal
1. Direct				
1.1 Contusion	Against a player	A: mild B: light C: severe	P: proximal M: medial D: distal	Yes No
1.2 Laceration	Against an object	A: superficial B: deep	P: proximal M: medial D: distal	Yes No
Indirect				
2.1 Structural	a) Muscle rupture	A: mild B: light C: severe	P: proximal M: medial D: distal	Yes No
	b) Detachment			Yes
2.2 Functional	Overexertion or fatigue		-	Yes No
				Yes No

Clinical presentation of structural lesions

Mild lesions present with a sharp pain provoked by a specific movement. It is localized and easy to appreciate at the fingertip. Occasionally a snapping sound is heard, and no structural alteration is detected.

In moderate injuries, with less than 50% of the muscle fibers damaged, the pain is sharp and easy to provoke with a specific movement. A snapping sound is heard, followed by pain and functional disability. On palpation, localized pain is provoked, and a morphological defect can be appreciated. A hematoma may be observed a few days after injury, especially when the epimysium

and perimysium are involved. The extensibility test is positive and contraction against resistance is impossible.

Total or subtotal ruptures or tendon avulsions manifest with a dull pain that is exacerbated by a specific movement; a snapping sound is heard and there is immediate functional disability. Palpation reveals muscle disruption with the development of a hematoma. The function of the myotendinous junction is lost.

Clinical presentation of functional lesions

They are characterized by pain, heaviness and muscle stiffness that increases with exercise and sometimes also during rest. On palpation, some muscle stiffness can be appreciated.

Functional injuries, without alteration of the structure, cause pain, heaviness, and muscle stiffness, usually during exercise and also sometimes at rest. In mild injuries (type 1), muscle pain is of late onset and

during rest, appearing, with muscle stiffness, a few hours after sports practice. Severe injuries (type 2) are painful, accompanied by cramps which usually improve after stretching. They are sometimes related to fatigue or neuromuscular disorders which may indicate subclinical muscular pathologies, masked by an intense load during training.

Diagnostic imaging

An imaging evaluation should be performed 24 to 48 hours after the injury. The imaging techniques indicated for muscle injuries are ultrasound and MRI. It will be necessary to decide, according to the circumstances, the

most appropriate technique. When there is suspicion of a muscle injury, of whatever degree, it is advisable to have an objective diagnostic test to determine its size and location, follow its evolution and determine the moment for its return to training.

Ultrasound

Ultrasonography is a quick and inexpensive diagnostic tool that can also be used to monitor the progress of treatment. However, there may be a dissociation between clinical signs and the ultrasound image. Ultrasound has a sensitivity of 77% in non-structural lesions and 93% in structural lesions. In addition, it allows the diagnosis of a structural lesion between two and four days after the trauma, considering that the edema begins to be reabsorbed after 48 hours [12]. For ultrasound assessment Verdugo et al [13] proposed a classification that considers 6 grades (Table 11), contemplating an aspect of interest such as the scar.

Table 11 - Ultrasound classification (Verdugo et al.)

Grade	Features	Prognosis
1. Myofascial tear, (fascia and superficial fibers)	A: small (<3 cm) B: moderate (3-6 cm) C: severe (>6 cm) peripheral edema	Good No sequelae
2. Fibrillar Tear	thickness less than 2 mm lesions <4 cm peripheral perilesional edema	Good No sequelae
3. Multifibrillar tear increased edema	lesions >4 cm	small scars
4. Fascicular tear	Affected fascia Muscular or peripheral Hematoma >3 cm	
5. Massive or total tear with or without bone avulsion.	extensive hematomas	
6. Adherences	Peripheral rupture opening of the scar	

Magnetic Resonance Imaging (MRI)

MRI detects small changes. It has a 92% sensitivity for non-structural lesions and allows the evaluation of deep muscles, where ultrasound cannot reach. MRI should be indicated for any suspected morphological lesion and helps to determine the edema and its pattern, as well as the size and location of the lesions [12] and also tendon involvement. However, MRI is not sensitive for measuring the extent of the lesion accurately. It is also not useful for determining the time of the player's return to competition [14], as it leaves scar signs for a long time.

The indications for MRI are the diagnosis of non-structural lesions, exclusion of structural lesions, in football players, when there is discordance between clinical and ultrasound findings, evaluation of complex

or deep muscles difficult to assess with ultrasound and in subtotal or complete lesions when it is suspected that the tendon is affected affected there is a bony avulsion.

The patient should be aware that it is difficult to differentiate mild from moderate partial lesions, especially when the lesion is small. In the presence of fluid, MRI may overestimate the entity of the lesion.

MRI with gadolinium contrast is indicated to assess the stability of the repair scar after structural injury. If MRI is available, it is proposed to follow the IMSULT classification [10][11] (Table 12).

Table 12 - ISMULT classification by image (Maffulli)

Subgroup	Ultrasound / MRI
Direct	Generalized hematoma of greater or lesser size
Indirect	
2.1 Structural A, B	Ultrasound: slight hyperechoic area that subsequently appears as inhomogeneous and hypoechoic, focal, very unstructured with a wide anechoic area inside and outside the muscle. MRI: edematous image and small hyperintensity signal due to interstitial and perifascial edema or due to a small hemorrhagic extravasation. The muscle is enlarged by edema, with an inhomogeneous hyperintense signal related to interstitial or perifascial edema or hemorrhagic extravasation.
2.1 Structural C, D	Ultrasound: inhomogeneous and disorganized areas, iso- or hyperechoic. Appearing successively marked structural changes, reaction of the rupture ends and wide anechoic zones within and between the muscles. MRI: retraction of the muscle end, hyperintense fluid caused by hemorrhagic extravasation between the two muscle ends.
2.2 Functional	Ultrasound: negative; hyper- or hypo echogenicity changes with time (3-5 days). MRI: negative. Limited edema

Prognosis

The prognosis of injuries, of equal size and severity, of the proximal portion of the hamstring and rectus femoris muscles have a worse prognosis than central or distal injuries. In contrast, distal triceps sure injuries have a worse prognosis than central or proximal injuries. Most hamstring injuries are moderate and therefore require a time off between 8 and 28 days [9]; more complicated tend to be soleus muscle injuries [15].

The concept of return to play after a muscular injury refers to the time that elapses until the player returns to competition without danger of recurrence and will depend on the decision of the player and the medical team and is influenced by aspects related to the period of the season and the importance of the matches. As a rule, the times proposed in Table 13 can be followed.

Table 13 - General rule of resting time

Type of injury	Resting time (days)
Contusion	
Slight	2 - 5
moderate	7 - 15
serious	15 - 25
Lacerations	
	Depends on the wound
Functional	
	5 - 15
Structural	
3A	15 -18
3B	25 - 35
	≥60

Treatment

Most muscle injuries respond well to conservative treatment. The surgical indication depends on the sporting activity, the muscle group affected, subtotal or complete lesions of the muscle belly or in the case of tendon avulsion.

The basis of treatment is to respect the muscle chains, restore early range of motion as long as it does not generate compensations, control pain with the visual analog scale (VAS), recover proprioception before strength and maintain cognitive activity of the muscle action as long as the pain is not greater than the basal VAS. Numerous treatments are proposed and used,

including protocols such as ICE, PRICE and POLICE, active and passive stretching, physical therapy, functional rehabilitation, and personalized training. Treatment should be based on injury classification; clinical and imaging diagnosis and scientific evidence to advise the most effective method depending on the type of injury.

The aim of treatment should be to leave the least scarring, the least amount of fibrous tissue, possible afterwards in the healing of a muscle injury. To this end, it is recommended to follow the PRICE or POLICE protocol (Table 14).

Table 14 - Basic treatment protocols

ICE	PRICE	POLICE
I: ice	P: protection	P: protection
C: compression	A: rest	OL: optimum load
E: elevation	I: ice	I: ice
	C: compression	C: compression
	E: elevation	E: elevation

Prevention of muscle injuries

Different protocols [16][17] have been proposed to prevent muscle-tendon injuries, such as NEH (Nordic Hamstring Exercise) and especially recurrences [18][19], but they do not prevent or decrease the severity of injuries [6]. Despite well-conducted and targeted training and warm-ups lower extremity muscle injuries are a plague in official football competitions [20].



Temperature and humidity measurement in CONMEBOL Tournaments

Temperature and humidity measurement in CONMEBOL Tournaments

Following the protocols and taking care of the health and performance of the players, a protocol has been established to avoid dehydration and heat stroke during high performance sports. This in turn reduces the risks for the players.

Measuring instrument

The measurement of temperature and humidity is a joint value that can be measured with different instruments, but CONMEBOL has decided to use a bulb thermometer.

The measurement is carried out by the CONMEBOL Field Medical Officer at the center of the pitch during each match. At 90 and 60 minutes before kick-off.

With this reflection of the current apparent temperature, the rehydration breaks during the match are determined, this applies to all tournaments that take place in high temperatures.



Bibliography

1. Ekstrand J, Bengtsson H, Walden M, Davison M, Hagglund M. Still poorly adopted in male professional football: but teams that used the Nordic Hamstring Exercise in team training had fewer hamstring injuries. A retrospective survey of 17 teams of the UEFA Elite Club Injury Study during 2020-2021 season. *BMJ Open Sport Exerc Med.* 2022; 8:e001368.
2. Ekstrand J, Hägglund M, Waldén M. Epidemiology of muscle injuries in professional football (soccer). *Am J Sports Med.* 2011; 39:1226-32.
3. Waldén M, Hägglund M, Ekstrand J. Time-trends and circumstances surrounding ankle injuries in men's professional football: an 11-year follow-up of the UEFA Champions Ligue injury study. *Br J Sports Med.* 2013; 47:748-53.
4. Ekstrand J, Waldén M, Hägglund M. Hamstring injuries have increased by 4% annually in men's professional football, since 2001: a 13-year longitudinal analysis of the UEFA Elite Club injury study. *Br J Sports Med.* 2016; 50:731-7.
5. Woods C, Hawkins RD, Maltby S, Hulse M, Thomas A, Hodson A; Football Association Medical Research Programme. The Football Association Medical Research Programme: an audit of injuries in professional football--analysis of hamstring injuries. *Br J Sports Med.* 2004; 38:36-41.
6. van der Horst N, Smits DW, Petersen J, Goedhart EA, Backx FJ. The preventive effect of the nordic hamstring exercise on hamstring injuries in amateur soccer players: a randomized controlled trial. *Am J Sports Med.* 2015; 43:1316-23.
7. van Beijsterveldt AM, van de Port IG, Krist MR, Schmikli SL, Stubbe JH, Frederiks JE, Backx FJ. Effectiveness of an injury prevention programme for adult male amateur soccer players: a cluster-randomised controlled trial. *Br J Sports Med.* 2012; 46:1114-8.
8. Pollock N, Patel A, Chakraverty J, Suokas A, James SL, Chakraverty R. Time to return to full training is delayed and recurrence rate is higher in intratendinous ('c') acute hamstring injury in elite track and field athletes: clinical application of the British Athletics Muscle Injury Classification. *Br J Sports Med.* 2016; 50:305-10.
9. Patel A, Chakraverty J, Pollock N, Chakraverty R, Suokas AK, James SL. British athletics muscle injury classification: a reliability study for a new grading system. *Clin Radiol.* 2015; 70:1414-20.
10. Maffulli N, del Buono A, Oliva F, et al. Muscle injuries: a brief guide to classification and management. *Transl Med* 2015; 12:14-8.
11. Maffulli N, Oliva F, Frizziero A, et al. ISMuLT Guidelines for muscle injuries. *Muscle, Ligaments Tendon J* 2013; 3:241-9.
12. Mueller-Wohlfahrt H-W, Haensel L, Mithoefer K, Ekstrand J, English B, McNally S, et al. Terminology and classification of muscles injuries in sport: The Munich consensus statement. *Br J Sports Med* 2013; 47:342-50.
13. Verdugo MA. Clasificación ultrasonográfica de los desgarros musculares. *Rev Chilena Radiol* 2004; 10:53-57.
14. Jacobsen P, Witvrouw E, Muxart P, Tol JL, Whiteley R. A combination of initial and follow-up physiotherapist examination predicts physician-determined time to return to play after hamstring injury, with no added value of MRI. *Br J Sports Med.* 2016; 50:431-9.
15. Järvinen TA, Järvinen M, Kalimo H. Regeneration of injured skeletal muscle after the injury. *Muscles Ligaments Tendons J.* 2014; 3:337-45.
16. Askling CM, Tengvar M, Saartok T, Thorstensson A. Acute first-time hamstring strains during slow-speed stretching: clinical, magnetic resonance imaging, and recovery characteristics. *Am J Sports Med.* 2007; 35:1716-24.
17. Malliaropoulos N1, Papacostas E, Kiritsi O, Papalada A, Gougoulas N, Maffulli N. Posterior thigh muscle injuries in elite track and field athletes. *Am J Sports Med.* 2010; 38:1813-9.
18. Arnason A, Andersen TE, Holme I, Engebretsen L, Bahr R. Prevention of hamstring strains in elite soccer: an intervention study. *Scand J Med Sci Sports.* 2008; 18:40-8.
19. Biz C, Nicoletti P, Baldin G, Bragazzi NL, Crimi A, Ruggieri P. Hamstring Strain Injury (HSI) prevention in professional and semi-professional football teams: a systematic review and meta-analysis. *Int J Environ Res Public Health.* 2021; 18:8272.
20. Alt T, Severin J, Schmidt M. Quo vadis Nordic Hamstring exercise-related research? A scoping review revealing the need for improved methodology and reporting. *Int. J. Environ. Res. Public Health* 2022; 19:11225.

PART TWO:

Anti-Doping Unit





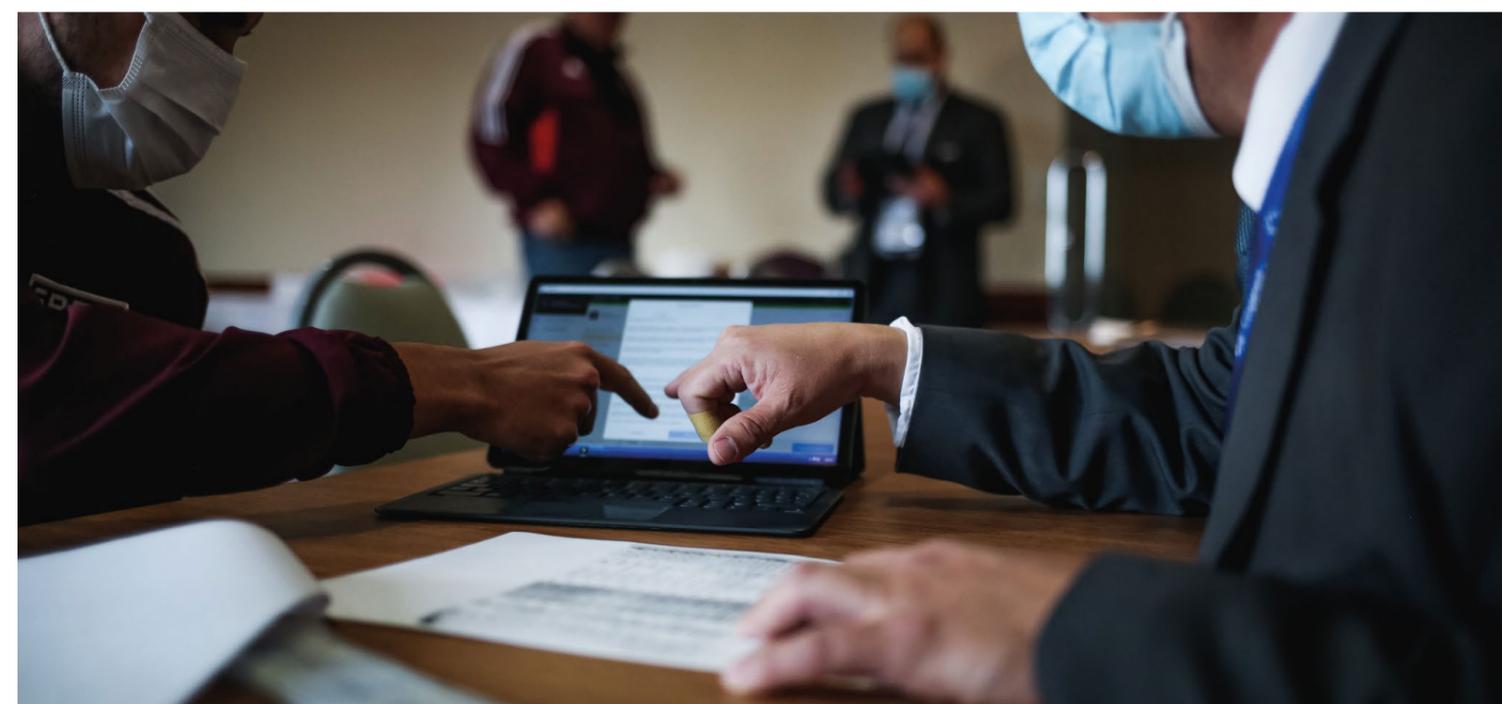
The Anti-Doping Unit has developed an annual Anti-Doping Control and Education Plan for all CONMEBOL competitions during the year 2022, which has been executed 85% according to plan, since three competitions have been postponed to the year 2023.

About the Control Plan, urine samples have been collected in all the competitions played, in addition to

blood samples in the CONMEBOL Libertadores and Finalissima. Thirty percent of the samples collected have been in out-of-competition controls, and 70% correspond to samples collected in competition.

Samples collected are sent to WADA-accredited laboratories.

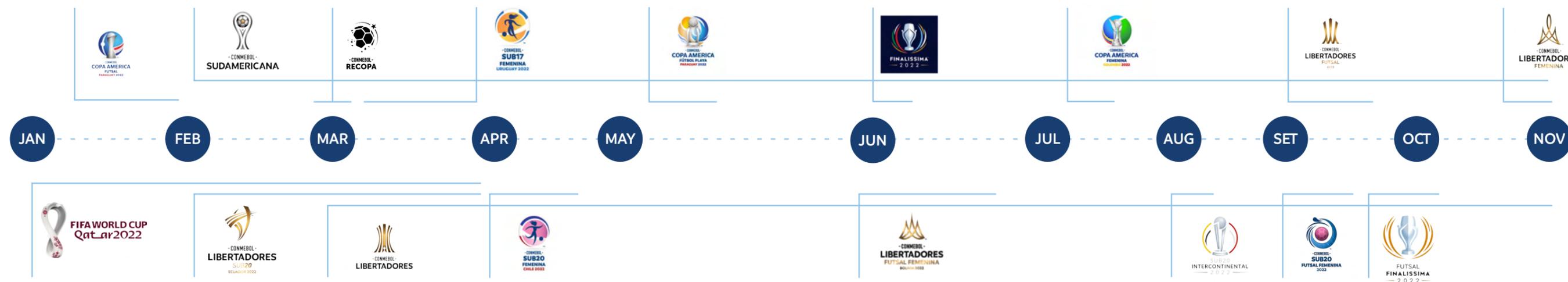
Introduction



CONMEBOL Competition Calendar 2022

A total of 17 CONMEBOL competitions were held in 2022, 6 more than the previous year. Three of these competitions were held jointly with the Union of European Football Associations (UEFA): the Finalissima (UK), the Intercontinental U20 (URU) and the Finalissima Futsal (ARG):

Figure 1 - CONMEBOL 2022 Competition Schedule



Of the total number of events in 2022, six of them were women's competitions, and eleven were men's competitions. In addition, one corresponds to the discipline of beach football, five are futsal and eleven are field football. Thus, the samples collected by discipline are divided as follows:

Table 1 - Total Controls by Discipline

Total Controls per Discipline	Total
Futbol de Campo	2579
Futsal	292
Futbol Playa	56
Total	2927

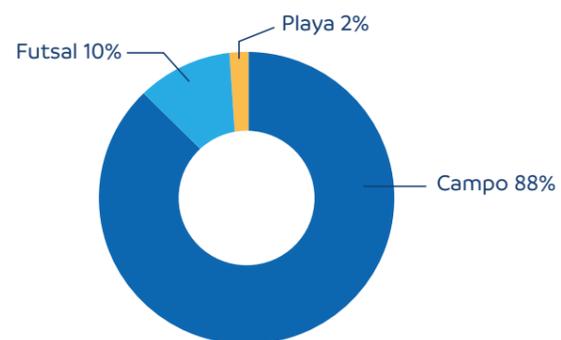
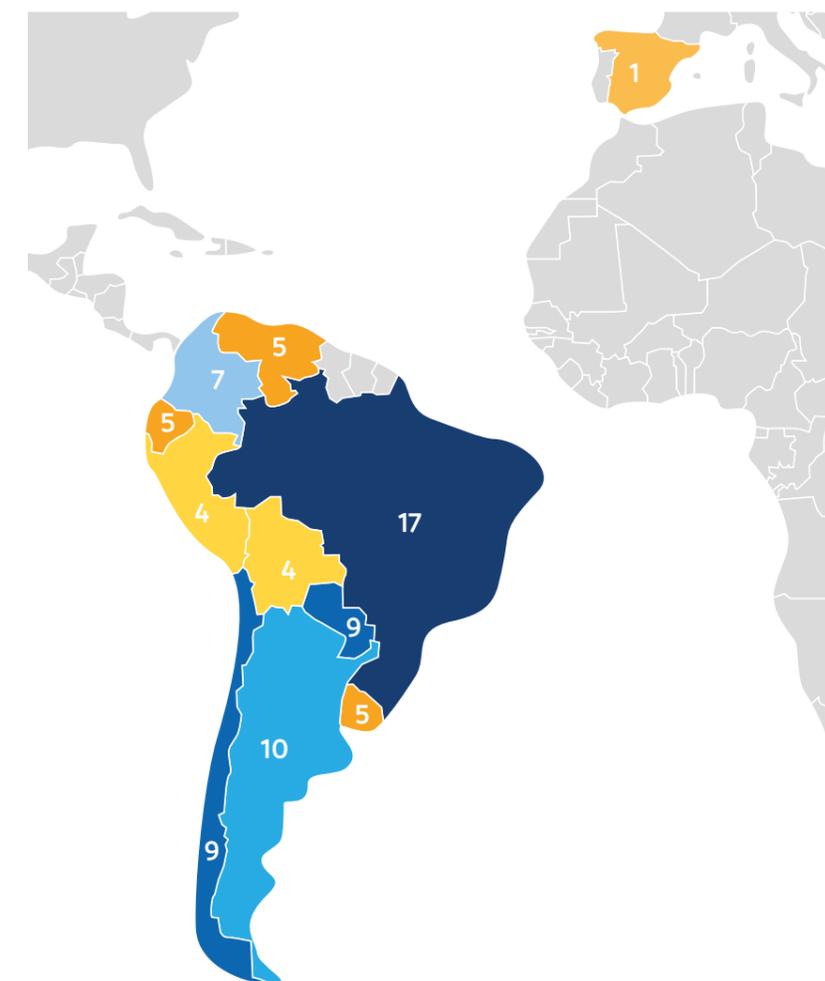


Table 2 - Geographical Distribution of Anti-Doping Officials

Country	Total
Argentina	10
Bolivia	4
Brazil	17
Chile	9
Colombia	7
Ecuador	5
Spain	1
Paraguay	9
Perú	4
Uruguay	5
Venezuela	5
General Total	76



Anti-Doping Officials 2022

The team of CONMEBOL Anti-Doping Officials consists of a total of 76 doctors from the 10 countries of South America and Spain. Of these, 58 are male physicians and 18 are female. In the year 2022, 13 new officials have been incorporated, which corresponds to a 15% growth compared to 2021.

Geographic Distribution of Anti-Doping Officials

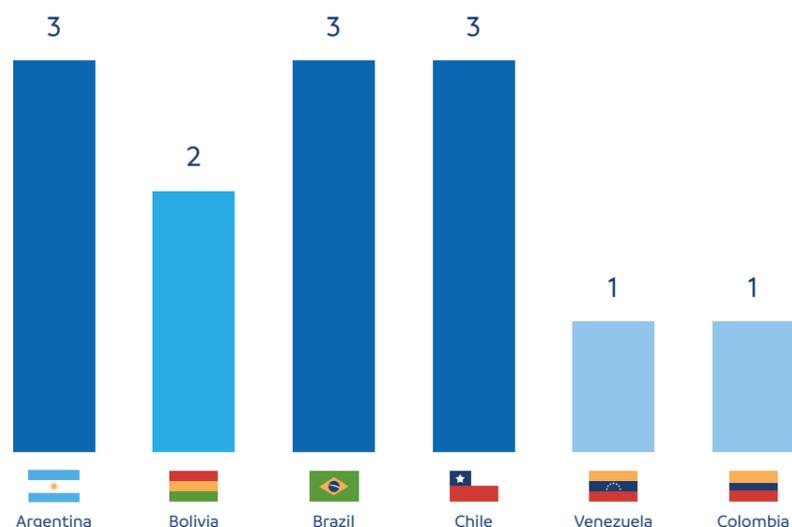
CONMEBOL's anti-doping officials are geographically distributed as follows:



The new officers who have joined in 2022, distributed by their country of residence, are from: Argentina (3), Chile (3), Brazil (3), Bolivia (2), Colombia (1) and Venezuela (1), this in order to strengthen the work team in key geographical points to respond to the logistical need of the Anti-Doping Unit.

Also, in response to the increase in female competitions, priority has been given to the incorporation of female medical officers. For this reason, 7 of the officers incorporated in 2022 are women, in addition to the 6 male officers who joined in the same period.

Figure 2 - Residency of New Medical Officers (Incorporated in 2022)



Anti-Doping Control Plan 2022

In all CONMEBOL competitions in 2022, the Anti-Doping Control Plan has been governed and applied based on the Anti-Doping Regulations 2021 and the protocols established after the COVID-19 pandemic.

The collection of urine samples has been carried out in compliance with the World Anti-Doping Code 2021 - WADA within the framework of the agreement signed between WADA and FIFA. All anti-doping materials used were from the renowned Swiss brand Lockcon.



LOCKCON

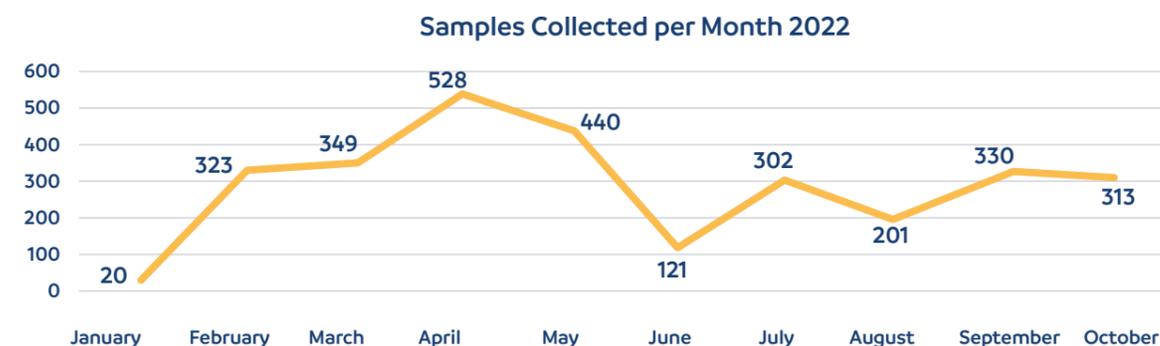
Number of Samples Collected

In 2022, the Anti-Doping Unit has collected a total of 2,927 anti-doping samples in all competitions during the year, based on the execution of the Annual Testing Plan. Compared to previous years, this indicates a decrease of 88.1% compared to the previous year, which is explained by the postponement of three competitions to 2023: CONMEBOL Libertadores Fútbol Playa, CONMEBOL sub17 Futsal and CONMEBOL Sub20 Futsal.

Table 3 - Number of Samples Collected per Competition

Competition	Number of samples collected
CONMEBOL Libertadores 2022	864
CONMEBOL Sudamericana 2022	807
Copa América Femenina - Colombia 2022	235
CONMEBOL Libertadores Femenina - Ecuador 2022	187
CONMEBOL SUB20 Femenina - Chile 2022	144
FIFA World Cup Qualifiers - Qatar 2022	113
CONMEBOL Copa America Futsal - Paraguay 2022	108
CONMEBOL Recopa 2022	90
CONMEBOL Libertadores Sub20 - Ecuador 2022	73
CONMEBOL Sub17 Femenina - Uruguay 2022	60
CONMEBOL Sub20 Futsal - Brazil 2022	56
CONMEBOL Copa América Fútbol Playa- Paraguay 2022	56
CONMEBOL Libertadores Futsal Femenina - Bolivia 2022	56
CONMEBOL Libertadores Futsal - Argentina 2022	56
Final Four Futsal - Argentina 2022	16
Finalissima 2022	4
Intercontinental U20 - Uruguay 2022	2
TOTAL	2927

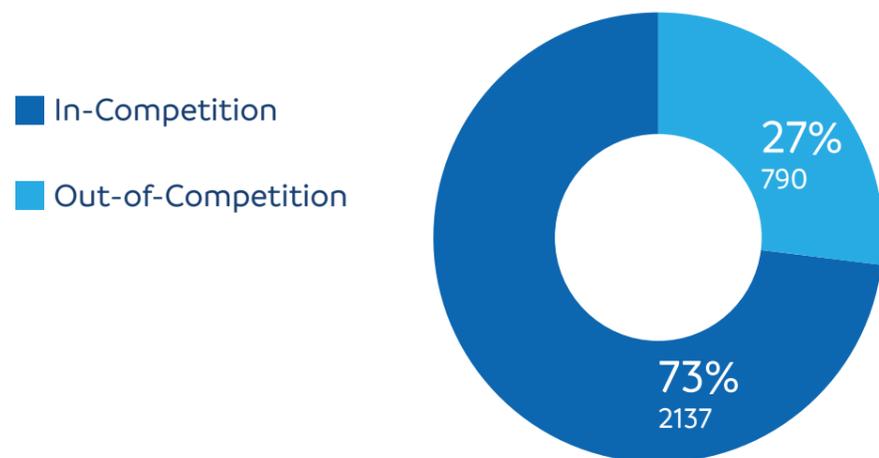
Figure 3 - Number of Samples per Month (IC and OC)



Types of Doping Controls

- 73% in competition (IC) (2137 samples collected)
- 27% out of competition (OC) (790 samples collected)

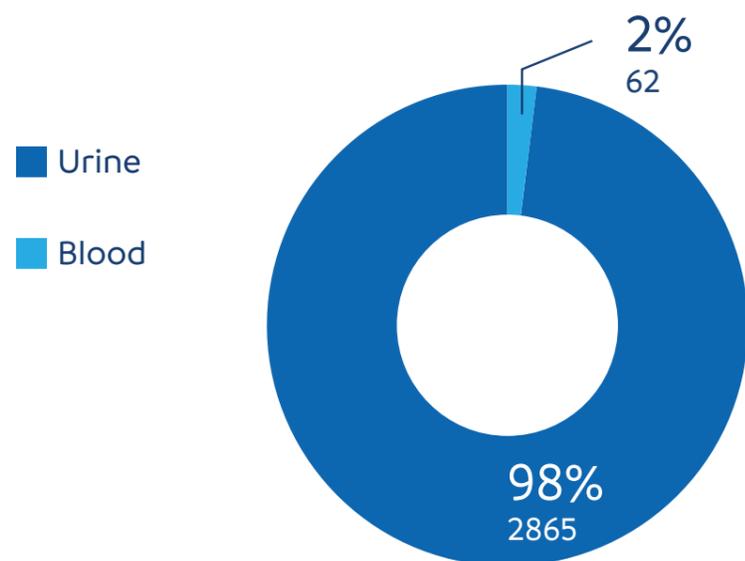
Figure 4 - Types of Doping Control (IC and OC)



Types of Samples Collected

- 2% Blood Samples (62 samples collected)
- 98% Urine Samples (2865 samples collected)

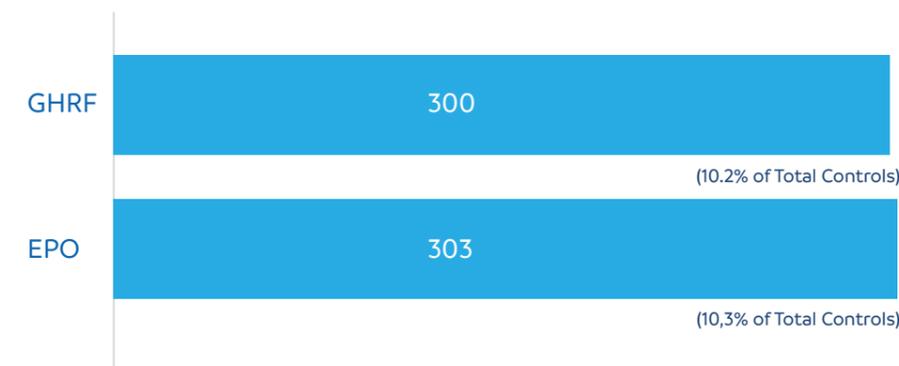
Figura 5 - Tipos de Amostras Coletadas (Urina e Sangue)



The collection procedure is the same for IC and OC.

Complementary Analysis

Figure 6 - Complementary Analyses (Urine and Blood Samples)

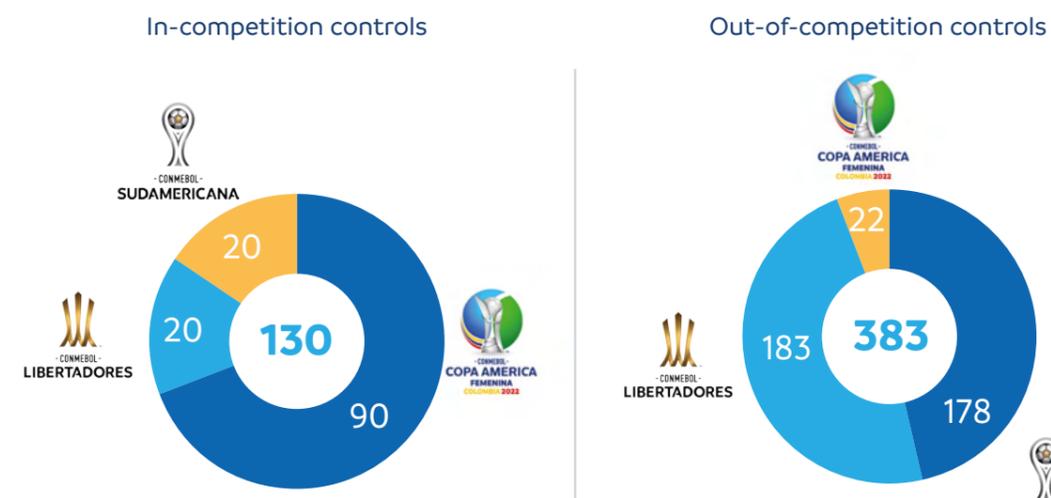


Complementary analyses have been applied to a total of 10% of all samples collected, thus complying with the International Standard for Controls and Research.

Sample storage

The World Anti-Doping Code 2021 (WADA) has established that anti-doping organizations must, within their Testing Plan distribution, store a number of samples for the purpose of reanalysis with new technologies or procedures in the future. The implementation of new detection methods and the emergence of increasingly precise instrumentation and machinery will allow the detection of forms of doping that might currently go undetected by testing systems, which is why they are stored.

Figure 7 - Stored Samples Discriminate by Competition (IC and OC)



CONMEBOL's Anti-Doping Unit has decided to store 513 urine samples for a period of 10 years (corresponding to 17.5% of all samples collected in CONMEBOL competitions in 2022).

Whereabouts

Throughout 2022, 32 requests for whereabouts have been processed for the different teams that have participated in decisive instances within our competitions. These whereabouts requests are completed to respond to logistical needs for carrying out out-of-competition checks on these teams. We have received whereabouts from the following teams (detailed according to the competition in which they were at the time of the request):

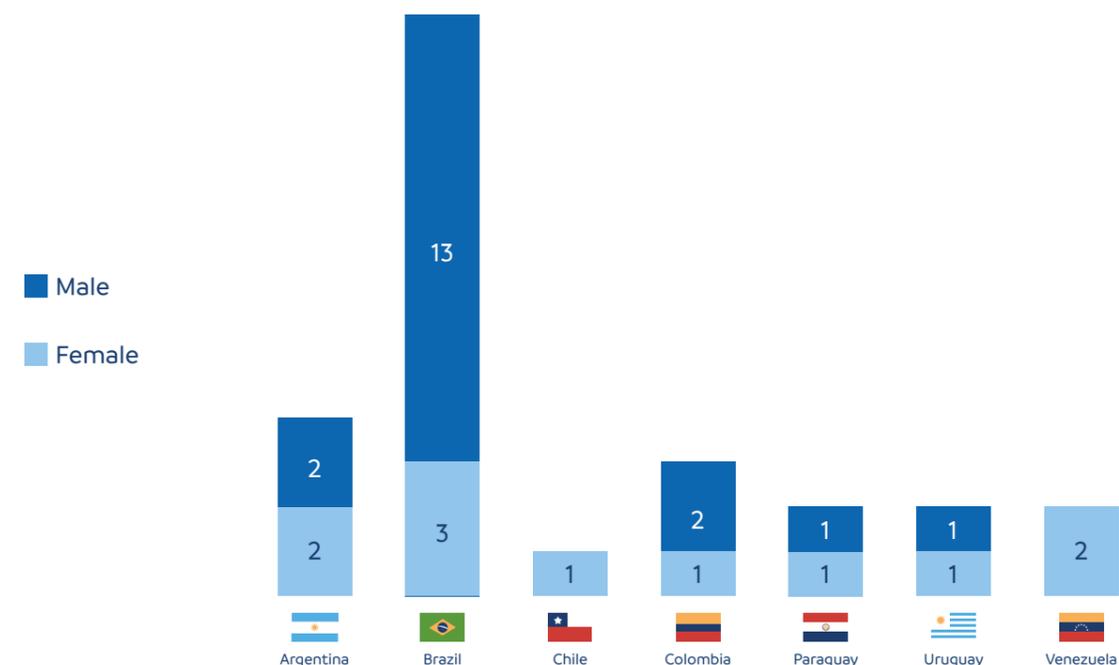
Selections

- **Argentina National Football Team**
South American FIFA World Cup Qualifiers - Qatar 2022
- **Argentine Women's Football Team**
CONMEBOL Copa América Femenina - Colombia 2022 - Semifinal Phase
- **Brazilian National Football Team**
South American FIFA World Cup Qualifiers - Qatar 2022
- **Brazilian U20 Women's Football National Team**
CONMEBOL Sub20 Femenina - Chile 2022 - Semifinal Phase
- **Brazilian Women's Football Team**
CONMEBOL Copa América Femenina - Colombia 2022 - Semifinal Phase
- **Chilean Women's Football Team**
CONMEBOL Copa América Femenina - Colombia 2022 - Semifinal Phase
- **Colombian U20 Women's National Football Team**
CONMEBOL Sub20 Femenina - Chile 2022 - Semifinal Phase
- **Colombian Women's Football Team**
Copa América Femenina - Colombia 2022 - Semifinal Phase
- **Paraguayan Women's Football Team**
Copa América Femenina - Colombia 2022 - Semifinal Phase
- **Uruguayan U20 Women's Football National Team**
CONMEBOL Sub20 Femenina - Chile 2022 - Semifinal Phase
- **Venezuelan Women's Football Team**
Copa América Femenina - Colombia 2022 - Semifinal Phase
- **Venezuelan U20 Women's Football National Team**
CONMEBOL Sub20 Femenina - Chile 2022 - Semifinal Phase

Clubs

- **Club Atlético Velez Sarsfield - ARG**
CONMEBOL Libertadores 2022 - Semifinal Phase
- **Club Atlético Boca Juniors Women's - ARG**
CONMEBOL Libertadores Women's 2022 - Semifinal Phase
- **Atlético Clube Goianense - BRA**
CONMEBOL Sudamericana 2022 - Semifinal Phase
- **Club Atletico Paranaense - BRA**
RECOPA/ CONMEBOL Libertadores 2022 - Semifinal Phase / CONMEBOL Libertadores 2022 - Final Phase (x2)
- **Clube de Regatas do Flamengo - BRA**
CONMEBOL Libertadores 2022 - Semifinal Phase / CONMEBOL Libertadores 2022 - Final Phase (x2)
- **São Paulo Football Club - BRA**
CONMEBOL Sudamericana 2022 - Semifinal Phase / CONMEBOL Sudamericana 2022 - Final Phase
- **Palmeiras Sportive Society - BRA**
Recopa 2022 / CONMEBOL Libertadores 2022 - Semifinal Phase
- **Palmeiras Women's Sports Society - BRA**
CONMEBOL Libertadores Femenina 2022 - Semifinal Phase
- **Asociación Deportivo Cali Femenina - COL**
CONMEBOL Libertadores Femenina - Semifinal Phase
- **America de Cali Women - COL**
CONMEBOL Libertadores Femenina 2022 - Semifinal Phase
- **Club Independiente del Valle - ECU**
CONMEBOL Sudamericana 2022 - Semifinal Phase / CONMEBOL Sudamericana 2022 - Final Phase
- **Foot Ball Club Melgar - PER**
CONMEBOL Sudamericana 2022 - Semifinal Phase

Figure 8 - Processed Whereabouts - 2022



Each Whereabouts Request must state:

- Name and surname of the physician responsible for the team (cell phone number and e-mail).
- Dates, travel schedules for the OUTGOING and RETURN Semi-Final Phase matches
- Data (name of the place, address, city, country, telephone, additional information).
- Night Residence/Hotel - 23:00 to 05:00 hs (place where the team will stay).
- Regular activities, trainings, meetings, etc. (6:00 a.m. to 10:00 p.m.).
- Scheduled home games.

Player Selection Method

CONMEBOL's Anti-Doping Unit performs in and out-of-competition doping controls on players participating in our competitions, collecting urine and/or blood samples.

The selection of designated players for the controls can be determined in two ways;

Randomly: through the method of drawing lots. The same is done during the meeting (in the case of competition controls), according to each discipline:

- Football Field: 75th minute of the match
- Futsal: After 2 minutes of the second half

- Beach Football: After 2 minutes of the third period.

In all cases, representatives of each team may be present.

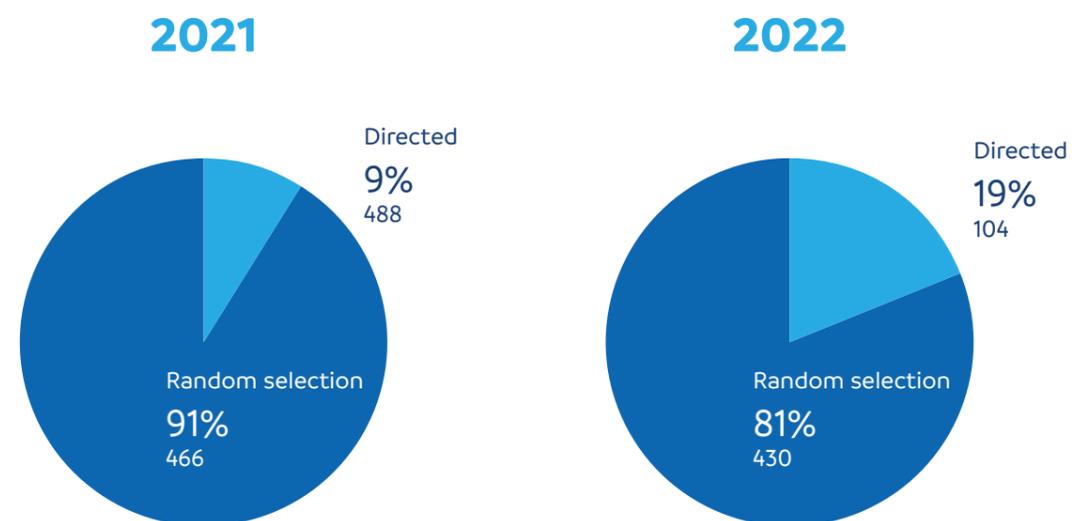
Managed Controls: in which any player present in the Good Faith List and in the Line-up Sheet of the match (in the case of a control in competition) may be selected.

In the sum of controls carried out in all CONMEBOL competitions during 2022, 19% of all the missions created have been carried out using the Directed

method for the selection of the players to be controlled, with the remaining 81% of controls using the draw method for such selection. This implies a considerable increase of 10% over the previous year in the use of the directed method for player selection.

This is explained by the fact that CONMEBOL's Anti-Doping Unit has been perfecting its system for classifying players when it comes to targeted controls, through a Risk Plan. This Plan is based on statistical data and categorization factors of actions within the field of play, which are seen as parameters for the selection of players who will undergo this type of control.

Figure 9 - Selection Method (Comparative 2021-2022)



The risks of doping and the effective use of resources are judiciously assessed to optimize detection. In football, as a team sport, targeted testing is mainly carried out to detect systematic doping. This method consists of the analysis of statistical data of the game, customized by club/selection and by player, which is followed throughout the competition by analyzing individual and collective performance. For this purpose, the relationship between minutes played and performance of each player is used, adding factors such as yellow and red cards, goals scored and conceded, age, physical build, playing position, abnormal biological parameters (blood parameters, steroid profiles, etc.), injuries, non-compliance with whereabouts reports, history of player checks and

rehabilitation after a period of suspension. The selection of these criteria is given in accordance with the International Standard for Testing and Investigations of WADA and CONMEBOL's Anti-Doping Unit.

This selection method optimizes the collection, evaluation and processing of anti-doping information from available sources, in order to implement an effective and intelligent control plan, establishing a research base of our players in all our competitions.



Logistics and Laboratories

All samples collected were processed by WADA-accredited laboratories; CONMEBOL works with two of them:



Deutsche Sporthochschule Köln
German Sport University Cologne

Figure 10 - WADA Accredited Laboratories to which CONMEBOL sends samples.

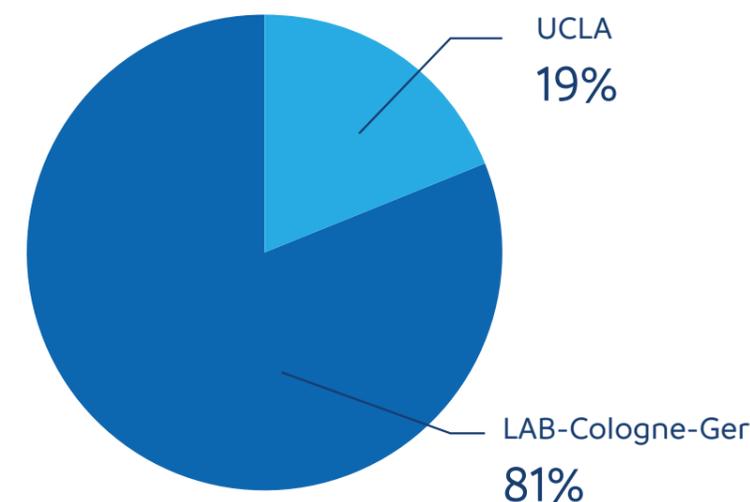


Figure 11 - Flow chart of samples sent to the laboratory each month.



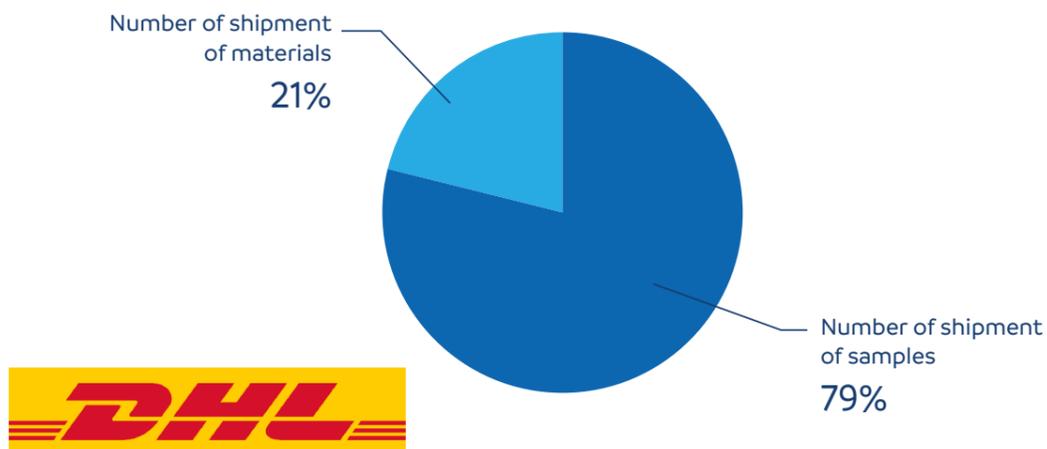
The urine samples have been sent by DHL Courier, and the blood samples have been personally transported by personnel of the Anti-Doping Unit from the collection point to the Laboratory.

in South America, and another 336 waybills have been generated for the shipment of samples from the sample collection site to the laboratories designated by the Anti-Doping Unit for each competition.

Through the DHL Platform, 90 waybills have been generated for the shipment of materials to our officials

A total of 426 guides were generated throughout the year.

Figure 12 - Types of DHL Waybills Generated (2022)



Therapeutic Use Exemptions (TUE)

Um jogador pode sofrer de doenças ou enfermidades. A player may suffer from illnesses or ailments that require the use of medication. In the event that the substance the player needs to take is on the current Prohibited List, a Therapeutic Use Exemption may allow the player to take that medication that would otherwise be prohibited.

WADA International Standard for Therapeutic Use Exemptions and in the current CONMEBOL TUE policy.

For the approval or denial of such TUE, CONMEBOL relies on the following documents in force:

- CONMEBOL Anti-Doping Regulations 2021
- World Anti-Doping Code 2021 (WADA World Anti-Doping Code 2021 (WAC), published by WADA

There are criteria for granting an AUT and these are described below:

International Standard for Therapeutic Use Exemptions 2021 (ISTUE)

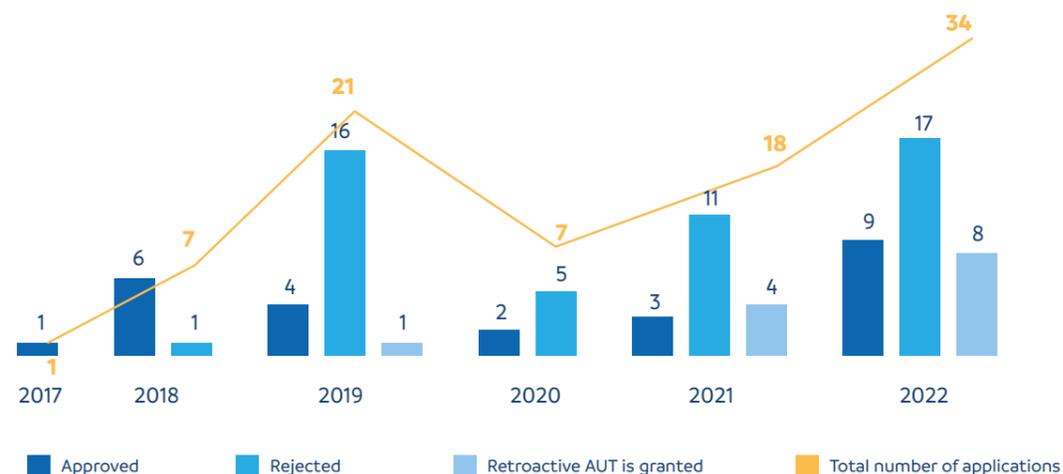
1. Any player who consults a physician who prescribes treatment or medication for therapeutic purposes shall inquire whether the prescription contains prohibited substances or methods. If this is the case, the player should request alternative treatment.

During all CONMEBOL competitions in 2022, the TUE Sub-Committee has processed a total of 34 applications, of which 17 have been approved (8 of them retroactively) and 17 have been rejected. The reason for the rejection is due to lack of documentation or medical examinations required to validate the application, or because the application did not correspond.

2. If no alternative treatment is available, a player with a documented medical history requiring the use of a prohibited substance or prohibited method must first apply for a TUE. However, TUEs are granted only in cases where there is a clear and convincing clinical need and no sporting advantage to the player.

3. The application and approval of TUEs is carried out according to a strict procedure, as established in the

Figure 13 - AUT Applications Processed (2022)

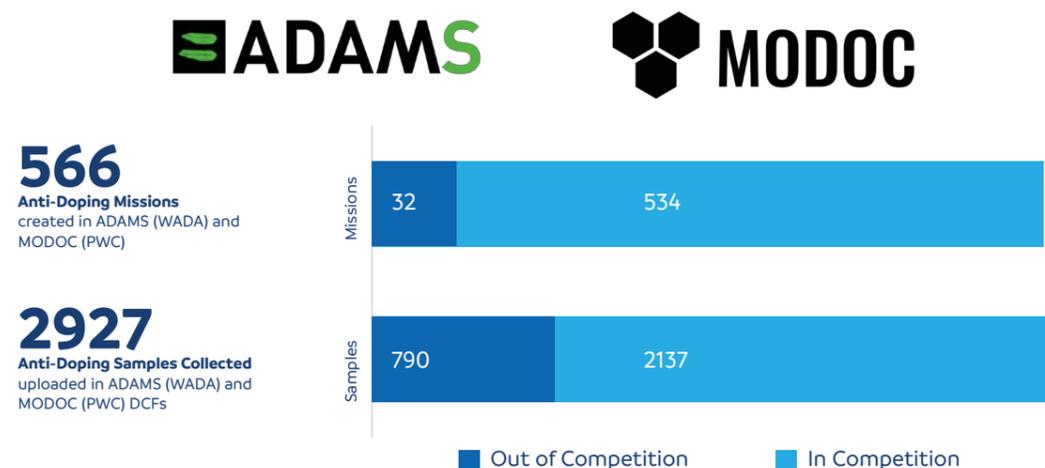


Doping Control Software

The 2022 Control Plan has been implemented using the ADAMS (WADA) platform for the execution of the plan, generation of Missions, loading of control forms and linking of sample results with the laboratory; and MODOC (PWC), for the implementation of controls through digital forms.

Using these tools, the following results have been obtained:

Figure 14 - Number of Missions and Forms. Doping Control created (2022)



The total number of samples collected in 2022 by the CONMEBOL Anti-Doping Unit represents a decrease of 12.6% in relation to the previous year. This is due to the readjustment in the calendar of the CONMEBOL Libertadores and Sudamericana 2020 due to COVID-19, whose semifinal and final phases have been disputed at the beginning of the year 2021. In addition, three competitions that were initially scheduled to be played in 2022 have been postponed to 2023. For the collection of these samples, 566 Anti-Doping Missions have been created on the ADAMS and MODOC platforms. All Doping Control Forms (CDF) have been uploaded to both platforms.

Figure 15 - Number of annual Doping Controls performed (2014-2022)



Adverse Analytical Findings (AAF)

Of the total samples collected in 2022, five AAF (Adverse Analytical Findings) were obtained. Below are the clubs of the players with AAF, the competition in which they were tested, and the substance that was found in the sample:

- Club Cienciano (PER) - CONMEBOL Sudamericana 2022. Substance: Dexamethasone (S9. Glucocorticosteroids)
- Club Santo Domingo (ECU) - CONMEBOL Libertadores Futsal Femenino 2022 (two players). Substance: Acetazolamide (S5. Diuretics and Masking Agents) - (both players)
- Club Deportivo Meta (COL) - CONMEBOL Libertadores Futsal 2022. Substance: Carboxy-THC (S8. Cannabinoids)
- Colombia National Team - CONMEBOL U20 Women's Futsal 2022. Substance: Triamcinolone acetonide (S9. Glucocorticosteroids).

With respect to previous years, for the third consecutive year the percentage of AAF cases has been maintained at 0.1% of the number of samples collected, which indicates that the Education Plan implemented by the Anti-Doping Unit has brought good results in the fight against doping in CONMEBOL competitions, generating awareness among players and support personnel.

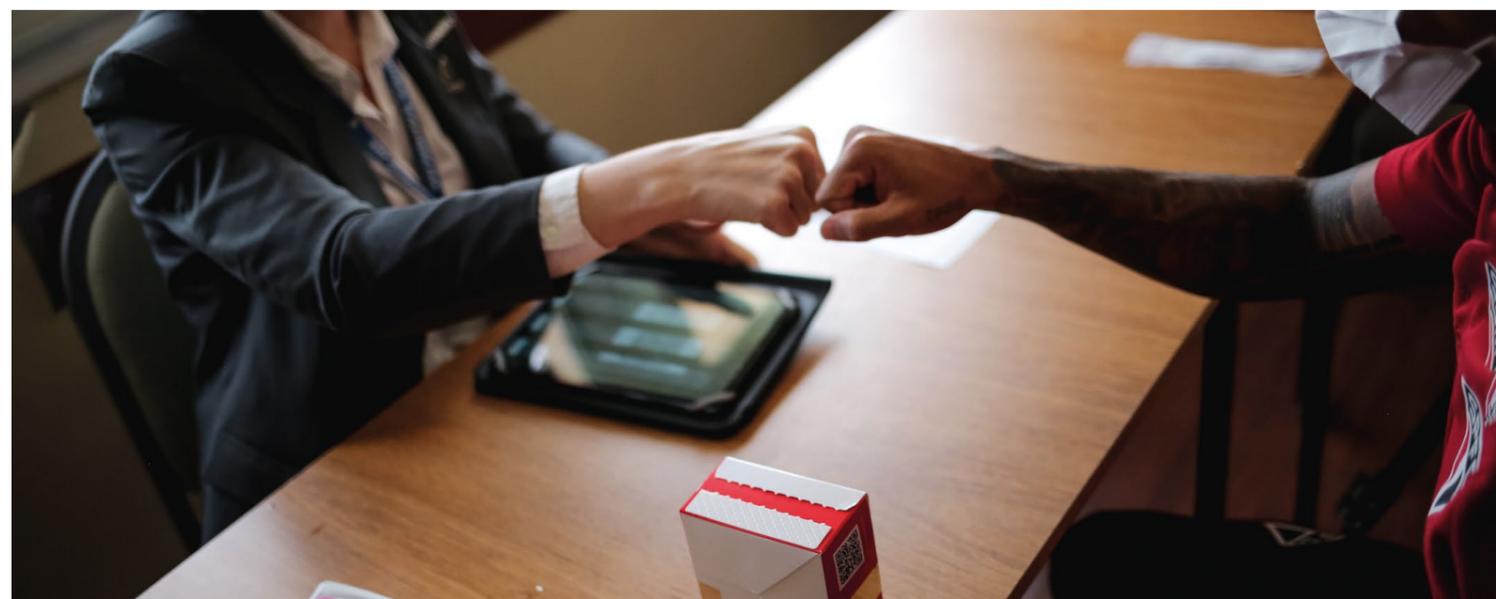


Table 4 - Annual Relationship between Collected Samples and Adverse Analytical Findings (AAF)

	2015	2016	2017	2018	2019	2020	2021	2022
N° of Controls	1412	1382	1573	1820	2677	1781	3351	2927
N° AAF	14	6	11	3	12	2	6	5
Percentage	0,90%	0,40%	0,70%	0,20%	0,40%	0,10%	0,10%	0,10%



Anti-Doping Education Plan 2022

Educational Talks

This activity seeks to reach players and support personnel, using educational talks as a pedagogical tool.

Each talk lasts 45 minutes and is guided by an EDUCATOR specialized in the subject, who seeks to directly influence and raise awareness about the fight against doping in South American Football.

Target

To provide basic information to players and support personnel regarding the importance of the risks involved in doping on their health, raising awareness to join them and fight against doping, promoting values and ethical principles of fair play.

The educational talks are aimed at:

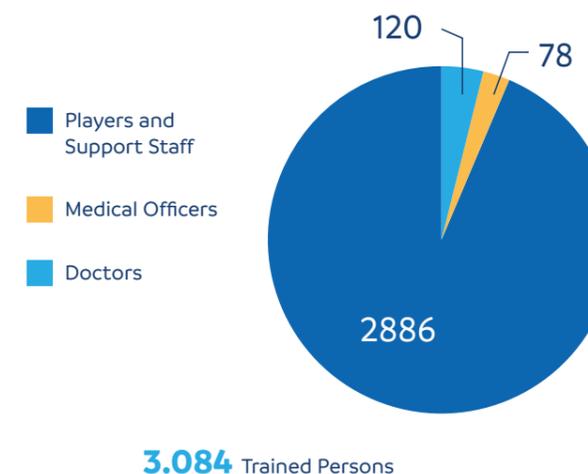
- Professional players
- Support personnel: doctors, coaches, nutritionists, psychologists, leaders, parents, etc.

Table 5 - Parts of the Anti-Doping Educational Talk.

Introduction	Brainstorming and interacting with the audience to identify anti-doping rule violations and the causes that lead to them.
Main Part	Presentation with slides, CONMEBOL video of the topics to be discussed.
Final	Closing with a playful activity of motivation and analysis that leads to a commitment to fight against doping in football.

In the year 2022, anti-doping talks have been carried out with the following group distribution as participating public:

Figure 16 - Audience of Anti-Doping Educational Talks (2022)



The topics developed were:

- List of Prohibited Substances and Methods;
- Risks of Nutritional Supplements;
- Anti-Doping Rule Violations;
- Consequences of Doping: Sanctions, Health and Social Damages;
- Doping Control Procedures;
- Rights and Responsibilities of Players and their Support Personnel;
- Therapeutic Use Exemptions;
- The Doping Injury to Sportsmanship.
- Applicable Player Location/Whereabouts Requirements.

Bibliografía

WADA International Standards

- International Controls and Investigation Standard 2021
https://www.wada-ama.org/sites/default/files/resources/files/international_standard_isti_-_2021.pdf
- International Education Standard 2021
https://www.wada-ama.org/sites/default/files/resources/files/2021_ise_spanish_0.pdf
- International Standard the Prohibited List 2022
<https://www.conmebol.com/documentos/lista-de-prohibiciones-2022/>
- International Standard for Therapeutic Use Exemptions 2021
https://www.wada-ama.org/sites/default/files/resources/files/estandar_aut_2021_espanol.pdf

- International Standard for Performance Management 2021
https://www.wada-ama.org/sites/default/files/2022-06/2021_estandar_internacional_de_gestion_de_resultados_isrm-final1.pdf

- CONMEBOL Anti-Doping Regulations
<https://www.conmebol.com/documentos/reglamento-antidopaje-2021/>

- TDSSA - Technical Document for Sport Specific Analysis
<https://www.wada-ama.org/en/resources/world-anti-doping-program/tdssa-technical-document-sport-specific-analysis#resource-download>



**8° SEMINARIO
COMISIÓN MÉDICA
& UNIDAD ANTIDOPAJE**

PART THREE

VIII Medical Commission
and Anti-Doping Unit
Seminar 2022



The event was attended by distinguished speakers with innovative topics both from CONMEBOL and the international scope, such as:

Special guests

- Alejandro Dominguez, President CONMEBOL
- Nery Pumpido, Assistant Secretary General - Football and Development Director CONMEBOL
- Frederico Nantes, Director of Competitions and Operations CONMEBOL
- Graciela Garay, Ethics and Compliance Director CONMEBOL
- Enrique Cáceres, President of the CONMEBOL Referee's Committee
- Mariano Zavala, Director of Judicial Bodies CONMEBOL
- Fabimar Franchi, CONMEBOL Women's Football Manager
- Dr. Francisco Forriol, Education Subcommittee CM and UA CONMEBOL
- Dr. Zoran Bahtijarevic, Medical Director UEFA
- María José Pesce, Director WADA Latin American Office
- Dr. Hans Geyer, Director of the Center for Doping Research and Prevention - Cologne Laboratory Germany
- Monika Egli, CEA Sales Lockcon
- Jorge Domínguez and Manuel Montenegro, Coordinators PWC

Program

VIII Medical Commission and Anti-Doping Unit Seminar 2022

The South American Football Confederation (CONMEBOL) gathered 71 Doctors, belonging to the 10 Member Associations, in the VII Seminar of the Medical Committee & Anti-Doping Unit, returning to its face-to-face format after 2 years of Pandemic. The purpose of the seminar was to analyze the work carried out during 2022 in CONMEBOL competitions, and to develop strategies for next year.

It was addressed to Medical Officials working in CONMEBOL competitions as field medical and/or anti-doping officials.

The first stage of the Seminar was held on Friday, November 11, with the 2022 management report of the Medical Commission, protocols that were carried out to return to competitions since COVID-19, and an introspection of the care systems implemented during

the peak moments of the pandemic, which allowed the safe development of the tournaments organized by CONMEBOL.

The second module of the Seminar, held on Saturday, November 12, began with the 2022 management report of the Anti-Doping Unit, and addressed topics such as the 2023 Prohibited List (Anabolics, diuretics and glucocorticoids), disciplinary measures, agreements (FIFA, UEFA, WADA), collection processes and handling of sample materials (urine/blood) and anti-doping control software, as well as an approach to the biological passport and dried blood drop analysis, among other topics.

This event allows the reaccreditation of officers year after year, in which their knowledge is theoretically measured by means of an evaluation tool.

8° SEMINARIO COMISIÓN MÉDICA & UNIDAD ANTIDOPAJE			11 y 12 de Noviembre de 2022 Luque, Paraguay			- CONMEBOL -		
DAY 1 - FRIDAY, NOVEMBER 11th - MEDICAL MODULES								
TIME	TOPICS	SPEAKER	TIME	TOPICS	SPEAKER	TIME	TOPICS	SPEAKER
09:00 - 09:10	Welcome from the President of CONMEBOL	Alejandro Dominguez, CONMEBOL President	09:00 - 09:15	Anti-Doping Module III: MANAGEMENT REPORTS - Moderators: Dr. Osvaldo Pangrazio / Dr. José Veloso		09:00 - 09:15	Management Report 2022 - CONMEBOL Anti-Doping Unit (Controls and Education)	Dr. Osvaldo Pangrazio
09:10 - 09:25	Welcome, presentation of the Medical Commission and Anti-Doping Unit and details of the Seminar	Dr. Osvaldo Pangrazio, President CONMEBOL, Medical Commission	09:15 - 09:30	Anti-Doping Tripartite Agreement - FIFA - CONMEBOL - UEFA (Controls and Education)	Dr. Osvaldo Pangrazio	09:30 - 09:50	Ethics and Compliance	Lic. Graciela Garay
Medical Module I: GENERAL REPORTS - Moderator: Dr. Osvaldo Pangrazio			09:50 - 10:10	Biological Passport (Steroid and Hematological) Concepts	Dr. Hans Geyer	COFFEE BREAK		
09:25 - 09:45	Management Report of the Medical Commission 2022	Dr. Osvaldo Pangrazio	10:10 - 10:25	Disciplinary Measures and Sanctions - CONMEBOL Anti-Doping Regulations	Dr. Mariano Zavala	Anti-Doping Module III: 2023 PROHIBITED LIST - Moderators: Dr. Jorge Sarango / Dr. Boris Zambrano		
09:45 - 10:05	Study of Injuries in UEFA competitions	Dr. Zoran Bahtijarevic	10:25 - 10:40	TUE Management Report	Dr. Jorge Sarango	10:55 - 11:10	2023 WADA Prohibited List (Substances and Methods)	Dr. José Veloso
10:05 - 10:20	CONMEBOL Competitions 2023	Mr. Frederico Nantes	Anti-Doping Module IV: SAMPLE COLLECTION PROCESS - Moderators: Dr. Paula Bolgerl - Dr. Hugo Martínez			11:10 - 11:25	Glucocorticosteroid Use (In-Competition and Out-of-Competition)	Dr. Jorge Sarango
10:20 - 10:35	Medicine Courses Applied to Development Projects	Mr. Nery Pumpido	11:25 - 11:40	Anabolics and Diuretics	Dr. Felix Drummond	11:40 - 12:00	Dried blood spot testing	Dr. Hans Geyer
10:35 - 10:45	Official Photo of the Medical Commission and Anti-Doping Unit		ROUND TABLE: Topics developed in the morning shift. Dr. Osvaldo Pangrazio, Dr. Hans Geyer, Dr. José Veloso, Dr. Jorge Sarango, Dr. Felix Drummond, Dr. Zoran Bahtijarevic			12:00 - 12:30		
10:45 - 11:00	COFFEE BREAK		12:30 - 14:00	LUNCH			Anti-Doping Module V: EVALUATION ANTI-DOPING UNIT	
Medical Module II: MEDICAL PROTOCOLS - Moderators: Dr. Jorge Pagura / Dr. Jorge Cheyre			Anti-Doping Module IV: SAMPLE COLLECTION PROCESS - Moderators: Dr. Paula Bolgerl - Dr. Hugo Martínez			16:50 - 17:30	Theoretical Evaluation Anti-Doping Medical Officers	CONMEBOL Anti-Doping Unit
11:00 - 11:20	Current Medical Protocols in UEFA Competitions	Dr. Zoran Bahtijarevic	14:00 - 14:20	Handling of Sample Collection Materials (Lockers)	Monika Egli	17:30 - 17:40	Practical Evaluation Anti-Doping Medical Officers	CONMEBOL Anti-Doping Unit
11:20 - 11:40	Extreme situations (heat, humidity, height and hydration)	Dr. Rocio Nuche	14:20 - 15:05	Management of anti-doping control software (MODOC)	Jorge Domínguez, Manuel Montenegro, Dr. Nadia Sosa	17:40 - 17:50	Feedback Theoretical and practical evaluation	CONMEBOL Anti-Doping Unit
11:40 - 12:00	Temperature measurement and recording	Dr. Fabio Krebs	15:05 - 15:50	Workshop - Procedure for the collection of Urine Samples	Dr. Jairo Rojas	ROUND TABLE: Topics developed in the afternoon shift. Dr. Osvaldo Pangrazio, Dr. Nadia Sosa, Dr. Jairo Rojas, Dr. Nilson Ferreira, Dr. Vaneza Lozano, Monika Egli		
12:00 - 12:20	Cranioencephalic Trauma	Dr. Jorge Pagura	15:50 - 16:35	Workshop - Procedure for the collection of Blood Samples	Dr. Nilson Ferreira, Dra. Vaneza Lozano	CLOSURE OF THE SEMINAR		
12:20 - 12:40	Management of Suspected Sudden Cardiac Death in UEFA Competitions	Dr. Zoran Bahtijarevic	16:35 - 16:50	COFFEE BREAK				
12:40 - 14:20	LUNCH		Anti-Doping Module V: EVALUATION ANTI-DOPING UNIT					
14:30 - 15:00	Photo Card to Medical Officers		Anti-Doping Module V: EVALUATION ANTI-DOPING UNIT					
Medical Module III: INJURIES - Moderators: Dr. Hugo Marambio / Dr. Gianni Mazzocca			Anti-Doping Module V: EVALUATION ANTI-DOPING UNIT					
15:00 - 15:15	Muscular injuries in men's Football	Dr. Alan Figueroa	Anti-Doping Module V: EVALUATION ANTI-DOPING UNIT					
15:15 - 15:30	Scientific Journal: Evaluation of Injuries - Our needs - Publications	Dr. Francisco Forriol	Anti-Doping Module V: EVALUATION ANTI-DOPING UNIT					
15:30 - 15:45	Injuries education and prevention	Dr. Jairo Rojas	Anti-Doping Module V: EVALUATION ANTI-DOPING UNIT					
Medical Module IV: FEMALE FOOTBALL - Moderators: Dr. André Pedrinelli / Dr. Nadia Sosa			Anti-Doping Module V: EVALUATION ANTI-DOPING UNIT					
15:45 - 16:00	Women's Football: Introduction and its development	Fabimar Franchi	Anti-Doping Module V: EVALUATION ANTI-DOPING UNIT					
16:00 - 16:15	Muscular injuries in women's football	Dr. Matilde Miralles	Anti-Doping Module V: EVALUATION ANTI-DOPING UNIT					
16:15 - 16:30	Knee injuries in women's Football	Dr. Paula Bolgerl	Anti-Doping Module V: EVALUATION ANTI-DOPING UNIT					
16:30 - 16:45	Common traumatic injuries in women's Football and scientific studies from CONMEBOL	Dr. Francisco Forriol	Anti-Doping Module V: EVALUATION ANTI-DOPING UNIT					
16:45 - 17:00	COFFEE BREAK		Anti-Doping Module V: EVALUATION ANTI-DOPING UNIT					
Anti-Doping Module I: WADA INTERNATIONAL STANDARDS - Moderator: Dr. Osvaldo Pangrazio			Anti-Doping Module V: EVALUATION ANTI-DOPING UNIT					
17:00 - 17:20	Monitoring of compliance with the World Anti-Doping Code and its Standards 2021	María José Pesce	Anti-Doping Module V: EVALUATION ANTI-DOPING UNIT					
17:20 - 17:40	International Anti-Doping Education Standard 2021	María José Pesce	Anti-Doping Module V: EVALUATION ANTI-DOPING UNIT					
17:40 - 18:00	CLOSING OF THE FIRST DAY		Anti-Doping Module V: EVALUATION ANTI-DOPING UNIT					



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