

Report of the Independent Observers

Games of the XXXI Olympiad, Rio de Janeiro 2016



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1. Acronyms & Abbreviations

2015 World Anti-Doping Code	2015 Code
Adverse Analytical Finding	AAF
Brazilian Anti-Doping Agency (NADO)	ABCD
Athlete Biological Passport	ABP
Anti-Doping Administration and Management System	ADAMS
Anti-Doping Organization	ADO
Anti-Doping Rule Violation	ADRV
Athlete Passport Management Unit	APMU
Atypical Finding	ATF
Atypical Passport Finding	ATPF
Blood Collection Officer	BCO
Court of Arbitration for Sport	CAS
Continuous Erythropoietin Receptor Activator	CERA
Chaperone Team Leader	CTL
Doping Control Officer	DCO
Doping Control Station	DCS
Doping Control Station Manager	DCS Manager
Erythropoiesis-Stimulating Agents	ESAs
External Quality Assessment Scheme	EQAS
Gonadotrophin Releasing Hormone	GnRH
Growth Hormone	GH
Growth Hormone Releasing Hormone	GHRH
Growth Hormone Releasing Peptides	GHRPs
Olympic Games	Games
IOC Medical and Scientific Commission Games Group	Games Group
Haemoglobin Based Oxygen Carriers	HBOCs
International Federation	IF
Insulin-like Growth Factor 1	IGF-1
International Olympic Committee	IOC
Isotope-Ratio Mass Spectrometry	IRMS
International Standard for Laboratories	ISL
International Standard for Testing and Investigations	ISTI
Laboratorio Brasileiro de Controle de Dopagem (Brazilian Doping Control Laboratory)	LBCD
Local Organizing Committee (Rio 2016)	LOC
Luteinizing Hormone	LH
Minimum Levels of Analysis	MLA
Report dated 18 June 2016 issued by Professor Richard McLaren in relation to the Sochi Games	McLaren Report
National Anti-Doping Organization	NADO
National Olympic Committee	NOC
Registered Testing Pool	RTP
Anti-Doping Department of the Organizing Committee of the Rio Olympic Games	Rio 2016
Rio 2016 Summer Olympic Games	Rio Games
SportAccord Doping Free Sport Unit	DFSU
WADA Technical Document for Sport Specific Analysis	TDSSA
Test Distribution Plan	TDP
Therapeutic Use Exemption	TUE
Therapeutic Use Exemption Committee	TUEC
World Anti-Doping Agency	WADA
WADA Independent Observers	WADA IO Team

2. Remit of the WADA IO Team in Rio

The IOC is responsible for delivering an anti-doping program for the Olympic Games that produces accurate and reliable testing outcomes, and that effectively deters cheating or detects any cheating that nevertheless occurs. The IOC delegates the implementation of the program to the LOC, but retains supervisory control and decision-making authority throughout, consistent with its ultimate responsibility.

The role of the WADA IO Team is to help instill confidence in both athletes and the public in the quality, effectiveness, and reliability of the IOC's anti-doping program for the Games. It does this by observing (by random sampling) all aspects of the Games anti-doping program, and by meeting with the IOC and the LOC on a daily basis during the Games to provide feedback and to suggest areas of possible "real-time" improvement to the program at the Games, as well as by making recommendations in its post-Games report for potential improvements to the program for future editions of the Games.

In Rio, for the first time, the WADA IO Team's mandate started on 24 July 2016, the day the Athletes Village opened.¹ It ended on 21 August 2016, the last day of competitions at the Games. During the intervening period (referred to in this report as "the Games period"), the WADA IO Team was able to observe all aspects of the IOC's anti-doping program in Rio, including the test distribution planning, sample collection and transport to the WADA-accredited Rio anti-doping laboratory (LBCD), sample storage and analysis at LBCD, the TUE administration process, results management (including review by laboratory experts in the IOC Games Group² of ATPFs in steroid and blood profiles to trigger follow-up testing), and the IOC's bringing of ADRV charges before the (new) CAS Anti-Doping Division. The WADA IO Team Chair and Vice-Chair discussed the WADA IO Team's observations and provided feedback at daily meetings with the IOC Medical and Scientific Director and Rio 2016 Anti-Doping Operations Manager, both of whom were extremely cooperative and professional, and very open and transparent in relation to all aspects of the program, which greatly facilitated the WADA IO Team's work. The WADA IO team takes this opportunity to compliment and thank them for taking this approach.

3. Executive Summary

Prior to and during the Rio Games, the IOC implemented a number of important recommendations made by previous WADA IO teams, resulting in some impressive advances in the following areas of the Rio anti-doping program:

¹ At previous Games, the WADA IO team's mandate only started after the Opening Ceremony, when the competitions began.

² The IOC Medical and Scientific Commission Games Group is appointed by the IOC President, and includes members of the IOC Medical Commission, experts from medical and anti-doping fields, Chief Medical Officers of future Olympic Games Organizing Committees, and directors of WADA-accredited laboratories. The WADA IO Team understands that the Games Group met daily to provide feedback and recommendations on all areas related to the remit of the IOC Medical and Scientific Commission and to provide feedback to the IOC Medical and Science Director. Representatives of the Games Group also attended the majority of the daily meetings that the WADA IO Team chair and vice-chair had with the IOC Medical Director.

- pre-Games Taskforce planning, which identified and sought to fill gaps in pre-Games testing of high risk athletes/athletes from high risk sports;
- test distribution planning prior to and during the Games, based on an intelligence-led risk assessment rather than random selection;
- the introduction of separate Out-of-Competition and In-Competition testing periods during the Games period as defined in the Code (whereas in the past the entire testing period from the opening of the Athletes Village until the Closing Ceremony was defined as In-Competition);
- the use of an "IOC APMU" for the ABP (steroidal module and haematological module) at the Games, to identify swiftly and follow up appropriately and without delay on atypical and suspicious findings; and
- the attendance of specialist anti-doping counsel in Rio for the duration of the Games to support the IOC legal team in conducting anti-doping results management, and the introduction of the CAS Anti-Doping Division to replace the IOC Disciplinary Committee as the first instance hearing panel for ADRV cases at the Games.

In addition, responding to WADA and/or IOC requirements, including requirements prompted by the revelations made in the McLaren Report about sample swapping at the Sochi anti-doping laboratory during the 2014 Olympic Games, LBCD was superbly equipped, operated very securely and generally very efficiently, and now represents an outstanding legacy from the Games for the anti-doping movement in South America.

On the other hand, the logistical arrangements made by Rio 2016 to support the sample collection process at official venues during the Games suffered from a number of serious failings, for various reasons, some of which were within Rio 2016's control and some were not, including the following:

- budget and operational cutbacks meant that resources that had previously been allocated to the anti-doping program were lost (e.g. loss of a contract for the provision of trained phlebotomists by a commercial company) and resources that had been recommended by the IOC/WADA Rio 2016 Anti-Doping Taskforce were not implemented (e.g. 30 percent extra chaperones to cope with anticipated drop-outs);
- tensions between Rio 2016 and ABCD meant that ABCD's resources were not fully maximized and it had minimal involvement in the Games;
- there were significant changes in the management and staffing of the Rio 2016 anti-doping department one year before the Games; and
- there was a lack of coordination/unified approach among the management team in the Rio 2016 anti-doping department during the Games itself.

The main logistical failings that arose as a result of these problems included:

- an apparent breakdown in the transfer of knowledge from previous Games to Rio2016 and/or in the effective use of that knowledge by Rio2016, in terms of insufficient training materials and content (observed during DCO training) and an absence of sport-specific and venue-specific guidelines;³
- a lack of adequate training and assessment of doping control personnel's general, venue-specific, and sport-specific knowledge, due in part to the lack of proper test events (which was in turn due to issues with ABCD's compliance status, meaning that IFs had to contract with DCOs directly for test events, many of whom did not ultimately work at the Games);
- inadequate advance planning (for example, instructions were reportedly only issued at the last minute to the warehouse responsible for supplying doping control equipment to the DCSs, and the warehouse staff were not familiar with the equipment and so filled orders inaccurately) and workforce scheduling (for example, staffing schedules had many DCOs moving from venue to venue rather than established teams working together daily);
- inadequate support for chaperones, including (i) lack of specific practical training; (ii) onerous travel requirements and a lack of adequate arrangements for getting them home at the end of late-night shifts; and (iii) lack of sufficient meal vouchers, which disincentivized chaperones to report for shifts and/or to stay for the duration;
- inadequate support for DCS Managers/DCOs, including (i) lack of advance briefing as to Games-specific, venue-specific, and sport-specific procedures; (ii) late receipt of mission orders and staffing rosters; (iii) the hotel intended to house the DCS Managers/DCOs was ultimately not built, which meant DCOs had to be moved several times during the Games;⁴ and (iv) very onerous journeys from accommodation to venues, with inadequate arrangements to get them home safely after late-night shifts;
- lack of required IT equipment and doping control equipment in the DCSs in the Athletes Village and at competition venues;
- lack of adequate whereabouts information to find athletes for testing during Out-of-Competition periods; and
- lack of continuity in managing the largest DCS, located in the Athletes Village.

In addition, only the Rio 2016 Operations Manager was present at the daily IOC/WADA IO Team anti-doping meetings; the Rio 2016 General Manager attended the IOC Medical and Scientific Commission Games Group meetings but generally did not attend the IOC/WADA IO Team anti-doping meetings. This limited the ability to discuss and address at those meetings issues that were under the General Manager's remit, and made it difficult to know whether corrective actions had been actioned or not, which

³ The IOC reported that this information was provided to Rio2016.

⁴ The WADA IO Team is aware of at least one DCO who had to relocate hotels no less than five times.

adversely affected the ability of the IOC and the WADA IO Team to assist in identifying and/or to ensure the timely implementation of appropriate corrective actions.

These various logistical issues were foreseeable and entirely avoidable, which makes their occurrence all the more disappointing. The aggregate effect was to strain the basic sample collection process at competition venues and in the Athletes Village DCS close to breaking point, with many discrepancies observed in the sample collection procedure (even if generally the integrity of the process was not undermined, and in particular no ADRV was lost due to departures from the mandatory sample collection procedures). Ultimately, it was only due to the enormous resourcefulness and goodwill of some key doping control personnel working at the Games that the process did not break down entirely.

As a result, much of this report must cover old ground, making recommendations to ensure that at future Games the sample collection process returns to the standard that was set at previous Games. However, the important advances and improvements that the IOC achieved in its anti-doping program in the lead-up to Rio and at the Games themselves also set a new benchmark, as well as illuminating opportunities to improve even further on the quality of the IOC's anti-doping program for future Games. Therefore recommendations are also made below to help the IOC, future LOCs, the Games-time WADA-accredited laboratory, and WADA to exploit those opportunities.⁵

4. Pre-Games initiatives

Whilst the mission of the WADA IO team normally focuses on the Games period alone, it is important to outline three particular initiatives that the IOC funded prior to the Rio Games that added significantly to the effectiveness of the anti-doping program at the Games.

4.1 The Rio 2016 Anti-Doping Taskforce

In 2014, the IOC formed a Rio 2016 Anti-Doping Taskforce, made up of the Director of the IOC Medical and Scientific Department and the Director of Education and NADO/RADO Relations from WADA, together with two external experts (a former IOC Medical Director and a former WADA Director). The Taskforce visited Rio a number of times prior to the Games, meeting with representatives of Rio 2016 and ABCD to discuss and assess the progress of the anti-doping preparations for the Games, and to make recommendations as to how the preparations could be improved and the program could be strengthened. After each meeting, the Taskforce produced and circulated detailed notes with comments and instructions on the steps that needed to be taken to ensure the program would be delivered successfully as planned.

As mentioned above, the anti-doping department at Rio 2016 had to be completely overhauled approximately one year before the Games, due to the loss of/internal

⁵ The WADA IO Team for Rio also agrees with the recommendations made by its predecessors at the 2012 London Games and 2014 Sochi Games, and commends them again to the IOC to the extent they have not already been actioned. To minimize the reading burden, it does not set all of them out again in this report, but rather refers the reader to the IO reports from those Games.

transfers of existing staff. A new Anti-Doping General Manager was appointed from Brazil, along with a new Anti-Doping Operations Manager recruited from Canada, who had managed the delivery of the anti-doping program for the Pan American Games for the LOC in 2015. Although both are very experienced, the challenges facing them were substantial. The Rio 2016 Anti-Doping Taskforce sought to support and assist them with a number of recommendations. It is unfortunate that not all of those recommendations were implemented, as that would have reduced the scale of many of the problems that later occurred.⁶

In particular, despite the Taskforce making many recommendations to ensure the full integration of ABCD into the anti-doping program at the Rio Games, beyond providing some DCOs for the Rio workforce (Rio 2016 seemed reluctant to use more ABCD DCOs, despite the logistical failings described throughout this report), ABCD was not involved in any way in the delivery of the Rio 2016 program. This is a missed opportunity from a legacy perspective in Brazil. The IOC did sign an agreement with ABCD shortly after the Games started, for ABCD to collect samples from athletes outside of the Athlete Village and competition venues. ABCD appeared to carry out that task efficiently and effectively, which only makes it more disappointing that Rio 2016 did not find a way to increase ABCD's input and involvement in the Games more generally.

IOC recommendations nos. 1-2:

- Rather than implementing another IOC/WADA-type Taskforce for future Games, the IOC should consider the appointment of a full-time, dedicated anti-doping expert, with experience in the delivery of high quality anti-doping programs at major events, who would be responsible for providing the strategic direction for LOCs on the planning and implementation of an effective anti-doping program at future Winter and Summer Olympic Games, in coordination with the NADO and IF programs, including ensuring effective transfer of anti-doping knowledge from the LOC of one Games to the next, so that mistakes can be avoided and good practices can be repeated. This expert would also be responsible for much closer and continued monitoring of a LOC's delivery of the program, ensuring that corrective actions are completed and important milestones are not missed.⁷ The IOC must hold the LOC to account if it fails to deliver important aspects of the strategic plan, in order to prevent it from arriving at the Games with insufficient resources and a compromised anti-doping program, as observed in Rio.
- The IOC should ensure that the NADO of the host country of future Games is fully engaged within the planning, test events and Games-time operation of the anti-doping program, so that expertise is utilized, development

⁶ As just one example, the Rio 2016 Anti-Doping Taskforce recommended that Rio 2016 recruit 30% more chaperones than it believed were required for the Games, to cater for anticipated drop-outs. In the event, Rio 2016 advised that this was not possible due to the additional costs involved, and therefore when chaperone turn-out was even lower than anticipated, Rio 2016 was completely exposed.

⁷ WADA has published Guidelines for Major Events (February 2016), which are intended to provide guidance on the essential criteria, time-lines and resources required to plan and deliver an effective, efficient and well thought-out anti-doping program at a Major Event.

opportunities are maximized, and a strong anti-doping legacy is left behind after the Games. (See further IOC recommendation no. 13, below).

4.2 The Rio 2016 Pre-Games Intelligence Taskforce

Another very significant innovation was the Rio 2016 Pre-Games Intelligence Taskforce “the Taskforce”. In its report after the Sochi Games, the WADA IO Team had recommended that the IOC, in cooperation with WADA, establish a taskforce of independent experts to develop intelligence-based target testing plans in the lead-up to and during the Games. In February 2016 the IOC and WADA signed an Memorandum Of Understanding to set up such a taskforce, whose role was to develop an intelligence-led risk assessment that could identify gaps in testing of higher risk athletes in higher risk sports in the lead-up to the Rio Games, to seek to persuade the relevant IFs and NADOs to fill those gaps, and to pass the outcomes of that exercise to the IOC to inform the TDP for the Games period itself.

WADA appointed a group of six NADOs to the Taskforce – namely, United Kingdom Anti-Doping (UKAD), which acted as secretariat, United States Anti-Doping Agency (USADA), Anti-Doping Denmark (ADD), Japan Anti-Doping Agency (JADA), the Australian Sports Anti-Doping Agency (ASADA), and the South African Institute for Drug-Free Sport (SAIDS) – with WADA providing oversight and access to information.

The Taskforce operated in the period from March 2016 to the opening of the Athletes Village in Rio on 24 July 2016 (when the IOC’s own TDP came into operation). The Taskforce limited its work to ten sports deemed to be of the highest risk and to the athletes in those sports who were considered most likely to place in the top eight positions in Rio (using Gracenote data “Virtual Medal Table”).⁸ The highest risk athletes in that pool were identified based on available information and intelligence, test histories (data that was not in ADAMS was obtained from the relevant IFs and NADOs), athletic performances, and other ISTI criteria. In addition the pre-Rio testing plans of relevant IFs and NADOs were obtained and reviewed to identify potential gaps. This resulted in the identification of a pool of 1,333 athletes who were deemed to warrant Taskforce attention due to either an apparent lack of adequate testing or an absence of information on planned tests.

The relevant IFs and NADOs were then provided with specific recommendations to fill apparent testing gaps for the identified 1,333 athletes (including specific types of testing and analysis, and, where necessary, the suggested addition of athletes to the IF’s or the NADO’s RTP, so that the whereabouts information necessary to conduct the testing would be available).

Of these 1,333 recommendations:

- 39.6% were accepted and actioned in full by the relevant IF/NADO;

⁸ However, full data on all sports (athlete test histories, etc.) were made available to the IOC prior to the opening of the Athletes Village in Rio.

- 22.6% were accepted and actioned in part (e.g., urine samples collected but not blood);
- 33% were not accepted or no response at all was received from the relevant IF/NADO; and
- 4.8% related to athletes who subsequently did not participate in the Games.

The recommendations resulted in fifteen AAFs, distributed across six different sports, twelve different nationalities and were the result of testing conducted by eight different IFs or NADOs. Whilst some of the AAFs may have been a result of an IF or NADO implementing testing based on their own TDP, the outcomes show that the work of the Taskforce was successful in identifying athletes at risk.

Even though the tests were conducted less than two months prior to the Games, eight of the AAFs were for anabolic steroids and two were for GHRPs, potentially indicating that the athletes in question had not expected to be tested and thought they could dope right up to the Games with impunity.

In addition, the IOC funded the Taskforce to conduct 162 Out-of-Competition tests that were focused on the 33 percent of athletes not tested by their IFs/NADOs,⁹ resulting in five AAFs (three for clenbuterol, and two for GHRPs).

In this manner, a number of athletes who were taking performance-enhancing substances in the lead-up to Rio were kept out of the Games.

In addition, in the week prior to the opening of the Athletes Village in Rio on 24 July 2016, the Taskforce delivered to the IOC and Rio 2016:

- (i) a full 2016 test history (number and type of tests) for athletes on the IOC confirmed entrants list at that time (of the 11,470 athletes on this list, 4,125 had no record of any testing in 2016, of which 1,913 were in the ten higher risk sports identified by the Taskforce, which highlights the (in)adequacy of test distribution planning by IFs and NADOs in these sports);
- (ii) 38 pages of specific athlete intelligence and recommendations; and
- (iii) a full log of all tests recommended by the Taskforce and details of the extent to which its recommendations had been actioned by the IF/NADO in question.

This was all enormously valuable intelligence, and greatly assisted the IOC and Rio 2016 in informing and refining the TDP during the Games period.

⁹ This cohort of athletes included ten athletes that were part of the IOC Refugee Team.

IOC recommendation no. 3:

- While the Pre-Games Intelligence Taskforce was a successful initiative, Olympic IFs and NADOs should be undertaking this type of gap analysis and testing themselves in the twelve months leading into the Games. The IOC should consider how best to implement a similar program for future Games, starting no later than twelve months prior to the Games, to ensure the adequacy of the testing being conducted by the Olympic IFs and NADOs in that period. The coordination of such a program (whether or not by a similar Taskforce) could be a further responsibility of the proposed IOC anti-doping expert (see IOC recommendation no. 1).

WADA recommendation no. 1:

- As part of its monitoring role, WADA should note those IFs and NADOs that did not respond to the Pre-Games Intelligence Taskforce requests and recommendations.

4.3 Re-Testing of 2008 and 2012 Samples

Also in the lead-up to the Rio Games, the IOC retrieved from storage 840 samples that had been collected at the 2008 Beijing Games and 403 samples that had been collected at the 2012 London Games, and had them re-analyzed by the WADA-accredited laboratory in Lausanne using improved analytical techniques developed in the intervening period. As of the time of writing this report, that re-analysis had resulted in a reported 98 AAFs (53 from Beijing and 45 from London). The IOC reacted quickly by initiating disciplinary proceedings against the athletes concerned and provisionally suspending them from competition pending resolution of those proceedings.

This swift action by the IOC directly protected the integrity of the Rio Games: 41 athletes whose Beijing and/or London samples re-tested positive were on the original long list for the Rio Games.¹⁰ Furthermore, the IOC's action delivered a strong deterrent message to all athletes leading into the Rio Games, given that the IOC publicized the fact that all Rio samples will be stored for future re-analysis. The IOC should be applauded for this further important pre-Games initiative.

¹⁰ Nine of that 41 were Russian track and field athletes, who in the event would ultimately have been prevented from competing in Rio due to the IAAF's suspension of the Russian Athletics Federation in any case.

WADA recommendation no. 2:

- WADA should remind all ADOs that it is a mandatory requirement of the ISTI that ADOs are required to have a storage and re-analysis strategy as part of the development of their TDP, and should also encourage ADOs to publicize those strategies, in order to maximize the deterrent effect.

IOC recommendation no. 4:

- The IOC should encourage all IFs to have an ISTI-compliant storage and re-analysis strategy for their samples that complements and supports the IOC's own strategy.

5. Test Distribution Planning Before and During the Games

When it comes to test distribution planning for the Games, the WADA IO teams in both London and Sochi strongly recommended that the IOC focus on "quality not quantity". The IOC implemented this recommendation in Rio, developing a TDP for the Rio Games period that moved away from reliance on large amounts of random testing simply to reach a pre-declared total number of tests, and focused on target testing of athletes at the Games based on a genuine assessment of doping risk. The TDP was informed by the anti-doping intelligence and consequent testing suggestions provided by the Pre-Games Intelligence Taskforce noted above, as well as by further information and anti-doping intelligence provided by certain IFs and NADOs in the lead-up to the Games (see below).

Target figures were still included in the TDP, to assist LBCD in its planning for the Games, but those targets were not made public prior to the Games. The plan called for the following number of samples to be collected:

Type of Sample	In-Competition	Out-of-Competition ¹¹	Total
Urine	2,785	1,695	4,480
Blood Serum	60	390	450
Athlete Biological Passport (Blood)	0	450	450 ¹²

¹¹ In its Anti-Doping Rules for Rio, the IOC implemented another recommendation of prior WADA IO Teams by narrowing the definition of the "In-Competition" period. Whereas in previous Games, the IOC had defined the "In-Competition" period as encompassing (for all participating athletes) the entire period for which the Athletes Village was open, in Rio for the first time it changed this to the period commencing twelve hours before a Competition in which the Athlete is scheduled to participate through the end of such Competition and the Sample collection process related to such Competition. As a result, testing of athletes in Rio, including in the Athletes Village, in the days leading up to their competitions counted as Out-of-Competition testing.

¹² These were allocated to test athletes in the ABP pools of the International Federations for Athletics, Cycling, Aquatics, Rowing and Triathlon.

The IOC specified that the top five finishers in every event were to be tested.¹³ However, this was mainly focused on high and medium risk sports, and did not occur at every event. (On some occasions it did not occur due to a lack of sufficient doping control personnel at the venue in question).

The remaining tests were to be conducted on a targeted basis driven by anti-doping intelligence and risk assessment, and focusing in particular on the higher risk athletes identified by the Pre-Games Intelligence Taskforce as well as other athletes identified by IFs and NADOs. The testing of these athletes was to be either Out-of-Competition, i.e. in the Athletes Village prior to an athlete's event, or In-Competition, i.e., at the competition venue immediately after the event.

The IOC and WADA communicated with all IFs and NADOs leading up to the Games, and set up a specific email address to receive testing requests from IFs and NADOs, as well as other intelligence or tips offs received from WADA's Report Doping "tip-off" function on the WADA website. Approximately 37 emails and/or tips were received by this latter route, including information from IFs and NADOs recommending tests of particular athletes or advising that certain tests had been completed prior to an athlete's arrival in Rio. These emails and/or tips were provided by WADA to the IOC and Rio 2016 and were incorporated into the TDP where applicable.

Furthermore, and just as importantly, the TDP was refined and updated throughout the Games period based on further intelligence obtained, including athlete whereabouts anomalies, and (as detailed further below) atypical and suspicious analytical findings reported by LBCD, as well as APMU requests for follow-up testing in reaction to ATPFs.¹⁴

To assist in assimilating this information into the TDP on an ongoing basis, so that the mission orders issued each night for testing the next day would include targeted selections based on the most up-to-date intelligence, Rio 2016 asked several NADOs to consider seconding their anti-doping testing managers to work in the Rio 2016 test planning department under the direction of the Rio 2016 Anti-Doping Operations Manager. The NADOs of Canada, China, Ireland, Japan, and South Africa supported this request, and the dedication and expertise of the staff members that they provided was key to the planning and administration of the daily testing program in Rio. Whilst this was a sensible pre-emptive move given the challenges that Rio 2016 faced in this area, the WADA IO Team felt it was a further lost opportunity that there were no ABCD representatives working within this team.

¹³ This would ensure that if an athlete who medaled subsequently lost that medal due to an AAF upon future re-testing of his or her sample, then the Rio sample of the athlete who stood to inherit that medal could also be re-tested before any re-allocation was done.

¹⁴ A mechanism was also established for Brazilian customs authorities and other law enforcement agencies to pass on any relevant information or intelligence to the IOC, via ABCD. The WADA IO Team is not aware of any information or intelligence that was received by the IOC or Rio 2016 via this channel, but such a mechanism and development of relationships with these authorities will hopefully act as a legacy for future partnerships with ABCD.

The logistical failings discussed below meant that not all of the planned target testing could be completed.¹⁵ However, the IOC and Rio 2016 are to be congratulated for the intelligence-led approach to test distribution planning in Rio.

On the other hand, there were other aspects of the Rio TDP that the WADA IO Team found surprising. For example, there was no Out-of-Competition testing conducted in football, and limited testing for ESAs in urine samples collected In-Competition, in particular for endurance disciplines in swimming, cycling and athletics. In addition, there was little or no In-Competition blood testing in many high risk sports and disciplines, including weightlifting. The WADA IO Team noted that some IF delegates and even athletes and athlete support personnel were surprised that only urine samples and not blood samples were being collected In-Competition. This was no doubt impacted by the lack of BCOs recruited by Rio 2016 (see further below), but it was a waste of the significant analytical capacity available at LBCD (not to mention the presence of leading scientific experts) not to conduct the maximum possible number of analyses for ESAs, GH and other prohibited substances, targeted on high risk sports and countries.

IOC recommendations nos. 5-10:

- The advances in test distribution planning based on intelligence-led risk assessment that were demonstrated in Rio should be consolidated and expanded upon for future Games. In particular, the TDP both for the lead-up to and during the Games should continue to be based on a thorough risk assessment, including a doping evaluation of sports and countries (developed with ADO partners) based on ADAMS data and performance data, as well as the testing plans and intelligence provided by the relevant IFs and NADOs (which could be provided through a dedicated email address). Samples collected should be analyzed not just for standard menu substances but also for additional substances based on the TDSSA and on intelligence received.
- The Pre-Games Intelligence Taskforce should start its work at least one year before the Games, so that there is sufficient time for all relevant data to be collected and analyzed, and for the resulting testing recommendations to be implemented in full. Representatives of the LOC and/or the NADO responsible for doping control at the Games should be involved in the work of the Pre-Games Intelligence Taskforce from the beginning.
- The IOC should ask the relevant IFs and NADOs to action the testing recommendations developed by the Pre-Games Taskforce for the pre-Games period. Those testing recommendations should be updated on an ongoing basis up to and during the Games, taking into account intelligence received from various sources, including in particular, information from the laboratory and APMUs regarding suspicious and atypical results that warrant follow-up testing. A failure by an IF or NADO to implement the testing recommendations during the Pre-Games period should be reported by the Pre-Games Taskforce

¹⁵ Rio 2016's informal estimate was that most (90 percent) of the highest risk athletes had been tested at least once, but most of the next tier of athletes, also of perceived material risk of doping, who may not have made a final but may have made the semi-finals, were missed.

to the IOC and to WADA. WADA should consider such information as part of its broader compliance and monitoring program.

- One or more members of the Pre-Games Intelligence Taskforce should be present at the Games to carry through this work, ensuring appropriate knowledge transfer and assisting the IOC and the LOC in making appropriate amendments to the Games period TDP to take account of emerging intelligence.
- In developing the TDP, the IOC and LOC should work closely with the laboratory to be used during the Games, to capitalize fully on the rare opportunity of having a well-resourced and equipped laboratory and many of the world's leading analytical scientists at its disposal. Matching the TDP with the laboratory capability and capacity should be a priority for future Games.
- Where a targeted athlete is ultimately not tested at the Games, or his/her Games period test results are suspicious, the IOC should provide full details to the relevant IF/NADO and WADA, so that they can follow up with further testing of the athlete after the Games as appropriate.

6. Sample Collection

As noted above, the TDP for the Games period anticipated the collection and analysis of 4,480 urine samples, 450 blood samples, and 450 ABP blood samples.

6.1 Testing Outside of Olympic-Accredited Venues

The IOC commissioned SportAccord's Doping Free Sport Unit (DFSU) to organize Out-of-Competition tests on its behalf during the Games period outside of Olympic accredited venues. This resulted in a total of 218 athletes being tested both inside and outside of Brazil,¹⁶ using 16 different sample collection authorities.

In addition, the IOC contracted directly with ABCD, which tested 75 athletes training or residing in Brazil during the Games period, some at the request of DFSU (included in the DFSU numbers mentioned above) and some at the request of Rio 2016.

In several cases, these tests were commissioned in response to intelligence obtained at or during the Games, and/or in order to pick up athletes that should have been tested but were not while they were at the Games. This aspect of the anti-doping program greatly improved the coverage offered by the TDP, functioned very efficiently, and led to two AAFs (one as part of DFSU testing and one from testing conducted by ABCD).

IOC recommendation no. 11:

- For future Games, the IOC should incorporate a similar mechanism in the TDPs for the conduct of intelligence-based testing both outside the host country and within the host country but outside the official venues during the

¹⁶ The testing inside Brazil by ABCD and other sample collection authorities on behalf of DFSU was conducted outside of Olympic-accredited venues. Rio 2016 conducted all testing at Olympic-accredited venues in Brazil.

Games period. This mechanism should be capable of conducting a greater proportion of the testing contemplated in the TDP, over a longer pre-Games period, and responding quickly to requests for further testing prompted by intelligence obtained during the Games.

6.2 Testing at Olympic Accredited Venues in Brazil – Logistical Failings

The issues outlined in the Executive Summary above led to the following serious logistical failings in the sample collection process at official venues in Brazil:

a) *Lack of sufficient and properly trained doping control personnel:*

- Chaperones:

The WADA IO Team was advised that originally 453 chaperones were recruited as part of the Rio 2016 anti-doping program and that approximately ten chaperone training sessions were held in Rio de Janeiro and Sao Paulo. However, attendance at those training sessions was not mandatory, and in any event these sessions did not involve the necessary role-play training, allowing chaperones to practice notifying mock athletes and completing the notification section of the doping control form. Nor did it involve any practical assessment.

When the Games period arrived, on many occasions test missions were compromised because a significant number of the chaperones scheduled to attend the mission (on several occasions, more than 50 percent of those expected) failed to turn up, or turned up very late. This meant there were often not enough chaperones to notify and chaperone the athletes who were to be tested, and/or there were not enough chaperones of the same gender as the athletes who were to be tested (there needs to be a gender match, in case the athlete needs to be accompanied into the changing room, for example). On several occasions volunteers with other duties at the venue had to be drafted in at the last minute in order to fill the gaps (although they had no experience or training to do so); on other occasions, the DCOs had to fill in, or else some of the planned testing had to be abandoned.

Furthermore, on many occasions those chaperones that did arrive were generally entirely new to the role and had received little to no adequate training or other preparation; and often spoke little or no English. Where there was no CTL allocated or present at the DCS (as was often the case), this meant the international DCS Manager or a DCO had to provide a brief and impromptu training session, which was conducted in English. However, in most cases there was not enough time for the chaperone to understand fully the requirements of the role, including how to complete the notification section of the doping control form, and the rights and responsibilities of the athlete following their notification for doping control. As a result, on many occasions the DCOs had to supervise the notification and chaperoning procedures closely, or (often) conduct the notification and chaperoning themselves.

Where such supervision or substitution was not possible, chaperones often accomplished notification of athletes by means of “verbal contact” alone, with notification of rights and responsibilities (which is acknowledged by the athlete’s signature in the notification section of the doping control form) often happening only once the athlete arrived at the DCS. In addition, as a result of their lack of experience and training, on occasion chaperones did not maintain direct view of the athlete at all times between notification for testing and arrival at the DCS. Ultimately this did not have any material adverse impact (in each case, the athlete understood he/she had been selected for doping control, and did ultimately report to the DCS, having been accompanied by the chaperone in the interim), but if any of the athletes had refused or failed to report for testing, then the lack of proper notification procedure may well have compromised the ability to bring an Article 2.3 ADRV case.¹⁷

LOC recommendation no. 1:

- Untrained and inexperienced chaperones should not be working at the Games. It undermines respect and trust among athletes in the anti-doping program, and provides opportunities for experienced and unscrupulous athletes who would want to abuse the system to manipulate the doping control process. Chaperones must be identified early in the selection process, trained appropriately, and given adequate opportunity to practise their role in advance of the Games, e.g. by undergoing scenario-based role play activities with experienced training staff, and by attending test events. They should also be given appropriate written training materials to guide them in the key aspects of their roles.

- Doping Control Officers (DCOs):

It appears that the rigorous DCO recruitment, training and assessment procedures that were followed for the Vancouver and London Games were not followed for Rio. The reasons for this omission are not clear.

- Rio 2016 deployed a total of 186 DCOs, 128 of whom were sourced from international ADOs and the remaining 58 from Brazil (38 of them from ABCD). Rio 2016 paid for the international DCOs' flights and accommodation, and paid them US \$100 a day.
- Initially, Rio 2016 planned to hold DCO training workshops for all DCOs in the months prior to the Games, but this was cancelled due to budget cuts. Instead several DCO briefings were held in the Village DCS as and when DCOs arrived in Rio. WADA IO Team members attended one of the DCO briefings,

¹⁷ The WADA IO Team identified this issue at an early stage and suggested corrective action, namely that a multi-language step-by-step guide for athlete notifications that had been used at a previous major event and that Rio 2016 had available in electronic form should be printed and distributed to each DCS, so that the DCS Managers could use them to educate and guide the chaperones working at the DCS, and the chaperones could use them to help advise notified athletes of their rights and responsibilities. Disappointingly, however, the IOC and Rio 2016 were not able to carry out this corrective action in a timely fashion, reportedly due to a number of apparently insuperable logistical problems.

which lasted approximately 45 minutes. The training provided an overview of the Rio 2016 staffing structure, the doping control form being used in Rio, the process for measuring specific gravity, and the partial sample procedure to be followed. However, the briefing was delivered in English, and it was apparent that many of the DCOs present were not fluent in English and could not follow the session. In addition, there was no practical assessment of any of the DCOs, and all international DCOs were assumed to be at the same level of experience and expertise.

- There were also DCO workshops held for Brazilian DCOs in both Sao Paulo and Rio, which were delivered in Portuguese. The WADA IO Team asked Rio 2016 for a copy of the workshop program, but did not receive it, and so cannot assess whether it was fit for purpose.
- In addition, the Rio 2016 anti-doping manual and technical procedures document were only distributed to the DCOs just before the Games. Several DCOs reported that they never received the procedures document at all.
- As a result, and as was apparent from observation of sample collection sessions, some of the DCOs were not sufficiently familiar with basic sample collection procedures (in particular, the ABP sample collection procedure),¹⁸ and/or had not been given adequate training in the parts of the sample collection process that were different in Rio from what they are used to (e.g., a slightly different doping control form; a different partial sample kit and procedure; different data-loggers for use with ABP samples). This lack of familiarity/training was the most obvious explanation for the larger than average number of “non-conformities” reported by LBCD upon inspection of samples arriving at the laboratory.¹⁹

IOC recommendation no. 12:

- The IOC should review the guidance it provides to the LOC on DCO recruitment and training, to ensure it is fit for purpose, and should police the LOC's efforts in this area to ensure that the DCOs recruited for the Games are sufficient in number and have sufficient experience and training to carry out all of the tests contemplated in the TDP with a proper degree of assurance.

¹⁸ On several occasions, WADA IO Team members had to recommend that particular DCOs not be permitted to carry out particular procedures without direct supervision or re-training. The extent to which those recommendations were implemented was not clear.

¹⁹ The WADA IO Team was advised that LBCD reported non-conformities in about 30 percent of the samples received, compared to a rate of about 10 percent at the 2012 Games in London. Recurring issues included (i) samples arriving without accompanying paperwork (which only arrived later); (ii) paperwork arriving without samples (which only arrived later); (iii) samples arriving with inadequate paperwork (e.g., wrong discipline, no athlete gender or age recorded); (iv) ABP samples arriving with the data-logger not turned on; (v) blood tubes containing an insufficient volume of blood; and (vi) blood collected in the wrong blood tubes. This created an excessive administrative burden for LBCD to report and for Rio 2016 to rectify these non-conformities on a daily basis; and the time taken to identify, report and address these non-conformities obviously extended (sometimes significantly) the reporting time for the results of analysis of the samples in question.

LOC recommendations nos. 2-3:

- Not all LOCs will have the resources to bring international DCOs to the host country in advance of the Games to receive training and be assessed, but the same goal can be achieved through measures such as online training sessions, webinars, in-depth training and assessment programs upon arrival, and follow-up/re-training programs where issues are identified.
- The LOC should establish strong communication links with international DCOs in advance of their arrival in the host country for the Games, including providing copies of the anti-doping manual and any technical procedures, and providing full information about hotel arrangements and the venue(s)/sport(s) where they will be working at the Games.

- Blood Collection Officers (BCOs):

Originally Rio 2016 had planned to source 25 phlebotomists from a local company in Brazil to collect blood samples during the Games period. However, that contract fell through just before the Games, and there was not enough time to start negotiations with a new supplier. As a result, there were only ten BCOs in the entire doping control workforce in Rio. Approximately half of those BCOs were also DCOs, but even when they were able to fulfil their BCO role (which was not often possible, due to the many other gaps they were forced to cover as DCOs), there was still an insufficient number of BCOs to support all of the blood testing required. For example, on one day at the Athletes Village DCS, only two BCOs were present to conduct 94 scheduled blood tests, which meant athletes had to wait for an unreasonably long time after they had provided urine samples for a BCO to become available to take their blood samples. On another occasion, there was no BCO at all at the Village DCS, and therefore all blood testing planned for that day had to be abandoned, even though the athletes in question had been notified and brought to the DCS. In addition, while some of the BCOs were highly experienced and proficient, others were not, leading on occasion to athlete distress/aborted tests.

LOC recommendation no. 4:

- An adequate number of experienced BCOs who are preferably phlebotomists or nurses who draw blood regularly as part of their normal employment should be appointed well in advance of the Games to collect the blood samples contemplated in the Games TDP. They should receive specific training in advance of the Games on the procedural rules relating to collection of blood samples during the Games.

b) *Inadequate planning/rostering of doping control personnel:*

- The Rio 2016 anti-doping logistics team was responsible for organizing the daily roster so that there were enough DCOs (including a DCS Manager and a deputy) and chaperones (including a CTL) at each venue to carry out the number of tests included in the TDP for that venue on that day. However, for reasons that were never very clear, rosters were often communicated in fairly chaotic fashion, and

often very late in the day prior to the next day, and sometimes changes were made to the rosters but not communicated properly or in a timely fashion to the test scheduling team. In addition, daily mission orders went out from the test scheduling team late the night before the mission in question, and in some cases only hours before a morning mission.²⁰ As a result, DCOs and chaperones often did not know where they were supposed to go, or when, resulting in a number of no shows or late arrivals. In addition, the DCS Managers did not know until very late how many DCOs and chaperones were assigned to the mission, making it impossible to do any forward planning.

- DCOs (including some DCS Managers) and chaperones were often moved around from one venue to another on a daily or near-daily basis. This meant it was difficult to build up team spirit and familiarity within a venue/sport. It also meant people had to find their way to a new venue each day, overcoming transport difficulties and often poor location/directional signage for the DCS, which may have contributed to the high chaperone attrition rate. In cases where chaperones were allocated to the same venue over a longer period of time, it was noticeable that they became much more comfortable with their roles and satisfied to be part of a team, and therefore much more likely to return for duty the next day.
- The “cluster managers” looking after competition venues diverted resources at times (especially DCOs and BCOs) from the Athletes Village DCS to fill some of the gaps in personnel at their venues. In addition, the DCOs themselves set up their own “WhatsApp” mobile phone messaging network to communicate among themselves to manage the staffing gaps and try to ensure they had enough personnel to carry out their mission orders (in many cases DCOs often helped out on days when they were supposed to be off duty). Despite these efforts, however, on many occasions a lack of sufficient personnel meant that several of the tests specified in the mission order could not be carried out (in such cases, it was the target tests that were sacrificed, and the testing of the top five finishers that was given priority²¹).
- In addition, there were several occasions when there was no or only one DCO of the same gender as the athletes being tested, and therefore an (untrained) chaperone had to witness the athlete passing his/her urine sample, which is obviously far from ideal. In addition, it was reported to the WADA IO Team that a chaperone who had witnessed the passing of a sample by an athlete was seen walking through the DCS waiting room holding the athlete’s sample while looking for the DCS Manager to advise what to do next (a clear departure from the mandatory procedures set out in the ISTI).
- A number of the football venues outside of Rio also encountered staffing problems, which led on at least one occasion to the appointed FIFA technical

²⁰ On one occasion of which the WADA IO Team is aware, the mission order arrived during the actual competition that was to be controlled.

²¹ Although on at least one occasion the WADA IO Team observed that planned testing of third and fourth place finishers at an event had to be omitted due to lack of staff.

officials stepping in and acting as DCOs to ensure the tests called for in the mission order were conducted.²² This was a solution in these extreme circumstances, but the LOC should ensure it does not occur at future Games to avoid the perceived conflict of interest.

- When these various problems were raised at the daily meetings, ABCD advised that it had further DCOs ready and available to join the Rio 2016 doping control workforce. The IOC gave a direct instruction to the Rio 2016 General Manager to accredit those additional ABCD DCOs as soon as possible so they could provide much needed support. This instruction was acknowledged and accepted by the Rio 2016 General Manager but then not actioned. After a week of delay, Rio 2016 advised that this additional resource would not be pursued because of (among other things), difficulties in getting new accreditations, lack of access to uniforms, and lack of time for training. This was very disappointing.

IOC recommendations nos. 13-14:

- Where there is a competent NADO with a record of Code compliance in the host nation, the IOC should require the LOC to contract with the NADO to deliver all anti-doping services at the Games, including recruiting experienced international DCOs from a range of countries and with a range of language skills to supplement its own DCO workforce.
- The IOC should encourage all future LOCs to pay DCOs and treat them on a par with Technical Officials, because (as Rio has shown) their commitment and goodwill is absolutely vital to the success of the Games anti-doping program.

LOC recommendation nos. 5-6:

- Rosters should be organized well in advance and subsequent changes kept to a minimum. Mission orders should be forwarded to the DCS Manager at least 24 hours in advance of the mission, allowing sufficient time for him or her to prepare the mission. Where necessary, a supplementary mission order with additional tests based on recently received intelligence etc. could be forwarded to the DCS Manager, preferably no later than 12 hours before the mission.
- A paperless system should be put in place as a priority for the communication of mission orders to the DCS Manager, in order to reduce the risk of the DCS Manager transposing the types of analysis specified in the mission order inaccurately on the chain of custody form sent to the laboratory with the samples collected in the mission (as happened on occasion in Rio).

²² FIFA technical officials are doctors who are familiar with the sample collection process and who are appointed to collect samples on behalf of FIFA at FIFA-sanctioned events.

c) *Lack of management of the Village DCS:*

- Although generally speaking experienced DCS Managers and CTLs with knowledge of the sport were assigned to work at competition venues, initially there was no permanent DCS Manager or CTL assigned to the DCS at the Athletes Village. This was only fixed for the last week of the Games when (following the intervention of the IOC/WADA IO Team), experienced DCS Managers who had been working at venues where the competitions had now finished were then assigned to shifts at the Village DCS.
- The lack of DCS Managers/CTLs permanently assigned to the Village DCS undoubtedly contributed to the difficulties experienced with testing at this important site. In particular, it meant that when the cluster managers took away DCOs/BCOs assigned to the Village DCS to fill staffing gaps at competition venues, there was no one ensuring that sufficient DCOs/BCOs remained at the Village DCS to conduct the testing planned there. It also meant there was no one focused on replacing chaperone no shows/late shows (e.g., by finding and drafting in volunteers who had been assigned to other duties in the Village). The lack of chaperones caused even greater problems in the Village DCS than in other venues, since well-trained and resourceful chaperones are required to go out into the Village and find the required athletes for testing based on often limited whereabouts information (see further below).
- There were two staff shifts per day at the Village DCS, but the schedule did not allow for a proper handover between the DCS Managers, the assistant DCS Managers and the CTLs on the different shifts. As a result, on a number of occasions the WADA IO Team observed that there was no debrief and very limited passing of information between shifts, both as to general operations and specifically as to athletes that had not been found for testing in the first shift. This led to chaperones working on the second shift approaching the same team delegations and asking the same questions as to the whereabouts of athletes as the first shift of chaperones had asked. These and other problems resulted in several complaints from NOCs being received by Rio 2016 and the IOC about the way testing was being conducted in the Village.
- These were the main reasons why the daily targets for Out-of-Competition testing in the Village were rarely met. In fact, often only 50 percent or less of these planned tests were carried out.

LOC recommendations nos. 7-9:

- Specific DCS Managers, assistant DCS Managers and CTLs should be allocated to each DCS for the entire period of the event in question and to the Athletes Village for the entire Games period. Ideally, a team of DCOs/BCOs and chaperones sufficient to cover all of the testing planned for that DCS should also be allocated.
- Where more than one shift is required at a DCS, particularly the Village DCS, the schedule should allow time for a proper briefing from one shift team to the

next, to ensure the subsequent shift is well informed of all issues encountered during the first shift and of follow-up actions required.

- The role of DCS Manager should be a priority for the LOC. Identifying suitable candidates with sufficient anti-doping experience and sport-specific background is critical. DCS Managers should be integrated into the venue management team in advance of the Games (including participating in any test event) and should be equipped with the appropriate equipment, resources and doping control personnel to ensure that they can meet the TDP requirements.

d) *No access to press areas for chaperones:*

The accreditations given to chaperones and DCOs omitted access to press areas, which hindered their ability to chaperone athletes selected for doping control as they passed through mixed zones and press conferences. In some venues, the DCS Managers were able to achieve *ad hoc* agreements with venue management to gain access to the press areas although this did not always filter down to the persons controlling access to these areas.

LOC recommendation no. 10:

- The LOC must ensure that all Doping Control personnel have access to press areas displayed clearly on their accreditation documents, and venue management should be briefed to facilitate such access for athlete chaperoning purposes.

e) *Insufficient IT equipment in DCSs:*

- WADA IO Team members observed several instances where there was inadequate and/or non-functioning technical equipment (computer, printer, shredder, etc.) at a DCS. This meant that mission orders could only be received by phone/tablet, and could not be printed, while paperwork containing sensitive information could not be shredded after use. DCS Managers had to have access to Wi-Fi to download emails containing the mission orders on their personal phones, which was sometimes a challenge.
- Even where there were computers, not enough log-in accounts had been assigned to the Rio 2016 doping control workforce and so the DCS Manager could not use the computers properly, e.g., to access ADAMS or the IOC's sport information system.

LOC recommendation no. 11:

- The LOC must ensure that suitable IT equipment is in place to enable Doping Control personnel to undertake their work efficiently. This includes ensuring that each DCS has ready access to the Internet, to ADAMS and the IOC sports information system.

f) *Insufficient doping control equipment in DCSs:*

- DCS Managers who visited their scheduled venues prior to the start of competition often found that no anti-doping equipment had been delivered to the DCS by the Rio 2016 logistics department. On such occasions, the cluster manager for the relevant venue had to go to the warehouse and distribute the equipment him/herself the day before competition started.
- Where the DCS Manager did not visit the venue in advance, sometimes the equipment issues were not resolved in advance. As a result, WADA IO Team members observed instances of insufficient equipment at a DCS to carry out the testing planned for that day, forcing the DCS Manager to improvise and find a solution. On one occasion, there were no clipboards and no refractometers at a DCS when the chaperones went out to notify the athletes who had been selected for testing (fortunately, some refractometers arrived shortly before the athletes arrived to the station). On another occasion, at the start of a session there were only seven doping control forms at a station, with many more tests planned for that day (once again, more forms arrived just in time for the testing). In at least two venues, there were no sharps bins to dispose of syringes after blood testing.
- As a result of the late distribution of doping control equipment to the venues in the cities outside of Rio where some of the football matches were staged, planned testing was not carried out at some of the early football matches.
- In addition, no means were provided to secure the doping control forms at the competition venues before giving them to the courier to drop off at the Doping Control Command Center. As a stopgap measure, the DCS Manager was instructed to put the forms in a partial sample bag and to seal the bag prior to giving it to the courier. This worked well until Rio 2016 started to run short of partial sample bags.
- ISTI Article D.4.7 states that the DCO should ensure that an athlete providing a urine sample either washes his/her hands prior to sample provision or wears suitable (e.g., latex) gloves during sample provision. One athlete commented to a WADA IO Team member that she preferred to wear gloves for the provision of the sample rather than wash her hands. She was tested twice during the Games. The first test was in the Athletes Village where the DCO did not initially have gloves available but was able to locate some in the DCS; the second test occurred at a competition venue where there were no gloves available in the DCS.
- The WADA IO Team also endorses the recommendation made by previous IO teams that anti-doping educational material/videos and posters should be available for athletes in the DCS waiting room, since that is an opportune time when the athletes may be particularly interested in obtaining such information. In Rio, there was a poster in one or two of the DCSs, but nothing else. In the circumstances, however, this was the least of Rio's problems.
- Finally, translation services were not available at some venues (or the process for obtaining a translator was unknown), making the sample collection process difficult for many athletes where the DCO spoke only Portuguese.

LOC recommendations nos. 12-15:

- At least five days before the first day of testing planned for a venue, the LOC should ensure that sufficient doping control equipment for all of the testing planned at that venue is transferred from storage to the DCS at the venue, and stored securely there within a locked cabinet.
 - The DCS Manager assigned to the competition venue should visit the venue one or two days before the first day of planned testing, and should check the stock of doping control equipment to ensure it is sufficient. He/she should then monitor the stock of equipment as testing progresses, and ensure it is replenished as required.
 - Educational and information materials should be made available within the DCS for the use of athletes and athlete support personnel.
 - In accordance with the requirements of the ISTI, a secure system must be put in place for the transport of doping control paperwork from the DCS to the Doping Control Command Center/laboratory.
- The doping control forms used in Rio included the usual multiple carbon copies (for the laboratory, for the athlete, etc.). Due to difficulties finding a printing company in Rio who could print such copies, these forms were only printed a few days before the opening of the Athletes Village which did not allow time for inspection and correction of any issues. When the forms were received from the printer, it was found that, when held up to the light, it was possible to see athlete details on the laboratory copy of the doping control form. Rio 2016 therefore issued an instruction to the DCS Managers to cut the top and bottom parts off the laboratory copy of each doping control form before sending them to the laboratory. In addition, the title of the box for declaration of medications and supplements used in the previous seven days only mentioned medications which was potentially misleading; while one athlete mentioned that this section was not large enough to record all of her information relating to medications and supplements taken in the previous seven days.
 - The Berlinger sample collection kits used in Rio came with the usual set of bar code stickers bearing the unique sample code numbers for each kit to be stuck onto the doping control form and the chain of custody form. The WADA IO Team in Sochi Games reported that the stickers could be peeled off the forms with ease. In Rio, however, the glue on the stickers was much stronger and could not be peeled off the form without ripping the paper. As a fail-safe measure, the sample number was still handwritten onto the form, and the bar code sticker was stuck over it.

WADA recommendation nos. 3-4:

- WADA should expedite the development of a paperless doping control form for future Games. This will avoid practical issues in the production of paper forms, and automatically identify any errors or omissions made in filling out the forms during the sample collection section, so that the necessary corrections are made with the athlete prior to the completion of the session, thereby

reducing the number of non-conformities that have to be addressed once the forms reach the laboratory. In addition, the documentation can then be transmitted to the laboratory electronically.

- Ideally, it should be possible by scanning the bar code on the athlete's accreditation to populate automatically many sections of the doping control form including name, country, gender, date of birth, sport and discipline. This could also include medications and supplements, which could potentially be pre-completed by the athlete within ADAMS.

g) *Transport of Doping Control Personnel:*

- Arrangements for transporting doping control personnel to and from venues were often inadequate, or even non-existent. Given the remoteness of some of the venues/the location of the DCS at those venues, this was again negligent on the part of Rio 2016. It was originally planned that Rio 2016 would provide such transport but that provision was removed when budgets were cut.
- The Rio 2016 Anti-Doping General Manager found resources to hire four people vans (one for each cluster group) to take international DCOs and DCS Managers to their venues and back to their hotels at night based on a set schedule. Those needing to travel outside of the scheduled times had to take public transport. This worked well on some occasions but not on others. On one occasion, the DCO van was scheduled to leave a venue before the courier had arrived to pick up the samples, so the DCS Manager sent the other DCOs back to their hotel with the van and waited at the venue on his own for the courier. By the time the courier had arrived, there was no means of getting back to the hotel and the DCS Manager was forced to sleep in the DCS overnight.
- These transportation issues undoubtedly contributed to the high attrition rate amongst chaperones and to the early departure of a handful of international DCOs.

LOC recommendation no. 16:

- As doping control is one of the last operations to finish at competition venues, it is critical that all doping control staff have access to some form of transport either back to their hotel (for international DCOs) or to a central transport hub that is in operation in the early hours of the morning (for all other staff).

h) *Insufficient meal vouchers for chaperones*

The failure to provide chaperones with sufficient meal tickets to allow them to have adequate meals for the often long shifts (and then long journeys home) they were being asked to undertake, also contributed to the high attrition rate of chaperones. These issues were eventually remedied in the last week of the Games thanks to the efforts of the Rio 2016 Anti-Doping General Manager, but they could and should have been avoided in the first place by adequate planning and preparation.

LOC recommendation no. 17:

- The LOC must ensure that all doping control personnel have access to a sufficient number of meals during their shifts.

i) *Lack of adequate liaison with IF delegates, venue managers, competition managers:*

At previous Games, the IOC entered into anti-doping agreements with each IF, setting out the testing to be conducted at the IF's event(s) at the Games, as well as procedures for selection of athletes, arrangements for chaperone/IO access to field of play, special testing procedures, etc. Previous WADA IO Teams have recommended that the IF not be advised of the details (timing, number, etc.) of tests to be conducted in its events at the Games. Whether in response to this or otherwise, the IOC did not enter into anti-doping agreements at all with the IFs for Rio. Meanwhile, while some IF representatives reported that there was good cooperation with Rio 2016 regarding the testing process, others said they had received no individual contact.

As a result, many of the IF delegates present at the venues in Rio were largely unaware of the process that the IOC was using to select athletes for testing (again, top five finishers as standard, with all other tests targeted based on intelligence²³). In addition, the specific desires of the IFs to limit access to field of play had not been discussed and resolved in advance with the Rio 2016 anti-doping team, which caused issues in terms of chaperones being given access as required for purposes of athlete notification in certain sports (including football and gymnastics).

In addition, there had only been limited discussion with some of the IFs concerning their particular practices in relation to doping control (e.g., in relation to athletes taking showers before reporting to the DCS; special testing arrangements for athletes who achieved world records).

One IF delegate was so upset with the perceived lack of collaboration that he effectively withdrew all cooperation with the doping control personnel working at his IF's event, which obviously made the work of the doping control personnel at that event much more difficult.

IOC recommendation no. 15:

- The IOC should agree to a written anti-doping protocol with each IF in advance of the Games. The protocol should not disclose the intended amount or timing of testing at the IF's event(s) at the Games, but should specify who the IF technical delegate will be, and his/her anti-doping roles and responsibilities, as well as selection draw requirements and materials (for

²³ In team sports where the mission order specified that the athletes to be tested should be selected by random draw, it generally did not specify the procedure to be followed in conducting the draw. In such cases, in the absence of an IOC-IF agreement setting out the details of the draw procedure, if there was no IF delegate around, the DCS Manager simply had to decide for him/herself what to do. For example, at the Canoe double slalom event, the DCS Manager decided simply to test whichever athlete got out of the canoe first. On another occasion, at the Artistic Gymnastics event, the DCS Manager performed a random selection of one athlete per competing team using a mobile phone "random selection" app.

team sports), any protocols for testing athletes who achieve record performances, any additional accreditation requirements for access to the field of play, any sport-specific anti-doping procedures, and (as suggested by the WADA IO Team in Sochi) an agreed procedure for how information and intelligence held by the IF (such as ABP data) can be accessed by, and shared with the IOC and how the IF can request target tests during the Games based on intelligence the IF may have received from its own sources/experts. The details relating to doping control procedures should then be included in the information provided to the DCS Managers working with that sport at the Games, to help them understand the sport's specific requirements and to ensure the testing procedure runs smoothly.

There was insufficient liaison by Rio 2016 anti-doping staff with venue managers and competition managers in advance of their events to discuss and agree upon the "post-event sequence" to be followed in notifying and chaperoning athletes after they have completed their participation in the event. At the 2012 London Games, a uniform practice was established in which the chaperones would notify the athletes before they went into the mixed zone for media interviews, but that was not carried over to Rio. Instead, it was left to each DCS Manager and/or CTL to seek out the IF delegate (if present), the venue manager, and/or the competition manager to try to come to a mutually acceptable arrangement. In many cases, all parties worked together efficiently and effectively (this was greatly facilitated where the DCS Manager or CTL had prior experience with the sport) and pragmatic solutions were agreed (even if they varied from venue to venue). In other cases, however, one or more party was less helpful and cooperative (or absent entirely), which added greatly to the difficulties that the DCS Manager had to overcome.²⁴

LOC recommendation no. 18:

- The LOC should agree with the competition manager and venue manager and (where possible) the IF technical delegate, prior to the Games on expected movements of athletes post-event and the most effective location and time for notification of athletes for doping control to take place.

IOC recommendation no. 16:

- The IOC has a catalogue of documents, venue maps, videos and reports from prior Games, which should be made available to future LOCs so that they do not need to re-invent the wheel. It should be the responsibility of the IOC's anti-doping expert suggested above (see IOC recommendation no. 1) to

²⁴ In one case observed by a WADA IO Team member, the IF delegate insisted that notification of athletes had to be delayed until after the medal ceremony and that it must take place at a particular spot, which he 'guaranteed' the athletes would have to come back to after the medal ceremony. In fact, the athletes exited at another spot and into a crowd of spectators. The WADA IO Team member present was forced to monitor one of the athletes briefly until the CTL was able to find and re-direct the chaperone who was waiting for that athlete at the place insisted upon by the IF delegate.

ensure an effective transfer and retention of this knowledge from one LOC to the next.

j) *Lack of adequate whereabouts information:*

Out-of-Competition testing is only possible if the athlete's whereabouts are known. As in previous Games, this was a major problem area for the IOC and Rio 2016 at the Rio Games. Several previous WADA IO Teams have made recommendations to try to address this problem but the IOC, for one reason or another, has not yet been able to find an effective and comprehensive solution. Nevertheless, it is a crucial component of a successful Games anti-doping program and cannot be neglected.

If an athlete at the Games was in an IF's or a NADO's RTP,²⁵ the Rio 2016 test planning staff were able to access his/her whereabouts information via ADAMS, and include that information in the mission order.²⁶ Often, however, the athlete simply put "Athlete Village" as his/her location without specifying the apartment block or room number where he/she was staying. To the extent this made it impossible to locate the athlete for testing, depending on the precise circumstances it could have been pursued either as a Filing Failure or as a Missed Test (as those terms are defined in the ISTI). Alternatively warnings could have been issued to prompt immediate corrective action by the athlete in order to avoid a Filing Failure. However, no pre-planning had been done to liaise with the IF or NADO with results management authority over such failures, to ensure that warnings could be issued or other timely corrective action taken to ensure timely provision of the required information.

To cater for the fact that the majority of athletes were not in an RTP, the IOC asked NOCs to provide room lists for their athletes staying in the Athletes Village and to update those lists as necessary if athletes changed rooms (which happened very often). NOCs were also asked to provide whereabouts information for athletes staying outside the Village. However, there was no sanction if a NOC failed to provide the required information²⁷ and so (with some honorable exceptions) many simply did not do so. Furthermore, the room list information was provided in different formats and logistical challenges experienced in the DCS at the Athlete Village (no computer access, no printer) meant that it was difficult to use/was not used properly (to the great frustration of those NOCs who had provided it). The original plan had been to focus testing efforts on athletes from NOCs that did not provide adequate whereabouts information, but the various logistical issues

²⁵ This was not as often as one would expect assuming the IFs and NADOs were doing proper risk assessments in accordance with the ISTI. As of 8 August 2016, only 4,795 of the 11,303 athletes entered for the Games were providing whereabouts information in ADAMS of which only 3,293 were providing full ISTI whereabouts information, including a daily 60-minute time-slot and location.

²⁶ As noted above, however, the DCS Manager at the Athletes Village was not able to access ADAMS to verify whereabouts information and/or to check for updates, which was obviously an important deficiency.

²⁷ It was suggested in pre-Games correspondence that in such circumstances, the IOC might ask the IF or NADO to include athletes in its RTP "on an expedited basis". However, this did not happen, and given the time to notify and train athletes on ADAMS so close to the Games, it was not a viable option.

identified above meant that that plan could not be fully carried out. This must be fixed for future Games. Athletes and NOCs must be sufficiently incentivized to provide adequate whereabouts information so that all testing can take place as set out in the TDP.

Rio 2016 had advised that it would also be possible to track athletes through the accreditation security system, or (at least) the Doping Control Command Center would be able to find out when a particular athlete had last "swiped" into an accredited venue using his or her accreditation (although the departure of the athlete from the same venue would not be recorded). In the event, despite several attempts (both verbally and by email), it proved impossible to obtain this information in Rio. However, the concept has significant potential for future Games.

As a result of the above issues, chaperones were often provided with little or no whereabouts information for athletes targeted for Out-of-Competition testing in the Athletes Village, and therefore, the majority of times had to resort to asking team officials and/or athletes from the same team where the athletes they were looking for were located. Providing the names of the athletes they were seeking was (at best) highly inefficient and obviously compromised the "no notice" nature of the testing. In addition, when initial attempts to find an athlete in his or her room were unsuccessful, chaperones often lacked the training and/or the confidence to follow up with further enquiries and effort to find the athlete in other locations in the Village (such as the dining hall).

Ultimately, many athletes targeted for testing in the Athletes Village simply could not be found and the mission had to be aborted. On some days, up to 50 percent of planned target tests were aborted in this way. Some of the athletes in question were then put on mission orders for Out-of-Competition testing the following day, or targeted for In-Competition testing on subsequent days, but due to the logistical issues outlined above it was often the case that those tests could not be conducted either. The WADA IO Team does not know how many athletes who were targeted for testing at the Games were ultimately not tested. Rio 2016 was planning to pass on the names of athletes in that category to the IOC so that the IOC could combine them with the names of those athletes who were not tested under the DFSU and ABCD testing programs and then provide the names to the relevant IFs and NADOs for their information and follow up.

IOC recommendations nos. 17-23:

- The IOC (and WADA) should work with the relevant IFs and NADOs to ensure that well in advance of the Olympic Games, all athletes entered or likely to be entered for the Games who are identified as high risk (based on the criteria set out in the ISTI and/or the work done by the Pre-Games Intelligence Taskforce), are inducted into an RTP and therefore are already filing full ISTI-compliant whereabouts information by the time the Games start so that information is available to the IOC and the LOC during the Games period (including providing block and room number when staying in the Athletes Village and a daily 60 minute time-slot and location for each day during the Games period).

- The IOC should agree with the relevant IF or NADO in advance of the Games on timely and effective procedures to be followed to address apparent Filing Failures and Missed Tests by RTP athletes that occur during the Games period.
- In addition, the IOC should consider incorporating a chip in each accreditation pass and setting up chip sensors in different locations within the Athletes Village, to allow the Doping Control Command Center and the DCS Manager in the Athletes Village to know when and where any accredited athletes who have been included in a mission order (whether in an RTP or not) are in the Village.
- Alternatively, doping control personnel could be stationed at the entry of the Athletes Village and/or the Village dining hall, equipped with a computer monitor that shows the photo and name of each athlete that scans his/her accreditation to enter the Village, with chaperones standing by ready to notify any such athlete who has been scheduled for testing that day.
- The IOC should consider developing a web-based IT platform for entering and storing rooming lists, similar to a hotel-type booking system. NOCs should be required to input the required information into that system on arrival and to update it as necessary thereafter, with meaningful consequences for non-compliance. The Doping Control Command Center and the DCS Manager at the Athletes Village should be able to access and search this information remotely for athletes included on a mission order and to print out the relevant information for use by the chaperones charged with locating those athletes for testing.
- The Doping Control Command Center should also be able to access and search remotely any whereabouts information that is already collected by NOC services, such as dates and times of athlete arrivals and departures from the host country. Bookings made by NOCs/teams of official venues for training purposes (which information is contained within the IOC's sports information system) should also be easily accessible.
- The Doping Control Command Center and the DCS Manager at the Athletes Village should also have access to athletes' accreditation photographs and the ability to print them out if necessary, to assist chaperones in identifying athletes for testing.

LOC recommendation no. 19:

- A dedicated e-mail account should be set up by the LOC for the DCS Manager at the Athletes Village, to receive ADAMS notifications and so that the DCS Manager can check whether any athlete on that day's mission order has changed his/her whereabouts since the mission order was issued.

6.3 Meeting Specific Gravity Requirements

ISTI Article G.4.6 states that if an athlete provides a sample that is too dilute for testing, the DCO should wait as long as necessary to collect a sample with a specific gravity (SG) suitable for analysis. However, it permits the Testing Authority (as defined in the ISTI) to establish a protocol to be followed by the DCO to determine whether exceptional circumstances exist that warrant ending the mission before such a sample has been collected.

As it had done in Sochi, the IOC issued a directive in Rio that an athlete who provided a dilute first sample should be required to wait at least 45 minutes (it had been 40 minutes in Sochi) before providing the second sample and he/she should be discouraged from consuming further fluids in the meantime. However, if the second sample was still outside the specified SG range, the sample collection process should be ended, i.e., only two samples would be collected. It was the WADA IO Team's understanding that this was not intended as a hard and fast rule, and that a DCO should continue to collect further samples if he/she suspected that the athlete may be trying to manipulate the system. but it did not observe any instances where the DCO insisted on the athlete providing a third sample (even though on one occasion, the athlete produced a dilute sample and then five minutes later produced a further dilute sample and so had clearly not emptied the bladder when providing the first sample; in such circumstances, the DCO should have insisted that the athlete stay and provide further samples until one within the required SG range was produced). In fact, during the entire Games period, only one athlete was required to provide a third sample when the first two were outside the required SG range.

According to ADAMS, there were 119 athletes whose first urine sample did not meet the SG requirements set out in the ISTI. Of the 109 who produced a second sample,²⁸ only 63 waited for at least 45 minutes before doing so and only 27 of those samples had a suitable SG for analysis, suggesting both that the 45 minute rule was not enforced correctly and that it was largely ineffective.

IOC recommendation no. 24:

- The IOC should revisit its protocol for addressing dilute samples, not only because it is not effective in its current form, but also because it creates opportunities for abuse. While there is no desire to keep athletes at a DCS for lengthy periods when they are trying in good faith but are genuinely unable to provide a sample with a suitable SG, at the same time, it is important to avoid creating opportunities for cheating athletes to manipulate the process in order to avoid detection. In particular, the IOC should make it very clear that if the DCO has any reason to suspect that the athlete may be trying to manipulate the process, he/she should be ready to insist that the athlete stays at the DCS for as long as it takes to provide a sample with a suitable SG.

²⁸ Ten athletes provided a dilute sample and (for unknown reasons) did not provide a second sample.

6.4 Conclusion in Relation to the Sample Collection Process in Rio

In conclusion of this section of the report, the WADA IO Team wishes to pay tribute to the many dedicated DCS Managers, DCOs/BCOs, and CTLs in the Rio 2016 doping control workforce who worked hard to overcome the above adversities. Without them, the Games anti-doping program would have almost certainly collapsed; but due to their initiative, tenacity and professionalism in the face of great difficulties, the many problems identified above were patched over and sample collection was conducted in a manner that ensured the identity and integrity of the samples.²⁹

In particular, the DCS Managers received no on-site training on their role, no venue-specific information, and no sport-specific guidelines, and often arrived at the venue for the first time on the first day of testing, where they were presented with untrained and insufficient numbers of chaperones, without access to press areas. Nevertheless, they managed to implement the planned tests to the best of their ability based on the resources they had available to them. They are a credit to the anti-doping system. Hopefully they will retain sufficient goodwill to make themselves available for future Major Events, despite the challenging circumstances they experienced in Rio.

In short, this Games experience highlights the utmost importance of having professional and experienced DCS Managers, DCOs, BCOs, CTLs and chaperones in the Games doping control workforce.

6.5 Summary of Sample Collection Figures

The final sample collection figures, as reported in ADAMS, are set out in the table below. However, due to a number of data entry errors, nearly 100 samples analyzed by LBCD during the Games period were not matched to an athlete. Approximately 40% of these errors are due to entry of an incorrect bottle code in ADAMS. Rio 2016 assisted the IOC in correcting these errors so that the samples can be matched to athletes and their testing histories can be updated.

²⁹ With one unfortunate exception: on the last weekend of the Games, LBCD reported that it had received doping control forms and chain of custody entries for two separate blood samples collected at the DCS in the Athletes Village, but it had not received the two blood samples themselves. Despite extensive searching, one of the missing blood samples was not located until two weeks after the end of the Games (and so had to be destroyed without testing), the other sample could not be located at all. Urine samples collected in the same mission from the two athletes concerned were received and duly analyzed by the laboratory but intended testing of the blood samples for (respectively) GH and ESAs could not be carried out. The WADA IO Team was advised that neither athlete had been specifically targeted for testing; they were instead selected randomly.

Type of Test ³⁰	Planned ³¹	Samples Collected by					Actual Total
		Rio 2016		Subtotal	Other SCAs ³²		
		IC	OOO		IC	OOO	
Urine	4,480	2,723	1,157	3,880 ³³	-	157	4,037
Blood	450	129	274	403	-	8	411
Blood + ABP	-	50	298	348	-	39	387
ABP blood	450	5	24	29	-	18	47
Subtotal	5380	2,907	1,753	4,660	-	222	4882
Total	5,380	4,660			222		4,882

Number of Athletes Tested (as reported in ADAMS)	Number	% of total of 11,303 athletes participating
Athletes tested once	2,611	23.10%
Athletes tested twice	527	4.66%
Athletes tested three times	81	0.72%
Athletes tested four times	13	0.1%
Athletes tested five times	4	0.04%
Athletes tested six times	1	-
Athletes tested (total) – from 137 countries	3,237	28.62%

- WADA recommendation no. 5:

See WADA recommendation no. 3 (WADA should expedite the development of a paperless doping control form in time for the next Games). If that recommendation is not adopted, then:

- WADA must provide clear guidance to LOCs on how to enter data from doping control forms into ADAMS, so that problems in matching results with athletes can be avoided in the future.

³⁰ The IOC defined a test at the Games not by the number of analyses carried out on a sample but rather by the type of sample collected. Therefore, if an athlete provided a urine sample and a blood sample at the same time, this would count as two tests.

³¹ By reference to the draft TDP provided by Rio 2016 to the WADA IO Team in Rio.

³² The collection of these samples involved 16 different Sample Collection Authorities.

³³ This includes a total of 202 dilute samples (which equates to 5 percent of the total number of urine samples collected), 83 of which were second samples.

LOC recommendation no. 20:

- LOCs must build into their planning appropriate checks to ensure data entry problems are minimized. In London, for example, the DCS Managers entered data from doping control forms into ADAMS immediately and the LOC checked and double-checked accuracy against the doping control forms subsequently received from the DCS. This ensured that all bottle codes were correct and the results of the sample analysis matched with the correct athlete.

IOC recommendation no. 25:

- The IOC should ensure that the data from the doping control forms that the LOC enters into ADAMS is checked for accuracy during the Games.

7. Transport of Samples to LBCD

In Rio an authorized courier picked up the samples and the laboratory's copies of the related doping control forms from the venue, as well as a chain of custody form (which he signed to record the transfer of samples to him from the DCS Manager). All of the samples were contained in a sealed bag or a cool box, as appropriate. The courier was also given an envelope (often, sealed in a partial sample bag; see above) containing the other copies of the doping control forms to be delivered to the Doping Control Command Center in the Athletes Village.

The courier then either:

- took the samples to the LBCD (either directly, or via another DCS, where he picked up more samples), and then took the other copies of the doping control forms to the Doping Control Command Center; or
- drove to the Athletes Village (either directly or via another DCS, where he picked up more samples) to drop off the doping control forms and then went on to LBCD to deliver the samples.

The courier worked alone. This meant that if he went to a second venue and had to park the van at that venue to walk to the DCS, he might leave samples and documentation from the first venue unattended in the van. To avoid any security risk, he would leave the van locked and parked inside a designated secure area of the venue while he was gone.

The couriers were required to follow a detailed security protocol for delivery of the samples to LBCD, part of which was suggested by the laboratory expert on the WADA IO Team:

- Courier van doors were to be sealed with numbered ties which were recorded on a manifest and changed with each opening and closing of the door. In the first half of the Games, the couriers did not uniformly observe this requirement but the WADA IO Team raised the omission with the IOC and Rio 2016, who promptly reinstated the requirement, and when a WADA IO Team member subsequently

travelled in a courier van to LBCD from a venue, the driver followed the proper process, including sealing of the van doors.

- Courier vans leaving the Athletes Village were checked by security upon departure, including a search of the cab and a check of the numbered seals against the driver's manifest.
- The names and company identification codes of all courier drivers and license plates of all courier vehicles approved for sample delivery to the laboratory were provided to the LBCD security personnel.³⁴ The driver was then required to call ahead to advise of his expected time of arrival at the laboratory (which some did and others did not).
- At the laboratory vehicle entrance gate, several guards verified the license number and the seals and checked with LBCD staff before allowing entry.
- Once inside the laboratory compound, the courier would break the seal on the van door and carry the samples directly to the dedicated sample delivery door, which was guarded by another security person. The sample containers were handed over by the courier directly to the LBCD staff. Each container was checked and verified by LBCD staff before the courier could leave with his/her copy of the signed chain of custody.

LBCD suggested that the couriers were not uniformly complying with these requirements but when a WADA IO Team member observed the entire process of transfer of samples from venues to LBCD all relevant procedures were observed each time, suggesting that the security of the samples was generally well-maintained during the transportation stage.

LOC recommendations nos. 21-22:

- Ideally, there should be a second person travelling in each courier van so that samples are never left unattended during stops on the way to the laboratory.
- To give the laboratory more advance notice of sample arrival times, a direct line of communication should be established between the laboratory and the DCS Manager. The DCS Manager should contact the laboratory as soon as the samples are ready for delivery, advising of the number and type of samples being sent, the name of the driver and license plate number of the vehicle, and the expected time of arrival at the laboratory.

³⁴ The security arrangements at LBCD during the Rio Games included 12 permanent guards from a private company as well as members of the National Guard (the special police force in charge of security for the Olympic venues) posted at the main entrance of the laboratory and at the service gate, which was the entrance predominantly used by the courier vans delivering doping control samples.

8. Analysis of Samples by LBCD

8.1 LBCD Resources

Following its re-accreditation by WADA in May 2015, LBCD was required to obtain ISO-17025 accreditation for and implement all currently available techniques for detection of prohibited substances and methods.³⁵

In addition, LBCD needed to increase its analytical capabilities and resources for the higher than usual sample volume expected during the Games, based on the TDP provided by the IOC, i.e. 4,480 urine samples and 900 blood samples.³⁶

LBCD made a tremendous effort to ensure it was fully prepared to meet these requirements. Many millions of dollars were spent building a completely new laboratory facility within the Chemistry Institute of the Rio de Janeiro Federal University, complete with state-of-the-art equipment that made LBCD among the best-equipped of all current WADA-accredited laboratories.³⁷ New laboratory personnel were recruited and trained, including attending multiple training sessions at other WADA-accredited laboratories as well as training sessions conducted at LBCD by visiting international experts. As a result, the LBCD is an outstanding legacy from the Games for the anti-doping movement in South America.

WADA personnel made four visits to LBCD (in August 2014, November 2014, November 2015 and April 2016) to check on progress during the periods leading up to LBCD's re-accreditation and further preparation for the Games. However, LBCD's WADA-accreditation was temporarily suspended again in June 2016, due to a non-conformity with the ISL, which triggered a further WADA visit in July 2016. Following the satisfactory implementation by LBCD of corrective actions addressing the non-conformity, the suspension of the accreditation was lifted on 20 July 2016 and the LBCD was declared fit to conduct doping control analyses for the Games.³⁸

³⁵ The application of a novel, recently developed method to detect gene doping was considered but ultimately it was not implemented due to the insufficient time to ensure proper analyst training and method validation before the Games.

³⁶ The IOC provided LBCD with an approximate breakdown of the number of urine samples expected each day, with the maximum expected on any one day set at 350. However, no daily breakdown of expected blood samples was provided.

³⁷ At least two instruments of each kind were available for each analytical procedure, ensuring the necessary backup in case of instrumental malfunction. In addition, engineers from Thermo Scientific (which supplied many of the instruments) were present at LBCD 24/7 during the Games period to provide technical support.

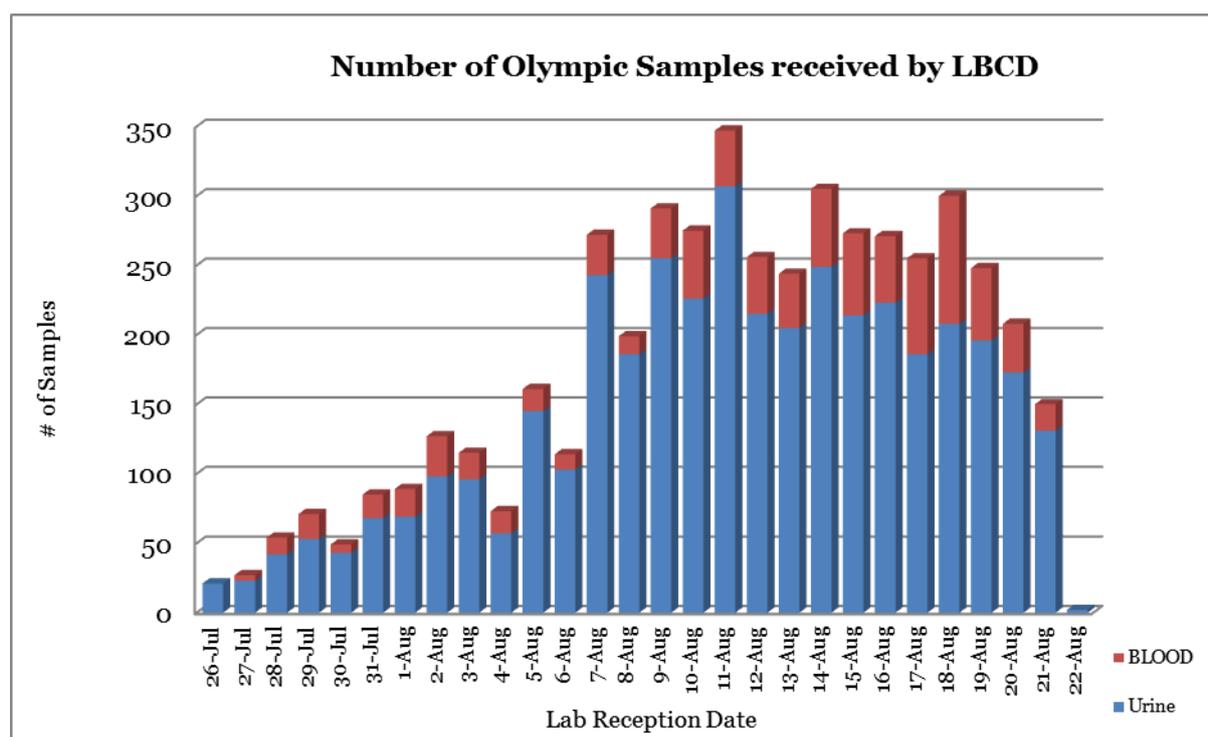
³⁸ One important condition for lifting the suspension for the Games was that external laboratory experts (outside of LBCD and the laboratory experts in the Games Group) had to review and confirm all AAFs that LBCD proposed to report before they were reported (not just recombinant erythropoietin (EPO) AAFs, for which a second opinion is mandatory for all WADA-accredited laboratories). LBCD complied with this requirement fully during the Games period, although doing so did cause some delays in reporting times.

8.2 LBCD's Work-shift Arrangements for the Games Period

Three working shifts of nine hours each (one-hour overlap for transition) ensured that LBCD operated on a 24/7 basis during the Games. Each shift was staffed by both LBCD personnel and international experts. (In addition to recruiting and training highly qualified Brazilian scientists, LBCD also hired and trained approximately 100 volunteers for the (less technically demanding) sample reception and preparation procedures to be conducted for the Games anti-doping program. In addition, during the Games period more than 60 international experts from 20 WADA-accredited laboratories worked at LBCD, either as analysts or as data or documentation reviewers.

Four different lab experts, appointed by the IOC as representatives of the IOC Medical and Scientific Commission Games Group, were present in the laboratory in alternating daily shifts. The roles and responsibilities of these experts, whether as observers, as advisers to the IOC, or as advisers to the lab director on behalf of the IOC, were not always entirely clear to the WADA IO Team. The IOC has advised that they carried out all of these roles, as well as monitoring, the APMU function (see further below), and quality assurance for the IOC.

Ultimately, due to the problem that Rio 2016 encountered with sample collection (discussed above), the expected daily maximum of 350 urine samples was never reached during the Games period: 307 samples were received on 11 August, otherwise, the busiest days generally fell within the range of 200-250 urine samples and on the majority of days less than 200 urine samples were received. In addition, at the beginning of the Games period in particular, the blood testing sections were under-utilized; in fact, several shifts had no blood samples at all to analyze. As a result, LBCD's full analytical capacity was not exploited which is disappointing, given that the latest equipment and best experts in the world were available.



8.3 Sample Reception and Aliquoting

Once samples delivered by the courier had been inspected, they were transferred directly to a secure accessioning room and transferred to LBCD staff to register, open, and process. There were six lines of sample reception and aliquoting available, so that up to 120 samples at a time could be processed immediately upon reception (subject to any non-conformities being addressed).

8.4 Sample Storage

Once aliquots were completed, the remainder of the A sample and the (still-sealed) B sample were taken to be stored in a walk-in cold storage room. There was a guard posted on permanent duty at the entrance of the cold room and that entrance was also monitored constantly by CCTV cameras.³⁹ At the recommendation of the WADA IO Team, no laboratory staff member was permitted to enter the cold room alone at any time (there had to be at least one accompanying person). In addition, the guard timed the entrance of staff into the cold room. If they stayed in the room for more than five minutes, they had to sign the log book, entering their names, time of entry and exit, signatures, and the reason for the longer stay in the cold storage room and the security guard had to counter-sign the entry.

In the view of the WADA IO Team, the aliquoting of A samples immediately upon reception at the laboratory (rather than holding them in storage prior to aliquoting), together with the multiple procedures for maintaining the security of the samples once they were put into storage following aliquoting, and the fact that a new BEREG-KIT urine sample collection bottle (released in April 2016) was used in Rio that provided a much tighter fit between the cap and the bottle, making it very difficult to get any leverage under the cap once it was screwed onto the top of the bottle, together minimized the risk of sample manipulation at the laboratory of the type described in the McLaren Report, if not removing that risk altogether. Indeed, there was very arguably a degree of overkill in the arrangements put in place in Rio which was understandable in the circumstances.⁴⁰

³⁹ In total, there were more than 180 cameras installed and operating constantly outside and inside the laboratory building, all of which were connected to a 24/7 CCTV monitoring room, in which 49 cameras could be monitored simultaneously. Cameras were equipped with motion detectors triggering automatic recording even when the footage from the camera was not on the surveillance screen in the monitoring room.

At the suggestion of the WADA IO Team representative at the laboratory, the image of the cold storage room was permanently displayed in the CCTV monitoring room, to enable 24/7 real-time monitoring of the storage room and the LBCD protocols were amended to provide for a 12-month retention period for recordings rather than three months as originally planned. (The WADA IO Team was advised that recordings of CCTV footage shot during the Games period will be provided to the IOC).

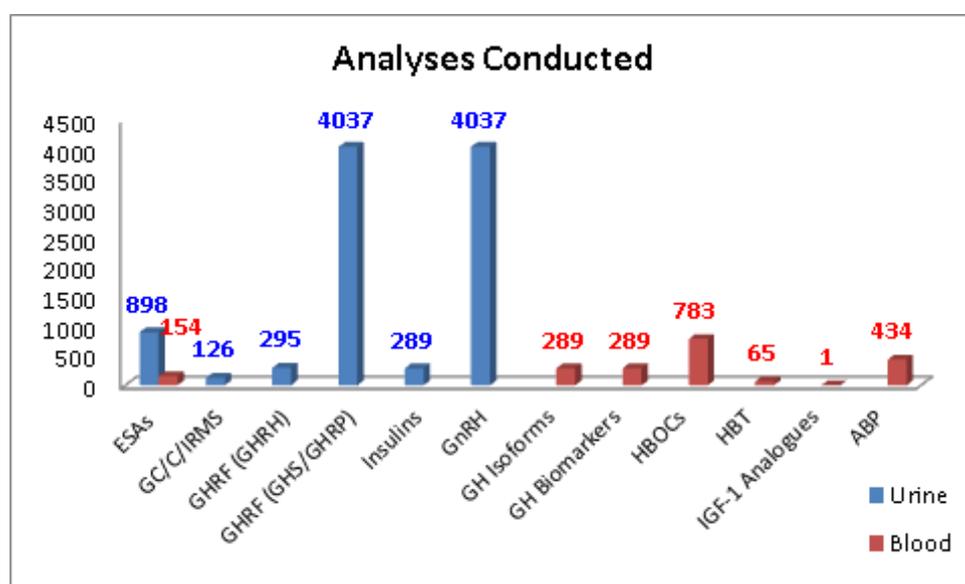
In addition, access to every room within the laboratory from a pedestrian corridor required swiping of an electronic identity card and fingerprint recognition via a sensor pad.

⁴⁰ Exceptionally, some samples had to be stored temporarily before the A sample was opened and aliquoted (e.g. when samples arrived before the doping control forms for those samples). As noted above, however, the security arrangements in relation to the cold storage room where such samples were stored were elaborate and appeared comprehensive. Nevertheless, for further assurance the IOC has advised that it will

8.5 Sample Analysis

LBCD tested all urine samples for all substances on the standard sample analysis menu but also for small peptides (e.g. GHRP and GnRH). Where requested by the IOC, it also tested urine samples for large peptides (GHRH, IGF-I analogs, insulins) and ESAs,⁴¹ and/or conducted IRMS analysis to confirm that steroids found in the sample were exogenous. LBCD also had the capacity to test for GH⁴² in blood (isoform test and biomarker test on each sample) and for ESAs in serum, as well as for ABP markers, HBOCs, HBT and ESAs in whole blood/plasma.

Below is a graph outlining the numbers of samples that underwent additional analysis by LBCD for the various prohibited substances that are not normally screened in a standard urine analysis.



arrange for forensic analysis of the samples in question (to check for signs of tampering) at the Lausanne laboratory where all the Rio samples are to be stored long-term.

⁴¹ The TDSSA imposes minimum levels of analysis (MLAs) for certain substances in different sports. For example, in some sports 15 percent or more of samples must be tested for ESAs. This MLA was met in all of the relevant sports at the Rio Olympics except Boxing, Rowing and Swimming (Long Distance 800m+). In addition, there was no ESA analysis conducted on samples collected in Artistic Gymnastics, Badminton, Basketball, Football, Synchronized Swimming, Tennis, and Water Polo, which all have an ESA MLA of 10 percent.

⁴² Tests conducted for both GH and GHRF may be combined in meeting the TDSSA MLAs for those substances. As all urine samples collected in Rio were analyzed for GHRFs, by default this technically meets the MLA for the GH/GHRFs. However, it is worth highlighting that there was no GH analysis undertaken with respect to samples collected in Artistic Gymnastics, Basketball, Badminton, Canoe/Kayak (Middle Distance 500m), Canoe Slalom, Handball, Tennis, and Water Polo, all of which have a GH MLA of 10 percent.

8.6 Suspicious and Atypical Findings

LBCD was commendably proactive in flagging suspicious and atypical findings so that appropriate follow-up action could be considered. For example:

- LBCD reported a faint CERA signal in the screening of a urine sample. There was a risk that the CERA signal would not be confirmed during the confirmation procedure and/or during analysis of the B sample, and so LBCD recommended that a blood sample be collected from the athlete as quickly as possible. Rio 2016 collected a blood sample and an additional urine sample from the athlete, both of which subsequently tested positive for CERA. The IOC therefore brought ADRV proceedings against the athlete, and the CAS Anti-Doping Division upheld the charge and excluded the athlete from the Games, and referred the case file to the IF to consider further consequences.
- As noted above, in another example of best analytical practice, the IOC instructed LBCD to conduct analysis for GnRH on all urine samples received. This permitted the expeditious GnRH analysis of all samples with suspiciously elevated concentrations of Luteinizing Hormone (LH). LBCD systematically notified the IOC via ADAMS to collect a follow-up sample from those athletes whose samples produced an ATF for elevated LH.

Once the Games were over, on the initiative of the Rio 2016 Operations Manager LBCD put together a list of all ATFs and other findings that had raised suspicions or questions, and the details of the athletes in question passed on to the relevant IFs/NADOs, so that they could take any necessary follow-up action and/or use the information as intelligence to inform their own testing programs. This is an important initiative, ensuring that as much ongoing benefit as possible is extracted from the IOC's anti-doping program at the Games, and should be incorporated as standard procedure for future Games.

8.7 Reporting Results of Analysis

In accordance with ISL Article 5.2.4.3.1.1, when a beta-2 agonist or a glucocorticoid was identified on initial testing of a sample, LBCD did not proceed immediately to confirmation, but instead asked the IOC whether the athlete in question had a TUE for the substance identified. At times, delays were encountered in receiving feedback from the IOC, the causes of which were not clear to the WADA IO Team. In at least one instance, the confirmation analysis for a beta-2-agonist proceeded due to a lack of response from the IOC, only for the IOC to confirm the existence of a TUE just before an AAF was reported.

LBCD put in place a process to ensure the accuracy of reported AAFs, which involved internal review of the analytical data by international experts and the experienced laboratory directors who were part of the Games Group, as well as the obtaining of a mandatory second opinion from the applicable nominated international expert (see footnote 37, above).

The turn-around times for reporting of negative analytical results agreed by LBCD with the IOC ranged from 30 hours (standard analytical menu) up to 84 hours (ESAs). The agreed turn-around times for AAFs ranged from 60 hours to 96 hours (ESAs and

HBOCs). The agreed turn-around time for IRMS results was 72 hours. Multiple reviews of analytical data by several experts, and the requirement to seek a second opinion for every AAF, sometimes provided by an expert located elsewhere in the world (e.g., for ESAs, an expert from the Montreal laboratory), meant that the agreed turn-around time for reporting an AAF was often passed, but it is understood that on average the targets were met.

To facilitate internal administration, the IOC required that LBCD inform the IOC staff by telephone of the imminent reporting of an AAF before LBCD entered a formal report in ADAMS. This was an unintentional and inadvertent breach of the mandatory requirements of ISL Article 5.2.6.14.2, and was promptly corrected by the IOC when pointed out by the WADA IO Team.

In total, 28 AAFs were reported by LBCD in respect of samples collected in connection with the Rio Games, of which half were covered by TUEs, and the other half were pursued and upheld as ADRVs. For further detail, see [Appendix 2](#) of this report.

8.8 B Sample Confirmation Procedures

The procedures for opening and aliquoting of B samples during B sample confirmation testing were generally well executed, and the results confirmed the findings made in respect of the A sample, with the sole exception of the previously-mentioned CERA finding in urine, which could be explained by the relatively low concentration of the protein and its instability in urine.

The directions received from the CAS Anti-Doping Division to produce laboratory documentation packages for A sample AAFs and B sample confirmations within very tight deadlines placed a significant burden both on LBCD and on the Games Group experts who reviewed the documentation packages prior to their release to the relevant parties.

8.9 Double-blind EQAS Samples

Six EQAS samples were sent to Brazil, to the attention of the IOC, to be introduced into test mission orders for analysis on a double-blind basis by LBCD. This is an essential part of the quality control of laboratory processes during the Games.⁴³

The process of introducing the EQAS samples into test mission orders in Rio went very well, thanks to the experience of the Chair of the IOC TUEC, who was part of the IOC's Games Group. In addition, LBCD correctly reported all the results of the EQAS samples, providing good assurance that the laboratory was conducting its analyses in line with the mandatory requirements of the ISL.

⁴³ The EQAS samples sent to Rio stayed in customs for more than 10 days, notwithstanding that the IOC had been provided with specific instructions beforehand for their extraction. This long stay in customs had the potential to compromise sample integrity and therefore the whole EQAS exercise. Fortunately, the sample integrity was not compromised.

8.10 Storage and Re-testing of Samples

The IOC has arranged for all of the samples collected as part of the Rio anti-doping program to be transferred securely after the Games from LBCD to the WADA-accredited laboratory in Lausanne, where they will be kept in appropriate and secure conditions ready for retrieval and re-analysis upon request by the IOC.

WADA recommendation no. 6:

- The laboratory expert on the WADA IO Team should be present at the Games laboratory 1-2 weeks before the start of the official Games testing period, as occurred in Rio for the first time, to help ensure that any logistical/technical/security issues are identified and addressed in advance of the expected higher number of samples and tests during the Games.

LOC recommendation no. 23:

- When the TDP is drawn up, and continuing throughout the Games period, there should be constant communication between the IOC/LOC and the laboratory in relation to analytical capacity, so that the laboratory's resources and instruments are fully utilized and the number of tests applied to the samples processed in the laboratory is maximized. In particular, the IOC/LOC should strive to provide the laboratory with accurate forecasts of urine and blood analyses planned each day during the Games period, so that the laboratory can organize its testing logistics (staff, reagents, instrumentation, etc.) accordingly. In addition, daily communication and feedback is also required to ensure that laboratory analyses can be prepared with the maximum number of samples. For example, if an ESA test is to be prepared for 4 samples, but each test can analyze up to 8 samples, then the IOC should identify 4 further samples to be analyzed for ESAs as well.

Games laboratory recommendations nos. 1-4:

- The Games laboratory should adopt LBCD's approach of registration and aliquoting of samples immediately upon their arrival at the laboratory as best practice during the Games. The arrangements for secure storage of the remainder of the A sample and the B sample after aliquoting should also be given particular attention, with the arrangements made by LBCD used as the point of departure, if not as a mandatory requirement.
- The Games laboratory should have a documented reporting protocol with the IOC, clarifying procedures and respective responsibilities and deadlines in relation to ADAMS reporting, requests for confirmation of TUEs covering beta-2 agonists or glucocorticoids identified on initial testing, and how laboratory recommendations such as for follow-up target testing of ATFs and on athletes whose samples produce suspicious findings will be addressed.
- The process of review of AAFs should be expedited during the Games. It is not necessary to have the analytical data reviewed not only by the second opinion provider (where applicable) but also by 4-5 different experts before reporting an AAF.

- Laboratory staff should be trained in performing mock B confirmation procedures (e.g. as part of stress tests) under Games conditions, so that personnel understand their responsibilities and roles as well as the requirements of B sample analysis. This pertains in particular to the process of B sample opening and aliquoting, as well as the interaction between laboratory personnel and athletes and their representatives.

IOC recommendations nos. 26-27:

- Terms of reference should be set out for the IOC laboratory experts so their roles and responsibilities are clear to all. . Also, a careful review of any potential conflict of interests of these experts should be conducted.
- At the end of the Games period, the Games laboratory should continue to provide a summary of all ATFs and samples that raised suspicions to the IOC/LOC, which they should then pass on to the relevant IFs and NADOs for use as intelligence and for appropriate follow-up or monitoring moving forward.

9. Athlete Biological Passport

Another important advance made in the IOC's anti-doping program in Rio was the creation of an "IOC APMU" for the Games, consisting of the former Director of the Lausanne Laboratory and the Director of the Montreal Laboratory. They were tasked with reviewing ABP haematological and steroidal profiles (respectively) to ensure that atypical or suspicious values and profiles were addressed in a timely manner by targeted analysis (e.g., IRMS for urine, ESAs/HBT for blood) and (where appropriate) with follow-up testing to collect additional samples for further testing.

Each morning during the Games period, LBCD would provide to the IOC APMU a spreadsheet of urine samples (steroidal module) and ABP blood samples (haematological module) conducted the previous day. For ABP blood samples, LBCD flagged any values that it considered suspicious, for review by the IOC APMU. The appropriate IOC APMU representative would review the results in the context of the athlete's longitudinal profile (accessed via ADAMS) and then direct any follow-up analysis (to be actioned by LBCD) or sample collection (to be actioned by Rio 2016) that was deemed appropriate in the circumstances.

In addition, any IF or NADO APMU with custodianship in relation to a particular athlete had full access to the results of Games period testing, and so was able to review those results as part of the athlete's overall profile during the Games.

In one case, although the ratio of testosterone to epitestosterone found in a urine sample collected at the Games was only 2.9 (i.e., well below the 4.0 threshold previously used), both the IOC APMU and the IF APMU noted atypical results in the steroid profile of the sample, and requested IRMS analysis, which duly confirmed that the testosterone and four other markers of the steroid profile in the athlete's sample were exogenous in origin. The athlete was subsequently charged with an ADRV, the charge was upheld by the CAS Anti-Doping Division, and the athlete was excluded from the Games.

Similarly, when the results of analysis of an ABP blood sample produced a suspicious profile, the IOC APMU instructed that the sample be tested for CERA. The sample duly tested positive for CERA, leading to an ADRV finding⁴⁴ and the consequent exclusion of the athlete from the Games, with the case subsequently referred to the athlete's IF to determine what further consequences should be imposed.

These are two excellent examples of the value that the ABP tool can add if used properly at the Games.

Importantly, while having access to the ADAMS accounts of athletes tested at the Games for the purpose of examining their longitudinal steroid profiles, the IOC APMU (steroidal module) noted that the profiles of several athletes in certain sports were clearly atypical and should certainly have led to follow-up testing prior to the Games. A report on the issue was requested by the IOC and should also be provided for WADA's consideration.

IOC recommendations nos. 28-30:

- The IOC APMU should continue to be incorporated as standard procedure for future Games, consisting of experts with expertise in the steroidal and haematological modules of the ABP and in endocrinology. It should be set up as part of the Pre-Games Intelligence Task Force, at least six to twelve months in advance of the Games, with an instruction to focus on those sports that do not liaise with an external APMU. Clear protocols should be established and agreed to guide its work, including protocols for close interaction and collaboration with IF and NADO APMUs looking at the same data.
- ABP (blood) testing should continue to be coordinated with the relevant IFs in advance of the Games to ensure tests are well planned and prioritized. Again this is a function that the proposed IOC anti-doping expert could manage and continue to enhance.
- In the longer term, if there are athletes in endurance-based disciplines where there is a high risk of blood doping, who might participate in the Games, but do not have an ABP blood passport, the IOC could consider requiring IFs to put those athletes into an ABP testing pool, so that they have an ABP (blood) profile and/or test history going back at least six months before the Games.

WADA recommendation no. 7:

- Where the IOC APMU identifies profiles (steroid and/or blood) that should already have been followed up prior to the Games, this information should be passed ASAP to the ADO that is custodian of the passport(s) in question with a specific recommendation for appropriate follow-up action. As part of its oversight, WADA should monitor to ensure that the ADO takes the necessary action without further delay. In the longer term, all ADOs should be utilizing the services of an APMU, preferably a lab-associated APMU, to manage all aspects of the ABP, including passport reviews and test recommendations.

⁴⁴ This was facilitated by the fact that A and B samples were collected in each ABP blood test.

10. Therapeutic Use Exemptions

The WADA IO Team observed the IOC TUE procedure and processes at the Rio Games. As at prior Games, it did not review content of TUE files, medical information and evidence, or how the TUEC evaluated the ISTUE criteria for recognizing or granting a TUE, as this was not within the scope of its mandate but rather was the role of the WADA Medical Department.

The IOC Medical Commission appointed a TUEC consisting of six physicians to consider applications for TUEs permitting the use of prohibited substances or methods during the Games.⁴⁵ The TUEC was supported by IOC Medical and Anti-Doping administration staff for the uploading of applications and decisions into ADAMS. The TUEC received a total of 67 such applications, but 15 were for substances or methods or routes of administration for which a TUE was not required (indicating either a lack of knowledge or doctors playing safe). The TUEC granted all of the remaining 52 applications,⁴⁶ which covered the following substances/methods:

- Stimulant = 1
- Diuretic = 2
- Narcotics = 6
- IV Administration = 7
- Glucocorticoids = 36

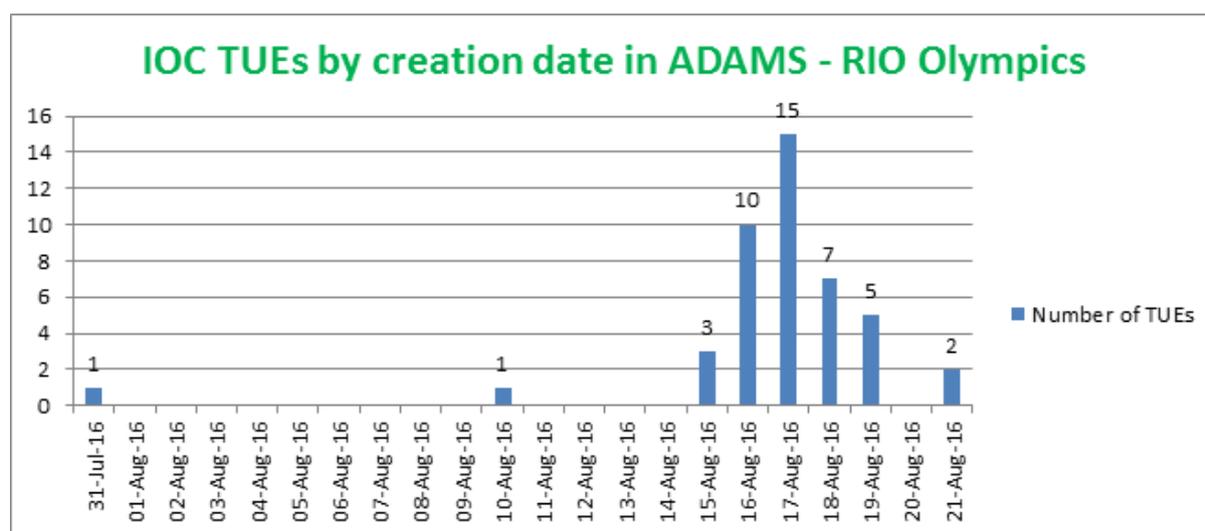
Although TUEs granted by TUECs of Major Event Organizers are only valid for the period of the Major Event, nevertheless Article 4.4.6 of the 2015 Code (and Article 4.4.5 of the IOC Anti-Doping Rules for Rio) gives WADA the right to review all such TUEs, to provide transparency and accountability. WADA's review right is only meaningful, however, if the IOC enters the details of any TUE granted into ADAMS straight away. After Sochi, the WADA IO Team noted in its report: "It was observed that the IOC did not routinely enter TUEs into ADAMS and, as a result, WADA did not have the ability to review the granting or denial of these TUEs." Therefore the IOC was aware that this was an area that required improvement. In addition, in pre-Rio correspondence the WADA IO Team

⁴⁵ In addition, Article 4.4.3 of the IOC Anti-Doping Rules for Rio stated: "Where the Athlete already has a TUE granted by his or her National Anti-Doping Organization or International Federation, he/she should file such TUE with the TUEC at least 30 days before the start of the Period of the Olympic Games Rio 2016. The TUEC shall be entitled, prior to the Period of the Olympic Games Rio 2016, to review any such TUE in order to ensure that it meets the criteria set out in the International Standard for Therapeutic Use Exemptions and, if necessary, request the provision of further supporting documentation. If the TUEC decides to review a TUE and determines that it does not meet the aforementioned criteria, it may refuse to recognize it; in this case, it must notify the Athlete and the Athlete's NOC promptly, explaining its reasons." In the event, however, as far as the WADA IO Team is aware, the IOC TUEC did not review any pre-granted TUEs before the Games period. It was advised that they were being reviewed on a random sample basis by the TUEC during the Games period. ADAMS only had a record of one existing TUE being reviewed and recognized by the IOC TUEC.

⁴⁶ Of the 52 applications, 44 were retroactively approved, i.e. the substance had already been administered to the athlete. The remaining 8 applications sought advance approval by the TUEC.

specifically requested that all TUEs granted by the IOC TUEC be entered into ADAMS as soon as possible, so that the WADA Medical Department was able to access and review them as it saw fit.

The IOC permitted TUE applications to be made in Rio either electronically or in hard copy (by deposit into a mail box in the Village Polyclinic). Many applications were submitted only in hard copy, which meant that the IOC had to scan them in order to upload them into ADAMS, which caused additional administrative burden. When applications were received, the TUEC held a meeting the next day to consider them, and was very prompt in its review and decision-making, as well as in contacting the athlete via the NOC to seek further information if the application was incomplete or to advise of the outcome as soon as the decision was made. On the other hand, despite reminders and requests for action by the WADA IO Team, there was a long delay in entering the TUE applications into ADAMS, and/or in updating the ADAMS entry once the application was granted,⁴⁷ which prevented WADA's timely review of the TUE file and decision, and so denied the IOC the extra layer of transparency and accountability that WADA's review of the IOC TUEC's grant of TUE application is intended to provide.⁴⁸



IOC recommendations nos. 31-32:

- The IOC should encourage submission of TUE applications and supporting documentation by email, so that they are already in digital form and can be easily uploaded to ADAMS.
- The IOC should ensure that it has sufficient staff, properly trained in use of ADAMS and all other relevant processes and procedures, to support all aspects of its anti-doping program at the Games (including, but not limited to, the entry of TUEs granted by its TUEC into ADAMS on the same day as the

⁴⁷ Up to and including 14 August 2016, 41 of the 52 TUE applications had been reviewed and approved by the TUEC. However, as the graph in this section indicates, only two had been registered as approved in ADAMS.

⁴⁸ By the end of the Games, 43 of the 52 approved TUEs had been entered into ADAMS.

decision is rendered, to provide WADA with the opportunity to monitor and review). The WADA IO Team endorses in this respect the more detailed recommendation made by the WADA IO Team for the Sochi Games.

11. Results Management

The WADA IO Team also reviewed the arrangements that the IOC had in place in Rio for results management and processing of potential ADRVs.

The WADA IO Team in Sochi had suggested that “the IOC Legal Department could also benefit from additional legal resources for issues related to anti-doping. This may not be required on a full time basis but the IO believes that there is at least an argument to recruit additional legal specialists for the period of the Games so as to support the Senior Legal Counsel of the IOC.” The IOC actioned that recommendation for Rio, having not only two internal IOC lawyers present but also two external counsel who were very experienced in anti-doping matters, which obviously provided a strong resource to support the results management process.

By far the most common ADRV seen at the Games is an Article 2.1 “presence” case, based on an AAF reported by the laboratory for a prohibited substance found in a sample collected during the Games period. In such cases, the IOC Medical and Science Director and the Games Group Chair conduct the review of the AAF that is mandated by 2015 Code Article 7.2 (i.e., looking for an applicable TUE, and/or for any ISTI or ISL departures that could have caused the AAF). If no TUE or material departure is found, the IOC lawyers prepare an application to the CAS Anti-Doping Division for adjudication of the ADRV and for appropriate provisional and final relief. The IOC is well-versed in this process, and it appears to have coped well with the work involved in getting these Article 2.1 cases processed and before the CAS in expedited fashion.

So-called “non-analytical” ADRVs (e.g., evasion/refusal/failure to submit to sample collection, tampering, possession) are much less common at the Games. However, if they do arise, they would also have to be pursued diligently, and therefore the IOC has to be ready to deal with the different forensic challenges that such cases pose. In particular, often the evidence will consist mainly of witness testimony, and there could well be factual disputes between the IOC’s witnesses and the athlete and/or his/her entourage, e.g., as to whether proper notification of the test was given to the athlete. In such cases, the decision as to whether there is sufficient basis to bring the case before the CAS may not be straightforward. There was some (informal) discussion of potential evasion/refusal cases at the daily meetings attended by the WADA IO Team Chair and Vice-Chair, but a more formal review process is required, involving IOC Legal and the external legal counsel mentioned above.

Finally, under ISTI Article I.5.1, results management responsibility for an Article 2.4 whereabouts violation lies with the IF or NADO to whom the RTP athlete provides his/her whereabouts information. As noted above, DFSU conducted Out-of-Competition testing on the IOC’s behalf in the lead-up to and during the Games. Where the athlete in question was in an RTP, DFSU used the athlete’s whereabouts information to find the athlete for testing. The IOC advised the WADA IO Team that it had received about 20 Unsuccessful Attempt reports from DFSU, when the athlete could not be found for testing

despite the RTP whereabouts information. The WADA IO Team advised that those reports should be forwarded to the IF or NADO with results management responsibility over the athlete in question, to determine whether they revealed any potential Filing Failure or Missed Test that needed to be followed up by the IF/NADO in accordance with the ISTI, and/or whether any follow-up target testing should be pursued. The IOC reported that it was going to send such correspondence to the relevant IFs shortly after the Games.

IOC recommendations nos. 33-36:

- The IOC should continue to ensure that it has additional legal resource with specific anti-doping experience available at future Games.
- The IOC should have a clear process in place for identifying potential non-analytical ADRVs (e.g., evasion/refusal/failure to submit to sample collection, possession, tampering) and forwarding them to IOC Legal to determine whether there is sufficient evidentiary basis to apply to the CAS Anti-Doping Division for provisional and/or final relief against the athlete (and/or athlete support personnel) concerned.
- The IOC should also have a clear process in place for processing Unsuccessful Attempt reports, to ensure they are provided as quickly as possible to the IF/NADO with results management authority in respect of any potential whereabouts failures. This is particularly important in the case of athletes who already have two whereabouts failures on their record, since a third could lead to proceedings being commenced and a provisional suspension being imposed.

12. Case Adjudication

In previous Games, it was the IOC Disciplinary Committee that determined in the first instance whether an ADRV had been committed and (if so) whether an athlete should be excluded from the Games and his/her results disqualified, with the athlete then having a right of appeal to the CAS Ad Hoc Division (or else to the CAS in Lausanne after the Games). This was efficient, but the IOC Disciplinary Committee was of course not independent of the party bringing the case (viz., the IOC), which could be perceived as unfair notwithstanding the existence of a right of appeal to the CAS. The WADA IO Team in Sochi therefore recommended that the IOC, “consider, in cooperation with CAS, to what extent CAS can support an optional disciplinary process at the Games so as to further reinforce a fair hearing process for athletes” and the IOC to its credit accepted that recommendation and provided in its Anti-Doping Rules for Rio 2016 that a new CAS “Anti-Doping Division” would take over as the first instance hearing panel for doping cases arising during the Rio Games. The CAS, in turn, played its part by appointing six arbitrators to form the CAS Anti-Doping Division in Rio, and by adopting bespoke procedural rules for cases referred to that Division. In the event, seven cases (two of them involving the same athlete) were brought before the CAS Anti-Doping Division during the Games, only one of which was contested by the athlete, and all of which ended in the ADRV alleged by the IOC being upheld, and the athlete excluded from the Games, with all relevant results disqualified, and the case then referred to the athlete’s IF to determine what further consequences, if any, should follow. The WADA IO Team

understands that the IOC is following up on the remaining cases that could not be brought before the CAS Anti-Doping Division in Rio.

In each case brought in Rio, the WADA IO Team was copied on all correspondence and submissions to the CAS by the parties, and on all correspondence and orders from the CAS to the parties. A WADA IO Team representative also attended the hearings held before the CAS in the one contested case. The following observations were made:

- Consistent with Article 7.9 of the 2015 Code, the IOC Anti-Doping Rules for Rio provided for the mandatory imposition of a provisional suspension where an Article 2.1 ADRV was alleged based on an A sample AAF for a non-Specified Substance, and created a discretion to impose a provisional suspension in all other cases. However, whereas the 2015 Code and the WADA Results Management Guidelines contemplate that it is the Results Management Authority that imposes the mandatory provisional suspension/decides whether to impose the discretionary provisional suspension, with the athlete then having the right to apply to a hearing panel to have the provisional suspension lifted, the IOC Anti-Doping Rules for Rio required the IOC to apply to the CAS Anti-Doping Division for an order imposing a provisional suspension in all cases. Where the AAF was for a non-Specified Substance, and therefore the Code (and the IOC Anti-Doping Rules for Rio) mandated a provisional suspension, the CAS effectively rubber-stamped the application and imposed a provisional suspension automatically, i.e., the process seemed unnecessary. On the other hand, where the rules made a provisional suspension discretionary, the IOC Anti-Doping Rules for Rio did not specify on what grounds the CAS should or should not grant the IOC's request for a provisional suspension (other than to say the CAS Anti-Doping Division may decide not to impose a provisional suspension if the athlete shows the ADRV is likely to have been caused by a Contaminated Product). Although the CAS Anti-Doping Division was not required, in the event, to rule on this issue, there was an indication that it might only grant a provisional suspension in discretionary cases if analysis of the B sample confirmed the findings made in respect of the A sample. The basis for this requirement was not obvious, at least to the WADA IO Team, and it is inconsistent with 2015 Code Article 7.9.2, which specifically contemplates that the (discretionary) provisional suspension will be imposed "prior to analysis of the Athlete's B Sample."
- The IOC Anti-Doping Rules for Rio also provided for the CAS Panel, once it had decided on the issue of provisional suspension, to go on to determine whether an ADRV had been made out on the evidence before it, and (if so) to impose appropriate permanent consequences, in the form of exclusion of the athlete from the remainder of the Games and disqualification of relevant Games results. However, experience (including in Rio) clearly shows that it is unlikely to be possible to have a fair hearing on all of these issues within the (very short) Games period. There is clearly a need to determine quickly whether an athlete should be prevented from further participation in the Games. However, there is no clear need to expedite the rest of the case, and a danger in doing so of interfering with the athlete's right to a fair trial:

- In Article 2.1 presence cases, the ADRV is established *prima facie* by the laboratory's report of an AAF in respect of the A sample, confirmed by analysis of the B sample. Even here, however, there may in fact be many (more or less complex) issues of fact and science to resolve before the ADRV alleged can be upheld, relating to whether there have been any material departures from the mandatory procedures for sample collection set out in the ISTI or from the mandatory procedures for sample analysis set out in the ISL, and/or relating to whether the substance found is prohibited (e.g. if it is not referenced by name on the Prohibited List, or if it is also produced by the body naturally and so the IOC has to prove exogenous source).

Furthermore, an athlete may want to try to argue that he/she did not intentionally or negligently permit the prohibited substance to enter his/her system, in an attempt to bolster a claim that he/she did not ingest the substance in issue and therefore the AAF "must" be the result of a departure from the ISTI or the ISL,⁴⁹ and/or to avoid disqualification of certain results.⁵⁰ However, to address these issues properly requires extensive professional input, from lawyers and from expert scientists, and, in most cases, that is simply not possible to do in the extremely expedited time frame contemplated by the IOC Anti-Doping Rules.⁵¹

- Where the case involves a "non-analytical" ADRV, even more time may be needed to assess and respond to the evidence provided in support of the alleged ADRV. For example, witnesses may have to be located and proofed; and documents may have to be authenticated and/or translated.

⁴⁹ In one case brought before the CAS Anti-Doping Division in Rio, it appeared to be suggested that evidence of how a substance did (or did not) get into the athlete's system might be considered by the CAS Panel (a) in determining whether or not the AAF reported established an ADRV; and/or (b) in determining whether the athlete's fault warranted imposition of a period of ineligibility from future events after the Games. Neither suggestion is correct: if a prohibited substance is present in the athlete's system, then an ADRV has been established, irrespective of how it got there; while Article 7.1.1 of the 2015 Code and Articles 7.1.2 and 10.2.2 of the IOC's Anti-Doping Rules for Rio are clear that it is for the IF to determine whether any period of ineligibility from events other than the Games should be imposed.

⁵⁰ While Article 9 of the IOC's Anti-Doping Rules for Rio provided for automatic disqualification of an athlete's results from a competition at which an ADRV was committed, Article 10.1.1 provided: "If the Athlete establishes that he or she bears No Fault or Negligence for the violation, the Athlete's individual results in the other Competitions shall not be Disqualified, unless the Athlete's results in Competitions other than the Competition in which the anti-doping rule violation occurred were likely to have been affected by the Athlete's anti-doping rule violation."

⁵¹ In the one contested case before the CAS Anti-Doping Division in Rio, a significant investigation (including analysis of the athlete's medications and supplements for contaminants) was completed in a matter of several days, as was the preparation of reports by two different experts analyzing the AAFs reported by LBCD in respect of the athlete's A and B samples, but that was only thanks to the extraordinary efforts by the lawyers and experts involved, and was clearly a very rare exception to the general rule.

IOC recommendation no. 37:

- The IOC should consider providing in its Anti-Doping Rules for future Games that it will (unilaterally) impose a provisional suspension immediately upon commencing ADRV proceedings against an athlete, in all cases. The Rules should then give the athlete the right to apply to the CAS Anti-Doping Division to lift the provisional suspension, and should specify what the athlete has to establish in order to get the provisional suspension lifted (the burden should be a heavy one).⁵² The Rules should then provide that if the provisional suspension is not challenged, or if it is challenged but upheld (including any appeal), then the athlete will be excluded from the rest of the Games, but all remaining issues in the case – the merits of the ADRV charge, and whether further consequences should be imposed, such as disqualification of results (and, if agreed with the athlete’s IF, whether a period of ineligibility from future events should be imposed) – may be decided by the CAS Anti-Doping Division in accordance with a normal (non-expedited) timetable after the Games (with the provisional suspension remaining in place in the interim), unless the athlete wishes to waive that right and have a full hearing during the Games.

⁵² As an example, WADA’s Model Anti-Doping Rules for IFs provide (at Article 7.9.3): “The *Provisional Suspension* may be lifted if the *Athlete* demonstrates to the hearing panel that the violation is likely to have involved a *Contaminated Product*. A hearing panel’s decision not to lift a mandatory *Provisional Suspension* on account of the *Athlete’s* assertion regarding a *Contaminated Product* shall not be appealable. The *Provisional Suspension* shall be imposed (or shall not be lifted) unless the *Athlete* or other *Person* establishes that: (a) the assertion of an anti-doping rule violation has no reasonable prospect of being upheld, e.g., because of a patent flaw in the case against the *Athlete* or other *Person*; or (b) the *Athlete* or other *Person* has a strong arguable case that he/she bears *No Fault or Negligence* for the anti-doping rule violation(s) asserted, so that any period of *Ineligibility* that might otherwise be imposed for such a violation is likely to be completely eliminated by application of Article 10.4; or (c) some other facts exist that make it clearly unfair, in all of the circumstances, to impose a *Provisional Suspension* prior to a final hearing in accordance with Article 8. This ground is to be construed narrowly, and applied only in truly exceptional circumstances. For example, the fact that the *Provisional Suspension* would prevent the *Athlete* or other *Person* participating in a particular *Competition* or *Event* shall not qualify as exceptional circumstances for these purposes.”

13. Appendices

13.1 WADA IO Team Members

WADA IO TEAM MEMBERS, RIO GAMES⁵³			
Role	Name	Position	Nationality
Chair	Jonathan Taylor	Lawyer, Bird & Bird LLP	UK
Vice Chair	Tim Ricketts	Director, Standards & Harmonization, WADA	Australia
Team Manager	Kevin Haynes	Senior Manager, Standards & Harmonization, WADA	UK
Member	Osquel Barroso (from 24 July until 13 August 2016)	Deputy Director, Science, WADA	Cuba/Italy
Member	Thierry Boghosian (from 12 August 2016)	Senior Manager, Laboratory Accreditation, WADA	USA
Member	Christine Cardis	Anti-Doping Administrator, International Skating Union (ISU)	Switzerland
Member	Sarah Fussek	Anti-Doping Coordinator, International Ski Federation (FIS)	Austria
Member	Stuart Kemp (from 24 July to 13 August)	Deputy Director, Standards & Harmonization, WADA	Canada
Member	Jakob Mørkeberg	Scientific Consultant, Anti-Doping Denmark	Denmark
Member	Orlando Reyes	Manager, National Anti-Doping Program, Coldeportes	Colombia
Member	Beckie Scott	Chair, WADA Athlete Committee	Canada

⁵³ Shannan Withers, Senior Manager, Executive Office, WADA, also assisted in the establishment of the IO Team and contributed to discussions and observations up until 12 August 2016.

13.2 AAFs and Outcomes From the Games Period as of 05 October 2016

	Sample Collection Date	Sport	Substance(s) Found	Athlete Gender	Test Type	Sample Type	Outcome
1	2016-07-31	Cycling	methoxy polyethylene glycol-epoetin beta (CERA)	M	OOC ⁱ	Blood	ADRV upheld*
2	2016-07-31	Weightlifting	GC/C/IRMS result for 19-Norandrosterone consistent with an exogenous origin	M	OOC	Urine	ADRV upheld
3	2016-07-31	Cycling	methoxy polyethylene glycol-epoetin beta (CERA)	M	OOC	Urine	ADRV upheld*
4	2016-08-01	Athletics	methoxy polyethylene glycol-epoetin beta (CERA)	F	OOC	Blood	ADRV upheld**
5	2016-08-01	Athletics	methoxy polyethylene glycol-epoetin beta (CERA)	F	OOC	Urine	ADRV upheld**
6	2016-08-04	Cycling	methoxy polyethylene glycol-epoetin beta (CERA)	M	OOC	Blood	ADRV upheld*
7	2016-08-04	Cycling	methoxy polyethylene glycol-epoetin beta (CERA)	M	OOC	Urine	ADRV upheld*
8	2016-08-07	Weightlifting	GC/C/IRMS result with exogenous origin of testosterone and four other markers of the steroid profile	M	OOC	Urine	ADRV upheld
9	2016-08-07	Field Hockey	betamethasone	M	IC ⁱⁱ	Urine	TUE
10	2016-08-08	Aquatics	hydrochlorothiazide	F	IC	Urine	ADRV upheld
11	2016-08-08	Shooting	methylphenidate	M	IC	Urine	TUE
12	2016-08-09	Weightlifting	Strychnine	M	IC	Urine	ADRV upheld
13	2016-08-09	Aquatics	prednisone; prednisolone	F	IC	Urine	TUE
14	2016-08-10	Aquatics	Amphetamine	M	IC	Urine	TUE
15	2016-08-11	Gymnastics	methylphenidate	F	IC	Urine	TUE***
16	2016-08-12	Weightlifting	GC/C/IRMS result with exogenous origin of testosterone and four other markers of the steroid profile	M	IC	Urine	Case pending

	Sample Collection Date	Sport	Substance(s) Found	Athlete Gender	Test Type	Sample Type	Outcome
17	2016-08-12	Aquatics	Terbutaline	F	IC	Urine	TUE
18	2016-08-12	Athletics	dexamethasone; triamcinolone acetonide	M	IC	Urine	TUE
19	2016-08-14	Gymnastics	methylphenidate	F	IC	Urine	TUE***
20	2016-08-14	Aquatics	Terbutaline	F	IC	Urine	TUE
21	2016-08-14	Aquatics	Terbutaline	F	IC	Urine	TUE
22	2016-08-15	Gymnastics	methylphenidate	F	IC	Urine	TUE***
23	2016-08-16	Gymnastics	methylphenidate	F	IC	Urine	TUE***
24	2016-08-17	Modern Pentathlon	hydrochlorothiazide	F	OOO	Urine	Case pending ****
25	2016-08-18	Triathlon	Prednisolone	M	IC	Urine	TUE
26	2016-08-19	Modern Pentathlon	hydrochlorothiazide	F	IC	Urine	Case pending ****
27	2016-08-20	Basketball	Amphetamine	F	IC	Urine	TUE
28	2016-08-21	Boxing	tuaminoheptane	M	IC	Urine	Case pending

* Entries marked * involve the same cyclist.

** Entries marked ** involve the same track and field athlete.

*** Entries marked *** involve the same gymnast.

**** Entries marked **** involve the same modern pentathlon athlete

ⁱ OOC - refers to Out-of-Competition

ⁱⁱ IC - refers to In-Competition