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THE ELIGIBILITY AND LEGAL PROTECTION OF FEMALE ATHLETES WITH DIFFERENCES OF SEX DEVELOPMENT

by

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Thesis submitted in conformity with the requirements
for the Degree of LLD
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“This fight is not just about me, it's about taking a stand and fighting for dignity, equality and the human rights of women in sport. All we ask is to be able to run free as the strong and fearless women we are!! .”

- *Caster Semenya*

ACKNOWLEDGEMENTS

Undertaking this Legum Doctor degree has challenged me in so many facits of life – challenges that would not have been so easily overcome without the support and guidance that I have received from so many people.

Firstly, I give all thanks to God who has instilled in me the strength and persistence to far surpass my own expectations and capabilities.

I would like to thank my advisor and mentor, Prof Rian Cloete, not only for your assistance and contribution towards this thesis, but also for the great impact you have had in my life over the last 6 years. Without your guidance and belief in me I would not have undertaken this mammoth task. My gratitude extends to the University of Pretoria for their unfailing support and financial assistance in awarding me with the UP Postgraduate Bursary.

To my dear friend Eleni Constas who has walked every step of this journey with me, thank you for your ongoing support and encouragement. Thank you for always lending your time to edit my work. I can never thank you enough for the enormous part you have played in my journey.

To my husband, Karel van Der Merwe, your never-ending encouragement and admiration has become the cornerstone in the completion of this thesis. Thank you for all that you are and every sacrifice that you have had to make in supporting me throughout my studies.

Last but never the least, to the gems that I am so fortunate to call my parents, thank you for always believing in my absurd dreams, no matter the insanity thereof. I could

never express the extent that your love and support has had on all that I am and all that I will ever be.

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LLD 2022

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ABSTRACT

On 30 April 2019, the Court of Arbitration for Sport (hereinafter referred to as "CAS") dismissed *Caster Semenya* and Athletics South Africa's (hereinafter referred to as "ASA") requests' for arbitration that called for World Athletics' (formally known as the International Association of Athletics Federations or the "IAAF") Eligibility regulations for the Female Classification (Athletes with Differences of Sex Development) (hereinafter referred to as "the DSD Eligibility regulations") to be declared invalid.[1] In their bid for the invalidation of the DSD Eligibility Regulations, *Semenya* and ASA's legal team appealed the CAS's award in the Swiss Federal Supreme Court on grounds that the regulation unfairly discriminates against female athletes, specifically those

[1] Court of Arbitration for Sport, *Mokgadi Caster Semenya v. International Association of Athletics Federations (IAAF)*, CAS 2018/O/5794, & *Athletics South Africa v. International Association of Athletics Federations (IAAF)*, CAS 2018/O/5798, Decision of 30 April 2019 [hereinafter referred to as the '*Semenya'* case].

affected by Differences of Sex Development (hereinafter referred to as "DSD"), in that it is only applicable to female athletes depicting certain physical traits. Their bid that the regulation is unnecessary in trying to uphold fair competition within the female category and that if same were to exist to ensure fair competition, it would result in a significant disproportion in consideration of the irreparable harm it would bear on the affected female athletes.[2] The team secondarily focused on the contentious scientific basis on which the regulation is based, indicating that World Athletics' presumed athletic advantage hypothesis was nothing more than a presumption at present. The call for invalidation of the DSD Eligibility regulations was thus brought in light of its violation of the "IAAF Constitution, the Olympic Charter, the laws of Monaco, the laws of jurisdictions in which international athletics competitions are held, as well as universally recognised fundamental human rights."[3] World Athletics, however, remained seemingly unscathed by the request of appeal and merely upheld the findings of the Bermon tests while they depended upon the CAS award to strengthen their argument. Fortunately for World Athletics, the Swiss Federal Supreme Court shared their stance in the ordeal, rejecting the request to appeal based on the notion that the CAS, being a competent court of law, made an informed and assumed correct decision. With all other recourses available to them exhausted, ASA and *Semenya* have turned to the European Court for Human Rights as their last resort to protect not only the livelihoods of female athletes with DSD but also their fundamental right to dignity.

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2 The *Semenya* case (note 1 above).
3 As above.

This study firstly investigates the viability of the CAS's award dated 30 April 2019 in accordance with the merits, evidence, and facts upon which the decision was based upon. Secondly, it will critically analyse the Swiss Federal Supreme Court's judgment to reject the appeal by *ASA* and *Semenya*. Reference will be made to the Doctrine of Proportionality in analysing the Swiss Federal Supreme Court's application thereof in the *Semenya* case. Comparisons are made between existing caselaw serving as precedents of the European Court for Human Rights and the facts contained in the *Semenya* case. Attention has also been drawn to the legal recourse currently available to affected athletes and the need for reform in current sports jurisprudence. Furthermore, emphasis will be given to the underlying causes of DSD development and why occurrences thereof is more prominently found in the populations of developing countries. Hereinafter, opinions and suggestions will be made as to appropriate and law-abiding ways as to how DSD should be regulated.

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INTRODUCTION

This thesis will pursue to investigate the judgments handed down by various courts in matters pertaining to the eligibility of female athletes with Difference of Sex Development to compete in elite competition and the impact thereof on international human rights. Conclusions will be drawn regarding the necessary jurisdiction required for courts to hear human rights matters and the need for a standard approach when considering the legality of limiting human rights. The Doctrine of Proportionality is proposed as an appropriate standard to ensure that limitations of fundamental rights are just and reasonable.

For centuries the sporting industry has been dedicated to establishing a regulated criterion for the female category within sport in the name of fair practice. This has led to the exclusion of many female athletes who do not conform with the proposed criterion of a ‘natural’ female athlete.

Various ideologies surrounding sex testing and the verification of gender has been implemented by sporting bodies to protect the integrity of female sports. Initially, these tests were merely aimed at preventing men from competing in the female category and later evolved to safeguard fairness and eliminate all individuals that fall outside the realm of cisgender female athletes This including the ineligibility of females with Differences of Sex Development. This ineligibility is presently regulated by the DSD Regulations, which permits female athletes with DSD to compete on grounds that either oral or physical medical treatments are undergone.

As the court of first instance, the Court of Arbitration for Sport (CAS) was the primary court to adjudicate the validity of eligibility regulations that contravenes human rights.

The CAS's Award dated 30 April 2019 stands as precedent for all matters pertaining to the exclusion of female athletes with Differences of Sex Development. This leading judgment prioritises fair sporting practise in limitation of an array of human rights based on evidence collected from a singular study that will be evaluated throughout this study. On appeal, the verdict was vindicated on grounds that, even though the regulations were found to infringe upon human rights, the infringement could be justified in light of fair play.

Generally, only courts of superior or constitutional status hold the necessary jurisdiction to hear matters where human rights are of concern. Human rights hold fundamental value due to its importance in society and therefore binds all legislation and creatures of state. Therefore, in exceptional circumstances human rights are subject to limitations if such limitation can be justified. The justification of the limitation of human rights requires experts of the highest calibre to interpret legislature in ensuring that justice is met, with many turning to the Doctrine of Proportionality as the chosen method for the resolution of human rights.[4]

The Doctrine of Proportionality can be characterized as an array of conditions to be considered by an interpreter before a fundamentally protected right may be limited[5] and consists of a three-fold test designed to ensure that limitations of fundamental rights by statutes are both balanced and reasonable[6]. While it is not mandatory to

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4 Cianciardo, J., 2010, 'The Principle of Proportionality: The Challenges of Human Rights', *Journal of Civil Law Studies,* Available at: https://digitalcommons.law.lsu.edu/jcls/vol3/iss1/11 (accessed on 05 February 2021).

5 Barak, A., 2010, 'Proportionality and Principled Balancing', *Law and Ethics of Human Rights*, Vol 4(1), p 1-16, Available at: DOI: 10.2202/1938-2545.1041 (accessed 22 August 2022).

6 Barak, A., 2012, 'Proportionality: Constitutional Rights and their Limitations (Cambridge Studies in Constitutional Law)', *Cambridge: Cambridge University Press*, Available at: doi:10.1017/CBO9781139035293 (accessed on 06 February 2021).

apply the Doctrine of Proportionality, this study will advocate therefore to establish a set standard of interpreting fundamental limitations.

Although the Court of Arbitration for Sport is not deemed a superior court, during its adjudication of the CAS award of 30 April 2019 it claimed jurisdiction of a matter where human rights were limited and determined the limitation justified. Whether or not the Court of Arbitration for Sport had the necessary jurisdiction to deliver such a verdict, in doing so it amplified its status on the hierarchy of courts and assumed superior status and as such should be held to the same standard as is expected from superior courts.

Research Originality and Contribution to Knowledge

The present study attempts to address multiple gaps in existing sport law, regulations, and court systems, and in doing so, makes important contributions. Firstly, the study extends the limited research in the understanding of Difference of Sex Development and its regulation in elite sport competition. Existing case law as well as academic journals aids in the research's relevance by emphasizing the lack of understanding of Differences of Sex Development.

Secondly the study assesses the mediating role of the court system between sport regulations and human rights, thus, explaining the mechanism through which sport regulations can negatively impact human rights in the absence of court intervention. The study achieves this through the examination of processes followed in case law in comparison to that following in Differences of Sex Development cases.

Whereas prior research has shown that the regulation of Differences of Sex Development in sport has presented as a difficult task for courts to arbitrate, no

previous study to the best of the author's knowledge and through searches of peer-reviewed databases has empirically explored the negative effects that the absence of a unified court process may have on the limitation of human rights in sport. Existing research on the court's involvement in Differences of Sex Development in sport has primarily focused on the outcomes of the Dutee Chand and Caster Semenya cases in the Court of Arbitration for Sports. This research bears originality in its identification of a set approach in courts to deal with the limitation of human rights in sport, such as in the case of the regulation of Differences of Sex Development in sport.

Aims and Objectives

This considered, this thesis seeks to make an example of the CAS award of 30 April 2019 and the appeals lodged against it in identifying its shortcomings as well as the reasons why only specified courts should have the necessary jurisdiction to hear matters where human rights are of concern. This research will critically analyse the scientific evidence surrounding gender verification in alignment to the international human rights that are limited in its presence. In doing so, this research will highlight the structures of the Doctrine of Proportionality and the need for a standard approach to be followed by courts when interpreting the limitation of fundamental rights. Lastly, this research aims to serve as an aid to the pending decision of the European Court for Human Rights in shedding light on the underlying crises of the obscured protection of athletes in courts and the fundamental need to reform sports justice.

Throughout the course of conducting this study, many concerns regarding the regulation of female athletes with DSD will be identified. This is indicative of the long-lived struggle assorted female athletes have had to endure over the last few centuries.

In its advocation for the rights of female athletes, this research remains focused on its primary objectives. The core objectives of this study are to:

1. Analyse the CAS award of 30 April 2019, DSD Regulations and the scientific evidence supporting it.
2. Identify the shortcomings of the Bermon tests and dangers of enforcing the existing DSD regulations.
3. Introduce the term 'Differences of Sex Development', criticise the existing binary framework of gender and isolate DSD from transgenderism.
4. Suggest the Doctrine of Proportionality as a standard uniform approach when interpreting the limitation of fundamental rights alongside other recommendations to improve the regulation of gender disputes in sport.

Research Importance

The findings of this study will redound to public good, considering the current lack of knowledge relating to DSD in sport in the international society. The undisclosed goal of the study is to rationalise society's perception of female athletes with DSD while raising awareness towards the consequential need for transformation within international sporting bodies and tribunals and its approach towards international human rights, standards and norms. The knowledge gained from this research may encourage scientific experts to broaden the pool of studies conducted in Differences of Sex Development and its impact on athletic performance.

Research Questions

Should athletes with Differences of Sex Development be regulated within the female category of sport?

- Are the Eligibility Regulations for the Female Classification (Athletes with Differences of Sex Development) the best way to safeguard the integrity of female competition?
- Was the Court of Arbitration for Sport objective and correct in the deliberation of its Award dated 30 April 2019?
- Can the limitation of human rights caused by the DSD regulations be justified under the Doctrine of Proportionality?
- Is there a possible alternative for preserving fairness in female sports without limiting human rights?

METHODOLOGY

Research Approach

This research will critically analyse of the current international sports law with regards to female athletes with Difference of Sex Development, as regulated by the International Olympic Committee Regulations and World Athletics Regulations. The research will focus on international literature related to Differences of Sex Development from both a scientific and legal perspective. Reference will be made to existing regulations in addition to an abundance of legislation, charters, and international standards of human rights. This research will substantiate the adversities faced by affected athletes by way of professional opinions found in internationally accredited journals, books, case law, and interviews. The structure of this research paper will be found on the facts and findings of the ongoing case of *Mokgadi Caster Semenya v World Athletics*. Reference to all sources appears in the bibliography.

International Literature

This research paper will include references to international legal systems including, Canada, South Korea, Monaco and South Africa. Further reference will be made to international standards promulgated by the United Nations, World Medical Association, African Commission on Human and Peoples' Rights and Council of Europe. The case law investigated will focus either on sports disputes or on human rights disputes. Such cases will be harvested from the Court of Arbitration for Sport, the Swiss Federal Supreme Court and the European Court of Human Rights.

Literature Review

A Timeline of Research

The IAAF enforced its Hyperandrogenic Eligibility regulations in 2011, affirming women with hyperandrogenism's eligibility to compete in international competition. The regulations held that no female athlete with hyperandrogenism would be permitted to compete in the female category of an international competition until such a time that her natural testosterone levels fall, or are restricted by way of medical intervention within the 'normal' female range Total Testosterone (TT) levels being less than 10 nmol/L.[7]

In 2015, the *Chand* case challenged the hyperandrogenism regulations in the CAS on the basis that it discriminated against female athletes affected by a naturally occurring physical characteristic based on an unproven presumption surrounding the relationship between TT and athletic performance, leading to a disproportion to "any legitimate objective."[8] The CAS suspended the Hyperandrogenic Eligibility regulations due to its discriminatory nature in the absence of sufficient evidence to establish any sort of justification to prohibit female athletes with hyperandrogenism from competing in international competition. The CAS further accommodated the IAAF with a grace period of two years in which to provide the necessary evidence to uphold its

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7 International Association of Athletics Federations Regulations governing eligibility of females with Hyperandrogenism to compete in women's competition, 2011, Available from: https://www.sportsintegrityinitiative.com/wp-content/uploads/2016/02/IAAF-Regulations-Governing-Eligibility-of-Females-with-Hyperandrogenism-to-Compete-in-Women%E2%80%99s-Competition-In-force-as-from-1st-May-2011-6.pdf (accessed on 1 May 2018).

8 CAS 2014/A/3759 *Dutee Chand v Athletics Federation of India (AFI) & The International Association of Athletes Federation (IAAF)* (herein after referred to the 'Chand case') para 4.

Hyperandrogenism regulations upon which the IAAF elected to retract the regulations in totality.

In 2017, Stéphane Bermon and Pierre-Yves Garnier conducted a study observing male and female athlete performances in relation to their mass spectrometry-measured serum androgen concentrations. All 2127 samples evaluated were obtained during the 2011 and 2013 IAAF Championships. It was found that female athletes with DSD have an "estimated competitive benefit of 2 – 5%",[9] this is prior to hormonal therapy and in four specific events, namely: 400m sprints, 400m hurdles, 800m, and 1 500m races.

In 2018, the IAAF enunciated its new version of gender verification regulations in the form of the DSD Eligibility Regulations, which are only applicable to female athletes with a particular form of Differences of Sex Development.[10] Formulated from the newly submitted Bermon tests, the DSD Eligibility regulation restricted the participation of female athletes with DSD only in specific events, being "400m races, 400m hurdles races, 800m races, 1500m race one mile races, and all other track events over distances between 400m and one mile (inclusive)"[11]. Should female athletes with DSD wish to compete in the restricted events, they are required to reduce and maintain their blood testosterone to a specified level of below five nmol/L.[12]

The British Journal of Sports Medicine (BJSM) published a letter dated 10 May 2018 by Pielke *et al* requesting Dr Bermon and Garnier to publicise the performance data

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9 Bermon, S., 2017, 'Androgens and athletic performance of elite female athletes', Current Opinion in Endocrinology & Diabetes and Obesity, vol.24, no.3, pp.246-251.

10 IAAF Eligibility Regulations for the Female Classification (athletes with differences of sex development), 2018, Available from: https://www.worldathletics.org/news/press-release/eligibility-regulations-for-female-classifica (accessed on 1 May 2018) [hereinafter referred to as the 'DSD Regulations'].

11 DSD Eligibility Regulations (note 10 above) para 2.2.

12 DSD Eligibility Regulations (note 10 above) para 2.2.

used to achieve their findings in the Bermon tests. The authors indicated that this request stemmed from their inability to recreate the Bermon test results by applying the reported methods to the performance data retracted from the IAAF's public web page, thus leading to the inquest.[13]

The Bermon tests were criticised by Pielke *et al* in 2018, who conducted their own study by cross examining the performance data received from the authors of the *Bermon* tests. Pielke *et al* found numerous errors with the data utilised that compromised of up to 33 % of the Bermon tests.[14] Such errors were summarised to include the duplication of athletes, the duplication of times recorded for several athletes, and so-called 'phantom times'. The authors concluded their findings by calling upon the BJSM to retract both Bermon and Garnier (2017) as well as its explanatory article published in 2018.[15]

Karkazis *et al* responded to the IAAF's promulgation of the 2018 DSD Eligibility Regulations by evaluating the effects thereof on female DSD athletes. This article found the DSD Eligibility Regulations to invoke an imbalance with the IAAF constitution's aim to achieve fairness in sport and promote participation for all by failing to uphold selective female athletes' right to dignity and privacy.[16] The article further examined the alternative measures available to affected athletes, same being:

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13 The British Journal of Sports Medicine, 2018, 'Call for Drs Bermon and Garnier to share anonymised underlying performance data', *The British Journal of Sports Medicine*, Available from: https://blogs.bmj.com/bjsm/2018/05/10/call-for-the-authors-of-bermon-and-garnier-to-share-the-underlying-performance-data/ (accessed on 2 August 2018).

14 The *British Journal of Sports Medicine* (note 13 above).

15 Pielke, R., 2016, 'The Edge – The War Against Cheating and Corruption in the Cutthroat World of Elite Sports', *Roaring Forties Press*.

16 Karkazis, K. & Carpenter, M., 2018, 'Impossible 'choices': the inherent harms of regulating women's testosterone in sport', *Journal of Bioethical Inquiry*, vol. 15, pp. 579–587.

denominating the choice of either using medical altercations, competing in the male category or retiring from competitive sport as an "impossible set of choices".[17]

In 2018, the *Semenya* case challenged the DSD Eligibility Regulations in the CAS on the basis that the regulation discriminated against female athletes with DSD on five different bases, being (1) the basis of birth, natural, physical, genetic, or biological traits; (2) the basis of sex; (3) the basis of gender; (4) the basis of physical appearance; and (5) against female athletes who compete in events that are specifically restricted. The CAS adjudicated its 2019 CAS award in favour of the IAAF, indicating that, although discriminatory, the DSD Eligibility Regulations are found to be "necessary, reasonable and proportionate"[18] in the preservation of the female category in elite competition and accordingly dismissed *Semenya*'s arbitration claims.

In 2020, *Semenya* appealed the 2019 CAS award in the Swiss Federal Supreme Court. The Swiss Federal Supreme Court reaffirmed that it bears limited jurisdiction to review the content of the matter and may only review same for the sole purpose of examining whether the CAS award "violates fundamental and widely recognised principles of public order".[19] It was held that, as an "independent court of arbitration", the CAS "comprehensively examined the *Caster Semenya* case" and that "its decision is also compatible with public order".[20] The Swiss Federal Supreme Court concluded

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17 Karkazis *et al* (note 16 above).

18 Court of Arbitration for Sport, 2019, 'Media release – CAS Arbitration: Caster Semenya, Athletics South Africa (ASA) and International Association of Athletics Federations (IAAF): Decision', Available at: https://www.tas-cas.org/fileadmin/user_upload/Media_Release_Semenya_ASA_IAAF_decision.pdf. [hereinafter referred to as the 'The CAS Award'].

19 Swiss Federal Supreme Court, *Mokgadi Caster Semenya v. International Association of Athletics Federation*, 4A_248/2019, Swiss Federal Supreme Court, 29 July 2019 [hereinafter referred to as the 'Swiss decision'].

20 The Swiss Decision (note 19 above) 2.

that the CAS award could not be appealed and further rejected the applicant's request for appeal.

In its report dated 20 March 2019, the United Nations Human Rights Council conducted a field study considering the "Elimination of Discrimination Against Women and Girls In Sport."[21] The Council noted concerns that the DSD Eligibility Regulations are "not compatible with international human rights norms and standards […] and that there is no clear relationship of proportionality between the aim of the regulations and the proposed measures and their impact".[22] It recognised that discriminatory sporting regulations lead to the exclusion of affected female athletes in sport altogether and thus called upon all states to refrain from enforcing sporting policies that are not "in accordance with international human rights norms and standards." In line with its findings, the report further requested the United Nations High Commissioner for Human Rights to "prepare a report on the intersection of race and gender discrimination in sports, including in policies, regulations and practices of sporting bodies, and elaborating on relevant international human rights norms and standards"[23].

On 25 April 2019, the World Medical Association (WMA) issued an official press release urging physicians not to implement the DSD findings based on the requirement of the regulation for affected female athletes to "medically reduce their natural blood testosterone level if they wish to continue racing as women in a few restricted

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21 United Nations Human Rights Council, 2019, 'Promotion and protection of all human rights, civil, political, economic, social and cultural rights, including the right to development', *United Nations Human Rights Council*, fortieth session, agenda item 3, Available at: https://undocs.org/pdf?symbol=en/A/HRC/40/L.10/Rev.1 (accessed on 17 April 2021) [hereinafter referred to as the '2019 UN report'].

22 2019 UN report (note 21 above) 2.

23 As above.

events."[24] The report finds the requirement "contrary to international medical ethics and human rights standards" and "contrary to a number of key WMA ethical statements and declarations".[25] The press release denounced the WMA's hesitancy regarding the ethical validity of the DSD Eligibility Regulations as it is based on "weak evidence from a single study, which is currently being widely debated by the scientific community. They are also contrary to a number of key WMA ethical statements and declarations, and as such, we are calling for their immediate withdrawal".[26]

In their report dated 15 June 2020, the United Nations High Commissioner for Human Rights, together with the Human Rights Council, conducted a study on the Intersection of race and gender discrimination in sport. Particular focus was placed on factors, "such as discriminatory social norms or obstacles to reconciling the burdens of care, work and sport, and internal to sport, including the lack of programmes to create a gender-sensitive and safe sporting environment or to address harassment and other forms of gender-based violence in sport, including sexual exploitation and abuse." It was found that female athletes "who do not conform to community-based gender norms related to the style of hair or dress, sexual orientation or participation in particular sports, may be subjected to harassment and exclusion by their families or communities."[27] The report concluded that the implementation of the DSD Eligibility Regulations would deny female athletes with DSD an equal right to participate in

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24 World Medical Association, 2019, 'WMA urges physicians not to implement IAAF rules on classifying women athletes', *World Medical Association*, available at: https://www.wma.net/news-post/wma-urges-physicians-not-to-implement-iaaf-rules-on-classifying-women-athletes/ (accessed on 23 May 2019).

25 As above.

26 World Medical Association (note 24 above).

27 United Nations Human Rights Council, 2020, 'Intersection of race and gender discrimination in sport', *United Nations Human Rights Council*, Forty-forth session, Agenda items 2 & 3, A/HRC/44/26, Available at: https://undocs.org/en/A/HRC/44/26 (accessed on 12 February 2021) [hereinafter referred to as the 'UN report 2020'].

sports and violates the right to non-discrimination more broadly resulting in a negative impact on athletes' enjoyment of their human rights.[28]

In September 2021, Alexander *et al* conducted a study examining the correlation between female endogenous testosterone and physical strength.[29] In alignment with their hypothesis, no evidence could be produced to suggest that any scientific relationship exists between heightened handgrip strength and total testosterone, SHBG and/or FAI in pre-menopausal females. The findings of Alexander *et al* lays down an explanation for the need of further studies that may lead to an alternative understanding of the female body and how it operates in correlation to the male body, specifically in relation to the positive association of testosterone with lean mass and strength in young and older males (and females).

The Impact of the DSD Eligibility Regulations

Whereas known cases of DSD amongst female athletes merely dates back to 2015 when World Athletics barred Indian athlete *Dutee Chand* from competing, athletes affected by gender regulating regulations prior to *Chand's* case are starting to come forward with what can only be described as horror stories. This sudden burst of confidence by affected athletes to rise above institutions such as World Athletics and the International Olympic Committee indicates the importance of the *Chand* and *Semenya* cases. Many of these cases have been reduced to interviews given by the athletes themselves and will be included as an instrument to this research.

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28 UN report 2020 (note 27 above).

29 Alexander, S E., Abbott, G., Aisbett, B., Wadley, G D., Hnatiuk, J A., & Lamon, S., 2021, 'Total testosterone is not associated with lean mass or handgrip strength in pre-menopausal females', *Scientific Reports*, Vol. 11, Article number: 10226, Available at: https://doi.org/10.1038/s41598-021-89232-1 (accessed on 22 September 2021).

Indian middle-distance runner *Santhi Soundarajan's* story highlights the unapproachable nature of World Athletics in matters dealing with DSD. *Soundarajan* was informed that she had failed a gender test after which World Athletics called her for an investigation. Her non-attendance, to the investigation that she pleas not to have any prior knowledge about, led to her ban.[30] Unlike her teammate *Chand*, *Soundarajan* excepted her fate, returned to her hometown as a derelict to her country and was forced into an identity change.

Upon her failure of a supposed gender test, Ugandan 800m runner *Annet Negesa* was advised by World Athletics that she would only be eligible to compete in her respective events should she undergo a procedure.[31] Eager to compete, *Negesa* proceeded with the surgery unknowing what the procedure entailed. In absence of her informed consent, a bruised *Negesa*, who was left sterilised without any advice to post-surgery treatments, returned home never to compete again.

Chapter Overviews

Chapter one introduces the most recent developments of gender verification legislation in competitive sport. The chapter sets out the research aim and importance, methodology, objectives, and delimitations of this thesis. Also included in this chapter is the literature review, which briefly illustrates a timeline composed by the most relevant documented history of the DSD Eligibility regulations.

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30 Soundarajan, S., 2016, 'Ten Years of Despair', *Fountain Ink Magazine*, Available at: https://www.youtube.com/watch?v=63hDLndWmqU (accessed on 12 January 2021).

31 Negesa, A., 2020, 'Annet's Story: Women in Sport Face Abusive Sex Testing', *Human Rights Watch*, Available at: https://www.youtube.com/watch?v=u5rZrO4KCro (accessed on 12 March 2021).

Chapter two outlines the history of the Court of Arbitration for Sport in its recognition as an independent arbitral court with independent arbitrators that may adjudicate legally binding arbitrational awards. The chapter focuses on the jurisdiction of the Court of Arbitration for Sport to hear human rights-related disputes and whether its list of arbitrators conforms to the diversity and expertise require to hear such matters.

Chapter three critically assesses the Court of Arbitration for Sport's award of 30 April 2019 pertaining to South African Olympian Caster *Semenya*. The chapter observes and studies the vast spectrum of discrimination induced through the application of the DSD Eligibility regulations, namely: - discrimination on the basis of sex, gender, race and discrimination on the basis of biological variant. The Bermon-tests are criticised for the weak and inaccurate conduction of the study, which the DSD Eligibility Regulations are based upon. Criticism of the British Journal of Sports Medicine will delineate the journal's failure to comply with proper peer reviews before publishing articles and the implications that follows. Taking the findings of the research into consideration, the chapter concludes whether the Court of Arbitration for Sport appropriately applied fact to law in its deliberation of the *Semenya* case.

Chapter four evaluates the Transgender regulation in comparison to the DSD regulations. The chapter further recognises the association of DSD alongside transgenderism together and considers the existing sex binary system assumed by sporting bodies. Alternative binary systems are considered for the regulation of sex in sport.

Chapter five discusses the Swiss Federal Tribunal's decision to deny *Semenya's* appeal to the Court of Arbitration for Sport's award of 30 April 2019 by acknowledging Swiss law and the Tribunal's limited jurisdiction to review the facts of the case. In doing

so, the chapter identifies Swiss public policy as a litigating factor in determining its jurisdiction to hear appeals to the Court of Arbitration for Sport's arbitrational awards. A summary expresses whether the Swiss Federal Tribunal exhausted its competencies to review the facts in the *Semenya* case.

Chapter six studies the three-fold test of the Doctrine of Proportionality and its comprehension related to the limitation of a fundamental right. In consideration of the principles of the Doctrine of Proportionality, this chapter scrutinises both the Court of Arbitration for Sport and the Swiss Federal Tribunal's invocation and ill conceptualisation thereof in the *Semenya* case.

Chapter seven offers an insight into the European Court for Human Rights and its history of reviewing the Court of Arbitration for Sport arbitrational awards. The chapter examines the European Court for Human Rights' case law that shares commonality with the *Semenya* case in an attempt to predict the precedent to be set in *Semenya*'s appeal in the European Court for Human Rights.

Chapter eight concludes this thesis by summarising its findings as a justification for the need for transformation within international sports law. Finally, the chapter provides recommendations to both the Court of Arbitration for Sport and International Sport Governing Bodies pertaining to the manner in which to proceed with the World Athletics' DSD Eligibility Regulations as well as any further gender verification regulations. This chapter will also introduce the vulnerable group principality into sports law.

Delimitations

Where any reference is made to the International Association of Athletics Federation (IAAF), such words or acronym shall be read and interpreted as reading World Athletics, and *vice versa*.

Where any reference is made to hyperandrogenism, such word or condition is to be considered one and the same to Differences of Sex Development.

This research is conducted up until, and including, 21 September 2022.

C H A P T E R 1

Historical Overview

SUMMARY

1.1. Introduction
1.2. A Historical Summary of Sex Testing and Gender Verification in Sports
1.3. A Historical Summary of the Hyperandrogenism and DSD Regulations

1.1. Introduction

Over the course of the last century, males and females in the sporting world have been separated into two different categories unique to a specific physical aptitude, performance, and capability level particular to each gender. This separation presents itself as a straightforward process of identification and classification based on physical attributes. Males are males, and females are females. Even so, the classification process remains one of a sensitive nature.

1.2. A Historical Summary of Sex Testing and Gender Verification in Sports

Perceived as the highest achievement of athletic excellence, the Olympic games first set out to host only the most prestigious male athletes as the intensity of the competition was seen as too strenuous for females.[32] This continued on throughout the 18th Century and the start of the 19th Century, and was only opposed in the 1920's when the Fédération Sportive Féminine Internationale (FSFI) finally initiated the first, and only, Women's 'Olympic' Games in 1921. Threatened that the rise of an

[32] Rogol, A. & Pieper,L., 2018, 'The Interconnected Histories of Endocrinology and Eligibility in Women's Sport', *Hormone Research in Paediatrics*, Vol 90, p 1-8, Available at: DOI:10.1159/000493646 (accessed on 26 August 2022).

independent women's 'Olympic' event would diminish the excellence of the Olympic games, the IOC agreed to the entry of women in the official Olympic games.[33] Not long thereafter, the IOC experienced the first complication with trying to delineate a clear-cut female category.

In 1925, British athlete Mary Weston achieved gold in the women's shotput field event and proceeded to hold the title during the years 1928 and 1929. Weston was born a female and lived as a woman up until the age of 31, when she allegedly started questioning her sex, decided to undergo sex-reassignment surgery and ultimately registered as a male, Mark Weston, in 1936.[34] This was but the initiation of concern regarding intersex athletes competing in the female category. A more regular occurrence of successful female athletes transitioning to male poised the point of fairness amongst other female athletes. This included the likes of Slovakian athlete, Zdeňka Koubková, who held the female 800m world record in 1934 and later opted for sex reassignment surgery[35], and German athlete, Dora Ratjen, who place fourth in the female High jump event in the 1936 Olympics and later lived the remainder of his life as a man[36]. Both Koubková and Ratjen were identified as females at birth and led their lives as women as other girls would have.

After the 1936 Berlin Olympic Games, the IOC expressed their apprehension in allowing athletes with "sex ambiguities" to compete in the female category, pointing out that this could result in men impersonating females in order to compete in the

33 *Rogel* et al (note 32 above).
34 As above.
35 As above.
36 Henne, K., 2014, 'The "Science" of Fair Play in Sport: Gender and the Politics of Testing', *Signs Journal of Women in Culture and Society,* Vol 39, p 787-812, Available at: DOI: 10.1086/674208 (accessed on 26 August 2022).

female category[37]. In accordance with the fear of unjust competition and the belief that female athletes had a 'cap' on their athletic ability, American Athlete Helen Stephens was subjected to the very first gender test of the modern Olympics era upon beating Stella Welsh's 100m female world record.[38] Although Stephens passed the physical examination of her genitals, a precedent was instilled by the IOC and its zero tolerance of males competing in the female category. In 1946, the IAAF made it mandatory for all female athletes to provide official medical confirmation of their sex based on tests undergone by physicians[39]. When record holder, Foekje Dillema refused to conform to gender testing or was said to 'fail' such test in 1950, she was stripped from all her titles and records and barred from competing further.[40] Similarly to those before her, Dillema was identified as female at birth and lived as a woman for the remainder of her life, regardless of the claims against her womanhood. A post-mortem test later confirmed that Dillema had both male and female sex chromosomes[41].

During the 1960's, the IAAF found a more concerted and supposedly more efficient way of conducting its sex testing that took the form of visual inspection of all athletes in front of a panel of gynaecologists and was dubbed "Naked Parades".[42] These parades were said to have taken place at both the European Athletics Championships and Asian Games in 1966 and the Pan American Game in 1967, however, was abandoned shortly thereafter due to opposition by female athletes and the advance in

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37 Henne (note 36 above).
38 Rogol *et al* (note 32 above).
39 As above.
40 Ballantyne, K N., Kayser, M., Groogtegoed, J A., 2012, 'Sex and gender issues in competitive sports: Investigation of a historical case leads to a new viewpoint', *Br J Sports Med*, Vol 46, p 614-617, Available at: DOI:10.1136/bjsm.2010.082552 (accessed on 26 August 2022).
41 As Above.
42 Ljungqvist, A., Patiño, M J., Martínez-Vidal, A., Sánchez, L., Díaz-Pereira, M. & Covadonga, Mateos-Padorno. 2006, 'The history and current policies on gender testing in elite athletes', *International SportMed Journal,* Vol 7, p 225-230, Available at: https://hdl.handle.net/10520/EJC48593 (accessed on 26 August 2022).

science[43]. Newly discovered genetic-based laboratory testing, also known as the 'Barr body' tests, took presence over the 'Naked Parades' in 1967 at the European Cup Track and Field Event in Ukraine[44] and was later introduced by the IOC at the 1968 Summer and Winter Olympic Games[45]. The Barr body consisted of a less intrusive buccal smear that tested for the presence of a Y chromosome as it was assumed that the Y chromosome was only present in the male chromosomal structure[46]. The whole initiative behind the Barr body revolved around the belief that two distinct sex categories exist; a male category that indicated the presence of a Y chromosome, and a female category that showcased the presence of an inactive X chromosome, and "that male or intersex bodies will undermine fair play in women's sport"[47]. The science behind the Barr body led to the myths that, (1) athletic competition was only meant for natural athletes, insinuating that 'artificial' athletes existed, and (2) that science could seamlessly identify the natural from the 'artificial' athletes[48]. This was the unfortunately not the case for Polish athlete, Ewa Klobukowska, who initially passed a visual inspection but failed the Barr body test due to her XX/XXY chromosomal structure.[49] Due to a lack of knowledge of varied cell patterns, Klobukowska was sadly stripped from her medals and banned from competitive competition.[50] While the Barr body test never unveiled a man masquerading as a female, it did realise the possibility of various

43 Rogol *et al* (note 32 above).
44 Ljungqvist *et al* (note 42 above).
45 Patel, S., 2021, 'Gaps in the protection of athletes gender rights in sport—a regulatory riddle', *Int Sports Law Journal,* Vol 21, p 257–275, Available at: https://doi.org/10.1007/s40318-021-00182-2 (accessed on 26 August 2022).
46 As above.
47 Henne (note 36 above).
48 As above.
49 Henne (note 36 above).
50 As above.

patterns in chromosomal makeup both in males and females – a discovery that later rendered the test inadequate in determining what natural sex truly is[51].

In 1980, former 100m record holder in the female category, Stella Welsh was murdered. During her post-mortem examination, a buccal smear test showed that both the XX and XY sex chromosomes were present in her DNA.[52] Similarly, Spanish athlete, Maria Patino, also tested positively for a Y chromosome as a result of a Barr body test conducted in line with the IOC's requirement to compete in the 1988 Seoul Olympics.[53] Regardless of the fact that Patino suffered from Androgen Insensitivity Syndrome (AIS), a condition that disabled the body from utilising testosterone, she was deemed ineligible from competing.[54] Patino objected her ineligibility to the then empowered Chairman of the IAAF Medical Commission, Prof. Arne Ljungqvist, who agreed that a fundamental change to sex testing initiated in the 1960s was necessary as science no longer supported its use and that further use thereof led to the discrimination of female athletes with differences of sex development (DSD) [55]. This was decided on the recognition of the impact of various conditions, such as "5-αsteroid–reductase deficiency, complete or almost complete androgen insensitivity, and chromosomal mosaicism"[56] that has a significant impact on the way the body utilises testosterone, ultimately concluding that athletes with these conditions do not have unfair advantages in female sports and thus should not be excluded from competing with cisgender females. Notwithstanding this realisation, sex verification

51 Patel (note 45 above).
52 Rogol *et al* (note 32 above).
53 Sudai, M., 2017, 'The testosterone rule-constructing fairness in professional sport', *Journal of Law and the Biosciences*, Vol 3;4(1), p 181-193, Available at: DOI: 10.1093/jlb/lsx004 (accessed on 26 August 2022).
54 As above.
55 Patel (note 45 above).
56 Ljungqvist *et al* (note 42 above).

tests continued throughout the 20th Century until its official abandonment in 1991 by the IAAF and 1999 by the IOC.[57] Even though Ljungqvist announced a congruent finding years before, the abandonment was based on the findings of the IAAF 1990 workshop that females born with defects of the sex chromosomes do not have unfair advantages over cisgender females and should be eligible to compete in the female category of elite competition[58].

Sex testing was later replaced with a gender verification model that came into play on a 'test on suspicion' basis, meaning that testing only took place when initiated by an interested party who questioned an individual's eligibility[59]. This model shifted focus away from the chromosomal structure and opted to rather concentrate on testosterone levels traced within the identified female athletes' body[60]. Due to its 'test on suspicion' nature, many of the athletes identified under the gender verification tests made a quiet unannounced exit from their respective events. In 2006, Indian athlete Santhi Soundarajan was subjected to a gender verification test that resulted in her suspension from female sports and the loss of her titles due to her higher than accepted testosterone levels.[61] Soundarajan was later vindicated as she was diagnosed with AIS, however, none of her titles were restored and she never competed again.[62] This type of testing continued on an individual basis up until the promulgation of the IAAF (now known as "World Athletics") Hyperandrogenism Regulations in 2011.

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57 Ljungqvist *et al* (note 42 above).
58 As above.
59 Patel (note 45 above).
60 As above.
61 Henne (note 36 above).
62 Henne (note 36 above).

1.3. A Historical Summary of the Hyperandrogenism and DSD Regulations

World Athletics (formerly known as the "International Association of Athletics Federations", and abbreviated as the IAAF) has, throughout their various attempts of sex testing and gender verification, had a singular goal of protecting the integrity and need of the female category in sport. This goal is validated due to the vast performance levels of males in relation to females. If males were allowed to enter female competition, the female category would simply absolve into a second male category and deter the chances of having a female champion.

In order to prevent this, World Athletics aimed to identify what factor is at the root of athletic performance and approaches this classification process by considering levels of athletic performance: "The difference in athletic performance between males and females is known to be predominantly due to higher levels of androgenic hormones in males resulting in increased strength and muscle development."[63] They do, however, recognise that in rare cases, female athletes are predominantly stronger than others due to medical conditions, categorised as Differences of Sex Development (DSD). The International Olympic Charter (hereinafter referred to as the "IOC") expands on this concept, basing performance on androgenic hormones as they are said to have a performance-enhancing effect relating to strength, power, and speed.[64] Such enhancing effects need to be monitored as they may provide a competitive advantage in sports. However, this provision of a competitive advantage has not yet been

63 IAAF Regulations governing eligibility of females with Hyperandrogenism to compete in women's competition, 2011, [hereinafter referred to as the 'Hyperandrogenism regulations'].

64 Rheeder, R., 2016, 'Respect for Vulnerability is a Human Right Article 8 Of the UNESCO Declaration on Bioethics and Human Rights and Senior Citizens in South Africa', *The South African Journal of Bioethics & Law,* vol.9, no.1, p 266.

confirmed.

World Athletics' 2019 Hyperandrogenism Regulations were first legally challenged in the leading judgement of *Dutee Chand v Athletics Federation of India (AFI) & The International Association of Athletes Federation (IAAF),*[65] where the court had to decide on the dispute that female athletes with higher testosterone levels held an athletic performance advantage. The court held that the onus of proof lay upon the IAAF to establish that hyperandrogenism regulations are, as a matter of fact, necessary and proportionate to pursue the legitimate objective of organising competitive female athletics to ensure fairness in athletic competition.[66] The IAAF was unable to provide "sufficient scientific evidence about the quantitative relationship between enhanced testosterone levels and improved athletic performance in hyperandrogenic athletes."[67] In the absence of such distinctive evidence, the Panel was unable to conclude that hyperandrogenic athletes may enjoy such a significant performance advantage that is necessary to exclude them from competing in the female category altogether.[68] The Court of Arbitration for Sport (CAS) panel adjudicated an "interim award" which consisted of a two-year grace period awarded to the IAAF to present newly formulated evidence proving that increased testosterone levels in a female does amount to an unfair advantage and that hyperandrogenism regulations are in fact necessary. After the passing of the two-year period, and even though the CAS panel confirmed that the regulations do include a degree of infringement upon the rights of certain athletes, the Panel awarded a further six-month

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65 The *Chand* case (note 8 above) para 15.

66 Tiwari, P., 2015, 'CAS Relief for Dutee, Jolt For IAAF', *Deccan Herald*, Available from: http://www.deccanherald.com/content/491855/cas-relief-dutee-jolt-iaaf.html (accessed on 13 March 2017).

67 *Chand* case (note 8 above).

68 *Chand* case (note 8 above) para 15.

extension based on the belief that such violation could be justified. This belief stemmed from newly filed evidence by the IAAF on 29 September 2017.[69] The science behind the new evidence resulted from hormone and performance data collected from 1132 females and 795 males who participated in the 2011 and 2013 IAAF World Championships. The IAAF's findings concluded that female hyperandrogenic athletes have an "estimated competitive benefit of 2 – 5%"; thus it could be possible that they hold the capacity to gain a more significant advantage due to muscle mass and strength.[70] This advantage can be summarised as a gain in muscle mass, a more dynamic central nervous system, the function of aggressiveness and risk-taking, and an increase in Erythropoiesis (EPO),[71] none of which had been accurately regulated in the past. Furthermore, one of the variables used to reach this conclusion included comparing hyperandrogenic athletes' performance before and after the use of anti-androgen medications.

A vital clue pertaining to the uncertainty of the CAS panel lies in the subject matter of their judgement. The Panel suggests that the extension was awarded merely on the grounds that, by filing new evidence, the IAAF complied with given directives in their 2015 judgement. However, a decision in terms of whether or not the new evidence carries substance in sufficiently proving that hyperandrogenic athletes have a profound sporting advantage remains unanswered.[72] Shortly after the lapse of the extension, the IAAF elected to retract the legislation rather than file substantiating evidence thereto. The *Eligibility Regulations for the Female Classification (Athletes*

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69 Tas Cas, 2018, 'Media release - The application of the IAAF hyperandrogenism regulations remain suspended', Available from: http://www.tas-cas.org/fileadmin/user_upload/Media_Release_3759_Jan_2018.pdf (accessed on 20 February 2018).

70 Bermon (note 9 above).

71 Bermon (note 9 above) 248.

72 Media release (note 69 above).

with Differences of Sex Development)[73] was formally enacted in 2018 and excluded the 200m sprint from its list of regulated track events. As hyperandrogenic athlete *Dutee Chand* competed in the 200m sprint, her cause of action in the legal matter was nullified which resulted in the termination of all legal proceedings pertaining to the regulations. The new DSD Eligibility Regulations did however result in the ineligibility of other female athletes.

In June 2018, South African athlete *Caster Semenya* supported by Athletics South Africa (ASA), formally lodged her objection against the IAAF's DSD regulations at the CAS, describing the regulations as being "discriminatory, unnecessary, unreliable and disproportionate."[74] *Semenya's* team of experts arguing on her behalf consisted of an extensive group of medical and legal professionals, all with a single goal of relying on facts to invalidate the regulation in totality. The CAS panel dismissed *Semenya's* objection on 30 April 2019 and stated that, although discriminatory, the regulations were in fact "necessary, reasonable and proportionate".[75] The finding, although final, left gaping holes in its award. The 165-page award expressly mentioned serious concerns regarding the physical application of the regulations, a few of which are: the difficulties of its implementation; the difficulty to rely (or not to rely) on concrete evidence of actual athletic advantage; and the side effects of hormonal treatment and human rights of the athlete concerned. Further identified flaws included that the DSD regulations made provision for merely five athletic events being all track races between 400m and one mile, namely: 400m races, 400m hurdles races, 800m races, 1500m races, and one-mile races. This was supposedly due to the newly formulated scientific

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73 DSD Regulations (note 10 above).
74 The CAS Award (note 18 above).
75 *Semenya* case (note 1 above).

evidence (as aforementioned), which indicated that females with higher testosterone levels gain a performance advantage in specified events. The problem, however, is that the specified events included in this scientific evidence included field events - Hammer Throw and Pole Vault - and did not make provision for 1500-meter races. This poses the question of how and under which pretences the regulations were formulated. Another predicament involves the World Athletics'' scientific basis upon which the newly formulated regulations are found that present as too vague to justify the limitation of the human rights of DSD athletes.

These were all concerns raised by the ASA and *Semenya's* legal team when they opted to request an appeal of the CAS award. When the CAS rejected the request to appeal, the *Semenya* party took the fight to the Swiss Federal Supreme Court, the only alternative court that holds jurisdiction to appeal CAS awards. The Swiss Federal Supreme Court confirmed the accreditation of CAS as an independent court as well as its deliberation of the evidence presented in the *Semenya* case and ultimately indicated that, although discriminatory, the regulations were necessary in light of protecting the interests of society.[76]

Since *Semenya*'s loss in both the CAS and the Swiss Federal Supreme Court, Bermon *et al* retracted their original study, advising that the tests findings contained some faults.[77] Despite its lengthy cross-examination in the academic world as well as in the courts, World Athletics and CAS has held the findings of the Bermon tests in high regard. In fact, even though Bermon *et al* has raised concerns in their own findings,

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76 The Swiss decision (note 19 above).

77 Bermon, S., & Garnier, P., 2021, 'Correction: Serum androgen levels and their relation to performance in track and field: mass spectrometry results from 2127 observations in male and female elite athletes', British Journal of Sports Medicine, Volume 55, e7, Available at: http://dx.doi.org/10.1136/bjsports-2017-097792corr1 (accessed 10 October 2021) [hereinafter referred to as the 'Bermon Correction'].

World Athletics remains unchanged in their opinion that the DSD Eligibility Regulations are appropriate and necessary to preserve 'fair sporting practice'. As the court of last resort, ASA and *Semenya* has now approached the European Court for Human Rights.

C H A P T E R 2

The Court of Arbitration for Sport's Ability to Hear Gender Specific Matters

SUMMARY

2.1. A Brief History of the Court of Arbitration for Sport
2.2. The Court of Arbitration for Sports' Jurisdiction Restrictions
2.3. The Court of Arbitration for Sport on Human Rights
2.4. The Court of Arbitration for Sport's Burden to Order Evidence *Ex Officio*
2.5. Challenging a Court of Arbitration for Sport's Award
2.6. Who are the Arbitrators, and Why Does it Matter?
2.7. Do the Existing Numbers of Participating Women in Sporting Regulatory Bodies Reflect Equal Opportunities for Women?
2.8. Advancing Female Participation in Sport

2.1. A Brief History of the Court of Arbitration for Sport

Almost simultaneously to its adoption on 30 June 1984, the Court of Arbitration for Sport (hereinafter referred to as "CAS") proved itself to be a revolutionary mark in the sports law industry. It would later be considered the pinnacle of all dispute resolutions that are sport-related as well as the creator of the governing law in the sporting industry, better known as *lex sportiva*. The need for a sport-specific alternative dispute resolution was the brainchild of the International Olympic Committee's (hereinafter referred to as "IOC") President at the time, H.E. Juan Antonio Samaranch, and initiated by then acting Judge Kéba Mbaye of the International Court of Justice in The Hague.[78]

[78] Court of Arbitration for Sport, 'History of CAS', *Court of Arbirtration for Sport,* Available at: https://www.tas-cas.org/en/general-information/history-of-the-cas.html (accessed on 26 August 2019).

The preliminary objectives for the CAS were to provide athletes with a quick and cost-effective dispute resolution forum that was flexible to the demanding lifestyle of a professional athlete. As the operational financer of the CAS, the IOC affirms that "the jurisdiction of the CAS should in no way be imposed on athletes or federations but remain freely available to the parties"[79]. Presently, the CAS enjoys dominant jurisdiction to hear sporting matters over and above national and international courts by way of consent. This, however, does not necessarily mean that each individual party to a dispute has consented to the CAS as the IOC articulates – whether it be verbally or written – but rather that the federation or organisation to which the athlete belongs has bound itself to the jurisdiction of the CAS. Considering the CAS's revolutionary status, this would ordinarily not be a matter of concern. Nevertheless, given the blurred lines concerning the CAS's independence from the IOC, especially after the promulgation of the World Anti-Doping Code that consents to the jurisdiction of the CAS for all international doping-related disputes, the seemingly not-so-independent jurisdiction of CAS tends to leave a bad taste in the mouths of aggrieved athletes, especially those forming part of the IOC.

In 1993, G*undel*, a German equestrian competitor, raised eyebrows towards the CAS's independence status by claiming its award was invalid and unenforceable due to the CAS's incompliance to the independence and impartiality requirements to be regarded as an official arbitral court, which unintentionally led to the CAS's revolutionised authoritative status. The Swiss Federal Tribunal held that the CAS was to be considered as an independent arbitral court with independent arbitrators who, by law, and as long as the IOC was not a party to a dispute, could adjudicate arbitrational

79 History of CAS (note 78 above).

awards accordingly.[80] This decision came under scrutiny in 2003 when two Russian cross-country ski athletes had corresponding CAS awards adjudicated against them for the use of the prohibited substance of Erythropoietin. [81] The pair approached the Swiss Federal Tribunal to, once again, challenge the independence and jurisdiction of the CAS to hear a matter where the IOC was indeed a litigating party. The Swiss Federal Tribunal remained consistent in their decision that the CAS, now having several years of successful "international sports-related disputes" resolved "quickly and inexpensively"[82] behind it, had established a legal foundation that guarantees independence and impartiality in all matters, including those where the IOC was partied to. This ideal was based on the notion that a vast number of cases in the CAS had at that time already been adjudicated against the IOC and in favour of the complainants. The Swiss Federal Tribunal reaffirmed that the CAS had proven itself as being an essential aspect of organised sport, and as such, the CAS should be deemed the superior court in competitive sports, laying all further possibilities of suspicions of the CAS's capabilities to rest.[83] In the *Mutu and Pechstein v Switzerland* case, both parties challenged CAS awards in the European Court of Human Rights on the basis of impartiality on the part of the CAS, invoking Article 6(1) of the European Convention on Human Rights (ECHR), the right to a fair and public hearing.[84] The

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80 Court of Arbitration for Sport, *G v Fédération Equestre Internationale*, CAS 91/53 1993, 1 Digest of CAS Awards 561, 569–70.

81 Court of Arbitration for Sport*, Lazutina v. International Olympic Committee*, CAS 2002/A/370, Decision of 18 December 2003& Court of Arbitration for Sport, *Danilova v. International Olympic Committee*, CAS 2002/A/371, Decision of 27 May 2003.

82 Swiss Federal Tribunal, Lazutina, *Danilova v. IOC*, FIS, CAS, Case 4P.267-270/2002 at paragraph 3.3.3.3.

83 As above.

84 Council of Europe, 1952, 'European Convention on Human Rights', Council of Europe Treaty Series 005 Strasbourg: Council of Europe, Available at: https://www.echr.coe.int/documents/convention_eng.pdf (accessed on 10 February 2021) [hereinafter referred to as the 'European Convention'] Article 6(1):
In the determination of his civil rights and obligations or of any criminal charge against him, "Everyone is entitled to a fair and public hearing within a reasonable time by an

ECHR, besides recognising that the lack of a public hearing in *Pechstein's* case does in fact amount to the breach of Article 6(1), dismissed the Claimant's challenge of the CAS's independence by majority, re-establishing the CAS as an independent and impartial arbitral tribunal.[85]

A further effort that assisted the IOC in pronouncing its independence from the CAS was the establishment of The Paris Agreement in 1994 in forming the International Council of Arbitration for Sport (hereinafter referred to as 'ICAS') with the aim to safeguard the rights and interests of athletes. The ICAS consists of 20 jurors of variant jurisdictions appointed in the following manner: at first, the IOC appointed four members, the Association of the Summer Olympic International Federations (ASOIF) appointed three members, the Association of International Olympic Winter Sports Federations (AIOWF) appointed one member, and the Association of National Olympic Committees (ANOC) appointed four members. This established the first twelve members of ICAS. These twelve ICAS members then go on to appoint four additional members, who together with the first twelve members elect the final four members unanimously, constructing the twenty members of the ICAS and thus ICAS's independence from both the CAS as well as the sporting bodies aforementioned. The IOC supposedly relinquished its governance over the CAS, which ceded in the International Council of Arbitration for Sports. The ICAS was created by the IOC in an

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independent and impartial tribunal established by law. Judgment shall be pronounced publicly but the press and public may be excluded from all or part of the trial in the interests of morals, public order or national security in a democratic society, where the interests of juveniles or the protection of the private life of the parties so require, or to the extent strictly necessary in the opinion of the court in special circumstances where publicity would prejudice the interests of justice".

85 Zavershinskaya, D., 2019, 'ECHR, Mutu and Pechstein v Republic of Switzerland, Application No 40575/10, 67474/10, 8 October 2018', *Arbitrational Journal by the Arbitrational Association*, Available at: https://journal.arbitration.ru/cases/echr-mutu-and-pechstein-v-republic-of-switzerland-app-40575-10-67474-10-8-october-2018/ (accessed on 28 April 2021).

attempt to satisfy critics of CAS's independence. However, while it appeared on face value that ICAS took controlled the financing and administration of the CAS, the IOC was yet to cut its ties with the judicial body. During the course of establishing the ICAS, the IOC ensured to reserve itself the right to nominate a substantial number of electoral members. In light of this, it is apparent that the IOC remains reluctant to grant the CAS its independence.[86] Notwithstanding the decision in the *Gundel* case that the CAS is truly an independent judicial body, the Swiss Federal Tribunal did point out that:

> "*Certain objections with regard to the independence of the CAS could not be set aside without another form of process, in particular those based on the organic and economic ties existing between the CAS and the IOC. In fact, the latter is competent to modify the CAS Statute; it also bears the operating costs of this Court and plays a considerable role in the appointment of its members."*[87]

2.2. The Court of Arbitration for Sport's Jurisdictional Restrictions

Whether challenging the CAS's application of Swiss principles, adverse arbitrational clauses or simply the context of matters heard, the CAS has unequivocally faced its fair share of disputes regarding its jurisdiction since its adoption in 1984. The CAS Code indicates Lausanne, Switzerland, as the seat of all the CAS proceedings, whether an appeal or arbitrary in nature.[88] In pursuant of its code and its adoption of Switzerland as its territory of choice, the CAS is obligated to assume the Swiss national laws and values as its own and additionally succumb to higher Swiss authorities such as the Swiss Federal Tribunal. As such, the competent Swiss authorities hold the

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86 Kane, D., 2003, 'Twenty Years on: An Evaluation of The Court of Arbitration for Sport', *Melbourne Journal of International Law 611*, vol. 4.

87 *G v Fédération Equestre Internationale* (note 80 above).

88 Court of Arbitration for Sports , Code of Sports related Arbitration in force as from 1 July 2020, Available at: https://www.tas-cas.org/fileadmin/user_upload/CAS_Code_2021__EN_.pdf, (accessed on 28 April 2021) [hereinafter referred to as the 'CAS code'].

capacity to: - set aside CAS awards, intervene at any time with an arbitration by adjudicating interim or conservatory measures, determine conflicts of Swiss laws and values, determine which rules and Swiss laws are applicable to arbitrations, appropriate which issues are in line or in contrast to Swiss public policy, as well as the status of the CAS awards as Swiss nationalists in accordance with article I.1 of the 1958 New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards.[89] This article stated that it is not required that either party to a CAS arbitration or appeal be a Swiss national. Instead, should any party assume a nationality other than Swiss, such an arbitration or appeal shall be regarded as an international arbitration in accordance with the Swiss Private International Law Act (hereinafter referred to as the 'PILA').[90] Therefore, anyone may be a party to a CAS arbitration and/or appeal.

For a matter to fall within the jurisdictional bounds of the CAS, both parties must have, either directly or indirectly, consented to its jurisdiction upon the rise of a dispute. Due to the majority preference of sporting organisations of having their disputes adjudicated by the CAS, many include an arbitration clause in their sporting rules which binds its members to the CAS's jurisdiction. As such, an athlete or their national federation, by means of his/her/its membership to a sporting organisation, indirectly consents to the CAS's jurisdiction. In some cases, these arbitrational clauses do not even form part of the rules of the sporting organisations but rather within an international federation's framework, statutes, or regulations, and therefore the CAS enjoys a monopoly over a vast number of sports arbitrations. Consent through

89 Coccia, M., Jones, K L., Demeulemeester, S., et al., 2013, 'International Sports Justice: The Court of Arbitration for Sport', *European Sports Law and Policy Bulletin*, Vol 1.

90 As above.

arbitrational clauses has been abundantly challenged within the parameters of both the Swiss Federal Tribunal and the European Court of Human Rights, of which a majority stemmed from the *Guillermo Cañas v ATP*[91] case. After his unsuccessful struggle in the CAS against the World Anti-Doping Agency (hereinafter referred to as 'WADA'), *Cañas*, a professional tennis player, sought relief from the Swiss Federal Tribunal in setting the CAS Award aside. WADA elected to rely on Article 190(2) of PILA in evidencing that *Cañas,* as an international party, waived his right to seek recourse against the CAS's award as same was considered an official arbitrational award rendered in Switzerland after *Cañas* indirectly consented to the CAS's jurisdiction by way of its inclusion in the *Association of Tennis Professionals* rules. The Swiss Federal Tribunal annulled the validity of the supposed waiver contained within the rules of an international association, holding that same would result in the impossibility of annulling any arbitrational award, regardless of its violation of the right to be heard.[92] Whilst the decision in the *Cañas* case legitimises international parties' right to a fair hearing, it is unfortunate that the context of the judgment is continuously misconstrued by parties wishing to set aside unsatisfactory CAS awards. In Decision 4A_600/2020, the Claimant approach the Swiss Federal Tribunal to set aside a CAS award based on the absence of voluntary consent. The Claimant relied on the *Cañas* and *Mutu* decisions in arguing that the respondent could not enforce its arbitration clause upon a dispute between the parties as it did not voluntarily consent to it and therefore CAS counterfactually accepted jurisdiction. [93] The Swiss Federal Tribunal

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91 Swiss Federal Tribunal, Decision ATF 133 III 235 of 22 March 2007, *Guillermo Cañas v. ATP,* [hereinafter referred to as the '*Cañas* case'].

92 Paulsson, J., 2013, 'The Idea of Arbitration', *Oxford University Press*, 270.

93 Swiss Federal Tribunal, Decision 4A_600/2020 of 17 June 2020, Available at: https://www.bger.ch/ext/eurospider/live/de/php/aza/http/index.php?highlight_docid=aza%3A%2F%2F17-06-2020-4A_600-2019&lang=de&type=show_document&zoom=YES& (accessed on 10 February 2021).

dismissed the application in support of both the aforementioned decisions, holding that the CAS's independence and impartiality have been established as an official arbitral tribunal and, as such, holds the necessary jurisdiction whether or not an arbitrational clause was consented to. Additionally thereto, the Tribunal authorised the inclusion of compulsory arbitral clauses on the condition that such clause utilises an independent and impartial tribunal to conduct its arbitrations. [94]

As pointed out by the UN Council, even though athletes may in specific situations raise human rights-related disputes against sporting institutions in domestic courts, such domestic courts only bear jurisdiction over their national Olympic committees and federations, not over international federations nor the IOC[95]. Unfortunately, human rights-related claims primarily originate within the international spectrum "where many decisions that may negatively impact or violate human rights originate".[96] Whereas domestic courts may have a more pronounced approach towards discrimination as a whole as well as bearing the necessary expertise to provide domestic remedies in circumstances of the breach of human rights, prohibiting the enforcement of discriminatory international regulations at national competitions may lead to a "catch 22" for its athletes. Interference in international sporting rules at a domestic level may drive a wedge between the national sporting body and the international sporting body, placing national athletes in an uncomfortable position that may "jeopardise the ability of athletes to compete internationally".[97] Instead, international sporting institutions

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94 Bärtsch, P. & Williams, A., 2021, 'CAS jurisdiction confirmed despite compulsory arbitration clause (Swiss Supreme Court')', *Practical Law Arbitration*, Available at: https://www.swlegal.ch/media/filer_public/f3/3d/f33d3c67-c994-413d-aabd-4862799d55fa/210324_philippe_bartsch_alice_williams_cas_jurisdiction_confirmed_despite_compulsory_arbitration_clause.pdf (accessed on 28 April 2021).

95 UN report 2020 (note 27 above).

96 As above.

97 UN report 2020 (note 27 above).

elect to avoid such a situation in its totality by designating the CAS with compulsory jurisdiction over sports-related disputes. Such compulsory jurisdiction is withheld in an arbitrational clause contained within the Olympic Charter, dictating the exclusivity of the CAS upon all national federations and their athletes who wish to enrol or participate within the Olympic games. This arbitrational clause "shields the global sports system from regulation by national legal systems, which is where human rights are typically protected".[98] Distressingly, neither the CAS Code nor the rules and regulations of international sporting institutions makes provision for international human rights, standards or norms.

2.3. The Court of Arbitration for Sports on Human Rights

The CAS Code clarifies the CAS's jurisdictional bounds as inclusive of any and all disputes that are sports related. Such a relation exists even if only the slightest sports connection is identified, no matter how loose such a connection may be. For instance, a breach of contract between an athlete and a sporting institution may be heard by CAS for the simple fact that the contract breached was a sporting contract, even though the dispute may appear personal in nature. By way of loosely interpreting the "sports-related" requirement to hear a dispute, the CAS has adopted a much broader jurisdiction than assumably initially intended. Unfortunately, neither the CAS Code nor the ICAS pre-empted the possibility of matters that, while related to sport in some degree, predominantly fall within another area of law that is best adjudicated by specialised courts, such as the European Court for Human Rights. Instead of relinquishing control of such matters, the CAS Code champions the CAS's ability to

98 UN report 2020 (note 27 above).

hear specialised matters in that the "ICAS may identify the arbitrators with a specific expertise to deal with certain types of disputes".[99]

Although scarce, disputes alleging the breach of human rights as held in the ECHR do occur within the bounds of the sporting world, the majority of which revolve around discrimination. International Human rights stem from the adoption of the Universal Declaration of Human Rights (hereinafter referred to as the 'UDHR') by all States party to the United Nations. The rights contained within the UDHR formulate the fundamental basis of the state's party to the UN, including Switzerland. The UDHR's preamble reads:

> *"Whereas the peoples of the United Nations have in the Charter reaffirmed their faith in fundamental human rights, in the dignity and worth of the human person and in the equal rights of men and women and have determined to promote social progress and better standards of life in larger freedom, Whereas Member States have pledged themselves to achieve, in cooperation with the United Nations, the promotion of universal respect for and observance of human rights and fundamental freedoms, Whereas a common understanding of these rights and freedoms is of the greatest importance for the full realisation of this pledge."*[100]

Likewise, most international sporting institutions include the UDHR's fundamental principles within their rules, regulations, and constitutions – including the likes of the World Athletics' Constitution, which states its purpose as to "preserve the right of every individual to participate in athletics as a sport, without unlawful discrimination of any kind undertaken in the spirit of friendship, solidarity, and fair play."[101]

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99 The CAS code (note 88 above) S14.

100 Universal Declaration of Human Rights, 1948, UN General Assembly, Available at: https://www.un.org/sites/un2.un.org/files/udhr.pdf (accessed on 11 February 2021), Preamble [hereinafter referred to as the 'UDHR'].

101 The Court of Arbitration for Sport, 'Sport and Human Rights: Overview from a CAS perspective (status 16 April 2021)', *The Court of Arbitration for Sport*, Available at: https://www.tas-

Considering the vitality of the human rights contained in the UDHR, various of these rights among different legal systems have inherited a constitutional like status, reigning its supremacy over and above any other existing law. As such, specialised courts such as the European Court of Human Rights exist to adjudicate human rights matters. Surprisingly, and considering its reluctance to relinquish control over human rights rooted matters, the CAS is equally hesitant to constitutionalise human rights in its decisions.[102] Instead, CAS elects to divert attention from the human rights infringements to sports infringements, essentially constitutionalising sporting rules and regulations over and above human rights and causing a significant lack of human rights expertise within the CAS and its list of arbitrators. However, if CAS wishes to act as the court of first instance to arbitrate human rights matters in sport, it will have to undergo major institutional reformation.[103]

Part of this institutional reform that would be required should the CAS elect to hear human rights matters is a clearly defined jurisdiction. During 2019, CAS heard two independent matters with human rights at its cores. Both applicants in the *Semenya* and *Henriques* cases approached the CAS to adjudicate human rights disputes in sport. matter selective application of its

During the *Semenya* case the CAS automatically assumed jurisdiction to hear the matter, regardless of the various human rights at stake. Consequently, the CAS's

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cas.org/fileadmin/user_upload/Human_Rights_in_sport__CAS_report_updated_16.04.2021_.pdf.

102 Heerdt, D., 2019, 'The Court of Arbitration for Sport: Where Do Human Rights Stand?', *Institute for Human Rights and Business*, Available at: https://www.ihrb.org/focus-areas/mega-sporting-events/commentary-court-of-arbitration-for-sport-where-do-human-rights-stand#:~:text=CAS%20was%20originally%20created%20as,sponsorship%2C%20or%20general%20disciplinary%20matters (accessed on 10 April 2021).

103 Duval, A., 2022, 'Lost in translation? The European Convention on Human Rights at the Court of Arbitration for Sport', International Sports Law Journal, Available at: https://doi.org/10.1007/s40318-022-00221-6 (accessed 01 September 2022).

award delivered in the *Semenya* case predominantly focused on the sporting aspect rather than the affected human rights. This award set president and continually contributed to both the international jurisprudence and the sporting community's failure to dignify women's human rights – specifically bodily integrity. In the case of *Henriques and others v IOC IAAF* a paradoxical award was awarded in relation to that of the *Semenya* case. *Henriques* and seven others approached the CAS to remedy "the existing gender discrimination with respect to the 50km Race Walk event" after unsuccessfully placing both the IAAF and the IOC on notice to include the Women's 50km Race Walk event at the Tokyo 2020 Olympic Games.[104] The CAS panel focused on the IAAF Council's decision of 10 March 2019 to adopt "entry standards for all events, men and women, except for women in the 50km Race Walk"[105] by merely finalising the qualification system that had already mainly been decided on in July 2018. The IAAF on 24 March 2019, after being notified of the Appellants' notice, put it to the IOC to "fulfil its duty to implement gender equality in the 50km Race Walk event at the Tokyo 2020 Olympic Games," to which the IOC responded on 26 and 28 March 2019 by confirming their decision "not to remedy the existing gender discrimination with respect to the 50km Race Walk event".[106] The Appellants' submitted that the IOC could not avail itself the defence that the 2020 Olympic Programme was already decided upon in June 2017 as "(i) it was its decision of February and March 2019 to deny IAAF's request to include women in the Tokyo 2020 Race Walk event, and (ii) such defence relies on an ordinary statute that must give way to the requirements of

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104 Court of Arbitration for Sport, *Inês Henriques, Claire Woods, Paola Pérez, Johana Ordóñez, Magaly Bonilla, Ainhoa Pinedo, Erin Taylor-Talcott & Quentin Rew v. International Olympic Committee (IOC) & International Athletics Association Federation (IAAF)*, CAS 2019/A/6225, Decision of 3 February 2020, [hereinafter referred to as the '*Henriques* and others' case].

105 The *Henriques and others* case (note 104 above) 8.

106 The *Henriques and others* case (note 104 above) 8.

the constitutional gender equality values stated in the fundamental principles of Olympism". The CAS panel, however, did not share the Appellants' point of view, electing to sidestep the human rights agenda by declaring its lack of "jurisdiction to decide upon the present matter with respect to the IAAF," deeming it "unnecessary to continue with the analysis of the other conditions."[107] As the supreme arbitral body to hear sports related matters, the CAS should not possess the power to single out cases that may or may not be heard by its panellists but instead have a clear jurisdictional limit on what it can and cannot hear.

By way of its arbitrational award in the *Semenya* case, the CAS mapped out the shortcomings of international tribunals who possess open-ended jurisdiction to hear matters of any calibre without the necessary expertise to truly exert their authority in a proper manner. This, however, does not mean that the CAS does not possess the required capacity to hear fundamental matters. Due to its open ended nature, human rights disputes requires high levels of interpretation, as is true during the application of the Doctrine of Proportionality, requiring skilled professionals to apply their discretion when deliberating the facts.[108] This places the CAS list of arbitrators in high demand as it is comprised of many skilled lawyers and judges that are more than capable of meeting the required level of interpretation.[109] It can be said that it is in the ECHR's best interest to assist the CAS in making the necessary institutional reformation required in order to use the CAS as an assisting court in promoting human rights compliance in privatised sporting regulatory bodies.[110]

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107 The *Henriques and others* case (note 104 above) 15.
108 Duval (note 103 above) p 18.
109 As above.
110 Duval (note 103 above) p 18.

2.4. The Court of Arbitration for Sport's Burden to Order Evidence *Ex Officio*

The CAS relies on the *ei incumbit probatio qui dicit, non qui negat* principle in establishing which party bears the necessary burden in proving or disproving a claim, indicating that each party bears its own burden in proving that which it affirms. Essentially, it is the responsibility of each party to bring the necessary proof in evidencing its submissions, being the appropriate burden of proof principle utilised by other international tribunals as well as the Swiss legal system. [111] Should the CAS deem it necessary to consider evidence additional to that provided by the parties in satisfying their burden of proof, the CAS code provides the CAS panel with the authority to do so under Article R44.3. As such, should the CAS panel not be satisfied with the evidential value provided by the parties, it may "order the production of additional documents or the examination of witnesses, appoint and hear experts, and proceed with any other procedural step".[112] As found in the *CAS 2003/O/506* case where the Respondent attempted to demand additional documents in line with Article R44.3, such authority can only be exercised by the CAS panel at its' discretion and therefore is not a right that can be exercised or demanded by either party.[113] The Respondent insisted that the same article indicated a secondary burden upon the CAS Panel to request additional evidence if the evidence provided proved insufficient, alluding that the CAS Panel "cannot simply take its decision on the basis of the evidence submitted by the parties, if it deems it insufficient." It was held that "in the Panel's opinion, this is clearly a discretionary power which a CAS Panel may exert with an ample margin of appreciation – 'if it deems it appropriate' – and which cannot

111 Coccia *et al* (note 89 above).
112 The CAS Code (note 88 above) R44.3.
113 Court of Arbitration for Sport, CAS 2003/O/506, Decision of 30 June 2004.

be characterised as an obligation."[114] The CAS Panel further confirms that such power bestowed upon the Panel by the CAS code is only to be invoked as a last resort in the rare occasion where the Panel is at risk of making an adverse decision if same is based on the evidence provided by the parties and thus does not substitute a secondary burden upon the Panellists.[115] For such reasons, the CAS Code should be regarded as "an adversarial system of arbitral justice, rather than an inquisitorial one," and therefore, neither party can simply instruct the CAS panel to present additional evidence as the burden lies on the parties and not the Panellists to "actively substantiate its allegations with convincing evidence".[116]

2.5. Challenging A Court of Arbitration for Sport's Award

The CAS panel in the *Dutee Chand* case correctly placed emphasis on the administrative processes and how they should be regulated in terms of establishing new regulations which have such a substantial impact on the athlete's rights. In doing so, the Panel referred to the mechanisms of Global Administration Law (GAL), an international standard defined by its legal rules, principles, and institutional norms that must be adhered to when any administration process is undertaken. GAL is a revolutionary phenomenon as it presents a solution to the promulgation of laws and regulations that are purely intra-state based and somewhat subjective in terms of the legal and political authority of legislators and regulators.[117] GAL makes provision for three primary standards that must be met in all processes of legislating and rule-making, namely: (1) Global Administration; (2) Possible Sources of Global

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114 CAS 2003/O/506 (note 113 above) par 54.
115 Coccia *et al* (note 89 above).
116 CAS 2003/O/506 (note 113 above) para. 54.
117 Kingsbury, B. & Donaldson, M., 2011, 'Global Administrative Law' in Max Planck Encyclopaedia of International Law, *Oxford University Press*.

Administrative Law; and (3) The Emergent Content of Global Administrative Law.[118] These GAL principles are essential in the framework of sex classification regulations due to the sensitivity of the matter, making it susceptible to arbitrary decisions. To this effect, the GAL procedural limitations towards legislators offer a form of recourse to affected athletes in ensuring fairness, transparency, participation, and proportionality. Furthermore, GAL states that sex classification rules and regulations must be deemed as legislation, and thus its regulators are bound by the GAL processes and must comply with the GAL standards, just as legislators would.[119]

The CAS serves as an essential organ to the GAL mechanisms in terms of the promulgation of global sports law. Lorenzo Casini identifies at least three overlapping functions between GAL and CAS, namely: (1) regarding the application of general principles of law to international sports institutions such as the IAAF; (2) the interpretation of sports law and its rules and regulations, which has a profound influence on the rulemaking processes implemented by international sports institutions; and (3) the goal of harmonisation of global sports law in providing just arbitrations and reviews thereof. In the confusion surrounding questions of whether the IAAF will face the consequences of their regulations, GAL standards go a long way in holding Sporting Regulatory Bodies and its regulators accountable.[120]

Even though the CAS panel has somewhat of a 'constitutional' status as all its decisions are considered final and binding in law, an aggrieved party does have additional means of review available to his/her disposal. Such additional means of

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118 Kingsbury *et al* (note 117 above).

119 Krech, M., 2016, 'To Be a Woman in the World of Sport Global Regulation of the Gender Binary in Elite Athletics', Undergrad, *Institute for International Law and Justice*.

120 Krech (note 119 above).

review have the potential to further over-rule CAS findings and may place additional pressure on the IAAF's regulatory activities. Review of CAS decisions may take place in the Swiss Federal Court due to it having jurisdiction over all review and appeals of arbitral decisions made in Switzerland and the CAS panel's location. This has the potential to correct the imbalance of power faced by athletes from their respective sport regulatory bodies. Another possibility of review lies in that of regional courts, which have jurisdiction to hear matters of misconduct in sporting competition, especially those sporting institutions that go beyond their own goals in promoting fair competition. Should the matter be of constitutional status, an athlete may bring his/her matter before a Regional Human Rights Court, on condition that such an athlete has exhausted all other remedies available to him/her. Unfortunately, when none of these courts are willing to place themselves in the position to counter arbitrational awards rendered by the CAS, as perceived in the *Semenya* case with the Swiss Federal Tribunal, athletes are left unremedied with no further recourse available to them.

2.6. Who Are the Arbitrators, And Why Does It Matter?

In consideration of the CAS' possible jurisdiction over female athlete's human rights disputes, it is crucial that its panel of arbitrators reflect a balance in its representation. It is easily assumed that World Athletics' ill gender-representation of its council consisting of merely 19 men and only 7 women is the rationale for the UN's conclusion that the DSD regulations are discriminatory. During its research study, the "intersection of race and gender discrimination in sport", the United Nations Human Rights Council (hereinafter referred to as the 'UNHRC') established a relation between "contemporary gender and race-based discrimination in sport" and "the structure of modern international sport emerged through the founding of sporting associations around the

globe and then their organisation into an international system".[121] This relationship tracks back to the nineteenth century when the configuration of sport idealised racialised masculinity while, in the interim, castigating racialised feminine.[122] This early stance in the sporting world led to the present existence of threads of discrimination against women woven into the various aspects of sport, including the unequal pay grade and minimal representation of females in leadership positions. The UNHRC acknowledged these underlying influences of the misperception of gender in sport and recognised that further investigation is required to fully comprehend the discriminatory impact commercialisation of sport has had on both representations of women in business practices and the participation of female athletes. [123] It is thus crucial that the CAS list of arbitrators reflect gender neutrality, especially if CAS intends to hear disputes regarding female human rights in sports. For this exact reason, it is imperative to identify who the arbitrators are, and the selective process followed when recruiting an arbitrator.

One of the fundamental responsibilities of ICAS is to appoint a number of independent arbitrators who will serve on the CAS's list of arbitrators for a renewable period of four years.[124] To be considered as an arbitrator to serve on the CAS list of arbitrators, ICAS requires a candidate to have sufficient legal training and language skills, and who in themselves have the confidence in their competency and knowledge in sports law and/or international arbitration.[125] As of 2017, CAS's list of arbitrators consisted of 352

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121 UN report 2020 (note 27 above).
122 As above.
123 International Working Group on Women and Sport, 1998, 'Women and sport: from Brighton to Windhoek – facing the challenge', progress report, Available at: https://iwgwomenandsport.org/programmes/insight-hub/ (accessed on 12 February 2021).
124 The CAS Code (note 88 above) Article S13.
125 The CAS Code (note 88 above) Article 14.

members, from which 314 were men and a mere 38 were women.[126] The following table was compiled to showcase a tally of members in correlation to the race- gender- and ethnicity diversity:

Region	Countries	Arbitrators	Men	Women
Africa	23	23	23	0
North America	3	54	44	10
Central America & The Caribbean	3	3	3	0
South America	8	18	18	0
West Asia	5	8	8	0
East Asia	10	28	24	4
Europe	32	190	170	20
Oceania	3	28	24	4
Total	87	352	314	38

Figure 1: A Table Showing CAS's list of arbitrators by region and gender (Source: International Arbitration Insights: CAS & Lex *Sportiva*).[127]

As of April 2021, the CAS's general list of arbitrators consists of 304 men and 40 women, achieving growth of two additional women over a four-year span.[128] CAS

126 American Bar Association, 2017, 'International Arbitration Insights: CAS & *Lex Sportiva'*, *American Bar Association,* Available at: https://www.americanbar.org/content/dam/aba/administrative/international_law/InternationalArbitrationInsights2017VolI1.pdf (accessed on 20 April 2021).

127 American Bar Association (note 126 above).

128 Court of Arbitration for Sport, 'List of arbitrators (general list)', *Court of Arbitration for Sport,* Available at: https://www.tas-cas.org/en/arbitration/liste-des-arbitres-liste-generale.html (accessed on 20 April 2021).

repetitively stresses the importance of having qualified arbitrators who resemble geographic and gender diversity, naming that as one of the central aims of their organisation.[129] Unfortunately, CAS, which is approaching its fortieth year of operation, has made diminutive progress in its efforts to achieve this aim. Over the course of nearly four decades, the CAS has managed to include merely 40 women in its general list of arbitrators, presenting a sheer 11 % of its arbitrators. Even more, destressing is that not one female representative is of African descent. To the dismay of the American Bar Association, their 2017 study of CAS led to the conclusion that "the pale, male, and stale paradigm persists within the CAS."[130]

In consideration of the exceptionally low percentile of female inclusion in the CAS's general list of arbitrators, the odds of facing an all-female, or even just a majority female CAS panel is virtually impossible. Generally, a CAS panel consists of three arbitrators; the first two arbitrators are each appointed by each respective party, who then elect the third arbitrator who also acts as the President of the panel.[131] Article R40.3 of the CAS Code deems a panel as being established once the appointment of both party-nominated arbitrators as well as the president arbitrator has been confirmed by the President of the Division, who has satisfied him/herself that each arbitrator complies with the compliance requirements of Article R33.[132] Should either party wish to challenge the appointment of either one of the arbitrators, such party must bring the challenge by way of the Challenge Commission within seven days of the appointment.[133] The ICAS will then decide whether the challenge is upheld, upon

129 American Bar Association, 2017 Committee (note 126 above).
130 American Bar Association, 2017 Committee (note 126 above) pp 27.
131 The CAS Code (note 88 above).
132 The CAS Code (note 88 above) Article R40.3.
133 The CAS Code (note 88 above) Article R34.

which the challenged arbitrator will be removed and replaced, or whether the challenge is rejected, upon which the arbitration will resume with the challenged arbitrator remaining in seat. When a challenge is rejected by the ICAS, the ICAS's decision to do so may only be appealed in the Swiss Federal Tribunal after the CAS award is delivered. Considering the low success rate of appeals of CAS awards in the Swiss Federal Supreme Court in congruent to the financial strain faced by aggrieved parties, such a challenge before the Swiss Federal Tribunal is barely worth the time and the effort.

The CAS panel in the *Chand* case consisted of Professor McLaren from Canada and Doctor Nater from Switzerland, with the Honourable Judge Bennet from Australia acting as the president arbitrator.[134] Similarly, the CAS panel in the *Semenya* case consisted of the Honourable Justice Fraser from Canada and Doctor Nater from Switzerland, with the Honourable Judge Bennet from Australia acting as the president arbitrator once again.[135] The representation of both panels elected in the *Chand* and *Semenya* cases provides positivity in that the elected arbitrators reflect both gender-representation and an extensive skill set, particularly when considering both Honourable Justice Fraser and Honourable Judge Bennet's extensive histories in human rights counsels and tribunals. This reflects the CAS's efforts in ensuring that the best possible panel for each independent case is elected, even if its list of arbitrators still requires inclusionary reform.

Additional to gender neutrality, in order for the CAS panel of arbitrators to truly reflect a representative list of arbitrators they would need to consider the inclusivity of

134 The *Chand* case (note 8 above).
135 The *Semenya* case (note 1 above).

arbitrators from the Global South as well as increasing its racial diversity.[136] Considering the demographic of female athletes predominantly representing "women of colour/black women, women of African descent and women discriminated based on but not limited to colour, social status and creed athletes from the Global South"[137], the CAS is advised to intensify their efforts of achieving geographic and gender diversity within its list of arbitrators by enforcing the inclusion of individuals of colour as well as those of non-binary gender identities.

2.7. Do The Existing Numbers of Participating Women in Sporting Regulatory Bodies Reflect Equal Opportunities for Women in Sport?

Whilst it is nearly impossible to date back to the exact date that sport originated, its origin can be assumed to backdate to the first recorded Olympic Games that took place in 776 BC.[138] The aspiration behind ancient sport was for men to display an array of masculinity which ultimately gave rise to the term 'hegemonic masculinity'. Hegemonic masculinity is the principle within sport that centralises masculine traits as the foundation of sports performance in light of an endearing nature.[139] It was thus not permitted for females to participate in sporting events in the early development of sport. It was only during the 1936 Berlin Olympics that female athletes were finally declared eligible for competing, marking a historic event in world athletics, as the IOC unknowingly drew the first line in the sand in creating two categories for competition:

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136 American Bar Association (note 126 above) Figure 1.

137 United Nations Special Rapporteur, 2022, 'Intervention: Mokgadi Caster Semenya v. Switzerland, Application no: 10934/21 in the European Court of Human Rights [hereinafter referred to as the 'UN Special Rapporteur Intervention: *Semenya* case'].

138 Murray, S. & Pigman, G., 2013, 'Mapping the relationship between international sport and diplomacy', *Sport in Society,* Vol 17, Available at: DOI:10.1080/17430437.2013.856616 (access on 01 September 2022).

139 Senne, J A, 2016, 'Examination of Gender Equity and Female Participation in Sport', *The Sport Journal.*

male and female. Eighty-five years have passed since female athletes entered the sporting scene, and as athletic participation in sports became increasingly popular amongst females, the imbalance of equality between the male and female categories became more prominent. The UN Council, in their 2020 report, pinpointed the role of the media as a major contributing force towards the low participation of women and girls in sport by way of low coverage of female competition.[140] On 08 February 2018, the United Nations Educational, Scientific and Cultural Organization (UNESCO) made public its call for more equitable media coverage of sportswomen, concluding that merely four per cent of media content in sport is comprised of women's sport.[141] Even more displeasing than the low coverage is the considerable extent of racial and gender stereotypical, specifically that which targets women of a particular minority propagation, that encompasses this four per cent of media coverage.[142] By electing to focus on female athlete's physical appearances rather than their athletic abilities or nominating only to cover female participation in sports of a masculine demeanour, the media amplifies the bias that female athletes already face on a day-to-day basis. The UN Council specifically indicated that it condemns the "negative and stereotypical portrayals of women and girl athletes in the media"[143] and urges sport governing bodies to address such portrayals timeously in order to prevent the development of inappropriate norms of femininity within society.

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140 UN report 2020 (note 27 above).

141 United Nations Educational, Scientific and Cultural Organization (UNESCO), 2018, 'UNESCO calls for fairer media coverage of sportswomen', *United Nations*, Available at: https://en.unesco.org/news/unesco-calls-fairer-media-coverage-sportswomen (accessed on 02 February 2021).

142 Zenquis, M R. & Mwaniki, M F., 2019, 'The intersection of race, gender, and nationality in sport: media representation of the Ogwumike sisters', *Journal of Sport and Social Issues*, vol. 43, No. 1.

143 UN report 2020 (note 27 above).

2.8. Advancing Female Participation in Sport

The concept of “beaten by a girl” is an age-old stereotype that is carried over from generation to generation by anyone, and everyone claiming that men are naturally better than women in sports or any other physical activity. This is due to the male body’s genetic makeup and biological traits being predominantly stronger and acclimated to excel at physical activities, more so than the female body. Even though many female athletes may not agree with the statement, it is very ambitious to challenge it when comparing current athletic performances between the male and female categories. When looking at existing world records set in running, the male category records an astonishing average of 11 % faster times than the female category.[144] Many factors exist as to why males excel over females, including a larger heart resulting in each litre of male blood carrying up to 11 per cent more oxygen than a similar quantity of female blood.[145] For this reason, it is imperative that different categories exist between male and female athletes. With such distinguishing categories of being the ‘good’ and the ‘best, it became comic when the ‘best’ was dethroned by the ‘good,’ giving rise to the concept ‘beat by a girl.’ Being ‘beaten by a girl’ created a great deal of embarrassment for the male athlete and became a term of mockery to inflict shame upon the male athlete, rather than a term of envy and honour to the female athlete. Unknowingly, generations have passed on this concept reinforcing females as the ‘good’ and males simply as the ‘best’.

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144 Hamilton, A., ‘Female and Male Performance Times’, *Peak Endurance Sport,* Available at: https://www.peakendurancesport.com/endurance-training/base-endurance-training/female-male-performance-times/ (accessed on 13 April 2020).

145 As above.

Together with the development of the concept of 'beaten by a girl', developed a far more enticing principle being the modernised hegemonic masculinity principle in sport and the fear of diminished masculinity. The concept of hegemonic masculinity, as found by Raewyn Connell in 1987, originally presumed the presumption of the "subordination of nonhegemonic masculinities," which meant honouring the assumed superiority of males.[146] A homophobic fear was instilled when not all men idealised the inferiority of femininity, jeopardising the honorary status of masculinity. Many academics have since construed Connell's principle of hegemonic masculinity in favour of the feminism movement in developing a stereotype of the male characteristics in a "catch-all" category. The principle of hegemonic masculinity, however, is not a matter of emphasised femininity.[147] In sport, hegemonic masculinity could be seen as unrelated to an identified individual or groups of individuals, but rather social and political perceptions of sporting practices favouring hegemonic masculinity. Modern elite sporting practices are heavily dependent on media coverage, as the media is dependent on the approval of society for their support, a society that craves sporting excellence. Why does a professional level sporting event get more viewing succusses than an elementary level sporting event? Due to society's desire to see the best – the strongest, fastest, most skilled athletes – this leading to the media's "representation of masculinity".[148] Unfortunately for feminism, elite sport is the one division of life that visually showcases male dominance, despite the exceptional quality of female sports, adding to the stereotype that masculinity is superior to

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146 Connel, R W., & Messerschmidt, J W., 2005, 'Hegemonic Masculinity: Rethinking the Concept', *Sage Publications, Inc*, Available at: http://www.jstor.org/stable/27640853 (accessed on 13 April 2021).

147 Connel *et al* (note 146 above).

148 Shifrer, D., Pearson, J., Muller, C. & Wilkinson, L., 2015, 'College-Going Benefits of High School Sports Participation', *Youth & Society* 47:3, pages 295-318, Available at: https://doi.org/10.1080/00948705.1992.9714497 (accessed on 13 April 2021).

femininity.[149] Sport can thus be seen as a role player in the construction of hegemonic masculinity.[150]

While conducting a study surrounding sport volunteerism, it was shown that women do not display the same social values in relation to the occupation.[151] Whereas women capitalized on family-related ties, men excelled in the work force, ultimately rendering women as the 'weaker' gender in relation to sport management positions, and as such, masculinity became the obvious choice to the gatekeepers – thus the best 'man' for the job.[152] The domain of masculinity in sports occupations is assumed not only to be the best fit but also the most comfortable fit as it poses no threat to the existing way of doing things. Some even argued that senior management of sporting bodies strategize to keep women out of the sporting workforce by imposing requirements that are unattainable by women who wish to capitalize on family-related ties.[153] Others have identified the underrepresentation of women in leadership or management positions in sport as a form of discrimination against women,[154] the same of which was recognised in the UN Council's 2020 report. The UN's 2020 report reinforced that the levels of participation of women in sport remain much lower than that of men as a result of several factors, being internal and external to sport.[155] These factors include,

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149 Nelson, M B., 1994, 'The Stronger Women Get, the More Men Love Football: Sexism and the American Culture of Sports', *Avon Books*.

150 Grindstaff, L. & West, E., 2011, 'Hegemonic Masculinity on the Sidelines of Sport', *Sociology Compass* 5(10):859 – 881, Available at: 10.1111/j.1751-9020.2011.00409 (accessed on 13 April 2021).

151 Harvey, J., Levesque,M. & Donnelly, P., 2007, 'Sport Volunteerism and Social Capital', *Sociology of Sport Journal* 24(2):206-223, Available at: DOI: 10.1123/ssj.24.2.206 (accessed on 13 April 2021).

152 Grindstaff *et al* (note 150 above).

153 Anderson, E D., 2009, 'The maintenance of masculinity among the stakeholders of sport', *Sport Management Review,* Vol 12, Issue 1, 3-14, Available at: https://doi.org/10.1016/j.smr.2008.09.003 (accessed on 13 April 2021).

154 International Working Group on Women and Sport, 1998, 'Women and sport: from Brighton to Windhoek – facing the challenge', progress report, Available from https://iwgwomenandsport.org/programmes/insight-hub/ (accessed on 2 February 2021).

155 The UN report 2020 (note 27 above).

but are not limited to “discriminatory social norms or obstacles to reconciling the burdens of care, work and sport, and internal to sport, including the lack of programmes to create a gender-sensitive and safe sporting environment or to address harassment and other forms of gender-based violence in sport, including sexual exploitation and abuse.”[156]

The UN Council reminds states of their commitment to the Beijing Declaration and Platform for Action in actively contributing towards the “the advancement of women in all areas of athletics, including coaching, training, and administration, and as participants at the national, regional and international levels.” As such, it is expected that states and sport governing bodies magnify their efforts of battling discrimination in sport by ensuring fair opportunities for female athletes and representation of women in leadership or management positions in sport.

156 European Commission, Gender Equality in Sport: Proposal for Strategic Actions, *European Commission*, 2014–2020, February 2014.

C H A P T E R 3

The Impact of World Athletics' Differences of Sex Development Regulations

SUMMARY

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3.2 Female Athletes with Differences of Sex Development
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3.2.2. Biological Variants and its regulation in Sport
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3.1. Introduction

When considering the enormous amount of evidence that was brought by both parties during the *Semenya* case, it goes without saying that the CAS panel had a rather large mountain ahead of them in reaching their final verdict known now as the CAS award of 30 April 2019. There is no doubt that in every arbitration faced by the CAS panel, or any other court for that matter, the outcome results in an aggrieved party and a relieved party. This while all affected parties rely on access to justice to ensure fair play by arbitrators and/or judges in their deliberation of all facts presented to the court. Access to justice was only recently incorporated in sports arbitration by the CAS in its attempt to reform sports law through three pillars of reformation being: independence, accessibility, and transparency.[157]

Considering the vast amount of research, evidence and documentation presented, as well as professionals and experts who testified for both parties, the *Semenya* case can be said to be one of the most challenging matters heard by the CAS panel to date. World Athletics was backed by three professors and two doctors, while *Semenya* and team doubled that with the support of six professors and four doctors. The matter was heard before the CAS panel between 18 April 2019 and 22 April 2019, taking a total of five days to hear all evidence and a further eight days to produce its verdict.[158] In consideration of all the information put forth, it is almost inconceivable to think that it was merely one scientific study, the only one of its kind to have ever been conducted

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157 Duval, A., 2015, 'The rules of the game: Three pillars for a reform of the Court of Arbitration for Sport: Independence, Transparency and Access to Justice', *Play the Game,* Available at: https://www.playthegame.org/news/comments/2015/019_three-pillars-for-a-reform-of-the-court-of-arbitration-for-sport-independence-transparency-and-access-to-justice/ (accessed on 12 January 2021).

158 The CAS Award (note 18 above).

and produce its findings that uphold the DSD regulations, and ultimately was the reasoning behind the arbitration. When the CAS panel finally delivered its award the international powerhouse, the United Nations responded by reiterating the importance of the risk of enforcing the DSD regulations, stating that:

> *"The panel of the Court of Arbitration for Sport reviewing Ms. Semenya's case agreed that the requirement to undergo intimate examinations to determine the extent of her "virilization" was "highly intrusive and could result in psychological harm". The regulations also create the risk of unethical medical practice, particularly when the informed consent of the person concerned is not required, and violations of the general prohibition on medically unnecessary procedures. The Special Rapporteur on the right of everyone to the enjoyment of the highest attainable standard of physical and mental health has stressed that informed consent to any medical intervention goes beyond mere acceptance and must be voluntary and sufficiently informed in order to protect human dignity and autonomy. Particular care is required where there are power imbalances resulting from inequalities in knowledge, experience and trust between health-care providers and individuals, particularly those from vulnerable groups."*[159]

Considering the firm basis of *Semenya*'s argument, the CAS panel's decision to dismiss *Semenya*'s objection and announce that, although discriminatory, the regulations were in fact "necessary, reasonable and proportionate" came as a shock to many.[160] The finding, however, and although final, left gaping holes in its award. The 165-page award aggressively and expressly mentioned serious concerns regarding the physical application, a few of which are: the difficulties of its implementation; the difficulty to rely (or not to rely) on concrete evidence of actual athletic advantage; and the side effects of hormonal treatment and human rights of the athlete concerned, all of which still exist and have not been addressed by World

159 The UN Report 2020 (note 27 above) p 9.
160 The CAS Award (note 18 above).

Athletics, CAS, or any other regulatory body. All this confusion leads to one question, whether the CAS panel applied law to fact correctly and appropriately while deliberating its' award of 30 April 2019? Four main facts are identified from the case that will be evaluated during the course of this thesis. These being:

(1) Female athletes with Differences of Sex Development are discriminated against on several grounds through the implementation of the DSD Eligibility Regulations, including discrimination on the basis of sex/gender, discrimination on the basis of a biological variant, and discrimination on the basis of race.

(2) The scientific background supporting the DSD Eligibility Regulations are far too insufficient, weak, and flawed to base such an intensified regulation on. Further contention focused on the selectivity of the existing scientific evidence claiming that naturally produced testosterone in a female with DSD provides such a female with a discernible competitive advantage over her competitors.[161]

(3) The medical complications in applying the regulation are far more severe and invasive than expressed by World Athletics and can cause irreparable harm.

(4) In their efforts of protecting the female category in elite competition, World Athletics overlooks its advocacy of unfair sporting practices for DSD athletes.

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161 Karkazis, K., 2012, 'Out of Bounds? A Critique of The New Policies on Hyperandrogenism in Elite Female Athletics', *The American Journal of Bioethics,* p 410.

On 15 June 2020, the United Nations High Commissioner for Human Rights, together with the Human Rights Council, published a report entitled: "Intersection of race and gender discrimination in sport' (hereinafter referred to as the 2020 UN report) aimed at identifying discrimination women faced in sport. Their report urged all sport governing bodies, such as the IOC, to intensify their endeavours to combat racism in sport and affording vulnerable groups of athletes the necessary protection to avoid discrimination of any kind.[162] The report suggests that these 'vulnerable' groups are references of underaged athletes, disabled athletes and athletes with DSD. By identifying the need for protection against discrimination on the basis of race and sex, the UN established its concerns that such discrimination truly exists within sport.

3.2. Female Athletes with Differences of Sex Development

On 30 April 2019, the CAS dismissed *Semenya*'s objection and announcing that although discriminatory, those regulations were in fact "necessary, reasonable and proportionate". One would think that for any discrimination to be considered "necessary, reasonable and proportionate",[163] the discrimination must surely be of a less severe nature. On the contrary, the discrimination that DSD athletes' faces are unyielding and not limited to merely one ground. Instead, DSD athletes are faced with discrimination on the basis of sex, discrimination on the basis of gender, discrimination on the basis of biological variant, and arguably discrimination on the basis of race, every day with very little recourse to their disposal. In their battle against World athletics, *Chand* and *Semenya* not only seek eligibility to compete in international athletics but, more importantly, fight for the rights of many others like them who have

162 The UN report 2020 (note 27 above).
163 The CAS Award (note 18 above) para 625.

accepted the fate installed upon them by World Athletics and merely have sadly been removed from athletics altogether. Many current athletes such as Margret Nyairere Wambui (Kenya), Francine Niyonsaba (Barramundi) and Maximilla Imali (Kenya) rely on the success of Caster *Semenya*'s case to continue on in their careers as female athletes with DSD. Others were either simply not lucky enough to compete during such a time of resistance against gender regulations or simply decided to evade public scrutiny by disappearing off the international athletic spectrum. Indian middle-distance runner *Santhi Soundarajan* was one of the latter athletes.

In a bid to avoid her childhood conditions of poverty, *Soundarajan* was motivated to succeed in her career as an international female athlete. After achieving several national gold medals and even a national record, *Soundarajan* was somewhat of a National Hero to all children growing up in poverty. Unfortunately, her most significant achievement in her career would lead to her greatest dismay. After winning the silver medal in the 800-meter event at the 2006 Asian Games held in Doha, she sparked the interest of World Athletics, who informed her she had failed a gender test that she had no knowledge of ever taking. In an interview with Fountain Ink Magazine, *Soundarajan* expressed that World Athletics never provided her with the results of her supposed gender test but merely told her that there was a problem with her and provided her with paperwork stating she would stop sports completely, instructing her to sign same.[164] When she applied to see her results under the Right to Information Act, the Athletics Federation of India informed her that World Athletics held that they called her for an investigation and her non-attendance led to her ban. *Soundarajan* pleas that the

[164] Soundarajan, S., 2016, 'Ten Years of Dispair', *Fountain Ink Magazine,* Available at: https://www.youtube.com/watch?v=63hDLndWmqU (accessed on 12 January 2021).

investigation was never communicated to her.[165] Upon acceptance of her ban, *Soundarajan* returned home to a much different community than that she left behind. The harsh scrutiny of society on *Soundarajan* has led to her cutting her hair and only wearing male clothing in the streets of her community to this day. “I am ready to wear churidar, to wear saree, to grow my hair long, plait it and even keep flowers in it.”[166]

Unfortunately, *Soundarajan* was not the only athlete that faced the rath of World Athletics’ Hyperandrogenic Eligibility regulations. Days before the London Olympics 2012, Ugandan 800-meter runner, *Annet Negesa*, received a call from her international manager, who advised her that there were some technical problems with her blood samples and that she could no longer compete.[167] The local officials from her federation accordingly instructed her to stay home, suggesting that she had an injury should anyone question her motives. While she knew this was untrue and that she was not sick, *Negesa* followed instructions hoping that this would lead to her eligibility to compete in the future. An official from the former IAAF, now World Athletics, allegedly reached out to her and arranged for her to go for a check-up in Nice, France. This ‘check-up’ consisted of a complete examination of her body, including measuring her whole body, conducting several scans, and proceeding with even more blood samples. *Negesa* expressed that she was confused by all these procedures conducted and their necessity, all while medical professionals provided her with more and more instructions without any answers.[168] *Negesa* holds that the

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165 Soundarajan (note 164 above).
166 As above.
167 Negesa, A., 2020, ‘Annet's Story: Women in Sport Face Abusive Sex Testing’, *Human Rights Watch*, Available at: https://www.youtube.com/watch?v=u5rZrO4KCro (accessed on 12 March 2021).
168 Negesa (note 167 above).

only information provided to her was that she had to undergo a medical procedure to enable her to run again.

When *Negesa* finally spoke up about her experience, she referred to the process as a trap:

> "*Going to the doctor with an executive from the federation. Because she was with me, escorting me, going to the hospital, they took me to the operation room, and they said that they are going to use the injection thing, whereby waking up finding myself I'm having cuts. I said whoa! They have done something which we did not agree on. And really, I was so scared.*"[169]

Negesa's internal sex organs had been removed. *Negesa* further explains that no one attended to her after the surgery had taken place. Neither the IAAF official nor the medical staff that conducted the surgery followed up on her recovery or explained what procedure was conducted on her. Shockingly, *Negesa* expressed that they did not provide her with "straight information after the surgery" or that she would have to go for hormone therapy throughout the rest of her life.[170] *Negesa* further stated that:

> "*For seven years, no one is coming to look for you. For seven years, no one is minding to know where you are. Why are they focusing too much to people of the Southern continent? That shows that there is discriminating and racism in sport. Because all of us we are human beings, and we are females. What I can say, let them stop taking people's or playing on people's bodies. Making people to be a guinea pig and doing their research on human beings and violating human rights."*
>
> *"My dream at first was taken away from me. But with God, I trust it will come back to me. I have to fight for my dream. I have to fight for it. That is my future now; I am focusing on my dream, which was taken away by the IAAF regulations."*[171]

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169 The UN report 2020 (note 27 above).
170 As above.
171 As above.

3.2.1. The Female Category in Sport

3.2.1.1. Discrimination in Female Competition

In their report dated 15 June 2020, the United Nations High Commissioner for Human Rights, together with the Human Rights Council published studied and pursued the elimination of existing discrimination faced by girls and women in sport, with substantial emphasis placed on the effects of eligibility regulations in female sports.[172] The report refers to numerous studies that were conducted on female participation in sport, underlining existing factors associated with the lower participation rates of females in all categories of sport.[173] Particular focus was placed on factors "such as discriminatory social norms or obstacles to reconciling the burdens of care, work and sport, and internal to sport, including the lack of programmes to create a gender-sensitive and safe sporting environment or to address harassment and other forms of gender-based violence in sport, including sexual exploitation and abuse."[174] It was found that female athletes "who do not conform to community-based gender norms related to the style of hair or dress, sexual orientation or participation in particular sports, may be subjected to harassment and exclusion by their families or communities."[175] The Media presents as a major contributory agent to society's social norms revolving around the perception of females in sport, whose representations of girls and women more often than not inseminate "gender and racial stereotypes" that vilify the ethnic and racial minority female athletes.[176] When considering the reporting

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172 The UN report 2020 (note 27 above).
173 As above.
174 As above.
175 The UN report 2020 (note 27 above).
176 Zenquis, M R., & Mwaniki, M F., 2019, 'The Intersection of Race, Gender, and Nationality in Sport: Media Representation of the Ogwumike Sisters', *Journal of Sport and Social Issues,* Vol 43(1), p 23-43, Available at: DOI:10.1177/0193723518823338 (accessed on 12 March 2021).

styles of many reporters and commentators in sport, references to female athletes' frequently revolve around their "physical appearance, age and personal lives, rather than their athletic abilities".[177] Placing such considerable emphasis on female athletes' physical appearance belittles the essence of being a woman.

> "In a letter to the Court of Arbitration for Sport regarding the 2018 IAAF regulations, three United Nations human rights experts raised concerns that the regulations effectively legitimize the surveillance of all women athletes based on stereotypes of femininity, adding that the regulations would in effect single out a group of women athletes, putting them at risk of repercussions far beyond the inability to compete while also subjecting them to shame, ridicule and intrusion upon their personal and private lives. Additional harms stemmed from the implication that the women need to be "fixed" through medically unnecessary interventions with negative health impacts."[178]

3.2.1.2. Female vs Woman

In the CAS ruling of the *Chand* case, even though the panel identified the existence of medical conditions rendering some females with elevated levels of endogenous testosterone in relation to other females, they further emphasized that such females remain female and are not eligible to compete in the male category.[179] It was also evident from the statement of the Panel that "the Regulations do not police the male/female divide but establish a female/female divide within the female category,"[180] thus inaugurating an unambiguous definition for the female category is of utmost importance.

When differentiating between a female and a woman, one could easily pass off the

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177 The UN report 2020 (note 27 above).
178 The UN report 2020 (note 27 above).
179 The *Chand* case (note 8 above).
180 As above.

one as a synonym to the other, while on the contrary, each term has its own distinct definition. Where the term “female” refers to a biological sexual orientation, the term “woman” is more psychologic in stature and revolves around the manner in which an individual classifies herself. The classification of a ‘female’ has proved itself to be an impossible task due to unprecedented methodologies and ideologies. Is it based on the predominant hormone or rather on sexual organs? Even though several attempts were made by sporting institutions such as the IAAF, this seems to be a question only nature can correctly answer. The CAS Panel did, however, lay out guidelines for future regulators in formulating such classification when it opted to focus its investigation on whether endogenous testosterone is an appropriate means of distinguishing between female within the female category, instead of further complicating the matter by trying to classify certain females as males. The panel further averred that the latter Hyperandrogenic Eligibility Regulations improperly stated “that hyperandrogenic females enjoy a significant performance advantage over their non-hyperandrogenic peers, which outranks the influence of any other single genetic or biological factor, and which is of comparable significance (if not identical magnitude) to the performance advantage [of 10 to 12%] that males typically enjoy over females,”[181] as no such evidence was presented before it. Ironically, there has also never been such a substantial degree of competitive advantage enjoyed by any female as to deem her eligible and to be competition for the male category. Accordingly, the panel held that the exclusion of hyperandrogenic females from the female category is not a ‘necessary and proportionate means of preserving fairness in athletics competition and/or policing

[181] The Hyperandrogenism regulations (note 63 above).

the binary male/female classification.'[182]

The main problem established when reading the hyperandrogenic eligibility regulations as provided by the IAAF is the lack of regulating who, and on what grounds, may accuse an athlete of such a condition. There is a controversial nature of accusing an athlete due to the said grounds mainly resulting from the athlete's inhabited masculine traits and prestigious athletic capacity in comparison to their fellow female competitors. In this instance, an athlete's physical appearance becomes her biggest disadvantage. Not adhering to societies opinion of what a female should act, dress or look like could lead to an intensive cycle of tests and medical procedures to prove critics otherwise. It has gotten to the point that even excelling in sport seems to be taboo. The injustice comes into display when considering an athlete's sporting excellence and abilities in the male category, compared to that of the female category. Take, for instance, the sporting phenomenon Usain Bolt. Bolt has beaten world record after world record, and in return, he earned respect from millions of fans and spectators worldwide. Adversely, as soon as a female athlete excels, such as *Caster Semenya*, she is immediately judged and questioned.[183]

Silvia Camporesi, a bioethicist and lecturer at King's College,[184] is but one amongst many academics who reject the IAAF's proposal that elite sporting currently maintains a level playing field. With reference to US swimmer Michael Phelps, whose prowess

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182 The *Chand* case (note 8 above).

183 Green, R, 2016, 'Suspended Hyperandrogenism Regulations Under the Spotlight At Rio Olympics', *International Bar Association*, Available at: http://www.ibanet.org/Article/NewDetail.aspx?ArticleUid=4887edb3-28e2-4546-be2f-6e5f14b7e61f (accessed on 29 November 2017).

184 Camporesi, S., 2017, 'Hyperandrogenism explained by Dr Silvia Camporesi', *Prime Media Broadcasting,* Available at: https://soundcloud.com/primediabroadcasting/hyperandrogenism-explained-by-dr-silvia-camporesi (accessed on 9 November 2016).

may have been accelerated by his double-jointedness and disproportionately long arms, she proves that female athletes often fall victim to discrimination in the classification process. In the case of *Dutee Chand*, lawyers presented an identical objection pertaining to the discrimination against women as there is no testosterone limit applicable to male athletes.[185] Male athletes with testosterone levels above what is considered to be the 'normal' range of male testosterone are permitted to compete without having to satisfy any medical criteria, including undergoing any medical examination or treatment as a precondition to eligibility.[186]

Furthermore, the IAAF continues to contradict itself while maintaining that the testing related to the accusation of an athlete for the reasons of a possible presumed advantage does not take the form of sex testing or gender verification but merely tests testosterone levels to prevent presumed unfair advantage. However, when consulting the medical guidelines entailed in the appendices that form part of the IAAF's Hyperandrogenism Regulations, it is hard to accept that an athlete's appearance has no relevance in their supposed 'testosterone tests'. These appendices consist of a variety of tests and illustrations compiled by the IAAF in order to illustrate their perception of what femininity entails. These tests include, amongst others, an endocrine assessment, as well as a physical examination by a sports physician and gynaecologists, which will be performed by rating the female athlete's physical features in terms of a scoring sheet that would, ultimately, indicate if a diagnosis of hyperandrogenism is appropriate or not. It is apparent that the IAAF did not for one second consider the implications that these tests would have on the athlete, both

185 Camporesi (note 184 above).
186 The *Chand* case (note 8 above).

physically and mentally, in allowing a stranger to explore the most private part of her essence, subject to a state of vulnerability that she would find herself in. Such tests, including physical examination and chromosomal testing, were recently deemed inappropriate by the CAS panel.[187]

As illustrated in the appendices below, for purposes of these tests, 'physical features' refer to the athlete's body build, breasts, pubic area and genitalia.

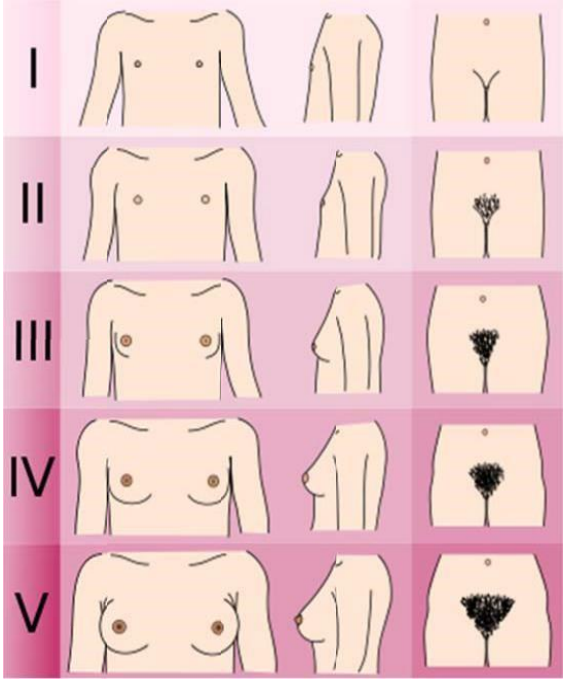


Figure 2: The Tanner-Whitehouse Scale, stipulating the 9 'clinical signs' in classifying possible signs of hyperandrogenism in female athletes. (*Source*: IAAF Hyperandrogenism Regulations, Appendices).[188]

187 The *Chand* case (note 8 above).

188 The IAAF Regulations governing eligibility of females with Hyperandrogenism to compete in women's competition, Appendices, 2011 (refer to note 63 above).

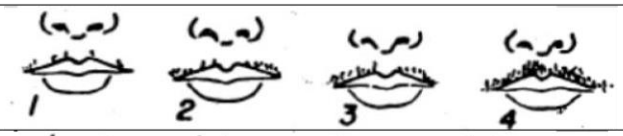
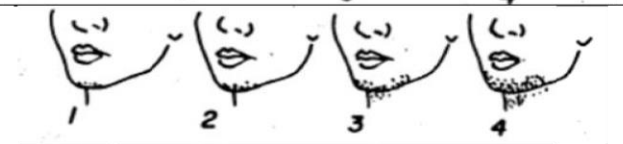
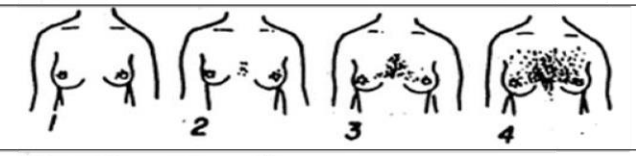
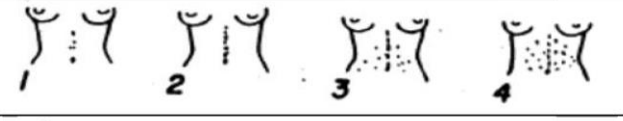
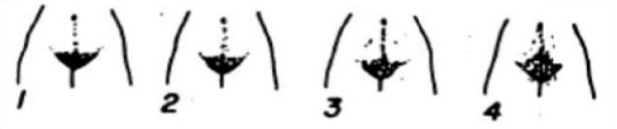
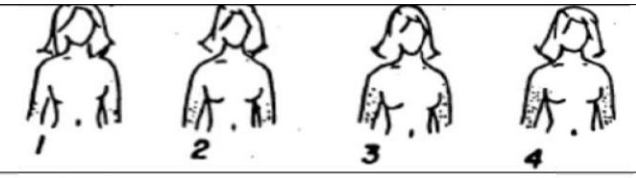
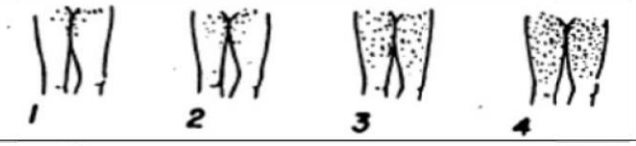
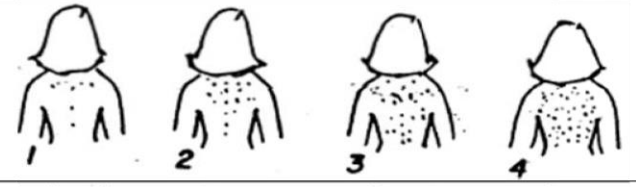
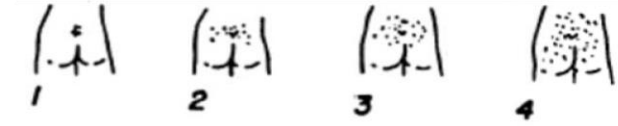
Body Area	Date of exam :		
Upper Lip		Score	
Chin		Score	
Chest		Score	
Upper Abdomen		Score	
Lower Abdomen		Score	
Arms		Score	
Thigh		Score	
Upper Back		Score	
Lower Back		Score	
	TOTAL SCORE		

Figure 3: The Hirsutism scoring sheet, according to Ferriman and Gallwey, used to grade the presence of terminal hair in classifying possible signs of hyperandrogenism in female athletes. (*Source*: IAAF Hyperandrogenism Regulations, Appendices).[189]

189 The IAAF Appendices (note 187 above) 6.

Karkazis *et al* raises the point that if these tests are done purely to prove testosterone levels, how could anyone single an athlete out? It is impossible to state that appearance has nothing to do with the above when it is at the centre of the problem. When appealing to a woman's levels of testosterone as a result of her appearance, one is simply appealing to her gender.[190]

In the UN report of 2020, the United Nations High Commissioner for Human Rights together with the Human Rights Council reiterated that "while most individuals have innate sex characteristics that fit typical expectations for female or male bodies, this is not true of everyone and no single marker is determinative of male or female sex."[191] The report further suggested that it is thus imperative that the DSD Eligibility Regulations should not target female athletes' whose bodies were perceived as "masculine".[192]

In an ideal scenario, all female athletes would be subjected to testosterone testing under the regulations. This way, the regulations would achieve absolute fairness as no female athlete would be isolated on the premise of her physical appearance. However, World Athletics' rationale behind the identification process of the testing protocols withheld in the regulations could be justified when considering the implications of testing each and every female athlete, for every elite competition. Taking into account that not all athletes are financially backed, World Athletics takes the responsibility to bear all costs involved in the testing process, including the costs of the assessment and diagnosis of the athlete, resulting in high financial liability on

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190 Karkazis, K., Jordan-Young, R., Davis, G., Camporesi, S., 2012, 'Out of bounds? A critique of the new policies on hyperandrogenism in elite female athletes', *The American Journal of Bioethics*, Vol 12(7), p 3-16, Available at: 10.1080/15265161.2012.680533.

191 The UN report 2020 (note 27 above).

192 As above.

the sporting body.[193] When considering the costs of testing, it is estimated that WADA incurred about $228 million in costs annually in covering about 270,000 doping tests on average.[194] This is a massive burden for a sporting body to bear, especially when, in the case of the DSD regulations, a low positivity return is expected. Thus, the identification on a case-to-case basis is necessary. In improving their hyperandrogenism regulations and its screening system, World Athletics have neutralised the assessment process in their DSD regulations, holding that:

> *"only the IAAF Medical Manager may initiate an investigation under clause 3.2, and he/she may only do so when acting in good faith and on reasonable grounds based on information derived from reliable sources, such as (for example, but without limitation) the athlete herself, the team doctor of the National Federation to which the athlete is affiliated, results from a routine pre-participation health examination, and/or information/data (including but not limited to blood testosterone levels) obtained from the collection and analysis of samples for anti-doping purposes."*[195]

3.2.2. Biological Variants and its Regulation in Sport

3.2.2.1. Genetic variations in sport

Over the years, several biological conditions have presented themselves in the sporting world, none of which has been frowned upon by sporting bodies. Instead, these biological anomalies, which presented its holder with unique biological traits offering them a sporting edge, have been celebrated and envied by society and fellow competitors. Such conditions, amongst many others, include *Marfan Syndrome,*

193 DSD Regulations (note 10 above) clause 3.15.
194 Maennig, W., 2014, 'Inefficiency of the Anti-Doping System: Cost Reduction Proposals', *Substance use & misuse*, Vol 49, p 1201-1205, Available at: DOI:10.3109/10826084.2014.912065.
195 DSD regulations (note 10 above) clause 3.3.

Acromegaly and *Hereditary Polycythaemia*.[196] Marfan syndrome is a biological condition affecting the body's connective tissues, resulting in a higher level of a naturally occurring hormone called transforming growth factor beta, or TGF-β. The syndrome is characterised by enlarged and elongated physical features, such as significant height, a large wingspan, longer fingers and toes and hyper-flexibility of joints. The result of enlarged and elongated features afforded the affected athlete with a competitive advantage over others. However, due to the side effect of an enlarged aorta, the syndrome poses a risk for fatal heart conditions. Affected athletes thus are warned against extreme physical exercise. On the contrary to DSD athletes, when diagnosed athletes, such as US swimmer Michael Phelps and US volleyball player Flo Hyman, excelled in their respective sporting categories, they were praised and celebrated rather than scrutinized for their gained advantage due to their biological conditions.[197]

Marfan Syndrome is not considered to offer affected athletes with an unfair competitive advantage by sporting entities. Acromegaly, better known as Gigantism, is a biological disorder affecting the body's pituitary gland, causing an excessive naturally produced level of growth hormone during adulthood. The disorder results in an increased size of several physical features, including one's hands, feet, arms, legs, torso and face. Human growth hormone is enlisted on the World Anti-Doping Agency (WADA) Prohibited List of drugs.[198] as an excessive amount result in the gain of an unfair

196 Pielke (note 15 above).

197 Bostwick, J M., Joyner, M J., 2012, 'The limits of acceptable biological variation in elite athletes: should sex ambiguity be treated differently from other advantageous genetic traits?', *Mayo Clinic Proceedings*, Vol 87(6), p 508-13, Available at: 10.1016/j.mayocp.2012.04.002.

198 World Anti-Doping Agency 'Prohibited List Documents', 2016, Available at: https://www.wada-ama.org/sites/default/files/resources/files/wada-2016-prohibited-list-en.pdf (accessed on 12 February 2017).

advantage. Acromegaly, however, is not regulated by any sporting body as a matter of fairness, despite the presence of excessive growth hormone. Affected athletes include a substantial amount of NBA (National Basketball Association) players, including that of Romanian basketball player Gheorghe Muresan. Hereditary Polycythaemia is a biological condition that enables the body to naturally produce a higher-than-average level of red blood cells.[199] This affords the affected athlete with endurance benefits due to the excessive production of red blood cells enabling the body to produce more Erythropoietin (EPO). EPO is commonly used amongst cyclists for the purposes of doping and does form part of the WADA's prohibited list of drugs. Finnish cross-country skier Eero Antero Mantyranta's career was celebrated despite his inherited biological traits presenting him with a competitive advantage. Hereditary Polycythaemia is not regulated by sporting bodies as a matter of unfair advantage.[200]

When considering the above-mentioned conditions and their characteristics, it is noticeable that DSD would form part of the same category as Marfan Syndrome, Acromegaly and Hereditary Polycythaemia if categories concerning biological conditions were to be established. This is due to the distinctive common characteristics which they all share, including:

I. They are biological conditions;

II. They result in the naturally occurring hormone in excessive measures; and

III. This excessive hormonal occurrence may present the diagnosed athlete

199 Pielke (note 15 above).
200 WADA (note 198 above) p 3.

with some sort of a sporting advantage.

In 2011 the IOC stated, with regards to the Hyperandrogenism Regulations, that "the purpose was to guarantee the fairness and integrity of female competitions for all female athletes." The IOC Medical Commission further provided that, "today the purpose of the femininity tests carried out on women athletes taking part in the Olympic Games is to make sure that all female athletes compete under identical anatomical conditions." What the IOC failed to acknowledge, however, was that similar biological conditions exist that have not been regulated as a matter of fairness. This research illustrates an opinion that 'fairness' refers to the impartial treatment of individuals preventing favouritism of one group of individuals in society over another. Thus, the imposition of strict regulations with regards to hyperandrogenic female athletes, and on the contrary, celebrating athletes affected by other medical conditions with the same characteristics, the IAAF and IOC differentiate between individuals. Instead, a universal regulation should be established regulating all medical conditions of the same statute.

While some consider genetic advantages as a "norm in world-class competitive sports, in which selective forces are at work from the moment a child starts running laps or bouncing a ball, with the naturally gifted achieving lofty heights unattainable to the less favourably endowed, no matter how hard they exert themselves.",[201] others have expressed their concerns with the notion that naturally occurring testosterone levels should be considered a natural advantage to be regulated, this due to the inconsistency in regulating other natural advantages such as Marfan Syndrome,

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201 Bostwick *et al* (note 197 above) p 511.

Acromegaly and Hereditary Polycythaemia.[202] The dilemma that presents itself with the concept of not initiating regulations over natural advantages is the severe impact that this may have on the female category of elite competition.

3.2.2.2. Should naturally elevated levels of testosterone be considered as a genetic variation

It is not surprising that, in line with the limited number of scientific studies surrounding DSD, many academics are of the opinion that testosterone in itself does not "dictate better athletic performance",[203] with some going as far as claiming that society should "stop talking about testosterone" as a variant of athletic performances between the sexes as it is neither "a sufficient nor even necessary ingredient" to achieve greatness.[204] Such opinions, however, stand indefensible against a multitude of scientific studies conducted on the effect of puberty on athletic performances between male and female children.

A Norwegian study examined the athletic performance of the top 100 Norwegian male and female athletes between the ages of 11 and 18 years in events including both short (60 meter) and long distance (800 meter) running, high jump and long jump, illustrating the performances recorded in diagrams. [205]

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202 Tucker, R., 2019, 'On Transgender athletes and performance advantages', *The Science of Sport,* Available at: https://sportsscientists.com/2019/03/on-transgender-athletes-and-performance-advantages/ (accessed on 29 March 2021).

203 Karkazis, K., 2019, 'Stop talking about testosterone – there's no such thing as a 'true sex'', *The guardian*, Available at: https://www.theguardian.com/commentisfree/2019/mar/06/testosterone-biological-sex-sports-bodies (accessed on 9 April 2021).

204 Karkazis (note 203 above).

205 Tonnessen, E., Svendsen, I E., Olsen, I C., Guttormsen, A. & Haugen, T., 2015, 'Performance Development in Adolescent Track and Field Athletes According to Age, Sex and Sport Discipline', *National Center for Biotechnology Information*, Available at: https://doi.org/10.1371/journal.pone.0129014 (accessed on 09 April 2021).

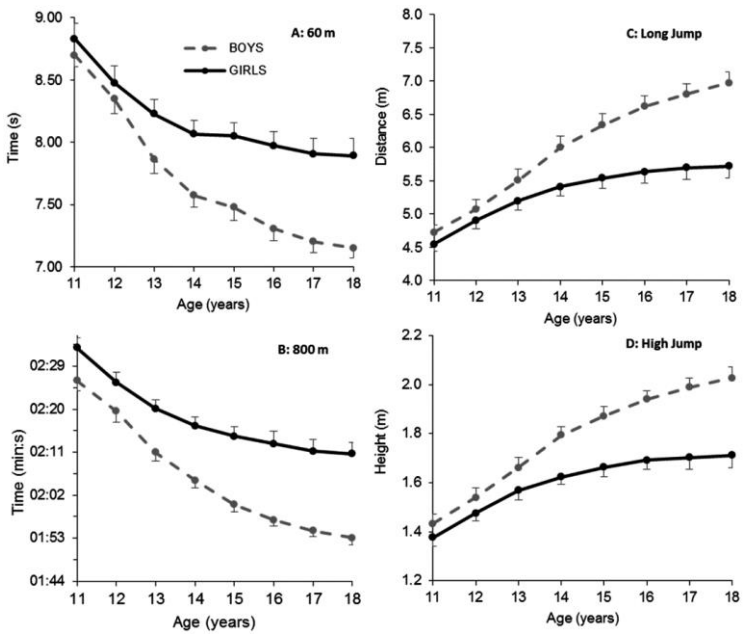

Figure 4: A diagram depicting the performance difference of male and female athletes between the ages of 11 to 18 in running and jumping disciplines. (*Source*: Performance Development in Adolescent Track and Field Athletes According to Age, Sex and Sport Discipline, Figure 1).[206]

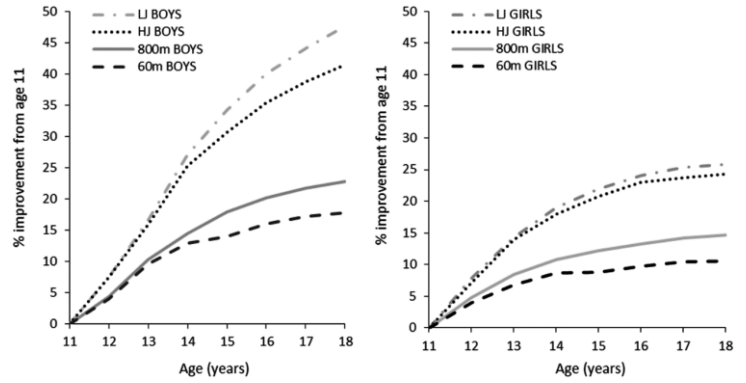

Figure 5: A diagram depicting the performance advantage increase of male and female athletes between the ages of 11 to 18 in running and jumping disciplines.

206 Tonnessen *et al* (note 205 above).

(*Source*: Performance Development in Adolescent Track and Field Athletes According to Age, Sex and Sport Discipline, Figure 2).[207]

The definitive conclusion exhibits that, between the ages of 11 to 12, little to no performance advantage exists between male and female children, whereas beyond these ages, an evident development in sporting advantage is noticed in pubescent males in relation to females.[208] Furthermore, the study demonstrates an overall annual improvement in performance advantage being approximately 50 % higher for males than that recorded for females.[209] It is thus evident that puberty is the manifestation of the improvement in performance advantage in male children above the age of 13. Prepubescent male children showcase minimal levels of testosterone, indicating low levels of Gonadotropin-releasing hormone (GnRH).[210] When puberty is initiated, a male experience changes in the neuronal input to both the hypothalamus and brain activity, causing a substantial rise in GnRH levels.[211] This heightened secretion of GnRH results in a significant contribution towards the body's regulation of testosterone levels, in other words leading to a major increase in the natural production of testosterone. Higher levels of testosterone lead to the body's development of secondary male characteristics, which creates the characteristics that we assume 'masculine', including physical attributes such as growth spurts and an increase in skeletal muscle.[212]

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207 Tonnessen *et al (*note 205 above).
208 As above.
209 Tonnessen *et al. (*note 201 above) p 2.
210 Nassar, G N. & Leslie, S W., 2021, 'Physiology, Testosterone', *StatPearls Publishing,* Available at: https://www.ncbi.nlm.nih.gov/books/NBK526128/?report=printable (accessed on 09 April 2021).
211 As above.
212 As above.

One can then assume that "the difference in athletic performance between males and females is "predominantly due to higher levels of androgenic hormones in males resulting in increased strength and muscle development,"[213] as did World Athletics in their Hyperandrogenic Eligibility Regulations. Assuming that testosterone can be considered a natural genetic advantage, meaning one assumes that "being 'male' is a natural genetic advantage",[214] not regulating any natural genetic advantage would cause havoc in the female category of elite competition, this being the need for the regulations in the first place. In other words, the female category in sport may be described as the absence of 'natural genetic advantage', being Y chromosomes in totality, testes, and testosterone which may be utilized by the body.[215]

By rule of elimination, this definition of the female category would result in the ineligibility of female athletes with DSD to compete in the female category; but as all theorems of sex definition have experienced over the last few decades – nothing about sex definition is that simple, or simple at all as a matter of fact. Evidencing that testosterone plays a role in the performance gap between females and males only proves that cisgender males hold a performance advantage over cisgender females due to their 'natural genetic advantage' being testosterone. This, however, does not prove that female athletes with DSD hold such a 'natural genetic advantage' even if they have elevated levels of testosterone. Attempting to establish a sought for performance advantage of a female with DSD over that of a cisgender female is very different as their androgen benefits are not as clear cut as those of a cisgender male compared to a cisgender female.[216] DSD is a collective term accommodating several

213 The Hyperandrogenic Regulations (note 63 above).
214 Tucker (note 202 above).
215 Tucker (note 202 above).
216 Tucker (note 202 above).

conditions related to sex development and remains relatively understudied, which is why "no theoretical basis to think that all those conditions would confer an advantage"[217] exists at present. All is not what it seems when it comes to DSDs and the concentration levels of testosterone that it's holder may display. This is due to the different effects' testosterone has on bodies displaying different variants of DSDs. Some variants of DSDs are almost guaranteed not to provide its holder with an advantage due to the holder's complete or partial insensitivity to the high levels of testosterone within their body.[218] In this case, the 'natural genetic advantage' not to be regulated does not refer to testosterone per se, but rather DSDs as a biological condition, as is the case for Marfan Syndrome, Acromegaly and Hereditary Polycythaemia as aforementioned. Until such a time where DSDs are distinguished and sound scientific evidence is presented to highlight the extent of performance that each variant provides, DSDs should be dealt with in a manner equivalent to its competitors.

Another predicament caused by the "absence of 'natural genetic advantage' being Y chromosomes in totality, testes, and testosterone which may be utilized by the body" classification of the female category is the presumption that all DSDs holders have a chromosomal structure of 46XY DSD, an unfortunate error assumed by World Athletics in their DSD Eligibility regulations too. Conversely, the classification of DSDs is based on numerous sex chromosomes, and while this includes 46XY DSD, it further introduces 46XX DSD, Ovo-testicular DSD, and 46XX testicular DSD.[219] 46XY DSD is

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217 Tonnessen *et al (*note 205 above).

218 Tonnessen *et al (*note 205 above).

219 Witchel, S F., 2017, 'Disorders of sex development', *Best Practice & Research: Clinical Obstetrics & Gynaecology*, Vol 48, p 90-102, Available at: Doi: 10.1016/j.bpobgyn.2017.11.005 / https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5866176/pdf/nihms922328.pdf (accessed on 03 September 2021).

one of the most frequently encountered DSD with mutations in the androgen receptor gene reported causing and interference with testosterone signalling.[220] Rooted by an anomaly in the androgen receptor, AIS can either cause complete androgen insensitivity or partial androgen insensitivity. Complete androgen insensitivity eliminates all androgenic advantages usually gained from testosterone and dihydrotestosterone, meaning that the body's endogenous testosterone, no matter the concentration levels, is essentially insubordinate.[221] Less commonly observed, 46XX DSD is mainly recorded to be caused by Congenital Adrenal Hyperplasia (CAH), which results from 21-hydroxylase deficiency.[222] Females with CAH can present with high levels of testosterone and dihydrotestosterone due to the adrenals producing an excessive amount of sex hormone precursors, which vanquishes the lesser production of oestrogens.[223] Individuals with Ovo-testicular DSD, being the least common DSD, have inherited the stereotypical term that most would familiarize as a 'hermaphrodite'. Ovo-testicular DSD holders hence bear genital ambiguity, with the majority having a chromosomal structure of XX, but an XY chromosomal structure is possible.[224]

Considering the variety of existent DSDs, 46XY DSD is the variant most likely not to present its holder with an athletic advantage due to limited or complete inability to utilize the excessive testosterone harboured within the body. As is, the DSD Eligibility

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220 Witchel (note 219 above) p 5.

221 Hornig, N C., de Beaufort, C., Denzer, F., Cools, M., Wabitsch, M., Ukat, M., Kulle, A E., Schweikert, H U., Werner, R., Hiort, O., Audi, L., Siebert, R., Ammerpohl, O., Holterhus, P M., 2016, 'A Recurrent Germline Mutation in the 5'UTR of the Androgen Receptor Causes Complete Androgen Insensitivity by Activating Aberrant uORF Translation', *PLoS One,* Vol 25;11(4), Available at: DOI: 10.1371/journal.pone.0154158, (accessed on 02 September 2022) p 8.

222 White, P C. & Speiser, P W., 2000, 'Congenital Adrenal Hyperplasia due to 21-Hydroxylase Deficiency', *Endocrine Reviews*, Vol 21, Issue 3, p 245–291, Available at: https://doi.org/10.1210/edrv.21.3.0398 (accessed on 09 April 2021).

223 Witchel *et al* (note 219 above).

224 As above.

regulations include the regulation of female athletes who are holders of the following specific DSDs:

I. 5α-reductase type 2 deficiency; [46 XY DSD]

II. Partial androgen insensitivity syndrome (PAIS); [46 XY DSD]

III. 17β-hydroxysteroid dehydrogenase type 3 (17β- HSD3) deficiency; [46 XY DSD]

IV. Ovo-testicular DSD; [10% < 46 XY DSD]

Alternatively, "any other genetic disorder involving disordered gonadal steroidogenesis"; and as a result, "has circulating testosterone levels in blood of five (5) nmol/L or above; and she has sufficient androgen sensitivity for those levels of testosterone to have a material androgenising effect".[225] Amongst the four isolated DSD variants, all but one is exclusive to females with a chromosomal structure of 46 XY DSD, with the outlier displaying a faint possibility thereof of less than 10%. The regulation makes no mention of 46 XX DSDs such as CAH, 21-hydroxylase deficiency or 11beta-hydroxylase deficiency, the DSDs known to produce an excessive amount of testosterone. A Swedish study examined the relationship between CAH and androgen insensitivity in two young female subjects in comparison to a male subject with PAIS.[226] The study found that "female carriers of *AR* mutations generally do not have symptoms or signs of androgen insensitivity, due to the presence of two X chromosomes", however "regarding androgen insensitivity, genotype-phenotype

225 The DSD Eligibility Regulations (note 10 above).

226 Lundberg Giwercman, Y., Nordenskjöld, A., Ritzén, E M., Nilsson, K O., Ivarsson, S., Grandell, U., Wedell, A., 2002, 'An Androgen Receptor Gene Mutation (E653K) in a Family with Congenital Adrenal Hyperplasia due to Steroid 21-Hydroxylase Deficiency as well as in Partial Androgen Insensitivity', *The Journal of Clinical Endocrinology & Metabolism,* Vol 87, Issue 6, p 2623–2628, Available at: https://doi.org/10.1210/jcem.87.6.8518 (accessed on 12 April 2021).

relationships are not obvious".[227] The Swedish study was unable to determine a scientific link between CAH and androgen sensitivity. For this reason, it is incomprehensible that World Athletics does not explicitly mention the 46 XX DSD in its regulation, making it possible that World Athletics focused their DSD regulations on 46 XY DSDs.

It could be argued that, by only regulating the 46XY DSD variant that is least likely to provide an athletic edge and failing to include all 46XX DSD variants, World Athletics has, perhaps unknowingly, declared XX females as biologically 'authentic' women while declaring XY female's womanhood disputable. To avoid discrimination amongst DSD variants, World Athletics should specify each variant to be regulated on merit instead of diagnosing presumed athletic advantage by way of the symptom of having higher testosterone levels.[228]

3.2.2.3. Therapeutic Use Exemption (TUE) vs DSD Eligibility Regulations

The Hyperandrogenic and DSD Eligibility Regulations compared to TUE values can be viewed as a set of parallel lines running in opposite directions. The two regulations strive to exist in a similar manner, with what seems like the same goal: to promote the health of an athlete while upholding fair play in sport. Unfortunately, both anomalies have failed to achieve the end goal. TUE results in a potentially ill athlete being advantaged due to her illness yet resulting in a gaping loophole that allows her fellow competitors to legally dope, whereas the Hyperandrogenic Eligibility Regulations

227 Lundberg *et al* (note 226 above)

228 Tucker, R., 2019, 'On DSDs, the theory of testosterone, performance the CAS ruling on Caster Semenya', *The Science of Sport,* Available at: https://sportsscientists.com/2019/05/on-dsds-the-theory-of-testosterone-performance-the-cas-ruling-on-caster-semenya/ (accessed on 29 March 2021).

result in the disadvantaged of a hyperandrogenic athlete at the expense of her health. Being the first of its kind, the Hyperandrogenism regulations required medical practitioners to treat athletes beyond purposes of illnesses and sickness but merely to make them eligible for competition. This includes the prescription and administration of treatment with potential side effects and costs frankly to satisfy a regulation. When comparing same to the principles of TUE, an evident disproportion, if not a complete contrast, in the regulators and their values are experienced. The logic? Cure athletes suffering from medical conditions with prohibited substances on the WADA list in order to have them compete safely and promote health while concurrently medicating perfectly healthy athletes, impairing their health, to diminish naturally occurring but prohibited substances in order to uphold fair sporting practice. Are regulations endangering some to protect others? When does equality, equal treatment and fair sporting practice come into play? And if so, does it come into play for all or merely for some?

3.3. Limited Scientific Evidence Available in Support of the DSD Regulations

3.3.1. Identifying the faults and challenges of the Bermon hypothesis formulation

In bringing medical terminology and concepts into perspective, it became evident that when considering sport and performance, a variety of factors exists that may have a normal distribution in the physiology of an athlete. This can include different medical conditions rendering a degree of advantages as per its impact on the athlete's physiology, making her prone to succeed in their sporting discipline. On the contrary, one could argue that this is merely a variation in normal physiology.

It is important to note that the level of hormones in the female body's endocrinology as found in her bloodstream is merely one determinant of whether the endocrinology

is disturbed or not.[229] An equivalent or perhaps even a more significant determinant is not so much whether the A substance in the female's blood has got high concentrations, but the endocrinology in principle is that most of these are proteins that bind to receptors in end organs. Such a receptor refers to the presence of a specified chemical on the membrane of a muscle cell that binds with the A substance.[230] This binding then results in chemical changes which may or may not build up more muscle. Thus, a number of things have to happen in terms of an increased concentration that must be taken into account. Subsequent to the total ignorance given to the receptor and the number of receptors on each athlete's muscles, which vary between individuals as it is genetically determined, is the sensitivity of these receptors and how receptive they are to the binding and the consequential chemical change. This is called receptor sensitivity.[231] This phenomenon leads to a "catch 22" situation in the regulation process as females can have very high levels of T, but due to their receptors not functioning in that it has receptor insensitivity, the athlete's physiology looks like, acts like and is in essence completely feminine. Such athletes respond to exercise like females with low T would as they are insensitive to the T and thus have no ability to generate an advantage from it. What the allowance of 5 T does not account for is that a female with a reading of 5.1 would ordinarily exceed the threshold but can have low sensitivity and will psychologically respond like females with low T. Whereas on the other hand, you can have a female with a 4.8 reading, falling within the threshold, with a high sensitivity to

229 Cadwallader, A B., Lim, C S., Rollins, D E. & Botrè, F., 2011, 'The Androgen Receptor and Its Use in Biological Assays: Looking Toward Effect-Based Testing and Its Applications', *Journal of Analytical Toxicology*, Vol 35, no.9, p 594-607.
230 Cadwallader *et al* (note 229 above).
231 Cadwallader *et al* (note 229 above).

T and they respond like women with a much higher T level.

Both the latter Hyperandrogenism regulations and the current DSD Eligibility regulations vaguely state that androgen receptor sensitivity must be tested yet have failed to implicate this to date. This may be as a result of the high degree of difficulty in regulating it as an individual's receptor sensitivity is never the same at all times. Instead, it is dependent on external stimuli, which leads to the human body naturally upregulated and downregulated its receptor sensitivity levels in order to maintain a healthy level of substance A.[232] Thus, the only way to remain completely objective and fair, regulations need to make provision in regulating everyone, define an appropriate level of T, as well as sensitivity and the response to that which must be tracked over a period as it can vary. Only then, in terms thereof, different categories can be established.

Further major flaws of the tests lie in the statistics and the sampling used. Each sub-group only had around 60 athletes within the group. They then divided them into tertiles (equal thirds), being top third, middle third and bottom third.[233] They then compared their performance based on the time between only the top and bottom group. The middle group was ignored. Essentially this provides for three problems, namely: (1) the basis of the test was only 20 athletes compared to 20 athletes; (2) Scientists may have double counted and tested athlete samples as samples were collected over two world championships in the absence of reporting how many of these athletes were tested twice; and (3) a cross-section study design was used to substantiate the effect

232 Cadwallader *et al.* (note 229 above).

233 Bermon, S., Vilain, E., Fénichel, P. & Ritzén, M., 2015, 'Women with hyperandrogenism in Elite Sports: Scientific and Ethical Rationales for Regulating', *The Journal of Clinical Endocrinology & Metabolism,* Vol 100, No. 3, p 828-830.

that high T caused higher performance, which is a significant problem because no other factors that could relate to performance were included in the statistical model.[234]

Adding to the flaws is the major upset revolving around the consent. Is endogenous T an anti-doping issue? No, the Hyperandrogenic Eligibility Regulations stated that it has no connotations to anti-doping – meaning they were not allowed to use the collection of blood samples, which was collected for anti-doping purposes only as that is what the athlete consented to. This has severe implications in terms of the scientific basis as the conduct by the scientific basis was unethical, rendering all findings inadmissible. Lastly and quite self-explanatory is the found conflict of interest as the investigators performing the study formed part of the IAAF. Thus, apart from the already established unsound scientific basis, there is a whole host of flaws in determining the 4-5% percentage.

What seems to be ignored is the lack of diversity included within the Bermon studies, as Dr Bermon herself admits that their studies in elite female athletics did not make provision for the androgen levels in black women compared with that in Caucasian women.[235] As a matter of fact, even the Eklund studies were purely Caucasian based. The CAS Panel also fails to address whether the IAAF included a diverse group of female athletes within their studies. Thus, no provision has been made for different ethnic groups, cultural backgrounds or natural surroundings. This is important as human beings adapt to their habitat, realities and unique roles played in society. Once again, laboratory testing in terms of testosterone and its effect on the female body is

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234 Pielke, R.,Tucker, R. & Boye, E., 2018, 'Serious Problems Found in a Partial Replication of Bermon and Garnier (2017)', *Sport of Science*, Available at: https://www.sportsintegrityinitiative.com/wp-content/uploads/2018/07/FINAL-Serious-Problems-Found-in-a-Partial-Replication-of-Bermon-and-Garnier.pdf.

235 Bermon *et al* (note 233 above).

rendered flawed and thus ineffective. Nevertheless, bodies such as the IAAF still rely upon it, despite its claim that "there are neither available data on serum androgen levels nor reliable statistics on the so-called hyperandrogenism among a large and high-level female athletes' population".[236] Furthermore, the IAAF will have to find the means and scientific results in support and justification of its regulations. This may lead to an impossible task as no female athlete has ever competed in a degree that comes close to the "10 – 12%" proved advantage required by the CAS panel.[237] After considering all the flaws in its' prior attempts, it is hard to imagine that the IAAF would be able to achieve this on the balance of probabilities.

3.3.2. *British Journal of Sport Medicine* (BJSM) and Precaution for Journals and Authors of False Positives

It goes without saying that in circumstances where academic journals and their assumed proclamations are used as a basis to establish a precedent regulation, it must bear the highest degree of credibility within its field. It is thus not only of the utmost importance that the researcher cross-examines such credibility before relying thereon, but even more so that the accredited academic journals implement a rigorous analysis of the content of journal articles before considering publishing it.

As per the official website of the World Athletics, it can be ascertained that policy legislators held the Bermon test results and findings in high regard while drafting the new DSD Eligibility Regulations, if not wholly basing its contents thereon. Statistics, study designs and conclusions contained in the Bermon tests were significantly challenged by several medical practitioners and specialists in the field by way of letters

236 Bermon *et al* (note 233 above).
237 The *Chand* case (note 8 above).

to the medical journals that published this study. This includes the opinion of a group of academics, *inter alia* Silvia Camporesi, as aforementioned, who declares the Bermon tests unsubstantial, nonsensical and certainly not suitable as the basis of such a profound regulation.[238] When scrutinized on the credibility of the methodology of their tests, Bermon and Garnier merely suggested that, due to the purpose of their tests being wholly exploratory in nature, no claim is made in terms of concrete and confirmatory results, even though they are of the opinion that the results carry strong relevance in the medical profession.[239] Camporesi and co-authors confirm the necessity of internal regulatory measures to be taken by academic journals before publication as they identify several hypothesis testing inconsistencies in the Bermon tests. They criticize that, in the absence of performing hypothesis testing corrections, the results of the Bermon tests remain flawed and subject to false positives, rendering them intermittent.[240] Irregularities found in the reliant five positives out of twenty-one tests becomes a severe issue in the overall test results as it creates a significant disparity in the reliability thereof. Despite the above, Bermon defends the results and advises the improbability of a 'result by chance' in even one instance, not even to mention five instances. When conducting a study of Bermon and Garnier (2017) and unilaterally controlling the discovery rate of false positives, Camporesi and co-authors exposed that testing was not done in a conservative manner in the least. These allegations go as far as suggesting that, should it be exposed to any method of false discovery available at present, none of the findings of Bermon and Garnier (2017)

238 Franklin, S., Betancurt, J O. & Camporesi S, 2018, 'The debate continues: the new IAAF Eligibility Regulations for Female Classification', *The British Journal of Sports Medicine.*

239 Bermon, S., & Garnier, P., 2017, 'Serum androgen levels and their relation to performance in track and field: mass spectrometry results from 2127 observations in male and female elite athletes', *The British Journal of Sports Medicine,* Vol 51, No. 17, p 1309-1314, [hereinafter referred to as the 'Bermon tests'].

240 Franklin *et al* (note 238 above).

would survive.[241] Thus, it is fair to conclude that these results were not founded on legitimate grounds, especially when considering that it forms the backbone of profoundly consequential regulations.

In confirmation to allegations of possible false positives, another group of academics, including the likes of sports scientists Ross Tucker and Roger Pielke, concluded an independent replication of the Bermon test results. Data samples necessary for the replication were found established from the publishing by Bermon and Garnier in 2017, as is apparent in Table 3 thereof.[242]

Table 3 from Bermon & Garnier (2017)			REPLICATION		
	N	average (SD)	N	Average	SD
100 m	112	11.88 (0.88)	112	11.88	0.88
100 m H	73	13.15 (0.48)	73	13.15	0.48
200 m	71	23.43 (0.90)	71	24.43	0.90
400 m	67	52.23 (2.56)	67	52.19	2.59
400 m H	67	56.34 (2.65)	67	56.30	2.59
800 m	64	121.80 (5.42)	64	121.80	5.42
1500 m	66	250.16 (6.42)	66	250.15	6.42
3000 m SC	56	581.61 (17.39)	56	581.61	17.39
5000 m	40	932.67 (39.73)	40	932.67	39.73
10 000 m	33	1912.6 (55.6)	33	1912.63	55.50
Marathon	92	9726.6 (790.9)	96	9726.63	790.87

Figure 6: Table showing replicated results as performed and published by Pielke, Tucker and Boye (2018) and based on data recollected from Table 3 From Bermon and Garnier (2017).[243]

Minor differences were perceived (as marked in yellow above) in their attempt to reproduce sample numbers and standard deviations, as appears in Table 3 from

241 Franklin *et al* (note 238 above).
242 Pielke *et al* (note 234 above).
243 Pielke *et al* (note 234 above).

Bermon and Garnier (2017). Even though these differences seem insignificant, they facilitated the opening of the can of worms. On account that the representative performance data in question remains inaccessible to the public, the scientists publicly called for Bermon and Garnier to furnish them with variables as used in their tests, being registered times from the 2011 Daegu World Championship and the 2013 Moscow World Championship, in order to conduct the recreation of the test itself.[244] On 6 July 2018, Dr Bermon subsequently produced this data to the scientists personally, still withholding the associated medical data due to supposed athlete confidentiality.

When comparing the newly attained times used for testing from Dr Bermon to that of actually registered times from the 2011 and 2013 World Championships, it is evident that major anomalies were present in the generating of the results. Four events are of particular interest in promulgating underlying errors, namely: 400m sprints, 400m hurdles, 800m and 1 500m races.[245] Above and beyond the inclusion of times ran by disqualified athletes by way of doping, Pielke and co-authors identify a further three inaccuracies within the formulation of results. Firstly, in several instances and in both World championships, a single athlete's time was recorded more than once. This results in the duplication of athletes and a watered-down sample pool. Secondly, on occasion, duplicate times were used in that identical times were recorded for several athletes who are very implausible on such an elite level of competition and is clearly incorrect. Lastly, even though less frequent, times were recorded for unidentifiable athletes rendering a so-called phantom time.[246] These problematic areas were

244 Pielke *et al* (note 234 above).
245 Pielke *et al* (note 234 above).
246 As above.

summarised as follows:

EVENT	Original data points	Duplicated athletes	Athletes included who were DQ'ed for doping	Duplicated times	Phantom times	**Total problematic data points**	**Percent of total**
400m	67	6	0	5	11	**22**	**32.8%**
400mH	67	6	0	12	1	**19**	**28.4%**
800m	64	8	3	0	0	**11**	**17.2%**
1500m	66	10	2	0	3	**15**	**22.7%**

Figure 7: Table depicting the flawed areas identified in Bermon and Garnier (2017) as found and published by Pielke, Tucker and Boye (2018).[247]

As can be observed from the table above, the erroneous section of the study contrives up to 33% of the framework that is declared to produce 'strong' results. [248] This percentage was calculated solely on the basis of the above four track events, leading to the drawn inference of the possibility of further misguided data amongst all other track and field events. It goes without saying that, with a problematic data fraction as high as a third, the reported results are compromised, and this has a significant effect on the evidential value of the test as a whole.

Considering the relevance and revolutionary status of such a newly established data basis, it is distressing to think that the *British Journal of Sport Medicine* (hereinafter the BJSM) failed to perform an in-depth analysis before the publishing thereof. Prior independent checks on research papers submitted to be publicized are regarded as a standard practice amongst academic journals - the rationale is to protect the integrity of the profession by preventing false positives in successive research due to their

247 Pielke *et al* (note 234 above).
248 As above.

interpretation of poorly generated results in a previous publicized paper. The BJSM's failure to attend to the audit of Bermon and Garnier (2017) has resulted in much more severe consequences than just causing a false conclusion in a dependent research paper or two. Instead, such shortcomings led to the rise of a series of controversial eligibility regulations in female athletics as promulgated by the IAAF. Pielke and co-authors further their concerns by exclaiming "the importance of data sharing in science as well as the role of independent checks on data with policy or regulatory significance" and encourages the BJSM to take notice hereof by adopting a more strenuous audit process on research papers to be published.[249] Some academic critiques spread caution to their colleagues who have or look to interpret the results as held in Bermon and Garnier (2017) to approach their research with the discretion and knowledge of prospective false positives withheld therein.[250] Whereas others, obviously offended by the pervasiveness of the tests, call upon the BJSM to retract both Bermon and Garnier (2017) as well as its explanatory article published in 2018.[251]

This led to the BJSM, as the responsible journal for the publication of these papers, to publicly call upon Drs Bermon and Garnier to share anonymised underlying performance data. This being due to the journal being "unable to reconcile the reported methods and results of BG17 with publicly available performance data from IAAF.org and have arrived at some questions that can only be addressed with access to the original data." [252] The journal further identifies faults in the Bermon tests as:

- "BG17 reports an average 800m (for n = 64) female time of 121.80 seconds

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249 Pielke *et al* (note 234 above).
250 Franklin *et al* (note 238 above).
251 Pielke *et al* (note 234 above).
252 The British Journal of Sports Medicine, 2018, 'Call for Drs Bermon and Garnier to share anonymised underlying performance data', *The British Journal of Sports Medicine,* Available at:

with a standard deviation of 5.42 seconds (data from BG17 Table 6, column 1);

- Given a normal distribution of times, this implies that there should be ~10 times < 116.38 (that is, <1 standard deviation below the mean, ~16% of 64);
- However, in Daegu 2011 and Moscow 2013, there are only two such times, and one of these has since been disqualified due to doping."[253]

The journal concludes its inquest with a statement suggesting the difficulties in trying to reconcile the reported results of the Bermon tests with that of the official IAAF data under the methods published in the paper. In short, the journal may be forced to retract the Bermon test and journal articles from its publications in order to avoid ethical issue surrounding whether the journals and its reviewers should have published the paper in the first place.

3.3.3. BJSM Updates Bermon Tests Without Notice

In August 2021, the BJSM discretely and in absence of any notification to the affected public, publicised a correction to the Bermon tests, once again taking the sports scene by storm.[254] The original paper published in 2017 by World Athletics employees, Stéphane Bermon and Pierre Yves Garnier, concluded that female athletes with higher testosterone levels held a sporting advantage over their cisgender female competitors in Hammer Throw, Pole Vault, 400m races, 400m hurdles races, 800m races, and one-mile races. This presumably found advantage was attributed to the endogenous

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https://blogs.bmj.com/bjsm/2018/05/10/call-for-the-authors-of-bermon-and-garnier-to-share-the-underlying-performance-data/ (accessed on 2 August 2018).

253 BJSM (note 252 above).

254 Bermon, S., & Garnier, P., 2021, 'Correction: Serum androgen levels and their relation to performance in track and field: mass spectrometry results from 2127 observations in male and female elite athletes', *British Journal of Sports Medicine*, Volume 55, e7, Available at: http://dx.doi.org/10.1136/bjsports-2017-097792corr1 (accessed 10 October 2021) [hereinafter referred to as the '*Bermon Correction*'].

testosterone which was named "the primary driver of the sex difference in sports performance between males and females"[255] and independently lead to the enforcement of the DSD Eligibility Regulations and the ban of several athletes from its date of publication to the present. While corrections in scientific research, especially those supporting newly found evidence, are common, its self-correcting nature usually has little to no impact on humanity. Where mistakes are noted, researchers clearly identify and admit the error which is then accordingly corrected.[256]

The result of the correction of the Bermon tests together with the timing thereof is, however, all but inconsequential on the livelihood of DSD athletes and the Olympic spirit. Subsequent to the Bermon tests leading to the ineligibility of several athletes to compete in the 2020 Tokyo Olympics held in 2021, the correction to the Bermon tests was published, just days after the conclusion of the 2020 Tokyo Olympics.

The possibility exists that, should the correction have been publicized days earlier, the DSD Eligibility Regulations may have been overturned in time for the DSD athletes to legitimately compete in the Tokyo Olympics. When questioned about Namibian athlete Christine Mboma's ineligibility to compete in her favoured distance of 400m sprint following her silver winning performance in the 200m sprint, World Athletic president Sebastian Coe once again relied on the recently admitted flawed evidence as justification of her ineligibility.[257]

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255 Court of Arbitration for Sport, Media release – Executive summary, Available at: http://www.saflii.org/images/cassummary.pdf, (accessed on 10 October 2021).

256 Pielke, R., 2021, 'Bombshell: World Athletics Admits its Research Underpinning DSD Regulations is "Potentially Misleading"', *The Honnest Broker Newsletter,* Available at: https://rogerpielkejr.substack.com/p/bombshell-world-athletics-admits (accessed on 10 October 2021).

257 Pielke (note 256 above).

In their analysis of their DSD Eligibility Regulations, World Athletics addressed the question as to why only certain track events are regulated thereunder, to which they offered the following reasoning:

> *"Based on the science, the IAAF considers that 46 XY DSD athletes would have an advantage in all events based on their levels of testosterone in the male range. However, the evidence to date indicates that track events run over distances between 400m to one mile are where the most performance-enhancing benefits can be obtained from elevated levels of circulating testosterone, i.e., both from the extra strength and power derived from the increases in muscle mass and strength, and from the extra oxygen transfer and uptake derived from the increased haemoglobin in the blood.*
>
> *Therefore, taking a conservative approach, to allow DSD athletes to compete in the gender with which they identify as far as possible without restriction, the new Regulations only apply to track events between 400m and one mile (and only to international competitions). However, the revised Regulations expressly confirm that the IAAF Health & Science Department will keep this under review. If future evidence or new scientific knowledge indicates that there is good justification to expand or narrow the number of events affected by the Regulations, it will propose such revisions to the IAAF Council."*[258]

While this explanation remains operative on the World Athletics' official website, Bermon *et al* have admitted in their correction that the claim of a "causal relationship" between endogenous testosterone and athletic performance in the limited track events was incorrect:[259]

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258 World Athletics, 'IAAF publishes briefing notes and Q&A on Female Eligibility Regulations', *World Athletics,* Available at: https://www.worldathletics.org/news/press-release/questions-answers-iaaf-female-eligibility-reg (accessed on 31 December 2021).

259 Bermon Correction (note 254 above).

> "*To be explicit, there is no confirmatory evidence for causality in the observed relationships reported... With this in mind, we recognize that statements in the paper could have been misleading by implying a causal inference.*"[260]

This, in addition to the above-mentioned errors identified in the Bermon tests, holds sufficient evidentiary value to evidence the lack of scientific research to enforce such adverse regulations. World Athletics responded to its correction by calling for an independent scientific review of the Bermon tests "to establish confirmatory scientific evidence for the causal relationships between the variables analysed".[261] In addition to this step taken by World Athletics, Pielke has called for, including immediate suspension of the DSD Eligibility Regulation pending independent scientific review of the Bermon tests to be overseen by an authoritative organization.[262] Should World Athletics, together with the IOC, fail to suspend its DSD Eligibility Regulations, CAS, who rendered their judgment on the basis of bad science, is expected to revisit their decision against South African athlete Caster *Semenya* and ASA. Further thereto, the British Medical Journal, as the publisher of the British Medical Students Journal (BJSM) is advised to conduct an internal audit in ascertaining how flawed science existed so long in its published works, regardless of the various journal articles disproving same.[263]

> *"The WA correction offered today provides a very public test of the integrity of World Athletics. The organization chose to base its 2018 regulation on a set of scientific claims. It now admits that those claims were wrong and potentially misleading. Doing the right thing in support of the*

260 Pielke (note 256 above).
261 Pielke (note 256 above).
262 Pielke (note 256 above).
263 Pielke (note 256 above).

athletes that it represents means changing course when the facts warrant. Let's see what happens."[264]

3.4. Newly Introduced Scientific Evidence

Apart from the legitimacy of the Bermon tests still being a heavily debated subject due to erroneous sampling, further studies surrounding the female body and testosterone have precipitated further havoc for Bermon *et al*. Many studies over the last century have studied the relationship between male endogenous as well as exogenous testosterone and its effect on the male's physical strength, with a majority concluding that a positive association could be found between lean muscle mass and testosterone in males. In alignment with similar studies conducted, Bhasin *et al* investigated whether a causal link existed between testosterone levels and strength in young males.[265] Sixty-one male participants between the ages of 18 and 35 years were divided into five groups at random where each group was administered with variant levels of anabolic testosterone supplements over the course of seven days. Resistance training in the form of a simple seated leg press exercise determined the participants' strength score. Various measures were taken to ensure proper and uniform form amongst participants, including warm up lifts.[266] It was found that the participants who received a lower dosage of testosterone showed an insignificant increase in thigh muscle and quadriceps size, whereas the participants who received higher dosages of testosterone did indicate mass increase depending on the level of

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264 Pielke (note 256 above).

265 Bhasin, S., Woodhouse, L., Casaburi, R., Singh, A B., Bhasin, D., Berman, N., Chen, X., Yarasheski, K E., Magliano, L., Dzekov, C., Dzekov, J., Bross, R., Phillips, J., Sinha-Hikim, I., Shen, R., & Storer, T W., 2001, 'Testosterone dose-response relationships in healthy young men', *American Journal of Physiology-Endocrinology and Metabolism*, Vol. 281, No. 6, Available at: https://doi.org/10.1152/ajpendo.2001.281.6.E1172 (accessed on 01 January 2022).

266 Bhasin *et al* (note 265 above).

testosterone administered. Similarly, the participants who received higher dosages of testosterone displayed incremental increases in leg press strength in comparison the those who received lower dosages.[267]

Accordingly, Bhasin *et al* concludes that increases in total testosterone in males' results in an influx of lean muscle mass and strength. In a paralleled study, Mouser *et al* examined the relationship between total testosterone levels and both lean and fat mass in males.[268] The research was conducted on data from the National Health and Nutrition Examination Survey collected between the years 1999 and 2000. It was found that males that fell within the top quartile of testosterone levels displayed higher lower body lean mass (LBLM) and upper body lean mass (UBLM) and less lower body fat mass (LBFM) and upper body fat mass (UBFM) than those in the lowest quartile of testosterone levels. In summary, a positive association can be made between higher levels of total testosterone and favourable lean and fat mass in males.

However, while research supports the idea that testosterone in males leads to heightened strength, studies regarding endogenous testosterone in females have been less readily available. Regardless of the 50% female representation of the human population, scientific research regarding the human body, muscle development and exercise remains male dominant, with merely 8% of sport and exercise research conducted between 2017 and 2019 relating to the female athlete solely, and even so that 8% is comprised of female-specific issues such as pregnancy and menopause

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267 Bhasin *et al* (note 265 above).

268 Mouser, J. G., Loprinzi, P. D., & Loenneke, J. P., 2016, 'The association between physiologic testosterone levels, lean mass, and fat mass in a nationally representative sample of men in the United States', *Steroids*, Vol 115, p 62–66, Available at: https://doi.org/10.1016/j.steroids.2016.08.009 (accessed on 01 January 2022).

and not athletic performance.[269] Due to the lack of scientific research conducted on female athletes, little is known about how the female body produces athletic performance.

During a study in 2009, Carmina *et al* observed ninety-five women diagnosed with PCOS between the ages of 18 and 40 in relation to non-PCOS weight-matched controls in order to analyse whether a degree of increased muscle mass exists in females with PCOS. This theorem stemmed from previous studies that claimed results of androgen excess in women affected by PCOS.[270] Carmina *et al* found that lean mass could be associated with adjusted fat parameters, insulin and/or free androgen index (hereinafter referred to as FAI) in women with PCOS, rather than with testosterone levels.[271] Whereas previous studies suggestively attributed lean muscle mass in women with PCOS to testosterone, Carmina *et al* suggests that, in fact, testosterone has little to no effect on lean muscle mass in patients with PCOS.

Instead, Carmina *et al* concludes that females with PCOS who reflect heightened lean muscle mass may correlate such increase to hyperinsulinemia and/or adjusted fat parameters, rather than whatever androgen level they may showcase.[272] In another study, Ibáñez *et al* observed the effects after administering the two leading treatments

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269 Alexander, S E., Abbott, G., Aisbett, B., Wadley, G D., Hnatiuk, J A., & Lamon, S., 2021, 'Total testosterone is not associated with lean mass or handgrip strength in pre-menopausal females', *Scientific Reports,* Vol 11, Article number: 10226, Available at: https://doi.org/10.1038/s41598-021-89232-1 (accessed on 22 September 2021).

270 Douchi, T., Oki, T., Yamasaki, H., Kuwahata, R., Nakae, M., Nagata, Y., 2001, 'Relationship of androgens to muscle size and bone mineral density in women with polycystic ovary syndrome', *Obstetrics and Gynecology*, Vol 98, p 445–449, Available at: https://doi.org/10.1016/S0029-7844(01)01450-8 (accessed on 01 January 2022).

271 Carmina, E., Guastella, E., Longo, R. A., Rini, G. B., & Lobo, R. A., 2009, 'Correlates of increased lean muscle mass in women with polycystic ovary syndrome', *European Journal of Endocrinology,* Volv161, no 4, p 583-589, Available at: https://doi.org/10.1530/EJE-09-0398> (accessed on 01 January 2022).

272 Carmina *et al* (note 271).

aimed at treating PCOS in young females diagnosed with PCOS being Ethinylestradiol-Drospirenone and Flutamide-Metformin.[273] Ethinylestradiol-Drospirenone refers to the use of oestrogen-progestogen oral contraceptive aimed at preventing ovulation whereas Flutamide-Metformin is a nonsteroidal antiandrogen that acts as a blockage for the androgen receptor, thus interrupting androgen activity.[274] Ibáñez *et al* found that in young females suffering from PCOS a formidable affinity exists between the body's development and adipocytokines in comparison to the insignificant link between body adiposity and testosterone.[275]

MacLean *et al* studied the physiological role the androgens play in the development of male and female mice.[276] This study's importance stemmed from the lack of scientific research surrounding the effects of androgen action in skeletal muscle of female specimen. The study produced both male and female Androgen Receptive mutant mice (hereinafter referred to as 'AR^{lox} mice') in order to observe whether androgens are necessary for ordinary development in either gender mice.[277] Maclean *et al* extraordinarily demonstrated the vast difference between the male and female dependability of androgens in their finding that androgens play an important role in muscle mass development in males, but not in females. Where male AR^{lox} mice

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273 Ibáñez, L. & de Zegher, F., 2004, 'Ethinylestradiol-Drospirenone, Flutamide-Metformin, or Both for Adolescents and Women with Hyperinsulinemic Hyperandrogenism: Opposite Effects on Adipocytokines and Body Adiposity', *The Journal of Clinical Endocrinology & Metabolism*, Vol 89, Issue 4, p 1592–1597, Available at: https://doi.org/10.1210/jc.2003-031281 (accessed on 01 January 2022).

274 As above.

275 As above.

276 MacLean, H E., Chiu, W S., Notini, A J., Axell, A M., Davey, R A., McManus, J F., Ma, C., Plant, D R., Lynch, G S., & Zajac, J D., 2008, 'Impaired skeletal muscle development and function in male, but not female, genomic androgen receptor knockout mice', *FASEB journal: official publication of the Federation of American Societies for Experimental Biology*, Vol 22(8), p 2676–2689, Available at: https://doi.org/10.1096/fj.08-105726 (accessed on 01 January 2022).

277 MacLean *et al* (note 276 above).

exhibited diminished genomic actions and muscle mass, female AR^{lox} mice developed normally with normal muscle mass.[278]

This revolutionary finding advocates for the presumption that androgens are not necessary to attain maximized muscle mass in females and thusly Maclean *et al* notes that:

> "*Although female muscle expresses the AR and is capable of an anabolic response when exogenous androgens are administered, our (their) data suggest that androgens play little or no role in regulating normal female muscle mass.*"[279]

Furthermore, Maclean *et al* exclaims that their findings serve as direct evidence that androgens that are activated through androgen receptors (AR) are not required for normal muscle mass development in females, instead, evidence suggests that growth hormones and oestrogen seemingly take over the anabolic-like role of testosterone in females.[280] More recently Alexander *et al* conducted a study on 716 females between the ages of eighteen and forty years old in examining the correlation between female endogenous testosterone and physical strength.[281] This study stemmed from the positive association between testosterone and lean mass in males, ultimately aiming to breach the deficiency of scientific research regarding testosterone in females. Testosterone is known to play a role in the regulation of skeletal muscle growth, easing the assumption that increased levels of testosterone lead to increased strength and lean mass. However, the main function of testosterone in the female body, being much less concentrated than that of a male's body, is mostly to regulate the reproductive and nervous systems and therefore its role in regulating skeletal muscle growth in

278 MacLean *et al* (note 276 above).
279 As above.
280 As above.
281 Alexander *et al* (note 276 above).

females is mostly unknown.[282] The study utilised data collected in the National Health and Nutrition Examination Surveys conducted in the United States to examine the strength outcome of males and females with regards to resistance training.[283] Grouping males and females of similar ages, Alexander *et al* found that, despite having significantly less testosterone than their male counterparts, females showcased unilateral strength and muscle gains after conducting resistance training.[284] Protein synthesis, being a biological process responsible for creating protein molecules, also displayed similar results in males and females both during rest periods as well as after resistance training.[285]

In their array of study subjects, Alexander *et al* were unable to produce data evidencing any significant effects of testosterone on lean index (LMI), upper body lean mass index (UBLMI), lower body lean mass index (LBLMI) or combined handgrip strength in females between the ages of 18 and 40, as showcased in the table below.

Variable (linear term)	Unadjusted linear model		Adjusted linear model	
	β (95% CI)	*p*	β (95% CI)	*p*
LMI	0.07 (− 0.04, 0.17)	*0.189*	0.05 (− 0.04, 0.15)	*0.237*
UBLMI	0.09 (0.00, 0.18)	*0.061*	0.06 (− 0.03, 0.16)	*0.171*
LBLMI	0.10 (− 0.01, 0.21)	*0.083*	0.05 (− 0.04, 0.15)	*0.228*
Combined handgrip strength	0.06 (− 0.03, 0.15)	*0.162*	0.01 (− 0.11, 0.12)	*0.926*

Figure 8: Standardised linear effect of total testosterone on lean index (LMI), upper body lean mass index (UBLMI), lower body lean mass index (LBLMI) or combined handgrip strength in 18–40-year-old females (n = 716) (*Source*: Total

282 Alexander *et al* (note 269 above).
283 As above.
284 As above.
285 As above.

testosterone is not associated with lean mass or handgrip strength in pre-menopausal females, Table 2).[286]

Conversely, the analysed data illustrated that it was rather free androgen index (FAI) that had a three-fold effect on LMI, UBLMI, and LBLMI, but not in combined handgrip strength only the three abovementioned values increased when the FAI was increased, as shown in the table below.

Variable	Unadjusted linear model		Adjusted linear model	
	β (95% CI)	*p*	β (95% CI)	*p*
LMI				
Quadratic term	–	–	− 0.03 (− 0.05, − 0.02)	***0.000****
Linear term	0.24 (0.03, 0.45)	***0.031****	0.02 (− 0.08, 0.25)	*0.276*
UBLMI				
Quadratic term	–	–	− 0.04 (− 0.05, − 0.02)	***0.000****
Linear term	0.24 (0.03, 0.45)	***0.029****	0.09 (− 0.08, 0.26)	*0.278*
LBLMI				
Quadratic term	–	–	− 0.02 (− 0.04, − 0.01)	***0.001****
Linear term	0.23 (0.02, 0.44)	***0.033****	0.08 (− 0.07, 0.22)	*0.260*
Combined handgrip strength	0.16 (0.08, 0.24)	***0.001****	0.06 (− 0.02, 0.15)	*0.137*

*denotes statistical significance ($p < 0.05$).

Figure 9: Standardised linear effect of free androgen index (FAI) on lean mass index (LMI), upper body lean mass index (UBLMI), lower body lean mass index (LBLMI) or combined handgrip strength in 18–40-year-old females (n = 716) (*Source*: Total testosterone is not associated with lean mass or handgrip strength in pre-menopausal females, Table 3).[287]

Based on previous research indicating that the use of insulin may have a significant effect on the affiliation between testosterone and lean muscle mass, Alexander *et al* conducted further analysis on a smaller group of females who administered insulin treatments.[288] Data was collected in a morning session before insulin treatments were

286 Alexander *et al* (note 269 above) Table 2.
287 Alexander *et al* (note 269 above) Table 3.
288 Alexander *et al* (note 269 above).

administered, and once again once the insulin was supplemented to the statistical model.[289] With the inclusion of insulin treatments, Alexander *et al* found FAI no longer demonstrated any effect on LMI, UBLMI, and LBLMI but contradictorily now displayed an association with handgrip strength.[290] Neither total testosterone nor sex hormone binding globulin (SHBG) offered any significance when insulin was supplemented in the study. Thus, Alexander *et al* concludes that, in alignment with their hypothesis, no evidence could be produced to suggest that any scientific relationship exists between heightened handgrip strength and total testosterone, SHBG and/or FAI in pre-menopausal females.[291]

The findings of Alexander *et al* plays an important part in the evidence surrounding the effects of testosterone within the female body in relation to lean muscle mass, or the lack thereof. The study places emphasis on lean muscle mass and its functional capacity within the female body, an important study considering its possible impact on sport at present. Alexander *et al's* findings indicate that the female body is capable of achieving increased muscular strength by way of advanced training without affecting its muscle mass index.[292] Muscular strength in the female body may thus be attributed to pre-existing neural adaptions and plays the most important role in athletic performance, rather than lean muscle mass. Where it is found that FAI and SHBG may relate to the female body's LMI, such a relationship does not necessarily translate to muscle strength or an increase in athletic performance.

289 Alexander *et al* (note 269 above).
290 Alexander *et al* (note 269 above).
291 As above.
292 As above.

While it is noted that the research conducted in Alexander *et al* measured merely the effects on handgrip strength, the study lays down an explanation for the need of further studies that may lead to an alternative understanding of the female body and how it operates in correlation to the male body, specifically in relation to the positive association of testosterone with lean mass and strength in young and older males (and females). With World Athletics utilising the findings of the Bermon tests in its DSD Eligibility Regulations to draw an inference between endogenous testosterone levels and athletic performance in the female category, studies such as Carmina *et al*, Ibáñez *et al*, MacLean *et al* and Alexander *et al* may inspire future studies that could lead to a better understanding of the effects of testosterone in the female body.

3.5. Understanding Differences of Sex Development

While simplistic conclusions are often drawn by spectators regarding ineligible female athletes under the DSD regulations, there may be a scientific explanation as to why the majority of ineligible female athletes are of African origin. The list of known ineligible female athletes includes the Namibian athletes *Beatrice Masilingi* and *Christine Mboma*, South African *Caster Semenya*, Ugandan *Annet Negesa*, Kenyan athletes *Maximila Imali, Evangeline Makena* and *Margaret Wambui*, Burundian *Francine Niyonsaba*, Nigerian *Aminatou Seyni* and Indian athletes *Dutee Chand* and *Santhi Soundarajan*. In the absence of even a singular ineligible Caucasian athlete, racial segregation in professional athletics is an easy inference to make. While this study is positive that racial exclusion is not an objective of the DSD Eligibility Regulations, statistics have revealed an isolation of African female athletes under the regulations. What may have been a desolating oversight by the promulgators of the DSD Eligibility regulation is the cause of DSD and why the exclusion of DSD female athletes from sport should be reconsidered.

3.5.1. What Causes Differences of Sex Development?

DSD is a comprehensive term that embodies a substantial range of congenital conditions that share a commonality in the atypical development of either the internal or external sexual organs, or both.[293] While many different variants of DSDs exists, all variants result in a deviation of the sexual organ that can be linked to a variety of hormones or genes or simply an interference in the development process.[294] The process responsible for sexual differentiation in foetal development is a highly influential process that prerequisites a particular sequence of events to determine the development of gonads into either testes or ovaries and their specific functions.[295] The slightest interference with this intricate process could more often than none result in DSD.[296]

In many studies, one such interference could encompass the consumption or encounter of male hormones by the mother during pregnancy, whereas other studies correlate the exposure to common agricultural pesticides during pregnancy with DSD in animals.[297] DSD may be immediately recognisable at birth just as frequently as it may be completely unrecognisable at birth. In cases such as the latter, affected individuals may show signs of DSD as early as postnatal virilization or much later upon

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293 Witchel (note 219 above) p 4.
294 Witchel (note 219 above) p 4.
295 Institute of Medicine (US) Committee on Understanding the Biology of Sex and Gender Differences, 2001, 'Exploring the Biological Contributions to Human Health: Does Sex Matter?', *National Academies Press (US)*, Available at: https://www.ncbi.nlm.nih.gov/books/NBK222286/ (accessed on 29 August 2022) p 49.
296 Institute of Medicine (US) Committee (note 295 above) p 50.
297 Michigan Institute of Urology, 'Urology Specialties, Conditions, Treatments & Technology', *Michigan Institute of Urology,* Available at: https://www.michiganurology.com/specialty/intersex/ (accessed on 01 September 2021).

puberty or even infertility.[298] For this reason, it is absolutely plausible for a female athlete with DSD to have never known about her condition.

As aforementioned, the process responsible for sexual differentiation in foetal development is a highly influential process that, if interfered with in utero, especially by toxicological dysregulation, can prominently affect the natural development of the male or female morphological characteristics.[299] The sex differentiation process takes place during the first trimester of pregnancy, which is also the time that the foetus is the most sensitive to chemicals and excessive hormones. Ample studies evidence the possibility that foetus exposure to EDCs in the first trimester can affect the development of primary and secondary sex characteristics, this includes incomplete or partial differentiation of the genitalia.[300] Decades of research and studies have time and time again exposed EDCs for their potential to interfere with the natural development of wildlife and human biology.

In 1999, Ostby *et al*[301] examined the effects of exposing pregnant rats to low doses of vinclozolin, a fungicide. While the study concluded that the instance of DSD, when exposed to higher dosages was more significant than compared to exposure to lower dosages, it confirmed that even low exposure levels during pregnancy could result in reproductive abnormalities.[302] In the same year Meijer *et al*[303] found that dairy cows consuming water contaminated with EDCs produced less milk and calved offspring

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298 Witchel (note 219 above).
299 As above.
300 As above.
301 Ostby, J., Monosson, E., Kelce, W R., Gray, L E., 1999, 'Environmental antiandrogens: Low doses of the fungicide vinclozolin alter sexual differentiation of the male rat', *Toxicology and Industrial Health*, Vol 15, p 48–64, *Stockton Press*, Available at: DOI: 10.1177/074823379901500106 (accessed on 01 September 2021).
302 As above.
303 Meijer, G A S., DeBree, J A., Wagenaar, J A., Spoelstr, S F., 1999, 'Sewerage Overflows Put Production and Fertility of Dairy cows at risk', *Journal of Environmental Quality,* Vol 28:1381-3.

that showcased an interruption in the reproductive development process[304]. This raises major health concerns as the primary use for domestic livestock, such as dairy cows, is human consumption. Due to their lipophilic nature, EDCs are capable to bioaccumulate after consumption and remain concentrated in fatty products such as dairy products and meat. On grounds thereof, it is highly plausible that merely consuming dairy produce could lead to EDCs exposure[305].

While many studies in relation to the adverse effects of EDCs are founded on animal-based research, there has been a major progression in the field of research concerning the effects EDCs have within the human body indicating the existence of the detrimental repercussion of EDC usage. Effects in human biology by EDCs include, "prenatal growth, thyroid function, glucose metabolism and obesity, puberty, fertility, and on carcinogenesis mainly through epigenetic mechanisms",[306] with recent studies hinting at the femininization of human development through the exposure of the anti-estrogenic or anti-androgenic properties contained within EDCs.[307] The severity of EDC exposure is largely dependent on periodic exposure and the vulnerability at the time of exposure. Case studies have indicated that EDC exposure is most potent during the foetal and early developmental stages of life, with negative

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304 Meijer *et al* (note 303 above).

305 Rich, A L., Phipps, L M., Tiwari, S., Rudraraju, H., Dokpesi, P O., 2016, 'The Increasing Prevalence in Intersex Variation from Toxicological Dysregulation in Fetal Reproductive Tissue Differentiation and Development by Endocrine-Disrupting Chemicals', *Environmental health insights*, Vol 10, p 163–171, Available at: https://doi.org/10.4137/EHI.S39825 (accessed on 31 December 2021).

306 Street, M. E., Angelini, S., Bernasconi, S., Burgio, E., Cassio, A., Catellani, C., Cirillo, F., Deodati, A., Fabbrizi, E., Fanos, V., Gargano, G., Grossi, E., Iughetti, L., Lazzeroni, P., Mantovani, A., Migliore, L., Palanza, P., Panzica, G., Papini, A. M., Parmigiani, S., Amarri, S., 2018, 'Current Knowledge on Endocrine Disrupting Chemicals (EDCs) from Animal Biology to Humans, from Pregnancy to Adulthood: Highlights from a National Italian Meeting', *International journal of molecular sciences*, Vol 19(6), p 1647, Available at: https://doi.org/10.3390/ijms19061647 (accessed on 31 December 2021).

307 McLachlan, J A., Simpson, E., Martin, M., 2006, 'Endocrine disrupters and female reproductive health', *Best Practice & Research Clinical Endocrinology & Metabolism*, Vol 20(1), p 63-75, Available at: doi: 10.1016/j.beem.2005.09.009 (accessed on 31 December 2021).

effects such as abnormal or disrupted sexual development only showing its potential during pubescence.[308] Other dependant variables in the potency of EDC exposure include the specific environment where the contamination takes place as well as individual genetic makeup.[309] As such, side effects appear to be individual specific with some being more susceptible to the adverse effects of EDC exposure than others, although, with this said, little is understood about the genetic vulnerability that appears more impressionable to environmental compounds than others.[310] While researchers confabulate the extent of EDC contamination and the extent of its effect on animal and human life, an ever-growing case list of abnormalities in the development of the sexual reproductive organs in both males and females native to contaminated areas emerge.

Svechnikov *et al* specifically investigated the direct effects of environmental chemicals on the male reproductive system, finding that its interference with the androgen receptors (AR) may constrict masculinization resulting in abnormal development of the male sexual organ.[311] This may be attributed to the estrogenic and antiandrogenic properties maintained within a diverse number of EDCs, including, "organochlorine pesticides, polychlorinated biphenyls, BPA, phthalates, dioxins, and furans".[312] Another study confirmed that it is not only the physical development of the male sexual organ that is affected by EDC exposure but that the quality of semen produced also raised major concerns.

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308 Dickerson, S M., & Gore, A C, 2007, 'Estrogenic environmental endocrine-disrupting chemical effects on reproductive neuroendocrine function and dysfunction across the life cycle', *Reviews in endocrine & metabolic disorders*, Vol 8(2), p 143–159, Available at: https://doi.org/10.1007/s11154-007-9048-y (accessed on 1 January 2022).

309 Svechnikov, K., Stukenborg, J B., Savchuck, I., & Söder, O., 2014, 'Similar causes of various reproductive disorders in early life', *Asian journal of andrology*, Vol 16(1), p 50–59, Available at: https://doi.org/10.4103/1008-682X.122199 (accessed on 1 January 2022).

310 Svechnikov *et al* (note 309 above).

311 Svechnikov *et al* (note 309 above).

312 As above.

Ratcliffe *et al* examined the semen quality of 46 male workers employed within the fumigation industry in Hawaii, all of whom faced occupational exposure to ethylene dibromide on an average frequency of eight-hour periods daily for five years[313]. The study established a significant decrease in the semen quality of the participants in relation to that of the health equivalent non-exposed controls, with the impaired semen showing a decrease in sperm count per ejaculation and an increase in morphed sperm cells.[314]

With the incidences of abnormal or disrupted sexual development on an uprise, so too is the imperativeness to gain a better understanding of the extent that environmental chemicals affect animal and human development, especially during the prenatal and postnatal developmental stages.[315] Researchers have identified that even the lowest doses of EDC exposure in the womb may have an ever-lasting impact on the biochemical processes required for the foetus' natural development.[316]

It is, therefore, an absolute necessity to conduct further scientific studies in order to distinguish the identities of the environmental chemicals responsible for the detrimental effects of abnormal sexual development, as well as determine their capabilities to further interfere with human development. Backless *et al* further emphasises the importance of evaluating "both genetic and nongenetic factors … as

313 Ratcliffe, J. M., Schrader, S M., Steenland, K., Clapp, D E., Turner, T., & Hornung, R W., 1987, 'Semen quality in papaya workers with long term exposure to ethylene dibromide', *British journal of industrial medicine*, Vol 44(5), p 317–326, Available at: https://doi.org/10.1136/oem.44.5.317 (accessed on 31 December 2021).

314 As above.

315 Blackless, M., Charuvastra, A., Derryck, A., Fausto-Sterling, A., Lauzanne, K., Lee, E., 2000, 'How Sexually Dimorphic Are We? Review and Synthesis', *American Journal of Human Biology*, Vol 12, p 151–166, Available at: https://transgenderinfo.be/wp-content/uploads/2013/01/Blackless-How-Dimorphic-2000.pdf (accessed on 02 September 2021).

316 Rich *et al* (note 305 above).

both have been found to disrupt the dimorphic process of sex determination and subsequent sex differentiation".[317]

3.5.2. Universal DSD Statistics

Due to a universal deficiency in data basis and registrations of DSD individuals, it is almost impossible to find absolute statistics for the DSD population. Instead, statisticians rely on sample studies to generate a generalised statistic, who quantified the ratio of DSD individuals to cisgender individuals to be "0,05% - 1,7%" of the world's population.[318] This generalised quantification further revealed that "the incidence of DSD varies among ethnic groups with the highest incidence in the Southern African population".[319]

In 2018, the Kenyan National Bureau of Statistics conservatively indicated that Kenya inhabits at least 779 414 individuals with DSD.[320] In its *Report of the Taskforce on Policy, Legal, Institutional and Administrative Reforms Regarding the Intersex Persons in Kenya,* the Bureau stated that: -

> *"To help develop specific statistics for the country, the Taskforce commissioned a field survey to establish their present status in Kenya. Based on the nature of the target population and the stigma surrounding the intersex conversation, the study applied the non-probability sampling technique, Snowball Sampling, which yielded a study sample through referrals. To complement*

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317 Blackless *et al* (note 315 above).

318 Tumanishvili, G G., 2016, 'Universal System Of Sex/Gender Registration', *Ivane Javakhishvili Tbilisi State University Faculty of Law Journal of Law*, No 2, Available at: https://www.researchgate.net/publication/318199606_Universal_System_Of_SexGender_Registration (accessed on 01 September 2021).

319 Witchel (note 219 above).

320 Kenyan National Bureau of Statistics, 2018, 'Report of the Taskforce on Policy, Legal, Institutional and Administrative Reforms Regarding the Intersex Persons in Kenya', *Kenyan National Bureau of Statistics*, Available at: https://www.knchr.org/Portals/0/INTERSEX%20TASKFORCE%20FREPORT-Abridged%20Version.pdf (accessed on 03 September 2021) [hereinafter referred to as th '*Kenyan Report*'].

> *data from the Key Informant Interviews, the survey reached out to various institutions across the country through purposive sampling using the following categories: Professional Regulatory Officers; National Government Administrative Offices; County Government Offices; Ministry of Labour and Social Protection; National Police Service; Correctional Facilities; Health Facilities; Educational Institutions; Religious Institutions, and Civil Society Organisations."*[321]

In line with the findings of its Nation Bureau, Kenya became the first African country to recognize its large population of DSD individuals and the need to formally recognize these individuals in their census in 2019.[322] To date, Kenya contains the largest known population of DSD individuals, with one in every fourteen individuals being affected by DSD whereas, statistically only one in one thousand to one in two thousand people are born with DSD globally.[323] The only other African country to attempt to quantify its DSD population is South Africa, who in its *National Intersex Meeting Report 2018*[324] provided an estimation of one in five hundred, or as high as one in two hundred being born with DSD. A further estimation suggests that around one in fifty possessed some degree of DSD, although the degree of variance is too small to formally classify as DSD.[325] In consideration of the nations affected by the DSD Eligibility Regulations in the 2020 Tokyo Olympics being Kenya, South Africa, Namibia, Uganda, Burundi, Nigeria and India, commonality can be identified in that they are developing countries, and with the exception of India, has an African-race dominant population. This

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321 The Kenyan Report (note 320 above).

322 Koigi, B., 2019, 'Kenya Becomes First African Country to Recognise Intersex People in its Census', *Fair Planet*, Available at: https://www.fairplanet.org/story/kenya-becomes-first-african-country-to-recognize-intersex-people-in-its-census/ (accessed on 01 September 2021).

323 The Republic of South Africa, 2018, 'National Dialogue on the Protection and Promotion of the Human Rights of Intersex People', Available at: https://www.justice.gov.za/vg/lgbti/2018-NationalIntersexMeetingReport.pdf (accessed on 01 September 2021).

324 The Republic of South Africa (note 323 above).

325 News 24 (as revised from Intersex, South Africa), 2009, '96 000 South Africans may be intersexed', *News 24*, Available at: https://www.news24.com/health24/sex/sexual-diversity/96-000-south-africans-may-be-intersexed-20120721 (accessed on 01 September 2021).

considered it is easy to assume that DSD biologically manifests as a majority in the African race, however, race may not have anything to do with the high DSD population in these areas.

The DSD populations in developed countries reflect a significantly lower concentration of DSD individuals than that of developing countries. In accordance with the universal deficiency in DSD statistics, precise numbers of the DSD populations in second world countries are not recorded. A sampled study in Turkey examined the frequency of DSD in 14 177 new-born babies of which eighteen were recorded to have ambiguous genitalia, suggesting a ratio of one and a third in one thousand people born with DSD in Turkey.[326] In 2017, Kristian Randjelovic *et al* together with the financial support of the United States Agency for International Development conducted several research studies on DSD populations in Albania, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia and Serbia. In Albania, data collected on the DSD statistics in maternity hospitals are reported to The Ministry of Health.[327] In terms of available data, nine babies[328] with DSD were born in 2013 in Albania from an average of 35 000 total births,[329] two in 2014[330] from an average of 35 000 total births[331] and five in 2015[332]

326 Aydin, B K., Saka, N., Bas, F., Bas, E K., Coban, A., Yildirim, S., Guran, T., Darendeliler, F., 2019, 'Frequency of Ambiguous Genitalia in 14,177 Newborns in Turkey', *Journal of the Endocrine Society*, Vol 3(6), p 1185–1195, Available at: https://doi.org/10.1210/js.2018-00408 (accessed on 05 September 2021).

327 Randjelovic, K., *et al*., 2017, Intersex research study Albania, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia and Serbia, *United Nations Development Programme*, Available at: file:///C:/Users/27765/Downloads/Intersex%20Research%20Study%20UNDP%202017%20(1).pdf (accessed on 05 September 2021).

328 As above.

329 Institute of Statistics, 'The Population of Albania', Available at: http://www.instat.gov.al/en/statistical-literacy/the-population-of-albania/ (accessed on 01 September 2021).

330 Randjelovic *et al* (note 327 above).

331 Institute of Statistics (note 329 above).

332 Randjelovic *et al* (note 327 above).

from an average of 33 000 total births[333]. A field study in Bosnia and Herzegovina suggested that its DSD population is so insignificant that little to no cases were reported in recent years. Merely one of the twenty-seven medical institutions offered that merely six DSD cases were noted over the course of the last four years.[334]

An attempt to conduct a study on the former Yugoslav Republic of Macedonia's DSD population revealed the disregard towards DSD and the general lack of knowledge pertaining thereto.[335] From the lack of information, a doctor advised that only three DSD individuals were identified in the last decade or so.[336] In Serbia, each DSD case treated within the country is registered to an individualised code. This system includes cases that originated in Serbia as well as those referred from Bosnia and Herzegovina and the former Yugoslav Republic of Macedonia.[337] Unfortunately, these figures are not freely available for study, however, medical staff confirmed that when a DSD case is found or referred, a consulting meeting takes place which happens about eight to ten times yearly.[338] From the information available it is evident that a common denominator exists not only in the insufficient medical knowledge regarding DSD globally but also in the lack of governmental interest in documenting DSD data and to formally recognising DSD individuals in their census instead of neglecting their existence. On the basis of various governing systems' 'concealing' approach towards DSD, it is no wonder that the global public has crucified DSD individuals as taboo and unnatural. Unless governmental systems are willing to make an active change in their

333 Institute of Statistics (note 329 above).
334 Randjelovic *et al* (note 327 above).
335 Randjelovic *et al* (note 327 above).
336 As above.
337 As above.
338 Randjelovic *et al* (note 327 above).

attitudes towards DSD individuals, as did Kenya, hate speech will continue to be a curse suffered by DSD individuals.

Whereas second world countries reflect a significantly lower concentration of DSD individuals than that of developing countries, similarly, a comprehensive analysis of medical literature between 1955 to 1998 affirms that DSD populations in first world countries are much smaller than that recorded in developing countries.[339] Such analysis was based on an array of surveys, including population and case surveys from independent medical practitioners, genetic studies, and environmental population studies. The data collected from each survey/study was then reconfigured into a table in order to unilaterally showcase the frequency of DSD in everyone thousand births.

339 Blackless *et al* (note 315 above).

*TABLE 1. Incidence of XXYY, XX(male), 47,XXX and XYY births in 17 published surveys**

Location	Year	Total # surveyed	XXYY	XX male	47,XXX	XYY	Incidence/1,000 live births	Method	Reference
Edinburgh	1964	20,725	1		11		0.575	Bs[a]	Maclean et al., 1964
Geneva	1968	8,184			1		0.122	Bs	Mikamo, 1968
London	1969	2,081				4	1.922	K	Sergovich et al., 1969
New Haven	1970	4,366			3	3	1.374	K	Lubs, 1970
Toronto	1974	73,229	1	2	2		0.068	Bs/K	Bell, 1974
Moscow	1974	2,500			1		0.400	K	Bochkov et al., 1974
Winnipeg	1975	13,939			5	7[b]	0.861	K	Hamerton et al., 1975
Ontario	1976	930				2	2.150	K	Lin et al., 1976
Denver	1976	40,371			12		0.297	Bs/K	Goad et al., 1976
USA	1977	13,751		1			0.073	K	Walzer et al., 1977
Tokyo	1978	12,319				3	0.244	K	Higurasi et al., 1979
Edinburgh	1979	23,196		1	11		0.517	Bs/K	Ratcliffe et al., 1979
Edinburgh	1980	3,993			3	4	0.002	K	Buckton et al., 1980
USA	1982	19,675			25		0.001	K	Schreinemacher et al., 1982
Telemark	1982	1,830				1	0.546	K	Hansteen et al., 1982
Belgium	1988	77,000	32[c]				0.416	K	Kleczkowska et al., 1988
Denmark	1991	34,910	5[d]	2	18	20[b]	1.289	K	Nielsen, 1991
Average total/1,000 live births (SD)			0.155 (0.185)	0.05 (0.019)	0.470 (0.364)	0.865 (0.740)	0.639 (0.665)		

Figure 10: Incidence of XXYY, XX (male), 47, XXX and XYY births in 17 published surveys. (*Source*: How Sexually Dimorphic Are We? Review and Synthesis, Table 1).[340]

The findings withheld in the table provides a representative ratio for the frequency of DSD cases in ten countries which can all be classified as first world countries, namely: Switzerland, England, Canada, Russia, United States, Japan, Scotland, Norway, Belgium, and Denmark. An average of 0.639 in one thousand births was found to serve as a representative ratio for the DSD population in ten first world countries. Ontario, Canada presents as an outlier in relation to the data collected in Toronto, Canada and Winnipeg, Canada, although it is noted that it was also the smallest survey done in a group of just 930, suggesting a coincidental value rather than a true representative

340 Blackless *et al* (note 315 above).

ratio.[341] With the exclusion of the study done in Ontario, Canada the adjusted average for DSD births may be represented as 0.471 in one thousand births. The authors of this study acknowledge that the medical data used to generate their findings are of strong Eurocentric nature and thus exhibit a generalised display of a "generic Euromerican, Caucasian"[342] DSD population rather than that of a global scale. The study further elaborates the inappropriateness of adapting its findings as true for all geographical settings, recognising that strong evidence points to a surprisingly high frequency of DSD in southern Africa and the plausibility of other large populations that may "exhibit substantial frequencies of intersexuality".[343]

The above mentioned studied all allude to a common assumption that DSD may not be related to race at all but rather to the geographical circumstances of the affected individuals.

3.5.3. Why DSD is More Frequent in Developing Countries

Before venturing into the biological reasons why DSD individuals are vastly more concentrated in developing countries than in developed countries, it is important to understand why the distinction between developing and developed countries exists. In terms of the World Economic Situation and Prospects' (hereinafter referred to as 'WESP') evaluation of the grouping system designed for analytical reasons, countries are placed in one of three categories, "developed economies, economies in transition and developing economies"[344] based on its geographical region, economic

341 Blackless *et al* (note 315 above).
342 Blackless *et al* (note 315 above).
343 Blackless *et al* (note 315 above).
344 World Economic Situation and Prospects, 2014, 'Country Classification', *World Economic Situation and Prospects*, Available at: https://www.un.org/en/development/desa/policy/wesp/wesp_current/2014wesp_country_classification.pdf (accessed on 07 September 2021).

vulnerability and gross domestic product (GDP). Developing economies are described as 'developing countries', a term strongly associated with poverty-stricken nations, predominantly focused on Africa. Recent studies narrowed the root causes of poverty in developing countries to various factors, including geography, disease, colonial history, slave trade, culture, and technology.[345] all of which can be seen as indigenous to the African continent. The study focuses on the profound benefit that Western Europe inherited in its favourable geographic environment leading to fruitful agriculture and a surplus in food production, this is in contrast to a deteriorating Africa that continues to suffer from an unfavourable and disease struck geographic environment.[346]

Of course, many other factors contribute to the hypothesis behind the extreme poverty faced by African countries and other developing economies, one of which is Malaria. Malaria is a disease vector that thrives off warmer tropical temperatures which enable the parasite to grow to an optimal size for transmittance of the disease.[347] This together with the weak infrastructure of developing countries to fight Malaria contributes to even more elevated levels of poverty. A study revealed that the fight against Malaria in sub-Saharan Africa negative impacts the annual GDP value by 1.3 percentage points, illustrating the detrimental effect Malaria has on a developing countries' economic progress.[348] Another finding reaffirmed Malaria's desolating impact on African

345 Bhattacharyya, S., 2016, 'The Historical Origins of Poverty in Developing Countries', *The Oxford Handbook of the Social Science of Poverty, Oxford University Press,* Available at: DOI: 10.1093/oxfordhb/9780199914050.013.13 (accessed on 07 September 2021).

346 As above.

347 As above.

348 Bloom, D E., Sachs, J D., 1998, 'Geography, Demography, and Economic Growth in Africa', *Brookings Papers on Economic Activity*, Vol 2, Available at: https://www.brookings.edu/wp-content/uploads/1998/06/1998b_bpea_bloom_sachs_collier_udry.pdf (accessed on 08 September 2021).

country's economic development in the form of mortality and morbidity.[349] In 2009, approximately 236 million people contracted malaria worldwide, of which 781 000 resulted in deaths and 90% thereof were from Africa, signifying a prominent need for malaria control measures.[350]

Dichlorodiphenyltrichloroethane (hereinafter referred to as 'DDT') was introduced as the primary Malaria control worldwide in the 1940s. DDT was initialised through a South African developed technique known as Indoor Residual Spraying (IRS) with insecticides, a process where pesticides are sprayed both indoors and outdoors in order to kill female mosquitoes carrying Malaria before transmission of the disease could take place.[351] The use of DDT, although banned in many countries due to its adverse effects on human and animal lives, proved to be the only pesticide that can control Malaria at such a success rate. In 1996 South Africa's attempt to replace DDT with a biologically friendlier counterpart Pyrethroids led to a dramatic increase in infections and deaths of its inhabitants by 2000, forcing the country to reintroduce DDT in its fight against Malaria.[352] DDT remains the preferred pesticide used in African countries today, with its residue being present year-round in the homes, furniture, food, air and general environment of locals.[353] Shockingly, when measured, the "highest

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349 Bhattacharyya, S., 2009, 'Root Causes of African Underdevelopment', *Journal of African Economies*, Vol 18(5), p 745–80, Available at: DOI: 10.1093/jae/ejp009 (accessed on 07 September 2021).

350 Quinn, L P., de Vos, B J., Fernandes-Whaley, M., *et al*., 2011, 'Pesticide Use in South Africa: One of the Largest Importers of Pesticides in Africa, Pesticides in the Modern World - Pesticides Use and Management', *Margarita Stoytcheva (Ed.)*, Available at: DOI: 10.5772/16995 / https://www.environment.gov.za/sites/default/files/docs/pesticide_usein_sa.pdf (accessed on 01 September 2021) p 77.

351 As above.

352 As above.

353 Quinn *et al* (note 350 above) p 77.

levels of DDT in blood were found in breast feeding infants of mothers living in sprayed houses".[354]

DDT is universally known as one of many endocrine-disrupting chemicals (hereinafter referred to as 'EDC's) that causes unwanted biological effects such as interrupting the steroid hormones both in wildlife and human beings.[355] Medical research has evidenced EDC's adverse effect on both human and animal reproductive biology, causing various reproductive variations by altering natural reproductive tissue leading to differentiation in the growth of the reproductive system if a foetus is exposed to EDCs during critical development phase in utero.[356]

Burger *et al* examined the water quality of the South African water system by measuring the presence of EDCs contained therein, exclaiming that the influence EDCs have on the surrounding wildlife and human habitation is no longer a matter of contention, but rather a health hazard.[357] After conducting an array of tests on numerous water samples collected from rivers, dams and other water systems in South Africa, Burger *et al* found that the presence of EDCs in the South African water system is even more severe than originally thought. The data collected indicated the presence of at least fifteen different EDCs, as tabled below.

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354 Quinn *et al* (note 350 above) p 77.
See also Bouwman, H., Becker, P J., Cooppan, R M., Reinecke, A J., 1992, 'Transfer of DDT used in malaria control to infants via breast milk', *Bulletin of the World health Organization*, Vol 70, p 241-250.

355 Matsushima, A., 2018, 'A Novel Action of Endocrine-Disrupting Chemicals on Wildlife; DDT and Its Derivatives Have Remained in the Environment', *International Journal of Molecular Sciences,* Vol 19(5):1377, Available at: DOI: 10.3390/ijms19051377 (accessed on 07 September 2021).

356 Rich *et al* (note 305 above).

357 Burger, A E C., Nel, A., 2008, 'Scoping Study to Determine the Potential Impact of Agricultural Chemical Substances (Pesticides) with Endocrine Disruptor Properties on the Water Resources of South Africa', *Water Resources Commission (WRC),* Report No 1774/1/08, Available at: ISBN 978-1-77005-714-2.

PESTICIDE	MATRIX	AREA FOUND	LEVEL	REFERENCE
2,4,-D	Marine water Fresh water sediment	Eastern Cape	0.055 µg/ℓ 0.006 µ/g	Fatoki & Awofulu (2003)
Aldicarb	High usage in Hex river valley	Western Cape	*	Weaver (1993)
Aldrin	Sediment	Eastern Cape	0.006 µg/kg	Fatoki (2003)
Atrazine	1. Surface water, Johannesburg 2. Residues in water and fish 3. Water and fish 4. Water	Gauteng Northern and central South Africa Vaalharts irrigation system Vaal river barrage Hartbeespoort dam	* 0.1-11.6 µg/ℓ * 0.78 µg/ℓ 3.76 µg/ℓ	Grange et al. (2003) Bouwman et al. (2003) Weaver (1993) Burger (In press)
Azinphos-methyl	1. Water 2. Run-off and spray drift 3. Streams 4. Water 5. Suspended sediment	Lourens river Lourens river Western Cape Western Cape Western Cape Western Cape	0.08 -0.7 µg/ℓ 27.8 and 0.0069 µg/ℓ * 0.2 µg/ℓ 0.6 µg/ℓ 152 µg/kg	Bennet et al. (2003) Schultz (2003a and b) Dabowski (2003) London et al. (2000) London et al. (2000) London et al. (2000)
BHC (Lindane)	1. Fish tissue (fat) 2. Marine water 3. Fresh water sediments	Crocodile river, Mpumalanga Eastern Cape Eastern Cape	0.86 µg/kg 4.5 µg/ℓ 1.84 µg/kg	Heath et al. (2003) Fatoki et al. (2003)
Chlorpyrifos-ethyl	1. Sediment cores 2. Water 3. Suspended sediment 4. Water	Lourens river, Western Cape Western Cape Hex river valley	0.8-12 µg/kg 0.19 µg/ℓ 245 µg/kg 19.13 µg/ℓ	Bennet et al. (2003) Dabowski et al. (2003) London et al. (1995a)
DDT, DDE, DDD (Banned but used for malaria vector (mosquito) control)	1. Fish tissue (fat) 2. Surface water	Crocodile river, Mpumalanga Ubombo and Ingwavuma KwaZulu-Natal	0.69; 0.90; 0.69 µg/kg *	Heath et al. (2003) Sereda & Meinardt (2003)
	3. Surface water 4. Water 5. Sediment 6. Water	Johannesburg Gauteng Madandze river Mvudi river Madandze river Mvudi river Makatini flats	1.8-2.0 µg/ℓ 1.6-3.2 µg/ℓ 1.8 µg/kg 3.6 µg/kg 0.02 µg/ℓ 2.8 µg/ℓ 0.68 µg/ℓ	Grange et al. (2003) Fatoki (2003) Burger (in press)
Deltamethrin	1. Surface water 2. Surface and ground water 3. Water	Ubombo and Ingwavuma KwaZulu-Natal Hex river valley Lourens river, Western Cape	* * * 1.4 µg/ℓ	Sereda et al. (2003) Dalvie et al. (2003) Dabowski et al. (2003)
Dieldrin (banned but used for tsetse fly control)	1. Water Fish 2. Fish tissue (fat)	KwaZulu-Natal Crocodile river, Mpumalanga	* 0.01 µg/kg	Bouwman et al. (2003) Heath et al. (2003)
Endosulfan	1. Wetlands near Lourens river 2. Surface and groundwater 3. Water 4. Fish tissue (fat)	Lourens river, Western Cape Hex river valley, Grabouw and Piketberg Mhakatini flats Vaal river barrage Rietvlei dam Hartbeespoort dam Crocodile river, Mpumalanga	0.8-12µg/kg 0.83-3.16µg/ℓ * 0.55 µg/ℓ 0.31 µg/ℓ 0.55 µg/ℓ 0.18 µg/ℓ 0.95 µg/kg	Bennet et al. (2003) Dalvie et al. (2003a) London et al. (2000) Burger (In press) Heath et al. (2003)
Heptachlor (banned)	Fish tissue (fat)	Crocodile river, Mpumalanga	0.01 µg/kg	Heath et al. (2003)
Lindane	Fish tissue (fat) Water	Crocodile river, Mpumalanga Mhakatini flats Vaal river barrage Hartbeespoort dam Rietvlei dam	0.99 µg/kg 0.01 µg/ℓ 0.02 µg/ℓ 0.03 µg/ℓ 0.01 µg/ℓ	Heath et al. (2003) Burger (In press)
Parathion	Farm dams	Elgin, Western Cape	*	Davies (1997)
Terbuthylazine	Water	Vaal river barrage	0.48 µg/ℓ	Burger (In press)

Figure 11: Some pesticides with ED properties found by analysis in South Africa

(*Source*: Scoping Study to Determine the Potential Impact of Agricultural Chemical

Substances (Pesticides) with Endocrine Disruptor Properties on the Water Resources of South Africa, Table 4).[358]

Adding to the authors' concerns, the research highlights that the studies conducted were merely aimed at testing the toxicity of water contained in the South African water systems and thus did not focus on testing for EDC activity specifically.[359] As the concentration levels of EDC activity takes place "a million times lower than the toxicity level",[360] testing for EDC activity would be a costly exercise falling way out of budget for developing countries such as South Africa.

For this reason, it is unknown what other EDCs are present in the South African water ways that are currently utilised for animal and human consumption. What is even more concerning is the unbiodegradable nature of many EDCs and their ability to persist in the environment for generations to come[361], not even to mention the costs of a safer alternative to EDCs or treatment for EDC exposure, making EDC exposure an infinitely impossible battle for the inhabitants of affected areas.

3.5.4. The RTS, S/AS01 (RTS, S) Malaria Vaccine

In October 2021 the World Health Organisation announced the introduction of a revolutionary vaccine known as the RTS, S/AS01 (RTS, S) malaria vaccine.[362] It took scientists 30 years of intensified research with the support of African research centres

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358 Burger *et al* (note 357 above) p 34-35.
359 Burger *et al* (note 357 above) p 34-35.
360 As above.
361 Dickerson, S M., & Gore, A C., 2007, 'Estrogenic environmental endocrine-disrupting chemical effects on reproductive neuroendocrine function and dysfunction across the life cycle', *Reviews in endocrine & metabolic disorders*, Vol 8(2), p 143–159, Available at: https://doi.org/10.1007/s11154-007-9048-y (accessed on 1 January 2022).
362 World Health Organisation, 2021, 'WHO recommends ground breaking malaria vaccine for children at risk', *World Health Organisation*, Available at: https://www.who.int/news/item/06-10-2021-who-recommends-groundbreaking-malaria-vaccine-for-children-at-risk (accessed on 08 October 2021).

to produce the RTS, S vaccine, indicating the immeasurable need to battle malaria in sub-Saharan Africa, not only now, but over the last few decades. Based on the results sourced from a pilot study conducted in Ghana, Kenya and Malawi, malaria continues to devastate sub-Saharan African families, causing more than 260 0000 annual deaths in children 5 years and younger.[363] While the WHO merely places the reduction percentage impact of the RTS, S vaccine at 30 per cent, the Director-General of WHO, Dr Tedros Adhanom Ghebreyesus expressed that:

> "*This is a historic moment. The long-awaited malaria vaccine for children is a breakthrough for science, child health and malaria control… Using this vaccine on top of existing tools to prevent malaria could save tens of thousands of young lives each year*."[364]

Although the rollout of the RTS, S vaccine is revolutionary and will have a definite impact in malarian stricken areas, especially in sub-Saharan Africa, it will take time to see its intended results. In fact, it may take another few decades before the RTS, S vaccine can confidently replace the use of pesticides as a weapon against malaria. This means that the use of pesticides will most likely remain, local individuals will continue to be affected by its negative effects and, should the DSD Eligibility regulations persist, athletes from these regions will continue to be excluded due to their geographic location and its poor economic status.

3.6. Disproportionate Medical Implications

When evaluating the Hyperandrogenic and DSD Eligibility Regulations, it is apparent that World Athletics had 2 main goals for regulating DSD. First and foremost, the regulations aimed at preserving the integrity and fairness of female competition while

363 World Health Organisation (note 362 above).
364 As above.

secondly also bearing in mind the best interests of DSD athletes. The latter was first seen in the Hyperandrogenism regulations that strived for "early prevention of problems associated with hyperandrogenism";[365] resulting in the compulsory medical treatments and medication that had to be undertaken in order for a female athlete to be eligible for competition. Unfortunately, it appears as if World Athletics focused much of their attention on achieving fairness, leaving little thought to the interests of DSD athletes or the effects of the prescribed anti-androgen medications used as a form of a testosterone suppressant.

Bearing tribute to its potential side effects, anti-androgen medications has inherited names like androgen deprivation therapy, chemical castration and antiandrogen pharmacotherapy, with some even referring to the prescription of its use as being 'legally poisoned'.[366] For several years, anti-androgen pharmacotherapy has been offered worldwide as a treatment for sexual offenders in an attempt to prevent sexual urges and, ultimately, sexual crimes. It, however, is not a therapy that is taken lightly. In the parts of Europe, such as Austria, Canada, England, France, Germany and Wales, official provisions have been submitted into the local legal systems, stating that such a treatment may only be administered and made available to a convicted sex offender within the criminal justice system.[367] Therefore, it would be considered a crime for a practitioner to prescribe anti-androgenic medication to an individual falling outside of the above-mentioned spectrum. This is due to the extraordinary amount of potential side effects, including the short term effects of "weight gain, hot and cold

365 The Hyperandrogenism Regulations (note 63 above).

366 Wolinsky, H., 1973, 'Comparative effects of Castration and Antiandrogen Treatment on the Aortas of Hypertensive and Normotensive Male Rats', *The Journal of the American Heart Association,* p 183-189.

367 Harrison, K., 2008, 'Legal and Ethical Issues When Using Antiandrogenic Pharmacotherapy with Sex Offenders', *Sexual Offender Treatment*, Vol 3, no 2.

flushes, headaches, nausea, lethargy, nightmares, leg cramps, gallstones, depression including suicidal thoughts, insomnia, difficulties in breathing and fluid retention."[368] More serious side effects include; "thrombophlebitis, pulmonary embolism,"[369] "hyperglycaemia, hypertension, shrinkage of the prostate vessels, diabetes,"[370] and "gynaecomastia".[371] Furthermore, long-term effects of anti-androgen medications include, "osteoporosis, unfavourable body composition, sexual dysfunction and reduced quality of life".[372] Should athletes elect not to proceed with the anti-androgen medications, an alternative is the removal of the gonads which is a procedure that results in sterilization.

Disappointingly, none of the prescribed 'treatments' withheld in the regulations improves the health of DSD individuals. On the contrary, following the prescribed treatments could potentially have serious and irreversible adverse effects on an individual's quality of life. World Athletics, nonetheless, have reiterated that their DSD regulations benefits DSD athletes, implying that the prescribed treatments are necessary in protecting the athletes' health by diagnosing them to prevent a further health hazard.[373] In the same breath, World athletics recognises the prescribed

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368 Harrison, K., 2007, 'The High-Risk Sex Offender Strategy in England and Wales: Is chemical castration an option?', *The Howard Journal*, Vol 46, no 1, p 16-31.

369 Bradford, J W., 1983, 'The Hormonal Treatment of Sexual Offenders', *Bulletin of the American Academy of Psychiatry and the Law,* Vol 11, p 159-169.

370 Spalding, L., 1998, 'Florida's 1997 chemical castration law: a return to the dark ages', *Florida State University Law Review*, Available at: http://www.law.fsu.edu/journals/lawreview/frames/252/spalfram.html (accessed on 22 October 2016).

371 Craissati, J., 2004, 'Managing High Risk Sex Offenders in the Community, A Psychological Approach', *New York Routledge*.

372 Basaria, S., Lieb, J., Tang, A M., DeWeese, T., Carducci, M., Eisenberger, M., Dobs, A S., 2002, 'Long-term effects of androgen deprivation therapy in prostate cancer patients', *The Journal of Clinical Endocrinology & Metabolism (Oxf),* Vol 56(6), p 779-86, Available at: DOI: 10.1046/j.1365-2265.2002.01551.x. PMID: 12072048 (accessed 20 August 2022).

373 DSD Eligibility Regulations (note 10 above) p A-10, reading:

> *"such conditions may have implications for the athlete's health, and diagnosis can often help to improve the conditions, avoid metabolic disorders, and possibly reduce the risk of later cardiovascular events and gynaecological cancers. A serious underlying medical*

treatments as a "sacrifice", indicating that:

> *"The IAAF wants athletes to be incentivised to make the huge commitment and sacrifice required to excel in the sport, and so to inspire new generations to join the sport and aspire to the same excellence. It does not want to risk discouraging those aspirations by having unfair competition conditions that deny athletes a fair opportunity to succeed."*[374]

3.6.1. World Medical Association (WMA)

During the CAS's deliberation of its decision in the *Semenya* case, the World Medicine Association (hereinafter referred to as the "WMA") released an electronic post urging physician's worldwide not to initiate the administration of the treatment withheld in the new eligibility regulations.[375] The Association advised that its council, on 25 April 2019, demanded the withdrawal of the regulations with immediate effect due to its flagrant discriminatory basis, which contrasts with both international medical ethics and human rights. [376] They further expressed their concern that healthy athletes would unjustifiably be reformed to become "patients" under the administration of its physicians, who merely acted per regulations.

The WMA warned physicians that "it is considered as unethical for physicians to prescribe treatment for excessive endogenous testosterone if the condition is not recognised as pathological."[377] Concluding the warning, the association expresses its

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> *condition should always be suspected if the onset of symptoms is fast and/or intense. In such cases, the possibility of an androgen-secreting tumour should always be investigated. All relevant information should be provided to the athlete's personal physician to determine the appropriate treatment".*

374 DSD Eligibility Regulations (note 10 above) clause 1.1 (i).

375 World Medical Association, 2019, 'WMA urges physicians not to implement IAAF rules on classifying women athletes', *World Medical Association*, Available at: https://www.wma.net/news-post/wma-urges-physicians-not-to-implement-iaaf-rules-on-classifying-women-athletes/ (accessed on 23 May 2019).

376 As above.

377 World Medical Association (note 375 above).

displeasure with the regulations due to its weak basis based on a single study which it itself disputes. This firm recommendation by the WMA to its physicians made a bold statement relating to the authenticity of the eligibility regulations.[378] Not only did it cause frowns and further investigation into the evidential basis of the regulations by international experts and laypersons, but it also diminished the ability of DSD athletes to adhere to the regulations. Despite the WMA's attempt to invalidate the eligibility regulations, the CAS panel confirmed the regulations to be necessary on 30 April 2019. The award, however, is somewhat perplexing in nature. It includes severe concerns related to the difficulties of administering the regulations with particular reference to the side effects of the suggested hormonal treatment, which could lead to "the practical impossibility of compliance" thereof.[379]

The WMA retaliated against the CAS panel's award on 15 May 2019 in an official statement to its member's reaffirming its opposition against the IAAF rules. The association, in unambiguous terms, disclosed its dissatisfaction with the IAAF's expectation of having medical practitioners use their expertise for purposes other than that of providing medical assistance that is in the best interests of their patient's health and dignity.[380] They reiterate that the mere fact that an athlete is diagnosed with DSD does not constitute medical need and that "medical treatment for the sole purpose of altering the performance in sport is not permissible."[381] This decision by the WMA to

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378 World Medical Association, 2019, 'Physician leaders reaffirm opposition to IAAF rule', *World Medical Association*, Available at: https://www.wma.net/news-post/physician-leaders-reaffirm-opposition-to-iaaf-rules/ (accessed on 23 May 2019), WMA President Dr. Leonid Eidelman said:

> *"We have strong reservations about the ethical validity of these regulations. They are based on weak evidence from a single study, which is currently being widely debated by the scientific community. They are also contrary to a number of key WMA ethical statements and declarations, and as such we are calling for their immediate withdrawal".*

379 The *Semenya* Case (note 1 above) p 2.

380 World Medical Association (note 378 above).

381 As above.

counter the new eligibility regulations, regardless of the CAS panel's decision, may have a severe impact on its enforceability and ultimately may render its application to elite athletics impossible.

3.7. Testing Methods

3.7.1. Incorporation of Androgen Receptor Sensitivity Tests in Regulations and Classifying DSD Athletes

In attempting to understand the complexity of testing for receptor sensitivity, it is essential to understand the biology behind human androgen receptors (hAR). Current knowledge surrounding the structure function relationships within the domains of the hAR consists of the N-terminal domain (NTD), the DNA-binding domain (DBD), and a carboxy-terminal ligand-binding domain (LBD).[382] For purposes of this study, particular focus is placed on the NTD which contains two activation functions, being AF1 and AF5. As aforementioned, it is necessary for proteins to bind itself to receptors in end organs to facilitate a presumed advantage in the female's body. Where the AF1 serves as the modulatory area for expediting same protein binding (which appears to be dependent on the structure and composure of the receptor after ligand binding), the AF5 instead features in a more independent manner.[383] During ligand binding, the receptors experience a two-fold process of steroid development, where it is assorted as either an untransformed steroid receptor or, alternatively, as a transformed receptor.

Untransformed receptors are essentially inactive, meaning it cannot bind to the

382 Cadwallader, A B., Lim, C S., Rollins, D E. & Botrè, F., 2011, 'The Androgen Receptor and Its Use in Biological Assays: Looking Toward Effect-Based Testing and Its Applications', *Journal of Analytical Toxicology*, Vol 35, no 9, p 594-607.

383 As above.

specific steroid, and thus associates itself with chaperone proteins in the LBD.[384] Chaperone proteins prevent the receptor from accessing the steroid, and therefore it is only if the receptor bears the ability to dissociate itself from these chaperone proteins that it can be classified as a transformed steroid receptor. This presents the first complication to the ideology that females gain an advantage from their high testosterone levels, as their receptors could be inactive, rendering their bodies immune from the steroid, irrespective of the concentrate level thereof.[385]

Even though heat shock protein 90 (hsp90) can be seen as a chaperone protein, it is still required in the construction of the LBD for ligand binding to take place. Once the conformation of the LBD is complete, and the ligand binding has been initiated, the transformed receptors experience a loss of hsp90 and ultimately become activated. Subsequently, the NTD's structure also changes to produce a platform of coregulator proteins, which serves as the section of the hAR responsible for the mediation of the "cell and gene specific effects of androgens."[386] As a conclusionary step to the binding process, the hAR links itself with the necessary DNA sequences responsible for

384 Cadwallader *et al* (note 382 above).
385 Cadwallader *et al* (note 382 above).
386 Cadwallader *et al* (note 382 above).

androgen response elements (AREs).[387]

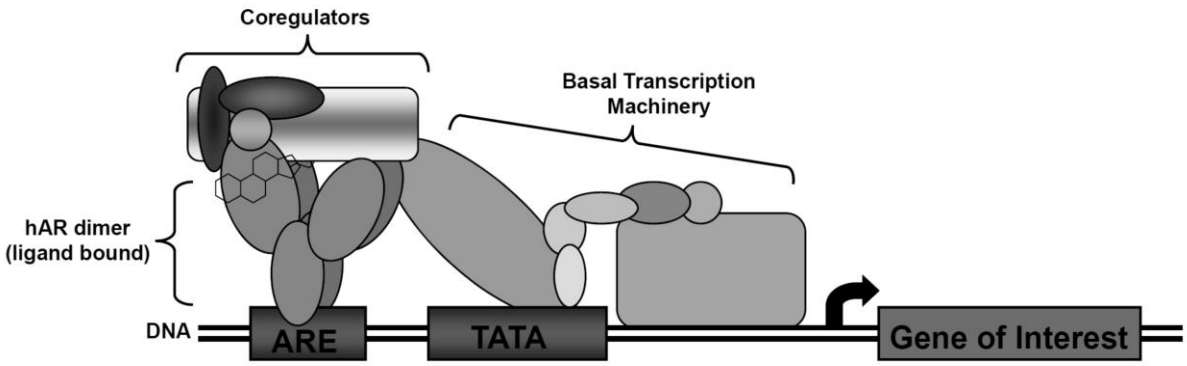

Figure 12: A diagram depicting the structure of an activated hAR dimer initiating transcription via an ARE with coregulator proteins bound, in visualizing the 'links in a chain' phenomenon. ARE, androgen response element. Modified from Nettles and Greene.[388]

In addition to human Androgen Receptors are Nuclear Receptor Coregulators or Coregulators of hAR. These coregulators are proteins induced by the hAR with the effect of either enhancing (coactivators) or reducing (corepressors) hAR mediated transactivation.[389] They further act to promote target genes in order to facilitate DNA binding, chromatin remodelling, or to novate essential transcription elements.[390] Coactivators are required for the ligand activation, which results in the escalation of free coactivators available for binding and unilaterally affects transcriptional activity of receptors. Notwithstanding, coregulators also play a great role in the activation of hAR,

387 Cadwallader *et al* (note 382 above).
388 As above.
389 As above.
390 As above.

as they interplay with coactivators in contributing to the sensitivity of hAR activity.[391]

These extrinsic transformation and binding processes are all links in a chain that contribute to the eventual chemical reaction that facilitate the presumed gained advantage. In the event that one, alternatively several, links are missing, regardless of its placement, the process is deemed ineffective, and the steroid receptor will remain inactive. This leads to the second complication, being the complexity of the testing of receptor sensitivity. Further complicating the testing process is the possibility of semi-transformed/untransformed steroid receptors. This occurs in the absence of ligand, rendering the hAR to a cytosolic state where the steroid receptors rapidly move in and out of the nucleus.[392] In this instant, the receptors may or may not be able to facilitate the chemical reaction. One of many reasons hereto is due to several medical conditions such as an array of "cancers, cardiovascular defects, neurological conditions, immune diseases, reproductive conditions, and psychiatric disorders have been associated with hAR dysfunction."[393]

3.7.2. Current forms of testing

Considering the above surface-level explanation of the hAR function process, which can only be regarded as a simplified version of a complicated system at most, it goes without saying that an intricate form of testing is required to evaluate it. What makes the regulation process even more specific, is that the binding reaction does not merely take place in one distinguishable receptor. Instead, where testosterone is more likely to bind with to hAR, resulting in the cross-reaction with the progesterone receptor (PR)

391 Cadwallader *et al* (note 382 above).
392 As above.
393 As above.

and the oestrogen receptor (ER), DHT more predominantly binds to the hAR itself.[394]

Current forms of testing for anabolic-androgenic steroids carried out by WADA include the detection of synthetic anabolic steroids with great success, yet it still faces significant difficulties in detecting and regulating naturally occurring anabolic (endogenous) steroids.[395] In order to isolate endogenous steroids from its counter-fit analogues, doping control bodies such as WADA need to establish clear criteria of its distinguishable characteristics found in urine.[396] Such criteria have been developed for some endogenous steroids such as testosterone, whereas several other endogenous androgenic steroids which can potentially increase active androgen levels and boost performance has proved this a challengeable task. Undistinguishable endogenous steroids include the likes of 4-androstenediol and 5-androstenediol, two prohormones which remain banned even when scientists and biologists have an incomplete understanding of their metabolism.[397] This indicates the need for improved detection capabilities to detect the presence of a steroid, the identity thereof as well as its capabilities.

Current forms of testing for anabolic-androgenic steroids, such as gas chromatography (GC)–MS, depends on significant knowledge of the autonomy of the steroid in order to recognise its presence in low concentrations of a known sample.[398]

Due to doping control bodies' inability to detect the presence of a steroid with a

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394 Cadwallader *et al* (note 382 above).

395 Kazlauskas, R., Trout, G J., Cawley, A T., 'The detection and confirmation of androstenediol abuse in athletes', *Australian Sports Drug Testing Laboratory, Australia, Blog*, WADA, Available at: https://www.wada-ama.org/sites/default/files/resources/files/kazlauskas-the_detection_and_confirmation_0.pdf (accessed on 10 October 2018).

396 As above.

397 Kazlauskas *et al* (note 395 above).

398 Cadwallader *et al* (note 382 above).

structure unknown to them, synthetic steroid manufacturers have started developing synthetic steroids made with the intention to evade conventional testing methods. In this manner, the manufacturers of such steroids retain the desire amongst athletes to induce anabolic activity. It is a situation of demand and supply. As athletes become more athletic and the athletic profession becomes more competitive, athletes continuously face the pressure of having to go the extra mile. Unfortunately, under the example of world champion athletes who were later exposed for their doping tendencies such as Lance Armstrong and Justin Gatlin, that extra mile comes in the form of heightened demand for newly manufactured and unidentifiable steroids. Thus, the need for new testing forms is crucial in order to retain doping-free sporting practice. An attempt to research new development in unknown steroid structures have recently been prioritised, including the more "sophisticated use of MS technology, such as full-scan liquid chromatography (LC) and GC–electrospray ionization orthogonal acceleration time-of-flight MS, full scan LC time-of-flight MS, and precursor ion scanning after LC–electrospray-tandem MS."[399] Although proven beneficial, these very newly administered test still has its shortfalls in identifying unknown steroid compounds.

All tests that currently exists is anti-doping based. In this regard, the purpose of such test is merely to detect the presence of a prohibited substance within the human body, without giving further consideration to the actual effect thereof as this is sufficient for proving whether doping has taken place. In terms of DSD tests, however, an additional step is required to determine the effect of such substance in the particular individual's body, taking into consideration T levels, receptor sensitivity over a period of at least 3

399 Cadwallader *et al* (note 382 above).

months and whether a chemical reaction took place between the 2 means. The following tests approve more appropriate for purposes of same.

3.7.3. Newly proposed testing mechanisms

Cadwallader *et al* suggest that a newly developed hAR Assay may be the solution that doping control bodies have been waiting for. These Assays have been specifically formulated to analyse transactivation in the hAR subsequent to binding, in determining whether there is proper function in the receptor, as inactive receptors may lead to interference in the biological activity concerned with the steroid.[400] Where the Assay perceives a high biological activity present in the receptor, it serves as an indicator that significant levels of luciferase of the specific steroid are active and present in the hAR. Additionally, these Assays are supposedly able to ascertain between synthetic and endogenous steroids.

Cadwallader *et al* further advises, even though other forms of bioactivity detective Assays are available to doping control bodies, theirs more accurately describes the activity and function known to be indigenous to the endogenous receptor. What makes their Assay even more impressive is the fact that it merely requires there to be a substance present and able to bind with the hAR, resolving the current issue of unknown structures and the possibility of subsequently overlooking substances unknown to the system. Listed by Cadwallader *et al* as the “beginning of the next generation of detection methods in the anti-doping field”, one must wonder, if such advanced technology is available, tried and tested, why has it not, as per public knowledge, been utilized by the IAAF or doping control bodies such a WADA? This

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400 Cadwallader *et al* (note 382 above).

when a test that does not concern itself with the possible presence of prohibited substances, but rather whether the body derived a performance advantage from any prohibited substance within the body could be revolutionary in anti-doping regulations in sport.

With this test, it may be found that an athlete with normal T levels falls victim to very sensitive hAR and may derive much more of an advantage even though she falls within the allowed perimeters of T levels.

3.7.4. The Prosperity of Including Genetic Testing in Elite Sport

During a study conducted in the UK in 2018, Patel *et al* drew awareness to the possibility of incorporating genetic testing in the elite competition.[401] The study was based on an online survey regarding genetic testing completed by seventy-two elite athletes and ninety-five support staff. The potential of the genetic testing phenomenon as expressed by the survey proposed several characteristics including early detection of sports performance, injury susceptibility, talent identification and selection, influence on eligibility and/or employment status.[402] While the survey invoked curiosity amongst the selective sporting industry, mixed views were shared regarding the use of gene results as a mode to determine an athlete's eligibility in elite competition with many athletes fearing this could lead to unequal treatment and additional discrimination in sport.

Merely a year later, in 2019, Patel *et al* published a successive article regarding the implications of regulating genetic testing in sport. Expressing concern about the

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401 Varley, I., Patel, S., Williams, A G., Hennis, P J., 2018, 'The current use, and opinions of elite athletes and support staff in relation to genetic testing in elite sport within the UK', *Biology of Sport*, Vol 35, p 13-19.

402 As above.

undoubtable disproportionate interference genetic testing could have on athletes' human rights, Patel *et al* highlighted the undeveloped stature of sport law protecting athletes and their rights, exclaiming that:

> "*The tendency of the law to treat discrimination in sport differently to other areas of society could leave athletes vulnerable. Whilst genetic information may be useful for understanding genetic traits and their relationship with athletic performance, going beyond this to select athletes on the basis of genetics is discouraged and the interests of sport should be fairly balanced against the human rights of the athlete"*.[403]

It is agreed that proposing yet another eligibility variable to the mix would merely act as a further complication to a problem that is already in absence of a robust testing and classification process. It is further agreed that an astronomical void is currently present in both sport law and sport law courts with regards to discrimination of athletes, as will be demonstrated throughout this thesis. Declaring athletes as ineligible on the basis of uncertain science and the premature understanding thereof would have a detrimental effect on both the quality of sport and the sporting spirit as a whole, possibly altering sport as we know it indefinitely. While the exact result of performance remains premature, what can be ascertained as proclaimed by David Epstein, is that "changing technology, genes, and mindsets, as well as innovation (techniques), democratization (new bodies and nations) and imagination (understanding what the body is truly capable of), are all attributed to sports performance; making today's athletes stronger, bolder and better than ever."[404]

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403 Patel, S. & Varley, I., 2019, 'Exploring the regulation of genetic testing in sport', *Entertainment and Sports Law Journal*, Vol 17 (1): 5, Available at: ISSN 1748-944X.

404 Epstein, D., 2014, 'The Sport Gene: Talent, Practice, and the Truth about Success', *Vintage Publishing*, 1- 4.

3.8. Fair Sporting practices

Fair play has in recent times become an essential attribute to elite sporting practices and competition, necessitating conformity to sporting rules and regulations, respect for the opposition as well as self-respect. Sports ethics stems from the ideology that sporting excellence is achieved by way of continually striving to improve one's personal best performance within the parameters of the rules and regulations – this while promoting health and wellbeing as a cornerstone of sport.[405] Considered as the perfect approach to ensure equal opportunity in sport, the principle of fair play has been praised by most and paid attribute to by the highest authorities in both sports jurisprudence and humanitarian values. Unfortunately, the principle of fair play is not as absolute as portrayed by sporting regulators and institutions. Sticking to the rules seems easy enough, a set boundary that should not be exceeded – except when the boundary is constantly evolving and changed by regulators. Sporting rules are arbitrary in that they are adaptive to everyday changes in newly developed technologies and athletic ability.[406] Sporting excellency is only praised until it is interrogated, and a new rule is required to cap superiority. What becomes tricky is trying to distinguish between which attributes is deemed that of a successful athlete and which are considered an unfair sporting advantage. The principle of fair play portrays not as an "insurmountable code underlying the very essence of sports, but just an appealing ethical label."[407]

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405 Păunescu, M., Gageab, G., Păunescuc, C. & Piţigoi, G., 2013, 'The Moral Dimension of Fair Play in High-Performance Sport', *Procedia - Social and Behavioral Sciences*, Vol 92, p 692 – 696, Available at: https://doi.org/10.1016/j.sbspro.2013.08.740 (accessed on 12 April 2021).

406 Sekot, A., 2012, 'Fair Play in the Perspective of Contemporary Sport', *Sport Science Review*, Vol 5-6, p 175–189, Available at: DOI: 10.2478/v10237-011-0071-2 (accessed on 12 April 2021).

407 Păunescu *et al* (note 405 above).

3.8.1. What does the Autonomy of a Successful Athlete Entail?

In establishing what factors have an imminent influence on athletic performance, one must ask what makes a successful athlete. Is it a matter of psychological factors such as persistence, hard work, determination and confidence or is it something solely based on genetics? Based on popular belief, an athlete's potential to excel in their respective sporting disciplines is limited by their genetic makeup. During the publication of the Bermon tests in support of the IAAF's Hyperandrogenic Eligibility Regulations, Bermon averred that "success in sport should be due to the combination of talent and dedication. These aspects are the rationale of the existing policies of the International Olympic Committee and the International Association of Athletic Federations.

These policies concerning the eligibility of females with hyperandrogenism have been criticized by some, but no other alternative than a simple withdrawal of these rules has emerged so far. A consequence of the latter could be to rely exclusively on a simple declaration of gender, regardless of any external sexual phenotype."[408] Does this mean athletics and sport, in general, are only made for individuals of a certain calibre? Further, do athletes suffering from hyperandrogenism and DSD not perform in terms of talent or dedication?

A recent analysis investigated whether a successful athlete is born or made, finding that both elements are critical in the formulation of an elite athlete.[409] When comparing athletes with different somatotypes during the progression of competition, the athletes

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408 Bermon tests (note 239 above).

409 Rodríguez Quijada, M., 2016, 'Is the Successful Athlete Born or Made? A Review of the Literature', *Apunts Educacion Fisica y Deportes*, Vol 123, p 7-12.

began to reflect similarities in their bone and muscle structures. It is thus established that "first the athlete is born – they must possess certain genetic characteristics and conditions – and he or she is then made during sports training."[410] In other words, even though athletic performance does require a degree of genetic excellence, without the hard work and gruelling hours of dedication, even an individual with a genetically perfected profile would still fail to achieve athletic brilliance that an individual with a far lesser ideal genetic profile who trains hours on end could.

Another mitigating factor surrounds genetic mutations and conditions, such as hyperandrogenism and DSD, that could afford its holder with performance advantages. "The issue of a genetically unique individual who, by virtue of their genotype, develops attributes that permit him or her to excel at that sport. Such genetic variability is inevitable and certainly could produce an 'uber-athlete' who would naturally excel in their retrospective sport. Indeed, it could be argued that elite sport selects for physiological outliers whose genetic potential for excellence has been realised through fortuitous interaction with environmental and cultural factors."[411] In terms of reported cases, it can be assumed that such conditions occur quite infrequently, and therefore, it may be instructive for the international sports federation to regulate and boycott it.

3.8.2. The Importance of *Oscar Pistorius v the IAAF*

The *Oscar Pistorius v the IAAF* case is of vital importance in the current argument construed in this thesis as it underlines the principles of a presumed unfair advantage

410 Rodríguez (note 409 above).
411 As above.

in the absence of a scientific basis to prove such allegations.[412] Oscar Pistorius is a double amputee Paralympian, better known as the 'blade runner'. This is due to the connotations to his prosthetic legs or 'Cheetah's' that takes the form of a 'blade', specially designed for amputees to participate in respective competitive sprinting categories. As a well accomplished Paralympian, Pistorius strived to participate in the 2008 Beijing Olympic games, which would ultimately allow him to participate as an able-bodied athlete. Pistorius was celebrated in society for his bravery and his courage to raise awareness for the disabled.

The IAAF, however, did not entertain this idea, banning Pistorius from the Olympics due to the unfair advantage he derived from his prosthetics. This ban was based solely on speculation from the IAAF, as limited and disconnected scientific proof existed at the time of the imposition thereof that could verify that the latter was true. Thus, Pistorius's legal representation instituted a claim of unfairness and possible discrimination.

The IAAF retaliated by performing several scientific tests that would justify their allegations of an unfair advantage. Upon the scientific findings, the IAAF's counterclaim was instituted at the European Court of Sport Arbitration, stating that the ban was proved to be just and fair.[413] The court overturned the counterclaim that the ban was justified, and Pistorius was cleared to participate in the 2008 Beijing Olympic

412 Court of Arbitration for Sport, *Pistorius v International Association of Athletics Federations*, CAS 2008/A/1480, Decision of 14 January 2008 [hereinafter referred to as the '*Pistorius* case'].

413 High Level Support Team Learning Legacies, 2010, 'Oscar Pistorius v the IAAF: Case study', High Level Support Team Learning Legacies, Available at: https://www.heacademy.ac.uk/knowledge-hub/oscar-pistorius-v-iaaf-case-study (accessed on 14 October 2016).

games.

The IAAF passed regulations in 2007, banning all athletes who rely on technological aids from participating in any Olympic Games. This is due to the supposed unfair advantage which an aided athlete gained over other abled bodied athletes. This once again was placed on appeal by Pistorius' legal team.

In accordance with the scientific tests performed by the IAAF, the court held that Pistorius did gain an advantage in order to run like an able-bodied athlete. The advantage allowed Pistorius to run, not worse than, but also not better than an able-bodied athlete. In this regard, the advantage merely balanced out the disadvantage he inherited as per his disability. Furthermore, the regulations were inconsistent with the principles and values of the Olympic Games and thus, provided that Pistorius met the standard qualification times, he could participate in his respective athletics categories. This currently remains the respective legal position.[414]

The judgment in *Oscar Pistorius v the IAAF* has gone unchallenged, providing an equal sporting opportunity for those with disabilities who wish to compete as an abled bodied athlete. With the merits of the Pistorius case closely resembling that of the *Dutee Chand* case, it would be assumed that the *Chand* case should have been indebted to a similar judgment. The only noticeable difference between the two cases would be that society approved of Pistorius heroic determination to overcome his disabilities and participate as an abled body athlete, whereas *Chand*'s medical

414 The *Pistorius* case (note 412 above) p 32.

disorder was frowned upon and not approved by society.

3.9. Conclusion

Focussing on the CAS panel's dismissal of *Semenya*'s objection on 30 April 2019, which was decided on the basis that the discrimination imposed by the DSD Eligibility Regulations that the regulations were in fact "necessary, reasonable and proportionate",[415] in contrast to the *Chand* decision where the CAS panel was unwilling to make such a conclusion, it is presumed that by way of submitting any sort of evidence (albeit weak in stature), World Athletics satisfied the CAS panel's legal obligation of matching evidential matter to an open-ended theorem required antecedent to the dismissal. Neither the concerns expressed above, nor the worries expressed by numerous other academics and professionals slipped past the attention of the CAS panellists, who recognized the existence and authenticity of these concerns. Disappointingly the CAS panel "simply decided that they did not matter as much as the theory and concept".[416] By electing to uphold an unproven theorem in the absence of tangible scientific evidential value and accepting same as the sole ground to substantiate the reasonableness for discrimination, the CAS panel has thrown all procedural requirements out of the window and elected to choose a side. While subjectivity in legal proceedings causes a lump in one's throat, what really jeopardises confidence in the court system, or in this case, sports arbitration is that a "study that has multiple data errors is still good enough to provide a reasonable support to a discriminatory policy"[417].

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415 The CAS award (note 18 above).

416 Tucker, R., Collins, M. & Santos-Concejero, J., 2013, 'The genetic basis for elite running performance', *British Journal of Sport Medicine*, Vol 47, p 545-549.

417 Tucker *et al* (note 416 above).

Unfortunately, as the court of first instance, the CAS enjoys the ability to award judgments that are virtually bullet proof from appeals. This causes a hindrance in an athlete's access to justice, affording them with little to no remedy to countermeasure possible subjective and procedurally flawed CAS awards.

C H A P T E R 4

Differences of Sex Development Studied in Conjunction with Transgenderism

SUMMARY

4.1. Introduction
4.2. Male-to-Female Transgender Athletes
4.3. DSD Regulations vs Transgender Regulations
4.4. The Preferred Sex Binary System in Sport

4.1. Introduction

While independent from the DSD eligibility battle, it seems likely that the *Semenya* case had empowered the transgender community to hold their own when a heated debate recently ignited between transgender activists and those fearing the inclusion of transgender male to female (hereinafter referred to as MTF) athletes in the female category of elite competition. Although trans athletes have been permitted to compete in their assumed sex category since 2004, given they undergo sex reassignment surgery,[418] and since 2015 on the premise that their testosterone level does not exceed the maximum allowed level,[419] an increasing popularity in the perspective to ban the participation of MTF trans athletes amongst sports' governing bodies once more threatens the inclusion of trans-athletes in elite competition. Several academic

418 International Olympic Committee, 2004, 'IOC approves consensus with regard to athletes who have changed sex', *Olympic News*, Available at: http://www.olympic.org/content/news/media-resources/manual-news/1999-2009/2004/05/17/ioc-approves-consensus-with-regard-to-athletes-who-have-changed-sex/ (accessed on 29 March 2021).

419 International Olympic Committee, 2015, 'IOC Consensus Meeting on Sex Reassignment and Hyperandrogenism November 2015', *Olympic News*, Available at: https://stillmed.olympic.org/Documents/Commissions_PDFfiles/Medical_commission/2015-11_ioc_consensus_meeting_on_sex_reassignment_and_hyperandrogenism-en.pdf (accessed on 29 March 2021).

writers have since scrutinized proposed bills banning transgender athletes from women's sports across the United States,[420] with the most recent entitled "Integrating Transwomen and Female Athletes with Differences of Sex Development (DSD) into Elite Competition: The FIMS 2021 Consensus"[421] which was authored by 70 well-known academics (hereinafter referred to as 'the authors') in the sports science field.

Unfortunately, the collective reference to DSD female athletes and transwomen by numerous academics and World Athletics itself has resulted in the communal association of the terms DSD and Transgender as one and the same, which is factually incorrect. In sharing their opinions surrounding the implementation of the regulations that are in place at current, the authors, after reinforcing that testosterone levels should be indicating biomarkers of athletic performance, stated:

> "*DSD women or transwomen athletes should be fully informed by medical personnel of the risks and consequences of testosterone suppression treatment and must never be coerced or forced into testosterone suppression. The athletes must be free to make the decision that is best for them.*"[422]

While the collective approach to advocate for the protection of DSD women and MTF Transgender individuals should be in high regard, it equivocally groups the two together and unfairly assumes that DSD female athletes' testosterone levels can be measured on the same premises as that of a trans-athlete. This grouping effect results in the assumption that DSD female athletes have a choice in the ordeal and/or have

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420 Stofan, J., 2021, 'Bill banning transgender athletes from women's sports in Florida clears first hurdle', *Channel 8 News,* Available at: https://www.wfla.com/news/florida/bill-banning-transgender-athletes-from-womens-sports-in-florida-clears-first-hurdle/ (accessed on 29 March 2021).

421 Hamilton, B R., Lima, G., Barrett, J. *et al*., 2021, 'Integrating Transwomen and Female Athletes with Differences of Sex Development (DSD) into Elite Competition: The FIMS 2021 Consensus Statement', *Sports Med*, Available at: https://doi.org/10.1007/s40279-021-01451-8 (accessed on 29 March 2021).

422 Hamilton *et al* (note 421 above).

consented to the use of oral contraceptives as a medical treatment leading to their eligibility. For this reason, it is important that a distinction between the two terms are made.

The promulgation of each new set of regulations has been followed by the introduction of new terminology. What started off as an already unknown term being hyperandrogenism, was recently amended to the term "Differences of Sex Development" or "DSD", all of which is constantly used linear to the term transgender. It is no wonder that this led to the ambiguity and an inability to develop a universal understanding of the condition amongst members of the public. Thus, athletes affected by DSD are commonly and incorrectly mistaken for being transgender. Note that when the regulation refers to an athlete affected by DSD, it cites a female athlete born with a physical medical condition that causes a difference in their sexual development when compared to the sexual development of a considered cisgender female. By regulation, these athletes are to undergo medical procedures to be eligible to compete.

Conversely, the Transgender Regulations defines transgenderism as, "individuals whose gender identity (i.e., how they identify) is different from the sex designated to them at birth, whether they are pre- or post-puberty, and whether or not they have undergone any form of medical intervention"[423]. Regardless of having a conflicting gender identity other than the body they were born in, transgender individuals are not born with distinguishable physical characteristics or impairments in relation to cisgender individuals, whereas individuals with DSD have a biological variant that

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423 IOC Consensus Meeting on Sex Reassignment and Hyperandrogenism, November 2015, Available at: https://stillmed.olympic.org/Documents/Commissions_PDFfiles/Medical_commission/2015-11_ioc_consensus_meeting_on_sex_reassignment_and_hyperandrogenism-en.pdf (accessed on 30 August 2022) [hereinafter referred to as the '2015 Transgender Regulations'].

causes physical differences in their bodies compared to cisgender individuals.[424]Accordingly, an MTF transgender individual's chromosomal make-up remains male, and any medical procedure aimed at rectifying such a condition is unnatural. A physical medical condition can be identified as a physical and naturally occurring disorder or defect within an individual's body. It is evident that the most imminent difference between the terms 'DSD' and 'Transgender' is its natural occurrence within the human body.

4.2. Male-to-Female Transgender Athletes

The male performance advantage in MTF transgender athletes has recently become a phenomenon in modern sport science studies. Sports scientist Ross Tucker identified two models reflecting the contrasting hypotheses allied with the eligibility of MTF transgender athletes to compete in the female category. The first model supports the existing transgender regulations, demonstrating the sufficiency of the required processes to lower MTF transgender athletes' testosterone levels in eliminating any male performance advantage that may exist, and accordingly advocates for the participation of MTF transgender athletes in female competition.[425] The confidence in the regulation stems from a study conducted by Joanna Harper in 2015, where eight transgender women's race times were evaluated over the course of seven years. The data was collected throughout the MTF transitioning process, therefore recording a 'male' and a 'female' time for each runner. All but one participant (who was identified as an outlier) displayed much slower times as an MTF transgender women compared

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424 National Collegiate Athletic Association Executive Committee, 2010, 'NCAA Inclusion of Transgender Student-Athletes', *National Collegiate Athletic Association*, Available at: https://www.ncaa.org/sites/default/files/Transgender_Handbook_2011_Final.pdf (accessed on 29 March 2021).

425 Tucker (note 228 above).

to their times achieved as a male.[426] Harper concluded by indicating that the reduction of testosterone and haemoglobin levels that takes place during the MTF transitioning process resulted in the vast reduction of "strength, speed, and virtually every other component of athletic ability", suggesting that the "endurance capabilities of transgender women athletes should be similar to those of 46, XX women".[427] As the first of its kind, Harper's work that was based on a controlled study was not considered to carry a high level of evidential value. The study was later referenced in another study conducted by Harper that ultimately shared their findings that "transgender women have testosterone levels below the mean of cisgender women and haemoglobin levels equal to that of cisgender women."[428] Interestingly enough, the authors of the latter study announced that the results obtain therein was presented to offer support to the IOC transgender guidelines affording MTF transgender athletes eligibility to compete in the female category of elite competition provided one year of hormone therapy is undergone.[429]

The second model rejects the theorem that MTF transgender athletes should be allowed to compete in the female category despite the completion of one year of hormone therapy. This largely stems from the belief that diminished testosterone levels only partially eliminates the male performance advantage that existed before such therapy was initiated.[430] A recent study correlated the pre-and post-hormonal

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426 Harper, J., 2015, 'Race Times for Transgender Athletes', *Journal of Sporting Cultures and Identities*, Available at: https://doi.org/10.18848/2381-6678/CGP/v06i01/54079 (accessed on 30 March 2021).

427 As above.

428 Harper, J., Ospina Betancurt, J. & Martínez-Patiño, M J., 2016, 'Analysis of the Performance of Transgender Athletes', *Sportscience*, Available at: https://www.sportsci.org/2016/WCPASabstracts/ID-1699.pdf (accessed on 30 March 2021).

429 Harper (note 426 above).

430 Tucker (note 228 above).

therapy fitness results of 29 transmen and 46 transwomen in the United States Air Force over a 10-year period. The results were then compared to the median performance of the cisgender males and females who also partook in the same set of fitness tests.[431] Focusing only on the MTF transgender women, the study indicated that the pre- hormonal therapy fitness results reflected the MTF transgender women performed "31% more push-ups and 15% more sit-ups in 1 min and ran 1.5 miles 21% faster than their female counterparts." These percentages were re-evaluated two years later when the post-hormonal therapy fitness results revealed that MTF transgender women displayed performances identical to their female counterparts in the push-up and sit-up tests while still preserving 12% faster times in the 1.5 miles.[432] The study concluded that, although the 15–31% athletic advantage displayed by MTF transwomen declined astronomically post-hormonal therapy, an imminent 9% performance advantage remained intact even after the required one year duration of hormonal therapy as per World Athletics' guidelines was completed, indicating that MTF transgender athletes may still enjoy up to 9% advantage in running events over cisgender female athletes while legally competing in elite female competition.[433] Consequently and in their attempt to preserve the integrity of the female sport, the second model elects to support the notion that, despite successfully completing the hormonal therapy required by World Athletics in the Transgender guidelines, MTF transgender athletes should not be eligible to compete in the female category due to the insurmountable advantage which they may still hold over their cisgender female

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431 Roberts, T A., Smalley, J. & Ahrendt, D., 2020, 'Effect of gender affirming hormones on athletic performance in transwomen and transmen: implications for sporting organisations and legislators', *The British Journal of Sport Medicatio,* Available at: https://bjsm.bmj.com/content/bjsports/early/2020/11/06/bjsports-2020-102329.full.pdf (accessed on 29 March 2021) [hereinafter referred to as the 'United States Air Force study'].

432 Roberts *et al* (note 431 above).

433 As above.

athlete competitors.[434]

More recently, the United States Air Force study was conducted on the remaining advantage gap post-hormonal therapy in MTF transgender women compared to cisgender females, presents a controlled analysis and data basis for an otherwise uncharted subject matter. It is easily assumed to be the pivotal study that can finally provide scientifically supported answers to many controversial questions. Joanna Harper, together with 69 other academics, quickly diminished such assumptions when they harmoniously reverted to the United States Air Force study in favour of allowing MTF transgender athletes to compete in female athletics subsequent to completing a year of hormonal therapy. After reconsulting the method, analysis and findings of the United States Air Force study numerous times to ensure no stone was left unturned, it is assumed that the 70 academics shared commonality in the presupposition that the found reduction of 15–31% to 9% athletic advantage displayed by MTF transwomen over cisgender females after the required one-year duration of hormonal therapy was sufficient to integrate transwomen into elite female competition. Contrastingly, the scientific value of the alleged performance advantage enjoyed by female athletes with DSD (also being a phenomenon in modern sport science studies) is solely supported by the apparent extremely broad shoulders of the Bermon tests, which will be discussed at a later stage. Ignoring the fact that the Bermon test's evidential value is shockingly low to none when considering the standard of testing, it was 'found' that female athletes with DSD have an "estimated competitive benefit of 2

434 Tucker (note 228 above).

– 5%"[435] pre-hormonal therapy.

This places a big question mark on the logic to integrate transwomen into elite female competition knowing that a 9% athletic advantage may exist between them and their cisgender competitors, while in the same breath assuming it proper that female athletes with DSD should undergo hormonal therapy for holding an "estimated competitive benefit of 2 – 5%".[436] As such, questions have arisen as to whether it is advisable or fair to permit transsexual athletes to compete, and if so, whether sport governing bodies, in the name of fair play, have the power to restrict the right of transsexual athletes to participate in the gender category by which society and the law accept them as human beings?[437] This is no simple question and leads to the inquest of possibly broadening the binary system used to categorise sexes in sport. The logic of accepting transgender athletes into female competition in maximizing their overall psychological wellbeing and self-fulfilment,[438] while advocating for the exclusion of female athletes affected by DSD reflects the confusion of regulatory sporting bodies attempting to safeguard female competition.

Guidelines reflect that the eligibility of a trans-athlete to compete was established in order to "maximize the overall psychological wellbeing and self-fulfilment of the transgender athlete."[439] Ross Tucker provides a theory that the presumed determining factor causing the different approaches to the two cases may be attributed to society's 'growing pains' in accepting the Transgender Regulations. When considering the

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435 The Bermon tests (note 239 above) p 248.
436 The Bermon tests (note 239 above) p 248.
437 Reeser, J C., 2005, 'Gender identity and sport: is the playing field level?' *British Journal of Sports Medicine*, Vol 39, no 10, p 695-699.
438 As above.
439 Reeser (note 437 above).

misperception of DSD athletes being transgender athletes and the 70 academic's approach to group DSD and transgenderism as one and the same, one must consider the absolute relevance of such theory:

> "I do wonder whether the growing concerns about the Transgender Regulations, and the fear about men identifying as and competing as women, has infiltrated the thinking. Well known scientist, doctor, sex and gender expert, and lawyer, Paula Radcliffe, has certainly been trying hard to conflate the issues when she can. I wonder if the prevailing wind direction shifted between 2015 and now, such that fear of a "trans-invasion" has coloured the way we view biological male, biological female, and ambiguous cases?"[440]

4.3. DSD Regulations vs Transgender Regulations

Due to its far briefer history than DSD matters, transgender athletes have only recently become an issue of contention in sport. Initially, transgender rules were supported by a study conducted by the Fédération Internationale de Volleyball (FIVB) regarding the athletic performance of a trans-athlete when competing in the opposite sex category. It was found that male to female trans-athletes derived advantages in the form of their male physical attributes such as height and thus, the FIVB established a rule stipulating that all athletes are permitted to compete in their birth sex category.[441]This was overturned in 2004 when the first transgender regulation was proposed by the IOC, indicating that trans MTF athletes were only eligible for female competition once they had fully undergone gender-confirming surgery and successfully completed a two-year treatment of cross-sex hormone therapy. [442] The regulation was scrutinized

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440 Tucker (note 228 above).
441 Reeser (note 437 above).
442 International Olympic Committee, 2015, 'IOC approves consensus with regard to athletes who have changed sex', Available at: http://www.olympic.org/content/news/media-resources/manual-news/1999-2009/2004/05/17/ioc-approves-consensus-with-regard-to-athletes-who-have-changed-sex/ (accessed on 29 August 2022).

on many grounds, a few of which were the absence of scientific evidence, the sever medical implications involved and the legality thereof.[443]

In 2015, Canadian national competition rules for trans athletes which was based on the provisions of the 2004 transgender regulations, was legally challenged in the *Kristen Worley v Ontario Cycling Association and Cycling Canada* case when transgender athlete, Kristen Worley, accused it of discrimination on the basis of sex and its contravention of the Human Rights Code, R.S.O. 1990 c. H. 19, as amended.[444] The parties agreed to settle the matter on the premise that the Ontario Cycling Association and Cycling Canada agreed to advocate for more inclusionary rules for MTF transgender athletes based on "objective scientific research"[445]. In the meanwhile, the sporting bodies agreed to follow the TUE standards as applied on an individualized assessment in regulating the participation of MTF trans athletes in the female category. It was, however, exclusively mentioned in the settlement agreement that the neither the Ontario Cycling Association nor Cycling Canada has control over the IOC or their regulations over international competition.[446]

Although it cannot be said that the *Worley* or *Chand* cases had an influence, the IOC did elect to amended its 2004 transgender regulation in 2015, streamlining it with the eligibility requirements with that of the 2011 Hyperandrogenic Regulations.[447] During the IOC's 'Consensus Meeting on Sex Reassignment and Hyperandrogenism', it was

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443 Patel (note 45 above).

444 Human Rights Tribunal of Ontario, 2015, *Kristen Worley v Ontario Cycling Association, Cycling Canada Cyclisme, International Olympic Committee and Union Cycliste Internationale*, HRTO file no: 2015-21367-I.

445 Minutes of settlement - Kristen Worley v Ontario Cycling Association and others, HRTO file no: 2015-21367-I, Available at: https://www.hrlsc.on.ca/sites/default/files/docs/en/Media/2017-07-06%20%20Worley%20v%20%20OCA%20%20CC%20MOS%20public.pdf (accessed 29 August 2022).

446 Minutes of settlement (note 445 above).

447 2015 Transgender Regulations (note 423 above).

confirmed that neither trans athletes nor DSD athletes were required to undergo surgery to meet the minimum threshold of the female competition.[448] Instead, both sets of regulations required a serum level below 10 nmol/L for a specified period before and during competition, with the transgender regulations additionally requiring the MTF trans athlete to declare herself as a female – a declaration that could only be changed after 4 years.[449] What remained contested is the specification of the maximum serum level of 10 nmol/L allowed, as no scientific evidence existed at the time that could justify a set threshold for what level amounts to a performance advantage in the female category.[450]

Since the streamlining of the two respective sets of regulations in 2015, the regulations have notably been dealt with unilaterally as one and the same, leading to a lack of distinction between the two. Following the *Semenya* case, World Athletics replaced its 2011 regulations with the 2018 DSD Eligibility Regulations, and almost simultaneously introduced its new Eligibility Regulations for Transgender Athletes in 2019.[451] The similarities between the current DSD and Transgender regulations are undoubtful, with both regulations requiring the athlete to specify their sexual orientation while additionally lowering the threshold for blood testosterone levels to below 5 nmol/L.[452] Both regulations also exclaim that no athlete is forced to undergo medical treatment

448 Patel (note 45 above).
449 2015 Transgender regulations (note 423 above).
450 Patel (note 45 above).
451 As above.
452 DSD Regulations (note 10 above) read together with World Athletics Eligibility Regulations For Transgender Athletes, 2019, Available at: file:///C:/Users/biancavdm/Downloads/C3.5%20%20Eligibility%20Regulations%20Transgender%20Athlete.pdf (accessed on 29 August 2022).

under the provisos and may instead elect to compete in the male category if they so wish.[453]

The problem with World Athletics' linear approach towards DSD and Transgenderism is the drawn inference that they can be used interchangeable to one another and cannot be separated. While it is commendable that sporting bodies are showing some sort of an attempt to progress their regulations in a manner that promotes inclusivity, it is apparent that they have not been able to distinguish between the two which in itself is the problem. In their attempt to provide the necessary biological evidence regarding performance advantage, sporting bodies have missed the essence of the issue at hand – biological sex cannot be neatly divided into categories.

4.4. The Preferred Sex Binary System in Sport

The sex binary system has formed part of Sport for as long as women have been permitted to compete. Initially, the division of the male and female categories were based on the allocated sex at birth. This quickly changed when female athletes such as Dora Ratjen, Stella Welsh and Foekje Dillema challenged the construction of the existing sex binary system. Sporting bodies turned to the biological-essentialist theory, relying on biology to make the distinction between the male and female sex.[454]

At its core, the biological-essentialist theory considers genetic makeup and hormonal structures to be the crux of gender differences between the sexes, allocating each sex

453 DSD Regulations (note 10 above).

454 Saguy, T., Reifen-Tagar, M., Joel, D., 2020, 'The Gender-Binary Cycle: the perpetual relations between a biological-essentialist view of gender, gender ideology, and gender-labelling and sorting', *Philosophical Transactions of the Royal Society*, Vol 376:1822, Available at: https://doi.org/10.1098/rstb.2020.0141 (accessed 27 August 2022).

with distinct biological characteristics.[455] These characteristics are considered to be invariable and true to the each of the sexes, classifying sex as binary. Individuals whose DNA shows a chromosomal structure of two X chromosomes will presumably develop into a female with feminine attributes, whereas the presence of an X and a Y chromosome will assume the male sex with masculine traits.[456] Similarly, variant hormones are considered either to be 'male dominant' or 'female dominant'. Although most sex hormones are present in both sexes, males are associated with higher testosterone levels and females with higher oestrogen and progesterone levels.[457] Accordingly, the biological-essentialist theory assumes that bodies reflecting higher testosterone levels fall within the male sex.

Sex testing and gender verification in sport was established in pursuit to prevent male athleisure from dominating the female category. Male athletes are thought to enjoy athletic performance due to increased strength and muscle development acquired from higher androgen levels.[458] This presumption is indicative that sporting bodies have adopted the biological-essentialist theory as its preferred sex binary system, and reiterated in the Bermon test, which also considers biological makeup as the determining factor in identifying sex. In their report of 2017, Bermon *et al*:

> *"This important recruitment bias is, in our opinion, an indirect evidence for performance-enhancing effects of hyperandrogenic DSD conditions and their associated high T concentration in female athletes, but we cannot exclude that*

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455 Saguy *et al* (note 454 above).

456 Morgenroth T., Sendén, M G., Lindqvist, A., Renström, E A., Ryan, M K., Morton, T A., 2021, 'Defending the Sex/Gender Binary: The Role of Gender Identification and Need for Closure', *Social Psychological and Personality Science,* Vol 1;12(5), p 731-740, Available at: DOI: 10.1177/1948550620937188 (accessed on 30 July 2022).

457 Saguy *et al* (note 455 above).

458 Hyperandrogenism regulations (note 63 above).

> *the Y chromosome in some unknown way may bring an advantage to female athletes."*[459]

Bermon *et al* has however confirmed the difference between sex and gender, stating that the sex binary system is true for 99% of individuals and that:

> *"The remaining individuals comprise the DSD, transgender, and gender non-binary individuals. Because sports competitions are dichotomous for male and female, whereas sex and gender may not always be, a logical and scientifically based objective approach to defining who belongs in the protected female category is necessary."*[460]

What Bermon *et al* does not consider is that, due to the variety of identification markers, sex is spectrum running from male to female rather than clear divisional line between male and female, with all others being considered outliers.[461] The regulation of the female category in sport in terms of the sex binary as suggested by Bermon *et al* and the DSD regulations becomes problematic when all who do not neatly fit into the proposed binary are excluded from competing in sports unless they compete in the male category or undertake medical treatment.[462] This results in the exclusion of many athletes, regardless of the margin that their biological markers fall outside the set perimeters, in order to achieve the preservation of the female category and regardless that such segregation impedes on human rights.[463]

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459 Bermon tests (note 239 above).

460 Bermon, S., Handelsman, D., Auchus, R., Linden Hirschberg, A., HuguesSex, I., 2019, 'Sex, gender, and sports', *British Medical Journal*, Vol 364, Available at: DOI: https://doi.org/10.1136/bmj.l1120 (accessed on 01 September 2022).

461 Martínková, I., 2020, 'Unisex sports: challenging the binary', *Journal of the Philosophy of Sport*, Vol 47:2, p 248-265, Available at: DOI: 10.1080/00948705.2020.1768861 (accessed on 01 July 2022).

462 Martínková (note 461 above).

463 Patel (note 45 above).

Presently, World Athletics has had a monopoly when deciding where the line between the sexes is drawn and how it should be regulated, evidently paying more regard to the contested scientific understanding of sex than to the impact it would have on human rights[464]. The ever-expanding understanding of sex and gender has challenged the binary system proposed by Bermon *et al* and the DSD regulations, calling for a more inclusive system. Some suggestions to an alternative binary included the ideas of either de-gendering or multi-gendering.[465] De-gendering aims at diminishing the idea of both sex and gender, assuming that the removal of sexes will place less emphasis on the natural division of human biology, essentially removing any sort of divisional line that exists.[466] On the other hand, multi-gendering aims at classifying sex/gender as a multinary system rather than a binary system.[467]

The de-gendering theorem advocates for the creation of a singular unisex category in sport. A unisex category is expected to be the simplest solution to the problems that arise from implementing sex binary in sport by allowing all sexes to compete together.[468] An example of a unisex marathon, however, reconsiders the fairness of unisex competition. In a starting line-up of 4 076 male and 1423 competitors, the top female athlete finished 66th overall.[469] While she managed to beat 4 011 males, she was still beaten by 65 of the male competitors. This demonstrates that sporting ability and hard work may only afford female competitors with an edge over a percentile of her male competitors and almost certainly eliminates any chance of a female

464 Patel (note 45 above).
465 Morgenroth *et al* (note 456 above).
466 As above.
467 As above.
468 Martínková (note 461 above).
469 As above.

champion in any sporting discipline.[470] The "balancing of abilities/skills" concept is offered as a solution to this dilemma by adapting sport as we know it in order to achieve a more equitable playing field amongst the sexes by balancing the each sexes unique abilities and skills to somewhat 'level out' one another's' strengths and weaknesses.[471] This could only be achieved through a total restructure of sport in a way that the skills and abilities required to excel in the respective sport is modified to include an equilibrium of skills and abilities shared amongst the sexes.

On the other hand, the multi-gendering theory provides answers to the concerns of transwomen and intersex athletes competing in the female category by providing additional categories to sport without changing the classification of the existing male and female categories.[472] An obvious solution would be to adding an Intersex category to cater for all those who do not conform to the traditional sex categories. Alternatively, others have suggested a sort of 'handicap' classification system that would be determined based on testosterone levels. [473]

While in theory the de-gendering approach could achieve resolution of the binary problems in sport, realistically, a total restructure of sport is not a viable solution as it may either result in the diminishment of female competitors or a loss of interest due to too vast of a restructure in sport. In light hereof, the multi-gendering system presents as a far easier transition into sport as no major changes to the existing sex categories or sport professions are required. The inclusion of an intersex female category and possibly a MTF Transgender category in international elite competition may be the

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470 Martínková (note 461 above).
471 As above.
472 Morgenroth *et al* (note 456 above).
473 Bianchi, A., 2017, 'Transgender women in sport', *Journal of the Philosophy of Sport,* Vol 44 (2), p 229-242, Available at: DOI: 10.1080/00948705.2017.1317602 (accessed on 30 July 2022).

best alternative solution to the evidently problematic binary system that is currently used in sport. The multi-gendering system introduces a more inclusive and less discriminatory approach to regulating sport in consideration to human rights and should, in the opinion of this research, be strongly considered as an alternative to the binary system.

C H A P T E R 5

The Swiss Federal Supreme Court's Approach to Arbitration Awards

SUMMARY

5.1. Introduction
5.2. The Swiss Federal Supreme Court's Approach to Arbitrational Awards
5.3. Public Policy within the Swiss Federal Supreme Court
5.4. Did the Swiss Federal Supreme Court Exhaust its Competencies in the *Semenya* Appeal?

5.1. Introduction

After the CAS dismissed *Caster Semenya* and ASA's plea for the invalidation of the World Athletics' DSD Eligibility Regulations, it was unanimously decided that the duo would appeal the CAS award of 30 April 2019 before the CAS. Upon the appeal in 2019, the CAS, however, endorsed its original decision maintaining that the marginal discrimination caused by the regulations was necessary, reasonable and proportionate in the strive to preserve the integrity of female athletics.[474] The duo persisted in their attempt to invalidate the DSD Eligibility Regulations by appealing the CAS award for a second time in the Swiss Federal Supreme Court. The appeal was brought despite the Swiss Federal Supreme Court's low success rate of appeals, this due to its limited jurisdiction and instances in which it may review the facts of the case. The *Semenya* appeal was lodged on the basis of alleged unfair discrimination in that the DSD Eligibility Regulations violates the prohibition of discrimination, her

474 The Swiss Decision (note 19 above).

personality, human dignity, and physical integrity, all of which fall under the margin of fundamental international rights.

The Swiss Federal Supreme Court reaffirmed that it bears limited jurisdiction to review the content of the matter and that it may only review same for the sole purpose of examining whether the CAS award violated fundamental human rights principles of public order.[475] In their judgment of 25 August 2020, the Swiss Federal Supreme Court announced their decision that the latter was not the case and validated the CAS Award on merit that the CAS is an independent and competent court of arbitration that conducted a comprehensive examination of the facts argued, including expert evidence, an accordingly delivered a legally sound decision.[476]

The Swiss Federal Supreme Court accepted the CAS decision as binding based on the expert evidence provided in support of the theorem that testosterone is the key contributor to enhanced performance between the sexes and thus upholds the CAS's view that female athletes reflecting a 46 XY DSD chromosomal structure produces similar testosterone levels to their male counterparts which provides them with an overwhelming competitive advantage over their cisgender female competitors.[477] As a result of the findings made by the CAS, the Swiss Federal Supreme Court held that the CAS award cannot be appealed to and as a result rejects the Applicants' request for appeal.

The Swiss Federal Supreme Court furthered its judgment by upholding that the right to fair sporting practice is a legitimate concern as it stands as the cornerstone on which

475 The Swiss Decision (note 19 above).
476 As above.
477 As above.

sports competition is based and therefore represents a significant public interest.[478] They also confirmed that the CAS correctly considered the private interests of the affected DSD female athletes in comparison to the private interests of non-DSD female athletes.[479] Based upon their findings, the Swiss Federal Supreme Court concluded their ruling with a few key findings. Considering *Semenya*'s alleged violations on her fundamental rights, the Swiss Federal Supreme Court found that the CAS award is in line with Swiss public order despite its prescribed used of androgen-suppressing medication necessary to lower testosterone levels. The use of androgen-supressing drugs for eligibility in the female competition is found no to infringe upon *Semenya*'s physical integrity. Accordingly, the Swiss Federal Supreme Court regards the CAS award compatible with universal principles of human rights as well as Swiss fundamental rights.[480]

The Swiss Federal Supreme Court's nonchalant approach towards the review of the facts in the *Semenya* case suggests the court's indisposition to deviate from the CAS panel's judgment. While this may or may not prove to be accurate, it is imperative to divulge the jurisdictional limitations of the Swiss Federal Supreme Court in ascertaining whether it exhausted its jurisdiction in reaching its final decision to reject *Semenya*'s appeal.

5.2. The Swiss Federal Supreme Court's Appeal and Review Process

When considering the Swiss hierarchical status of courts, the Federal Supreme Court rules as Switzerland's highest judicial authority with its main objective being to uphold

478 The Swiss Decision (note 19 above).
479 As above.
480 As above.

federal law in ensuring the correct application thereof as well as the protection of the constitutional rights of its citizens.[481] Thus, the Federal Supreme Court stands as a court of final instance on all judgments, awards, and appeals made by secondary Swiss courts. Ordinarily, when faced with an appeal the Federal Supreme Court is permitted to review a judgment should either party allege the violation of either a "federal law, international law, inter-cantonal law or cantonal constitutional right". [482]

However, the review of the facts of a case demands higher stakes suggesting that the facts of a case may only be reviewed should they be "patently incorrect or based on infringement of federal law".[483] Arbitrational awards such as the CAS awards, however, are governed by the Swiss Federal Private International Law Act (hereinafter referred to as "PILA"), and can only be challenged on the grounds laid out in Article 190(2) thereof before the Swiss Federal Tribunal (hereinafter referred to as "SFT"). [484] In this respect, it can be said that the responsibility of maintaining legality within arbitral institutions such as the CAS rests upon the shoulders of the SFT by way of its sole capacity to review both procedural and factual decisions delivered by arbitral institutions.[485] The grounds laid out in Article 190(2) of PILA are limited to 5 definitive instances, being:

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481 The Swiss Political System, 'Swiss courts', *Democracy The Swiss Political System*, Available at: https://www.ch.ch/en/demokratie/federalism/separation-of-powers/switzerlands-courts/ (accessed on 11 February 2021).

482 Legislationline, 'The Paths to the Swiss Federal Supreme Court: An Outline of Switzerland's Judiciary Structure', *Legislationline*, Available at: https://www.legislationline.org/download/id/5275/file/Swiss_Paths_to_SC_Judiciary_Structure_en.pdf#:~:text=Appeals%20to%20the%20Federal%20Supreme,on%20infringement%20of%20federal%20law (accessed on 11 February 2021).

483 As above.

484 Mavromati, D., 2016, 'The Role of the Swiss Federal Tribunal and Its Impact on the Court of Arbitration for Sport (CAS)', *Social Science Research Network Electronic Journal*, Available at: SSRN: https://ssrn.com/abstract=2845237 or http://dx.doi.org/10.2139/ssrn.2845237 (accessed on 22 February 2021).

485 As above.

(a) "*If the sole arbitrator was not properly appointed or if the arbitral tribunal was not properly constituted;*

(b) *if the arbitral tribunal wrongly accepted or declined jurisdiction;*

(c) *if the arbitral tribunal's decision went beyond the claims submitted to it or failed to decide one of the items of the claim;*

(d) *if the principle of equal treatment of the parties or the right of the parties to be heard was violated;*

(e) *if the award is incompatible with public policy*."[486]

While this list presents as incomplete, the SFT avoids further interpretation hereby emphasising its exhaustive nature.[487] The SFT goes on to admit that the grounds for the annulment of arbitrational awards in terms of PILA are primarily focused on procedural inconsistencies – providing only item (e) thereof, being a *violation of public policy,* as a remedy to material review.[488] As a defence, the SFT "has consistently held that this relates not to domestic public policy but to international public policy; furthermore, the concrete result of the award must be contrary to public policy. Wrong or arbitrary findings of fact or a clear violation of rules of law will not suffice."[489] In the same breath, the SFT distinguishes the PILA's repudiation of arbitrariness as a ground to set aside an arbitrational award, be it due to the recognition of facts or application of the law.[490] Likewise, it rejects the European Convention on Human Rights violation as a ground to review an arbitration award, suggesting that such violation may only be

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486 Federal Act on Private International Law,1987, Parliament of Switzerland, Article 190(2).

487 Hurni, C., 2012, 'How Arbitration-Friendly is the Swiss Federal Supreme Court?', *New Developments in International Commercial Arbitration*, p 79.

488 As above.

489 Wiebecke, M., 2020, 'The International Arbitration Review: Switzerland' *The Law Reviews,* Available at: https://thelawreviews.co.uk/title/the-international-arbitration-review/switzerland (accessed on 02 March 2021).

490 Swiss Federal Tribunal, Decision 4P.115/1994 of 30 December 1994 c. 2a, Available at: https://www.swissarbitrationdecisions.com/sites/default/files/23%20septembre%202014%204A%20231_0.pdf (accessed on 01 March 2021).

considered as contributory to one of the grounds listed in Article 190(2) of PILA.[491] In other words, the SFT, which supposedly maintains the responsibility of maintaining legality within arbitral institutions, does not have much control over arbitral tribunals after all.

5.3. Public Policy within the Swiss Federal Supreme Court

While the slim possibility of success in the Swiss Federal Supreme Court was apparent to *Semenya*'s legal team, they nonetheless opted to proceed with the request to appeal in the hope that the adverse effects of the CAS award on the DSD community would compel the SFT to intervene. Accordingly, *Semenya's* team invoked item (e) of Article 190(2) of PILA, alleging that the CAS award violates public policy on an international scale by way of discrimination and the impedance on DSD athletes' health. While both these grounds constitute violations of the European Convention on human rights which, according to the SFT it does not constitute a ground to review an arbitration award and that the CAS Award's correlation to public policy remains.

The term public policy has been a long-debated matter in international law, with many academics forming contrasting opinions regarding the term's true meaning.[492] It goes without saying that each country has its own interpretation of what 'public policy'

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491 Swiss Federal Tribunal, Decision 4A_238/2011 of 4 January 2012, Available at: https://www.swissarbitrationdecisions.com/sites/default/files/4%20janvier%202012%204A%20238%202011.pdf (accessed on 01 March 2021) & Decision 4A_404/2010 of 19 April 2011, Available at: https://www.swissarbitrationdecisions.com/sites/default/files/19%20avril%202011%204A%20404%202010.pdf (accessed on 01 March 2021).

492 See the discussion of Mills, A., 2008, 'The Dimensions of Public Policy in Private International Law', *Journal of Private International Law*, Vol 4 (2), p 201-236, Available at: 10.1080/17536235.2008.11424339.

entails in terms of its own domestic policies, rules and principles. Its application, however, far surpasses that of merely domestic laws.

The consensus amongst the international community is paramount due to the existence of international conventions and a country's participation therein by consenting to the creation of dispute resolution systems.[493] Courts of variant jurisdictions have identified that no absolute definition exists for the term 'public policy', yet it is presumed that it includes a degree of illegality in its existence or application that would result in the distinct detriment of either a single "ordinary reasonable and fully informed member of the public" or the public good as a whole.[494]

Swiss courts, in particular, have had numerous encounters with the principle of public policy due to the citation thereof in the PILA. In *Tensaccia S.P.A v. Freyssinet Terra Armata.R.L* the SFT held:

> "*Even though the public policy reservation is broadly acknowledged… it behooves nonetheless the Swiss judge to interpret art. 190(2)(e) PILA when relied upon as a ground for appeal and to determine what the Swiss legislator had in mind when it adopted this undetermined legal concept. Assuming a definition is needed, one could say that an award is inconsistent with public policy if it disregards those essential and broadly recognised values which, according to the prevailing values in Switzerland, should be the founding stones of any legal order.*"[495]

Contrary to the latter notion that art. 190(2)(e) PILA "relates not to domestic public policy but to international public policy",[496] it is apparent that in practice the SFT elects

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493 Tosun, H A., 2019, 'Public Policy Concepts in International Arbitration', *UC Berkeley*, Available at: DOI: 10.13140/RG.2.2.21002.82885 (accessed on 01 March 2021).

494 Tosun (note 493 above).

495 Swiss Federal Tribunal, Decision 4P.278/2005 of 08 March 2006, Tensaccia S.P.A v. Freyssinet Terra Armata .R.L., Available at: https://www.swissarbitrationdecisions.com/sites/default/files/8%20mars%202006%204P%2078%202005.pdf (accessed on 01 March 2021).

496 Wiebecke (note 489 above).

to stick to Swiss values rather than that contained in international charters such as the European Convention on Human Rights. This was reiterated in the *Tensaccia S.P.A v. Freyssinet Terra Armata. R.L* decision where the SFT made it be known that "there is no more room for doubt" with regards to the consideration of international laws within its courtroom – unless the international law contains values considered to be an indispensable value within society, the SFT is not obliged to hear a matter pertaining to the violation of such a provision.[497] Ultimately, the SFT found that:

> "*The provisions of competition laws, whatever they may be, do not belong to the essential and broadly recognized values which, according to the concepts prevailing in Switzerland, would have to be found in any legal order. Consequently, the violation of such a provision does not fall within the scope of art. 190(2)(e) PILA. The possibility of such a violation affecting one of the principles that case law deducted from the concept of material public policy is hereby reserved.*"[498]

The SFT further acknowledged the existence of two categories within the principle of public policy being, procedural public policy and substantive public policy. Accordingly, the SFT suggested that, whereas procedural public policy warrants parties with a right to fair trial, the objective review of facts and applicable procedures to be followed, substantive public policy recognizes fundamental rights encroached in charters and constitutions set to uphold public good and, as such, guarantees compatibility to these values.[499] Breach of procedural public policy occurs "in case of violation of fundamental and generally recognized procedural principles, the disregard of which contradicts the sense of justice in an intolerable way, so that the decision appears absolutely incompatible with the values and legal system of a state ruled by laws",[500]

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497 Decision 4P.278/2005 (note 495 above).
498 Decision 4P.278/2005 (note 495 above).
499 As above.
500 Federal Tribunal, Judgment 4A_490/2009 of 13 April 2010, Atlético/Benfica, at 2.1.

whereas a breach in substantive public policy ensues when there is a disregard of "some fundamental legal principles and consequently becomes completely inconsistent with the important, generally recognized values, which according to dominant opinions in Switzerland should be the basis of any legal order".[501]

The *Tensaccia S.P.A v. Freyssinet Terra Armata. R.L* decision accentuates that the SFT's approach towards art. 190(2)(e) PILA assumes 'procedural public policy' by definition to be the Swiss legislator's intended meaning of 'public policy' while promulgating the PILA.[502]

5.4. Did the Swiss Federal Supreme Court Exhaust its Competencies in the *Semenya* Appeal?

In debating whether the SFT thoroughly exhausted its competencies to override an arbitrary arbitration award before rejecting *Semenya*'s request for appeal, its application of article 190(2)(e) of PILA must be considered in line with either 'essential and broadly recognized' international values or, alternatively, Swiss values. As it is unclear what the SFT considers as 'essential', it is assumed that the Swiss court invoked Swiss laws and values in reaching its findings in the *Semenya* case. In Switzerland, the fundamental rights contained under Chapter 1 of Title 2 of the Federal Constitution of the Swiss Confederation (hereinafter referred to as the 'Swiss Constitution') takes precedence over any other existing federal or cantonal laws.[503]

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501 Federal Tribunal, Judgment 4A_558/2011 27 March 2012, Matuzalem, at 4.1.

502 As above.

503 Federal Constitution of the Swiss Confederation of 18 April 1999 (Status as of 1 January 2021). Available at: https://fedlex.data.admin.ch/filestore/fedlex.data.admin.ch/eli/cc/1999/404/20210101/en/pdf-a/fedlex-data-admin-ch-eli-cc-1999-404-20210101-en-pdf-a.pdf (accessed on 08 March 2021) [hereinafter referred to as the 'Swiss Constitution'].

Unsurprisingly, the values contained in the Swiss Constitution shares a substantial commonality to the values contained in the European Convention on Human Rights. As a matter of fact, considering the individual rights infringed upon by the DSD Eligibility Regulations, the protection afforded to such individuals under the Swiss Constitution far surpasses that of even the European Convention on Human Rights.

The European Convention on Human Rights could be considered to provide a blanket cover to individuals such as DSD athletes, as contained in:

(1) Article 2 – Right to life;

(2) Article 3 – Prohibition of torture; and

(3) Article 8 – Right to respect for private and family life.[504]

Unilaterally, the Swiss Constitution ventures into specific rights that could easily be appealed to by DSD athletes, including:

(1) Article 7 – Human dignity;

(2) Article 9 – Protection against arbitrary conduct and principle of good faith;

(3) Article 10 – Right to life and to personal freedom;

(4) Article 13 – Right to privacy; and

(5) Article 14 – Right to marry and to have a family.[505]

As is true for most legal systems existing today, the Swiss Constitution makes provision under article 36 for specific circumstances in which its fundamental rights may be restricted. The provision holds explicitly that fundamental rights are

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504 Convention for the Protection of Human Rights and Fundamental Freedoms as amended by Protocols No. 11 and No. 14., Available at: https://rm.coe.int/1680063765, (accessed on 10 February 2021).

505 The Swiss Constitution (note 503 above).

sacrosanct, and as such, restrictions thereof must have a legal basis and can only be justified if it proportionally stands for the protection of public interest or the protection of the fundamental rights of others.[506] For the court to evoke the protection of public interest as its ratification for the restriction of a fundamental right, it has to be satisfied that the disadvantage endured by the public surpasses the depravation the restriction would cause to the right holder. While the SFT may consider sporting competition as a significant public interest, it does not diminish the actuality that the right to sporting competition is not a fundamental right in the Swiss Constitution and so, for it to assume superiority over individual fundamental rights, article 36 requires the utmost impoverishment to public interest. Article 35 places an onus on the SFT to ensure that "fundamental rights, where appropriate, apply to relationships among private person", essentially compelling it to uphold and implement fundamental rights above all others.[507]

The SFT judgement in the *Semenya* case reveals an omission of addressing the requirements laid out in article 36 of the Swiss constitution and a possible error in interpreting the doctrine of proportionality. Such an oversight has the potential to the expanding lack of responsibility on court systems to ensure the protection of individuals who face the intimidation from the supremacy of sporting regulatory bodies. If the sporting legal system so effortlessly accepts a study with a commensurable amount of proven data errors as sufficient to provide reasonable support to justify the discrimination of individuals, leading to the vindication of a 'discriminatory policy' (in

506 The Swiss Constitution (note 503 above).
507 The Swiss Constitution (note 503 above) Article 35 (3).

the words of the CAS),[508] there is no telling what actual protection athletes have over the sporting monopoly.

All things considered, the Swiss Federal Supreme Court conducted itself in line with the boundaries and precedents set in prior case law. Whether such conduct is considered appropriate is still undetermined as several Swiss values and fundamental rights remain infringed upon. It can be argued that the SFT acted as a subsidiary of the CAS in instinctively accepting the correctness of the CAS findings, rather than invoking article 190(2)(e) of PILA in proving the incompatibility of the CAS award with that of procedural public policy warranting *Semenya* with the right to a fair trial, including the objective review of facts and appropriate procedures to be followed. To the dismay of *Semenya* and all who depend on her successful objection to the DSD eligibility regulation, the SFT elected to remain obedient to existing precedents instead of advancing fundamental rights in sport, regardless of the painful need for the latter.

508 The Swiss Decision (note 19 above).

CHAPTER 6

The Doctrine of Proportionality and its Use in the Court of Arbitration for Sport and Swiss Decisions

SUMMARY

6.1. Introduction
6.2. Proportionality in the *Semenya* Case

6.1. Introduction

With a profound increase in its popularity in constitutional courts worldwide, the Doctrine of Proportionality seems the chosen method for the resolution of human rights adjudications in the ECHR.[509] As such, it came as no surprise that the principle was invoked by both the CAS and the Swiss Federal Supreme Court in the *Semenya* case. This does, however, not mean that the principle goes without criticism, with critics emphasising the detrimental effects its vague and ambiguous application could have on the interests of individuals and minorities.[510] This was specifically brought forward by the UN Special Rapporteur's intervention in "Pursuant to Article 36(2) of the European convention on Human Rights and Rule 44(3) of the Rules of Court". [511] The intervention gave an insight into the *Semenya* case and the manner in which the Doctrine of Proportionality was applied thereto.[512]

509 UN Special Rapporteur Intervention: *Semenya* case (note 137 above) 3.
510 Tsakyrakis, S., 2008, 'Proportionality: an assault on human rights?', *International Journal of Constitutional Law*, Available at: DOI: 10.1093/icon/mop011 (accessed on 05 February 2021).
511 UN Special Rapporteur Intervention: *Semenya* case (note 137 above).
512 As above.

To accurately examine the application of the principle, it is imperative to understand the mechanism of 'proportionality' and the manner in which it was designed to produce the best possible outcome. The principle of proportionality can be characterized as an array of conditions to be considered by an interpreter before a constitutionally protected right may be limited.[513] This limitation may be a consequence of the application of a statute that was promulgated, which may result in the infringement of a constitutional right of an individual, or even the enforcement of a constitutional right of an individual which may infringe upon the constitutional right of another individual. As the principle of proportionality is one with a rather complex stature, it allows for many contrasting interpretations and modifications of the conditions and steps to be followed, this being merely the first of several criticisms the principal faces.

With reference to statutes affecting human rights, the most prominent procedure followed in the application of the principle of proportionality seemingly takes the form of a three-fold test:

(1) Adequacy – the principle of suitability;

(2) Necessity; and

(3) Proportionality *stricto sensu*.[514]

These steps were designed to ensure that limitations of constitutional rights by statutes are both balanced and reasonable. The first sub-step discusses adequacy, also referred to as proper purpose or the suitability of the interference of a right. It holds that the statute affecting the constitutional right must portray adequacy or suitability in

513 Barak 2010 (note 5 above).
514 Barak 2012 (note 6 above).

achieving the proper purpose intended by the legislator.[515] In summary, the interpreter must determine the end (goal) which the legislator strived for in comparison to the means which the legislator designed in order to achieve the said end, ultimately determining whether the means is an adequate/suitable measure to achieve the end (goal).

The second sub-step ascertains the necessity of the means involved and whether that are "no alternative measures that may similarly achieve that same purpose with a lesser degree of limitation".[516] The third sub-step, and undoubtedly the most used step of the principle of proportionality, is the concept of proportionality *stricto sensu.* Proportionality *stricto sensu* can be said to be the act of balancing between the "importance of achieving the proper purpose and the social importance of preventing the limitation on the constitutional right".[517] Once weighed, the interpreter will then theoretically be in a position to make a better calculated decision on the legitimacy of the limitation of the constitutional right in correlation to the proper purpose of the statute.

Whereas many critics argue that the need for the first and second sub-step is diminished due to the rarity of an utterly irrational statute as well as the rarity of a legislator's inability to reasonably justify the necessity of its aim,[518] others argue that it is imperative not to surpass these steps due to the third sub-step's vague and ambiguous nature. A more in-depth analysis of proportionality *stricto sensu* suggests

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515 Cianciardo, J., 2010, 'The Principle of Proportionality: The Challenges of Human Rights', *Journal of Civil Law Studies,* Available at: https://digitalcommons.law.lsu.edu/jcls/vol3/iss1/11 (accessed on 05 February 2021).

516 Feldman, D., 1999, 'The Human Rights Act 1998 and constitutional principles', *Legal Studies*, Vol 19(2), p 165-206, Available at: DOI:10.1111/j.1748-121X.1999.tb00091.x (accessed 20 August 2022).

517 As above.

518 Tsakyrakis (note 510 above).

the imagery of lady justice holding up the scales of moral equality, with the idea of balancing the advantages and disadvantages of the statue reflecting on either side of her scales. The advantages would, in theory, substantiate the need for the statute, whereas the disadvantages would reflect the level of deprivation of liberty the limitation would have on the individual. Judge Bernhard Schlink attempted to place same in layman's terms: should a mean be found unhelpful/unnecessary in achieving the end, using such mean would be considered out of proportion. It would also be considered disproportionate to use a means that is more than necessary in achieving the ends, thus, more harmful upon the constitutional right than needs be.

Also considered disproportionate would be using inappropriate means. Enough is enough, as more than enough or more than appropriate is out of proportion.[519] While this seems to make sense, the question that goes without a definitive answer is what metric is used when balancing or weighing up the applicable interest.[520] Justice Aharon Barak argues that a common denominator in the form of social importance exists and that the marginal significance that each interest has for society is required to administer the balancing principle.[521] This approach suggests that any interest that is protected by a right may be considered equivalent to the constitutional rights held by an individual – in such a situation, the interests of the majority will almost always take precedence over the interests of an individual or minorities.[522] The absence of the supremacy of Constitutional rights or its authority to take precedence over ordinary private interest would lead to the dissolution of constitutional value entirely. In fact, if

519 Schlink, B., 2012, 'Proportionality in Constitutional Law: Why Everywhere but Here', *Duke Journal of Comparative & International Law,* Vol 22(2), p 291–302.
520 Tsakyrakis (note 510 above).
521 Barak 2012 (note 6 above).
522 Tsakyrakis (note 510 above).

constitutional right's constitutional value were absolved, there would be no need for the principle of proportionality, supporting the vitality of the third sub step.

Even though proportionality *stricto sensu* purports the appearance of a complicated calculation with mathematical metrics that will always supply a correct outcome, the incommensurability of values and interests suggest that the principle is actually one of a simple structure. The interpreter will balance the interests based on the hierarchical status of the constitutional right and the severity of the infringement thereof, in correlation to the legitimacy of the need of the end and the consideration of the significance thereof in society. In theory, the higher the constitutional right's hierarchical status, the more important the proper purpose behind the limitation should be for it to be considered proportional. Similarly, the lesser the hierarchical status of the constitutional right is, the less substantial the proper purpose behind the limitation will have to be.[523] Another critique behind the principle of proportionality lies in the fact that the discretion of balancing lies solely with the interpreter. While, ideally, we would like to believe that it is possible for courts and judges to remain objective, "the balancing of rights, interests and values entailed in the analysis of appropriateness is unavoidably subjective."[524]

6.2. Proportionality in the *Semenya* Case

The doctrine of proportionality played a significant role in both the consideration and outcome of the *Semenya* case in the CAS and Swiss Federal Supreme Court, with both courts concluding that the DSD Eligibility Regulations met the requirements of

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523 Bendor, A., 2015, 'How proportional is proportionality?', *International Journal of Constitutional Law*, Vol 13(2), Available at: DOI: 10.1093/icon/mov028 (accessed on 05 February 2021).

524 Schlink (note 519 above).

limitation according to the principle of proportionality. Unfortunately, both courts seemed to erroneously place emphasis on only certain aspects of the principle of proportionality and ostensibly evading other aspects thereof.

In consideration of the first sub-step of the principle, it can be construed that the interpreter in the *Semenya* case was the Swiss Federal Supreme Court, the legislator was World Athletics, the end perused by the DSD Eligibility Regulations was fairness in sport and "preserving the integrity of female athletics",[525] and the means was "drug related lowering of the testosterone level"[526] of DSD athletes. As CAS concluded in its findings that testosterone provides an insurmountable competitive advantage to its holder, the Swiss Federal Supreme Court adopted the same finding as true and correct. In the context of this finding, enlisting medical sterilisation and/or testosterone limiting drugs to achieve the end result is, so to say, capable. Thus, the DSD Eligibility Regulation passes the first sub-step of adequacy. The second sub-step is where the decision-making process appears to go inherently wrong in the Swiss Federal Supreme Court's application of the principle of proportionality. The requirement of necessity should not be assumed to be an 'easy' hurdle to cross in proving proportionality as 'necessity' is, in fact one of the cornerstones of human rights law. As aforementioned, necessity requires the absence of "alternative measures that may similarly achieve that same purpose with a lesser degree of limitation".[527]

In its 2019 award in favour of World Athletics, the CAS panel by majority held that the DSD Eligibility Regulations are "necessary and reasonable" due to the measures

525 The Swiss Decision (note 503 above).
526 As above.
527 Ellis, E., 1999, 'The Principle of Proportionality in the Laws of Europe', *Hart Publishing*, p 117-144.

contained in the regulation allowing for "the minimum treatment invasion", that are "commonly prescribed" as a treatment for women to "reduce the level of testosterone".[528] Regrettably, neither the CAS panel nor the SFT council accurately grasped the essence of the requirement of necessity. Instead of satisfying themselves that the medical treatment required by the DSD Eligibility Regulations was not the most serious or most invasive measure that the regulation could have taken; therefore, necessity is present, the courts should have made an inquisition into whether any alternative measure exists that could achieve a similar result to the oral contraceptives with a lesser impact on the athletes' fundamental rights.

The risks of utilising oral contraceptives as a method of reducing testosterone levels should not have been downplayed by the courts, especially when such contraceptives are administered at a much higher dose than that of the intended use thereof by manufacturers as such risks can be fatal.[529] It is for this reason that the United Nations Human Rights Council held that "there is no clear relationship of proportionality between the aim of the regulations and the proposed measures and their impact".[530]

As a result of the CAS and the SFT's obscured application of the requirement of necessity in reaching its' decisions, it appears as if the courts accordingly omitted from satisfying the third sub-step of proportionality *stricto sensu*. Proportionality *stricto sensu* places emphasis on the "importance of achieving the proper purpose and the

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528 The CAS Award 2019 (note 18 above).

529 Savulescu, J., 2019, 'Ten ethical flaws in the Caster Semenya decision on intersex in sport', *The Conversation,* Available at: https://theconversation.com/ten-ethical-flaws-in-the-caster-semenya-decision-on-intersex-in-sport-116448 (accessed on 17 April 2021).

530 United Nations Human Rights Council, 2019, 'Promotion and protection of all human rights, civil, political, economic, social and cultural rights, including the right to development', *United Nations Human Rights Council* Fortieth session, agenda item 3, Available at: https://undocs.org/pdf?symbol=en/A/HRC/40/L.10/Rev.1 (accessed on 17 April 2021).

social importance of preventing the limitation on the constitutional right".[531] Although omitted, the compliance to the third sup-step could arguably lead to the DSD Eligibility regulations toughest encounter yet. It is, however, difficult to begin to conceptualise how World Athletics could possibly justify the concerns raised by the United Nations Human Rights Council related to the DSD Eligibility Regulations, in that it contravenes a substantial amount of "international human rights norms and standards, including the right to equality and non-discrimination, the right to the highest attainable standard of physical and mental health, the right to sexual and reproductive health, the right to work and to the enjoyment of just and favourable conditions of work, the right to privacy, the right to freedom from torture and other cruel, inhuman or degrading treatment and harmful practices, and full respect for the dignity, bodily integrity and bodily autonomy of the person."[532]

531 United Nations Human Rights Council (note 530 above).
532 United Nations Human Rights Council (note 530 above).

C H A P T E R 7

Will the European Court for Human Rights' Shed Light on the Fundamental Need to Reform Sports Justice?

SUMMARY

7.1. Introduction
7.2. An Internationally Diverse Perspective on Human Rights and Values
7.3. Limitations on the Rights of Female Athletes with DSD
7.4. The European Convention on Human Rights and The European Social Charter of 1961

7.1. Introduction

In considering the facts of the *Semenya* case, it is clear that the need for reform in sports justice is upon us, and it is more pressing than ever. Unless the right to fair sporting practice only extends its protection to those who fall within World Athlete's ideology of who qualifies as "female" and "male", fair sport should be available to all who wish to participate in it.

Sport plays a crucial part in our present society. It no longer only serves as a form of enjoyment for the players competing but has transformed into a multi-billion-dollar industry and extends into so many other industries, including marketing, advertising, corporate, sales, legal, education, medical, politics and even government. Stakes are high, and not only for the athletes competing. It goes without saying that when you mess with sport, you are messing with a large percentage of the world's population, qualifying sport as a rather important public interest. The need for protection of fair sport gave rise to the creation of sporting bodies and associations in order to ensure the protection of athletes and that no man – or woman – is unfairly celebrated in the

sporting industry. It came as no surprise that both the public and sporting associations were distressed when tabloids started purporting the possibility of males competing in the female category. The fear of having male athletes competing in the female category is a legitimate cause for concern, and it is crucial to protect the female category from diminishing into an 'alternative' category. Previous studies have concluded that male athletes enjoy a 10 to 12 % competitive advantage over female athletes, and thus the need for a female category is necessary should female athletes stand any chance of success in sport.[533]

With this said, the presumption that female athletes with DSD enjoys a competitive advantage over female athletes without DSD has been assumed but not documented. Contrary to the CAS findings and the Swiss Federal Supreme Court's decision to uphold such findings, more scientific evidence is required until the notion that a female athlete with DSD's naturally produced testosterone provides her with any form of competitive advantage can be undoubtedly certified. Until then, it cannot be seen as 'fair sporting practice' to ostracize females with DSD from competing in the female category of sport in the absence of an alternative category that is not male, and it certainly cannot be used as the bargaining tool to limit such athlete's fundamental right. An athlete is a human being first and foremost. No human being should be expected to ratify the automatic ceding of his/her fundamental rights in order to qualify for the protection of a private interest, in this case, the right of fair sporting practice.

With all other recourses available to them exhausted, female athletes with DSD turn to the European Court for Human Rights as their last resort to protect not only their

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533 Handelsman, D., Hirschberg, A., Bermon, S., 2018, 'Circulating Testosterone as the Hormonal Basis of Sex Differences in Athletic Performance', *Endocrine Reviews*, Vol 39, Available at: DOI 10.1210/er.2018-00020 (accessed 22 August 2022).

livelihoods but also their fundamental right to dignity. Considering the adversities faced by DSD athletes, the European Court for Human Rights might just be the best chance they may get. Notwithstanding the judgments passed down by the CAS and Swiss Federal Supreme Court, when analysing the European Court for Human Rights' approach to similar case law it becomes apparent that they do not take the infringement of human rights lightly. While examining the European Court for Human Rights past case law that dealt with forced sterilisation, two specific cases proved to be of particular importance. While *V.C. v. Slovakia*[534] has disconnected mitigating factors to that of the *Semenya* case, the European Court for Human Rights evaluated the interference of sterilisation on a person's integrity. In *V.C. v. Slovakia,* the complainant was a pregnant woman in labour who signed the public hospital's compulsory consent forms before she was permitted admission into the labour ward. Upon certain complications during the birth, the woman was sterilised. The woman claimed that, because she signed the paperwork under coercion while in labour and as such she did not understand to content thereof. The hospital claimed that the consent attained was sufficient and that the sterilisation was necessary as the women may not survive another pregnancy. Upon its evaluation of the facts, the court expressed that sterilisation in the absence of consent constituted a "major interference with a person's reproductive health status and bore upon many aspects of personal integrity", including the "requirement of respect for human freedom and dignity".[535] The court concluded that both Article 3 and Article 8 of the European Convention had been

534 European Court of Human Rights, *V.C. v. Slovakia*, Application no. 18968/07, Judgment of 08 November 2011, Available at: https://www.bailii.org/eu/cases/ECHR/2011/1888.html.

535 European Court of Human Rights, 2015, 'Thematic Report: Health-related issues in the case-law of the European Court of Human Rights', *Council of Europe*, Available at: https://www.echr.coe.int/Documents/Research_report_health.pdf (accessed on 10 February 2021).

substantively violated.[536] Article 3 of the European Convention emphasises the prohibition of torture, stating: "no one shall be subjected to torture or to inhuman or degrading treatment or punishment",[537] whereas Article 8 of the European Convention values the right of respect for private and family life, indicating that "no interference by a public authority with the exercise of this right" is permissible unless it is "in accordance with the law and is necessary in a democratic society".[538] While one could argue that the *Semenya* case is in the absence of "forced" sterilisation, the European Court for Human Rights' decision in *V.C. v. Slovakia* indispensably lays down its absolute disregard for sterilisation of a human being against his/her will.

Then came *Transgender Europe and ILGA-Europe v. the Czech Republic*, which that shares interchangeable merits to that of the *Semenya* case. Transgender Europe and ILGA-Europe approached the European Court for Human Rights in order to invalidate the Czech Republic's legislation that legally requires individual's wishing to change their gender identification status to be sterilised, on the basis that it is in breach of the 1961 European Social Charter.[539] In its deliberation, the court identified a inconceivable amount of case law, international opinions and legislation to assist it in its decision. The court maintains its position in its past judgments being that the "requirement to undergo sterilization or treatment involving a very high probability of

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536 *V.C. v. Slovakia* (note 534 above) 29.

537 Convention for the Protection of Human Rights and Fundamental Freedoms as amended by Protocols No. 11 and No. 14', *Council of Europe*, Available at: https://rm.coe.int/1680063765 (accessed on 10 February 2021).

538 Convention for the Protection of Human Rights and Fundamental Freedoms (note 537 above).

539 European Court of Human Rights, *Transgender Europe and ILGA-Europe v. the Czech Republic,* complaint No. 117/2015. ECHR 2018, Judgment of 15 May 2018, Available at: https://www.coe.int/en/web/european-social-charter/processed-complaints/-/asset_publisher/5GEFkJmH2bYG/content/no-117-2015-transgender-europe-and-ilga-europe-v-czech-republic?inheritRedirect=false#:~:text=The%20complainant%20organisations%2C%20Transgender%20Europe,provisions%20of%20the%201961%20Charter, (accessed on 10 February 2021).

sterilization applying to persons who wished to change their names and gender on their birth certificate to reflect their gender identity was a violation of the right to privacy as guaranteed by Article 8 of the European Convention".[540] Amongst the sources mentioned by the court were statements by the Commissioner for Human Rights, the United Nations, and the Inter American Court of Human Rights, who all respectively shared a similar opinion that the requirement of sterilisation, all be it surgically or hormonally, contravenes an individual's right to "bodily integrity", "human dignity", "privacy", "health" and "their right to found a family".[541]

The court reiterated its findings surrounding the utmost importance of dignity in relation to the right to health in prior case law, divulging that "human dignity is the fundamental value and indeed the core of positive European human rights law – whether under the European Social Charter or under the European Convention of Human Rights and [that] health care is a prerequisite for the preservation of human dignity".[542] The judgment expresses that the requirement to administer any kind of sterilisation "violates free consent" while further infringing upon physical integrity, human dignity and the right to protection of health. The court persisted that "any kind of medical treatment which is not necessary can be considered as contrary to Article 11".[543] The final judgment indicates an infringement of Articles 2, 3, and 8 of the European

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540 European Court of Human Rights, *A. P., Garçon and Nicot v. France,* Complaint No. 79885/12, 5247/13, 52596/13, ECHR 2017, Judgment of 6 April 2017, Available at: https://hudoc.echr.coe.int/spa#{%22itemid%22:[%22001-172913%22]} (accessed on 10 February 2021).

541 *Transgender Europe and ILGA-Europe v. the Czech Republic* (note 539 above).

542 European Court of Human Rights, *International Federation of Human Rights Leagues (FIDH) v. France*, Complaint No.14/2003. ECHR 2004, Judgment of 03 November 2004, Available at: https://hudoc.esc.coe.int/eng/#{%22sort%22:[%22ESCPublicationDate%20Descending%22],%22ESCDcIdentifier%22:[%22cc-14-2003-dmerits-en%22]} (accessed on 10 February 2021).

543 *Transgender Europe and ILGA-Europe v. the Czech Republic* (note 539 above).

Convention on Human Rights and ultimately concluded an adverse violation of Article 11 of the 1961 Charter.[544]

7.2. An Internationally Diverse Perspective on Human Rights and Values

As a principle praised globally, human rights are essential elements in striving towards lasting world peace. The protection thereof is thus of paramount importance and the reason for the establishment of the Universal Declaration of Human Rights. The UDHR emphasizes the international right not to be subjected to inhuman or degrading treatment and that no one shall be subjected to torture or to cruel, inhuman or degrading treatment or punishment.[545] The UDHR further proclaims that all human beings are "born free and equal in dignity and rights",[546] ultimately enforcing international protection upon all arbitrary interference against the right to privacy and attacks upon an individual's honour and reputation.[547] Even though the right to sporting practices may not be included in the UDHR itself, several international sports charters and Constitutions promote sport and physical activity as an essential factor in human development.[548] The development of sport specific charters ensures the protection and development of an ethical basis of sport that "promotes human dignity and safety

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544 Council of Europe, 1996, 'European Social Charter (Revised)', *Council of Europe*, ETS 163, Available at: https://www.refworld.org/docid/3ae6b3678.html (accessed on 18 February 2021) [hereinafter referred to as the 'European Social Charter'], Article 11 – The right to protection of health

> "With a view to ensuring the effective exercise of the right to protection of health, the Parties undertake, either directly or in co-operation with public or private organisations, to take appropriate measures designed inter alia:
> 1 to remove as far as possible the causes of ill-health;
> 2 to provide advisory and educational facilities for the promotion of health and the encouragement of individual responsibility in matters of health;
> 3 to prevent as far as possible epidemic, endemic and other diseases, as well as accidents."

545 Article 5 UDHR (note 100 above).

546 Article 1 UDHR (note 100 above).

547 Article 12 UDHR (note 100 above).

548 The European Sports Charter, 1992, *Council of Europe*, Article 1, Available from: https://rm.coe.int/16804c9dbb (accessed on 24 January 2019).

of those involved in sport, by safeguarding sport, sportsmen and women from exploitation for political, commercial and financial gain and from practices that are abusive or debasing including the abuse of drugs and the sexual harassment and abuse, particularly of children, young people and women."[549] This has led to an international standard of upholding human rights in sport, such as in the Olympic Charter and the World Athletics Constitution itself. The Olympic Charter refers to the practice of sport as a human right and that "every individual must have the possibility of practising sport, without discrimination of any kind and in the Olympic spirit, which requires mutual understanding with a spirit of friendship, solidarity and fair play."[550] Almost identically the World Athletics Constitution strives to "ensure that no gender, race, religious, political or other kinds of unfair discrimination exists, continues to exist; or is allowed to develop in athletics in any form, and that all may participate in athletics regardless of their gender, race, religious or political views or any other irrelevant factor."[551]

These international rights can be seen in several national constitutions. Canadian Constitutional law comes in the form of the *Canadian Charter of Rights and Freedoms*. For the purposes of this research paper, the focus is shifted to the Charter as passed by the Government of Quebec.[552] A clear fundamental right that is emphasized by way of repetition throughout the Charter is the integrity of a person. The integrity of a person

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549 The European Sports Charter (note 548 above).

550 Olympic Charter, 1983, 'Lausanne: Comité International Olympique 1982', Available at: https://stillmedab.olympic.org/media/Document%20Library/OlympicOrg/General/EN-Olympic-Charter.pdf#_ga=2.148366128.680479932.1618687577-114147422.1617093589 (accessed on 09 January 2021).

551 International Association of Athletics Federations Constitution, 2017, Available at: https://athletics.org.za/wp-content/uploads/2017/11/2019-IAAF-Constitution.pdf (accessed on 09 January 2021).

552 The Charter of Human Rights and Freedoms, 1977, *Les Publications du Québec,* Available at: http://legisquebec.gouv.qc.ca/en/showdoc/cs/C-12?langCont=en#ga:l_ii-gb:l_i-h1 (accessed 09 January 2019).

refers to the humanity of a person, essentially the life of that person. Such a right cannot be renounced, varied, or dictated by anyone other than the person themselves. Thus, the Charter does not make provision for the specificity of a person by way of reputation, profession, medical status or sex. Therefore, regardless of the fact that an individual may classify as an elite athlete with the inherited responsibility to uphold rights of fair sporting practices, that individual's life is first and foremost safeguarded by the Charter, including the health of that individual.[553] It further stipulates that, should the exercise of such right lead to exclusion or preference, discrimination exists.[554] When considering Canada's national legislation, the Government extends this fundamental protection of human life by way of the *Physical Activity and Sport Act.*[555] In particular, section 4(1) of the Act emphasizes that The Government of Canada has high regard for ethical standards and values in sport and makes provision for fair participation.[556] By establishing a regulation that makes simultaneous satisfaction of both the right to life and the right to fair participation virtually impossible, World Athletics is in direct contradiction to the Charter.

The Korean Constitution shows a high degree of commonality with the Canadian

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553 The Charter of Human Rights and Freedoms (note 552 above) Section 4:-
"Every person has a right to the safeguard of his dignity, honour and reputation."

554 The Charter of Human Rights and Freedoms (note 552 above) Section 10:-
"Every person has a right to full and equal recognition and exercise of his human rights and freedoms, without distinction, exclusion or preference based on race, colour, sex, gender identity or expression, pregnancy, sexual orientation, civil status, age except as provided by law, religion, political convictions, language, ethnic or national origin, social condition, a handicap or the use of any means to palliate a handicap.
Discrimination exists where such a distinction, exclusion or preference has the effect of nullifying or impairing such right."

555 Physical Activity and Sport Act, Government of Canada, 2003, Available at: https://laws-lois.justice.gc.ca/PDF/2003_2.pdf (accessed on 24 January 2019).

556 Physical Activity and Sport Act (note 555 above) Section 4(1):-
"The Government of Canada's policy regarding sport is founded on the highest ethical standards and values, including doping-free sport, the treatment of all persons with fairness and respect, the full and fair participation of all persons in sport and the fair, equitable, transparent and timely resolution of disputes in sport."

Charter in its elevation of the right to a high quality of life for all of its citizens.[557] The right to a high quality of life comes in the form of the fundamental right to happiness, which, if upheld, is believed to "contribute to lasting world peace and the common prosperity of mankind and thereby to ensure security, liberty and happiness" for the posterity of all, forever.[558] The Korean Constitution reassure all citizens of their human worth and dignity by guaranteeing this right to the pursuit of happiness at the hands of the State.[559] The high standard of happiness withheld in their Constitution is of such a nature that even if certain rights of citizens are not enumerated in the Constitution itself, that right will still not be neglected.[560] In this manner, the country takes upon itself and its government to classify and protect this fundamental right.[561] Sport has a unique link to the right of happiness in that it brings enjoyment and satisfaction to those participating in it, conferring a somewhat fundamental status to freedom of sports activities.[562] The extent of freedoms such as the freedom of sports stretches so far that the Korean Constitution has rendered it immune to any form of national or international limitation.[563] In light thereof, we can assume that rights and freedoms

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557 Constitution of the Republic of Korea, 12 July 1948, Available from: https://www.refworld.org/docid/3ae6b4dd14.html (accessed on 24 January 2019).

558 The Constitution of the Republic of Korea (note 557 above) Preamble.

559 The Constitution of the Republic of Korea (note 557 above) Article 10:-

"All citizens shall be assured of human worth and dignity and have the right to pursue happiness. It shall be the duty of the State to confirm and guarantee the fundamental and inviolable human rights of individuals."

560 The Constitution of the Republic of Korea (note 557 above) Article 37:-

"(1) Freedoms and rights of citizens shall not be neglected on the grounds that they are not enumerated in the Constitution.

(2) The freedoms and rights of citizens may be restricted by law only when necessary for national security, the maintenance of law and order or for public welfare. Even when such restriction is imposed, no essential aspect of the freedom or right shall be violated."

561 Panagiotopoulos, D P., 2013, 'Sports Law: Structures, Practice, Justice - Sports Science and Studies', *Hellenic Center of Research on Sports Law (HCRSL),* Available at: https://www.researchgate.net/publication/276205124_Sports_Law_Structures_Practice_Justice_Sports_Science_and_Studies/citations (accessed on 12 January 2019).

562 As above.

563 The Constitution of the Republic of Korea (note 557 above) Article 10.

associated with sports have a "character of civil liberties".[564]

The South African Constitution is woven with common threads to the fundamental rights as mentioned in both the Canadian Charter and the Korean Constitution. This is portrayed in the form of the right to security and control over a person's own body, as well as the right to have their dignity respected and protected, both of which have been infringed upon by the DSD Eligibility Regulations.[565] As one of merely two national legal systems that had primary *locus standi* against World Athletics' DSD Eligibility regulations for impeding on the rights of one of their athletes, the South African government had to make the decision whether to uphold its Constitution and stand by Olympian Caster *Semenya*, or shy away from the pressure and justify the breach as a fair limitation to her rights. With a lack of infrastructure to take on an international powerhouse such as World Athletics, history already proved the Indian Government unable to uphold its own Constitution, leaving Dutee *Chand* to fight her own battle. Fortunately, the South African government elected to support not only *Semenya* but DSD athletes globally in declaring the values of the DSD Eligibility Regulations unconstitutional on an international scale.

7.3. Limitations on the Rights of Female Athletes with DSD

Whilst the recent uproar of DSD athletes unquestionably came about as a result of *Caster Semenya*'s exclusion from female competition, the case has since turned into a campaign against the ostracization of DSD females – with *Semenya* standing as an advocate for all excluded female athletes with the DSD gene variant. The *Semenya*

564 Panagiotopoulos (note 561 above).

565 The Constitution of the Republic of South Africa, 1996, Available at: https://www.gov.za/documents/constitution-republic-south-africa-1996 (accessed on 24 January 2019).

case no longer refers to "*Caster Magodi Semenya v World Athletics*" but rather the entire DSD Community versus World Athletics. It has been established that the DSD Eligibility Regulation's requirement of sterilization, all be it by way of medical altercation or drug-related means, has a far more adverse impact on the lives of the affected athletes than initially considered by the CAS and the Swiss Federal Supreme Court. Although the requirement is not forced upon the athletes, non-adherence in this regard leads to the exclusion from elite competition, which for many means a loss of future income, and with reference to the *Transgender Europe and ILGA-Europe v. the Czech Republic* judgment, presents a violation of free consent.

The facts of the *Transgender Europe* and *Semenya* cases present to be ostensibly symmetrical, with both applicants appealing legislations requiring sterilization of an individual in order to achieve the elimination of discriminatory exclusion. Whereas Transgender Europe prayed for the abolition of the requirement of sterilization in order to legally change one's sex, *Semenya* similarly prays for the abolition of the requirement of sterilization in order to compete in elite competition. Unfortunately, even though it appears as if the cases should presumably share the same outcomes, the European Court for Human Rights will have to further investigate the *Semenya* facts than what was necessary in the *Transgender Europe* case. Due to its straightforward set of facts, the *Transgender Europe* case did not require much deliberation of facts or the application of the Doctrine of Proportionality. Changing one's legal sex stems from the right of free expression and free association, making it a protected interest that does not contravene upon public interests. The Czech Republic, therefore, had no defence to the existence of the legislation and the limitation upon the applicant's rights. In its unlikeness, the *Semenya* case involves a respondent that enjoys the validation of its defence by the CAS award. World Athletics

pleads the protection of public interest in fair sport and claims to do so by the 'least intrusive' manner, this being sterilization and/or oral contraceptives.

It is assumed that proper procedure would result in the European Court for Human Rights resorting to the application of the Principle of Proportionality in weighing up the affected interests in the *Semenya* case. However, before proportionality should take place, it is important that the facts of the case be reviewed. The Swiss Federal Supreme Court dismissed the review of the facts of the case due to its limited jurisdiction to do so. Fortunately for *Semenya*, and contrary to the Swiss Federal Supreme Court, the European Court for Human Rights bears the necessary jurisdiction affording it the ability to adjudicate on disputes and complaints regarding infringements of the European Convention for the Protection of Human Rights and Fundamental Freedoms, particularly in matters where civil rights are affected.[566]

7.4. The European Convention on Human Rights and The European Social Charter of 1961

As a final attempt to overturn the CAS panel's 2019 award reaffirming the existence of the DSD Eligibility regulations and its application, *Semenya* will strive to satisfy the European Court for Human Rights that the administration of said regulations violates not only the European Convention on Human Rights (hereinafter referred to as the referred to as the 'European Convention') but also the European Social Charter of 1961 (hereinafter referred to as the 'Social Charter'). While both charters share a commonality in their affirmation of afforded human rights, The European Convention

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566 European Court of Human Rights, 'European Human Rights System', *International Justice Rescource Center*, Available at: <https://ijrcenter.org/european-court-of-human-rights/#:~:text=The%20Court%20has%20jurisdiction%20to,principally%20concerns%20civil%20and%20political> (accessed on 18 February 2021).

provides an in-depth pronunciation of its rights, eliminating any possibility of ambiguity. Amongst many fundamental rights, *Semenya* will doubtlessly emphasise article two (right to life), three (prohibition of torture) and eight (right to respect for private and family life) in accordance with the *Transgender Europe and ILGA-Europe v. the Czech Republic* judgment. Article 2 of the European Convention ensured that "no one shall be deprived of his life intentionally" save when such deprivation "results from the use of force which is no more than absolutely necessary", including "in defence of any person from unlawful violence; in order to effect a lawful arrest or to prevent the escape of a person lawfully detained; in action lawfully taken for the purpose of quelling a riot or insurrection."[567] In addition to the prevention of deprivation, article 3 of the European Convention prohibits "inhuman or degrading treatment or punishment".[568] This all while article 8 of the European Convention affords individuals the right to respect for their private and family life as well as the insurance that public authority shall not interfere with such a right unless it is in "accordance with the law and is necessary for a democratic society in the interests of national security, public safety or the economic well-being of the country, for the prevention of disorder or crime, for the protection of health or morals, or for the protection of the rights and freedoms of others."[569] The Social Charter adds the "right to benefit from any measures enabling him to enjoy the highest possible standard of health attainable."[570]

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567 Council of Europe, 1952, 'European Convention on Human Rights', *Council of Europe Treaty Series 005 Strasbourg: Council of Europe*, Available at: https://www.echr.coe.int/documents/convention_eng.pdf (accessed on 10 February 2021) [hereinafter referred to as the 'European Convention].

568 The European Convention (note 567 above).

569 As above

570 Council of Europe, 1996, 'European Social Charter (Revised)' *Council of Europe,* ETS 163, Available at: https://www.refworld.org/docid/3ae6b3678.html (accessed on 18 February 2021) [hereinafter referred to as the 'European Social Charter'].

In its report written in advocation for the elimination of discrimination against women, the United Nations Human Rights Council noted its concerns that the implementation of the DSD Eligibility Regulations inevitably leads to the violation of the right not to be discriminated against. The council emphasises that the DSD regulations may impede on the human rights of female athletes affected by DSD, violating a multitude of fundamental rights including, but not limited to, "the right to freedom from torture and other cruel, inhuman or degrading treatment or punishment, the right to work and to the enjoyment of just and favourable conditions of work, the right to the highest attainable standard of physical and mental health, the right to sexual and reproductive health, the right of everyone to be free from arbitrary interference with their privacy, and the right to respect for the dignity, bodily integrity and bodily autonomy of the person."[571] Due to its findings, the council reminds states not only of their obligation to prevent the violation of human rights at all costs but also to ensure that should such violation take place; aggrieved individuals are granted access to effective remedies to alleviate such breach.[572] The abovementioned report concludes with the confirmation that a lack of "remediation of human rights abuses in sport" exists currently, "neither in general nor in terms of the equal rights of women and girl athletes specifically."[573]

Considering the UN's apprehension towards the DSD regulations, its adverse effect on human rights instils an unsettling consciousness in the UN. Should history make a habit of repeating itself, it is perpetuated that the administration of oral contraceptives for any means other than its intended use will inescapably result in the breach of human rights contained in both the European and Social Charters.

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571 The UN report 2020 (note 27 above).
572 The UN report 2020 (note 27 above).
573 As above.

C H A P T E R 8

Conclusion and Recommendations – Establishing Appropriate Rules and Regulations in Approaching DSD in Elite Competition

SUMMARY

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8.1. The Court of Arbitration for Sport's Award of 30 April 2019

In 2018, South African Olympian Caster *Semenya* and ASA put it to the CAS to permanently put an end to the generational battle of the sexes and who may or may not conform to the respective categories. Whereas *Semenya* pursued claims of discrimination, World Athletics asserted the principle of necessity. Ultimately the CAS panel accepted that, whereas the regulations are *prima facie* discriminatory, such discrimination is, in fact, necessary in order to maintain the distinctive male-female

categories in elite competition.[574] CAS confirmed that sex is not dependant on legal status nor gender identification, but rather on human biology, which is persistent of whether or not the physical traits which identify an individual as male or female are present or not. The distinction between the human biology of a male or female is found to be necessary in order to deem the insuperable advantages between the sexes as independent from one another.[575] Based on the newly conducted evidence presented by the World Athletics, known herein as the Bermon tests, the CAS panel decided that "endogenous testosterone is the primary driver of the sex difference in sports performance between males and females,"[576] and therefore, the regulations were indeed rendered necessary. Emphasis is placed on the fact that the regulations do not force athletes to have surgery in that testosterone levels can be controlled effectively by the use of conventional oral contraceptives.[577]

This thesis examined whether the CAS award of 30 April 2019, which led to the ineligibility of female athletes with differences in sexual development to compete in the female category of elite athletics unless their natural testosterone levels are restricted by way of medical intervention, correctly applied fact to law and whether such award is appropriate. A particular focus of this research was to examine whether the same result would be achievable if the Doctrine of Proportionality was correctly applied to the limitation of human rights caused by the DSD regulations.

After given due consideration to the scientifically proved impact of naturally occurring

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574 Court of Arbitration for Sport, 2019, 'Media release – Executive summary', *Court of Arbitration for Sport*, Available at: https://www.tas-cas.org/fileadmin/user_upload/CAS_Executive_Summary__5794_.pdf (accessed on 04 June 2019).

575 Media release – Executive summary (note 574 above).

576 As above.

577 As above.

levels of testosterone in the female category of the sporting industry, in line with the legitimacy of the Bermon tests, an adverse inference is drawn from the evidence relied upon. The CAS panel is found to have failed to acknowledge the inadequate quality of the medical tests relied on by the World Athletics, which forms the foundation of the DSD Eligibility Regulations. Instead, the CAS elected to exercise its authority by affirming World Athletics' speculation that no other known factor contributes to the performance advantage gap between males and females, and therefore it is accepted that "endogenous testosterone is the primary driver of the sex difference in sports performance between males and females".[578] The existing scientific evidence supporting such a statement is found to be flawed and singular in its findings. Additionally, by correcting their own findings Bermon *et al* solidified *Semenya*'s argument across the original CAS hearings, the appeal as well as the appeal in the Swiss Federal Supreme Court that the scientific basis for the regulations is unfounded. Further examination of the list of concerns as published by the CAS within its award regarding the application of the regulations revealed extensive infringements upon international human rights, standards, and norms. It is found that these limitations of human rights cannot be justified when applying the threefold test of the Doctrine of Proportionality.

For these reasons, this thesis finds irregularity in the CAS award dated 30 April 2019 in that a lack of a neutral consideration was given to fundamental fairness, poorly researched medical data, outdated testing techniques and irregular judgments made

578 Media release – Executive summary (note 574 above).

in support of collateral case law.

8.2. Transformation within Sports

This thesis argues against the legality of the World Athletics' DSD Eligibility Regulations and its consequences of the limitations of human rights. A consequential need for transformation exists within international sporting tribunals and its approach towards international human rights, standards and norms. As pointed out by the UN Council, even though domestic courts may have a more pronounced approach towards human rights-related disputes, their interference in international sporting rules may drive a wedge between the national sporting body and the international sporting body, placing national athletes in an uncomfortable position that may "jeopardize the ability of athletes to compete internationally".[579] Therefore, national federations and their athletes who wish to enrol or participate within the Olympic games accept the arbitrational clause entrusting the CAS with exclusive jurisdiction.

Regardless of the fact that neither the CAS Code nor the rules and regulations of international sporting institutions makes provision for international human rights, standards, norms or the appropriate tests required to justify the limitation thereof, the arbitrational clause effectively "shields the global sports system from regulation by national legal systems, which is where human rights are typically protected".[580] This will undeniably lead to controversial judgments as seen in the *Semenya* case.

At present, CAS awards may only be appealed to by the Swiss Federal Tribunal, whose review of the *Semenya* appeal showed that there is a need for an obligation on

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579 The UN report 2020 (note 27 above).
580 The UN report 2020 (note 27 above).

courts hearing human rights matters to affirm the legality of limitation of human rights. The absence of such a requirement on courts may result in an avoidance of liability as it is not mandatory to take on the responsibility to confirm that a limitation of human rights is justified as seen in the *Semenya* appeal.

The only other recourse available to the aggrieved party is to submit a claim in the European Court of Human Rights. While there have been several other sporting disputes referred to the European Court of Human Rights, not one specifically pertained to an athlete whose human rights have allegedly been infringed upon by international sporting institutions.[581] It remains unclear "whether, and under what conditions, the European Court could exercise jurisdiction in such cases thus remains largely untested".[582]

8.3. Recommendations

8.3.1. Pertaining to All Courts hearing Human Rights Matters

Any court that elects to hear human rights disputes should be held to the same standard as is true for Constitutional or Supreme Courts. It is proposed that this standard include that courts familiarise its judges/arbitrators with the international human rights standards and norms by "collecting and publishing data on the number and types of discrimination and abuse, specifically data disaggregated by race, gender and with attention to marginalized communities".[583] Additionally, it should be each court's primary goal to ensure the protection of human rights when matters concerning the limitation of human rights are heard. It is suggested that the threefold test of the

581 The UN report 2020 (note 27 above).
582 As above.
583 The UN report 2020 (note 27 above).

Doctrine of Proportionality be satisfied before a limitation can be affirmed. Any court failing to meet these perimeters should not have jurisdiction to hear human rights specific matters.

8.3.2. Pertaining to the DSD Regulations

Tucker states that:

> *"It would seem to me that had this been based on the quality of evidence, the integrity of the scientific process, and procedural integrity, rather than the biological concepts for testosterone and performance advantage when comparing biological males to females, the outcome arrived at would not be possible."*[584]

On the grounds that the regulations lack concrete scientific evidence, this thesis makes a proposal to World Athletics to revisit its DSD Eligibility Regulations. It has been established that World Athletics focused its DSD Eligibility Regulations strictly on a binary system formulated by the biological-essentialist theory. In the absence of the necessary scientific evidence and understanding of sex biology, such a binary system results in the exclusion of athletes based on an unpolished binary system.

This research agrees with World Athletics in that the need for specified categories within sports is necessary to protect vulnerable groups, however, it also concludes that sport should be inclusive. In order to achieve inclusivity, this study recommends that a binary system inclusive of an intersex and transgender category be adopted in sport regulations. This would achieve sex fluency in sport. The creation of two additional categories is the least intrusive solution to the binary problem in sport and would abolish the need for athletes to unduly medicate in order to be eligible to

584 Tucker (note 202 above).

compete in sports, elimination the limitation of human rights.

8.3.3. Pertaining to International Sport Governing Bodies

International sporting bodies are urged to establish a forum that will be responsible for reviewing all newly proposed rules and regulations within the sporting world. Same forum will be a party to the UN and thusly subjected to international human rights standards and norms in ensuring all sporting rules and regulations are in compliance thereof. Should a sport governing body wish to propose a new rule or regulation, such proposal will take the form of a Bill submitted to the forum, who will then be responsible for reviewing, revising and/or revoking such a Bill. The forum will equally be responsible for ensuring that sporting codes, constitutions, and/or charters of the all sport governing bodies provide aggrieved athletes with adequate remedies that are "equally accessible to all athletes regardless of resources and geographic location"[585] should their rights be violated. The establishment of such a forum would eliminate the existence of discriminatory regulations that would otherwise have "negative effects on athletes' rights, including those addressing athletes with intersex variations".[586] While such a forum is non-existent, national courts, as well as sport governing bodies themselves, should be held responsible for ensuring that all sporting rules and regulations are in compliance with international human rights standards and norms.

8.3.4. Kazan Action Plan (KAP)

In terms of the Kazan Action Plan (KAP):

> *"Gender equality and the empowerment of women and girls in and through sport are not only fundamental components of national and international sport policy but are also crucial factors*

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585 The UN report 2020 (note 27 above).
586 The UN report 2020 (note 27 above).

for good governance, and for maximizing the contribution of sport to sustainable development and peace."[587]

The need for reform in the governance of international sport is ever growing, especially in areas such as human right protection and the recourse against overreaching sport governing bodies. Uniformity amongst sport governing bodies in relation to human rights protection, specifically in relation to the eligibility regulations, is non-existent. For these reasons, suggestions have been made for a globally acknowledged "world sports governance agency" that would hold the responsibility of maintaining good governance within the national and international sporting realms.[588] Other suggestions place emphasis on the overload of discrimination currently faced by athletes by bidding for an "international anti-discrimination in sport unit" to unify sport governing bodies and their rules and regulations pertaining to discrimination within sports. As such, sport's governing bodies will answer to a higher power that may invoke sanctions and/or penalties for non-compliance.[589]

In 2017, UNESCO's Sixth International Conference of Ministers and Senior Officials Responsible for Physical Education and Sport adopted the Kazan Action Plan, a concept introduced to encourage international uniformity amongst legislators in the fields of physical education, physical activity and sport.[590] The KAP provides explicitly for the proposed establishment of a "global observatory for women and sport" in

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587 United Nations Educational, 2017, 'Scientific and Cultural Organization (UNESCO)'s Sixth International Conference of Ministers and Senior Officials Responsible for Physical Education and Sport, MINEPS VI, 2017, 'Kazan Action Plan'', *United Nations Educational, Scientific and Cultural Organization (UNESCO)*, Available at: https://en.unesco.org/mineps6/kazan-action-plan (accessed on 03 February 2021) [hereinafter referred to as the 'KAP'].

588 Arcioni, S., 2015, 'The creation of an independent body for the control of governance in sport worldwide', *Ethics and Governance in Sport*, p 75–83, Available at: https://doi.org/10.4324/9781315679501 (accessed on 01 February 2021).

589 Patel, S., 2015, 'Inclusion and Exclusion in Competitive Sport: Socio-legal and Regulatory Perspectives', *Routledge*, p 173, Available at: DOI: 10.4324/9781315775074 (accessed on 02 February 2021).

590 The KAP (note 587 above) Action 4.

stressing that good governance in sport is impossible "without gender equality and the empowerment of women and girls, and is vital "for maximizing the contribution of sport to sustainable development and peace."[591]

Such an observation would ensure fulfilment of essential values within sport governing bodies, including "accountability, transparent institutions, responsiveness, and inclusive procedures at all levels", while also promoting the representation of women within leadership positions in sport.[592] The KAP further recognizes the importance of protecting humans in sport and puts it to sport governing bodies to safeguard the protection of human rights in sport while particularly ensuring the rights of female athletes.[593]

This thesis supports the KAP's proposal to establish a "global observatory for women and sport" in inaugurating a higher authority that would essentially regulate and unify sport governing bodies as well as their rules and regulation.

8.4. Introducing vulnerability as an extension to Human Rights

The concept of the right to 'vulnerable groups' first made its appearance in European law when the European courts recognised that individuals forming part of vulnerable minorities consistently fell victim to the disadvantages in society and thus was in desperate need of special protection. Unfortunately, existing human rights law has not been modernised or developed in an appropriate manner to recognise a need for the special protection of vulnerable groups.[594] It is due to this lack of reform of human

591 The KAP (note 587 above) p 11.
592 The KAP (note 587 above) p 3.
593 The UN report 2020 (note 27 above).
594 Chapman, A. R., & Carbonetti, B., 2011, 'Human Rights Protections for Vulnerable and Disadvantaged Groups: The Contributions of the UN Committee on Economic, Social and Cultural Rights', *Human*

rights laws as well as the absence of supportive statutes that courts have been forced to invoke the vulnerability principle in recognising the dire need to protect disadvantaged minority groups in society. In doing so, courts have initiated the growth in universal human rights laws to constantly develop according to the needs of a modernised society, all while enhancing its own credibility.[595]

The concept of vulnerable groups, although uncommon, has been implemented internationally by courts for several decades up to date. This includes the formation of special protection and empowerment of previously disadvantaged social groups such as women, children, mentally disabled, minority races and the poor. This concept allows the court to ascertain between different means of inequality in a substantive manner, ultimately creating a link between vulnerability and human rights.[596]

Since its increased application in courts globally, the vulnerability principle has become popular for its devotion to protecting persons belonging to particular minorities of society.[597] These minority groups are formed by way of shared characteristics or belief systems amongst persons who face constant discrimination for their part in such collective and have been roughly summarised as to include "indigenous peoples, ethnic minorities, refugees, migrant workers, women, children, people with HIV/AIDS, persons with disabilities and older persons".[598]

Rights Quarterly, Vol *33*(3), p 682–732, Available at: http://www.jstor.org/stable/23015998 (accessed on 02 January 2022).

595 Chapman *et al* (note 594 above).

596 Peroni, L., & Timmer, A., 2013, 'Vulnerable groups: The promise of an emerging concept in European Human Rights Convention law', *The Oxford Journal*, p 1056-1085, Available at: https://doi.org/10.1093/icon/mot042 (accessed on 20 March 2017).

597 United Nations, 'International Norms and Standards Relating to Disability: Part V. Persons with disabilities and multiple discrimination - Rights of special groups' *United Nations*, Available at: https://www.un.org/esa/socdev/enable/comp500.htm (accessed on 02 January 2022).

598 United Nations (note 597 above).

8.4.1. Vulnerability from an African and European Point of View

The concept of vulnerability has recently blown up as a legal principle aimed at empowering vulnerable individuals or groups who have for many years succumbed to despair in connection to the discrimination they constantly face in society. In 2011 the African Commission on Human and Peoples' Rights (hereinafter referred to as the 'African Commission') promulgated the Principles and Guidelines on the Implementation of Economic, Social and Cultural Rights in the African Charter on Human and Peoples' Rights which is aimed at accentuating the principle of vulnerability as an extension of existing human rights.[599] It is argued that the concept of vulnerability in itself cannot be separated from human rights as vulnerability stems from the breach of individual human rights when a State fails to afford such individuals with the necessary protection. Human rights and human rights movements exist for that very reason, protecting those who are in absence of any other forms of protection.[600] The principality of vulnerability in human rights, although never exclusively mentioned in legal systems, has been present in both African and European case law, with reference dating back as far as the 1990s.

The conceptualisation of vulnerability as a human right has been present in European and African legal systems for years without acknowledgement being drawn to the term as a legal concept. Although earlier case law inclusive of the vulnerability concept exists, the 1995 judgment delivered in *Chapman v the United Kingdom*[601] is

599 Heikkilà, M.,& Mustaniemi-Laakso, M., 2020, 'Vulnerability as a human rights variable: African and European developments', *African Human Rights Law Journal*, Vol 20, No 2, p 777-798, Available at: http://dx.doi.org/10.17159/1996-2096/2020/v20n2a19 (accessed on 02 January 2022).

600 Heikkilà *et al* (note 599 above).

601 European Court of Human Rights, *Chapman v. The United Kingdom*, Application no. 27238/95, Judgment of 18 January 2001, Available at: https://www.bailii.org/eu/cases/ECHR/2001/43.html (accessed on 02 January 2022) [hereinafter referred to as the '*Chapman* case'].

considered as the pinnacle case leading to the development of the term 'vulnerability' and in gaining recognition as such. In *Chapman*, the applicant was a Gypsy and legal owner of a piece of land to be utilised as a caravan site. The UK authorities refused to grant the applicant with the necessary permission to site his caravan on the land, violating the applicants right to the prohibition of discrimination, in the view of the applicant, who would go on to claim that the UK authorities had an obligation to protect minority groups due to their 'vulnerability'.[602] Even though the appeal by Chapman was unsuccessful, the court recognised the likelihood of "future consensus amongst the member States of the Council of Europe regarding the special needs of minorities and an obligation to protect their security, identity and lifestyle, which may lead to a different outcome in similar cases" in light of the obligations by states upon minority groups as provided for in the Framework Convention for the Protection of National Minorities by the Council of Europe.[603]

The case of *V.C. v Slovakia* was previously discussed in line with the breach of Articles 3 and 8 of the European Convention through forced sterilization in the absence of consent of a Roma woman.[604] The same case, however, also identified the vulnerability of Roma women to concede to forced sterilisation due to the existing high birth rate Roma women achieve in relation to the local population.[605]

In the *Centre on Housing Rights and Evictions (COHRE) v. Italy* case the complainant, represented by the Centre on Housing Rights and Evictions (COHRE), alleged that the Roma and Sinti communities' fell victim to the violation of several rights held in the

602 The *Chapman* case (note 601 above).
603 The *Chapman* case (note 601 above).
604 *V.C. v. Slovakia* (note 534 above) p 29.
605 As above.

European Social Charter. This supposed breach consisted of an extensive list of rights, including "the right to adequate housing including forced eviction… mass expulsion of Roma migrant workers"; "the obligation of non-retrogressive measures/ progressive realization"; "the lack of protection and investigation of violence" and the "right to protection against poverty and social exclusion."[606] The application was founded on eviction action by the Respondent State that was allegedly targeted on specific groups of racial and ethnic minorities based in Italy. The court delivered a judgment confirming that the Respondent State was guilty of the aggravated violation of the rights held by vulnerable minorities in Italy and called upon both the European Committee of Social Rights and the Committee of Ministers of the Council of Europe to ensure that the decision was enforced accordingly.[607]

The concept of protection afforded to vulnerable minorities is a communal principle in African legal systems applicable to groups 'who have faced and/or continue to face significant impediments to their enjoyment of ... rights', such as women and children".[608] In *African Commission on Human and Peoples Rights v Republic of Kenya*[609] the principle was summoned by members of the Ogiek community, who, for generations have inhabited the Mau Forest, upon being issued with a thirty-day notice of eviction. The applicant relied upon the essentiality of the Mau Forrest to the

606 European Committee of Social Rights, *Centre on Housing Rights and Evictions (COHRE) v. Italy*, Complaint no. 58/2009, Decision of 8 December 2009, Available at: https://hudoc.esc.coe.int/eng/#{%22sort%22:[%22ESCPublicationDate%20Descending%22],%22ESCDcIdentifier%22[%22cc-58-2009-dmerits-en%22]} [hereinafter referred to as the 'Italian case'].

607 Italian case (note 606 above).

608 African Commission on Human and Peoples' Rights, African (Banjul) Charter on Human and Peoples' Rights, Adopted 27 June 1981, OAU Doc. CAB/LEG/67/3 rev. 5, 21 I.L.M. 58 (1982), Available at: https://www.achpr.org/legalinstruments/detail?id=49 (accessed on 02 January 2022).

609 African Commission on Human and Peoples' Rights, *African Commission on Human and Peoples Rights v Kenya*, Application no. 006/2012, AFCHPR 28; Judgment of 26 May 2017, Available at: https://africanlii.org/afu/judgment/african-court/2017/28 (accessed on 02 January 2022) [hereinafter referred to as the '*Ogiek community'* case].

continuity of the Ogiek's way of life and as such, the community considers itself as one and the same with the forest. Accordingly, the applicant suggested that the community, as an indigenous Kenyan tribe, should have been considered before the respondent decided to proceed with eviction steps.[610] The court supported the applicant's argument in that the respondent failed to account for the significant importance of the Mau Forest in preserving the culture of the Ogieks as a community indigenous to the respondent, concluding that, "due to their obvious vulnerability often stemming from their number or traditional way of life, indigenous populations even have, at times, been the subject and easy target of deliberate policies of exclusion, exploitation, forced assimilation, discrimination and other forms of persecution, whereas some have encountered extinction of their cultural distinctiveness and continuity as a distinct group".[611] In view of the above, the Court recognises the Ogieks as an indigenous population that is part of the Kenyan people having a particular status and deserving special protection deriving from their vulnerability.

Sharing similarity with the Kenyan *case*, *Open Society Justice Initiative v. Côte d'Ivoire*[612] also dealt with the suppression of vulnerable minorities by states. As one of the world's leading cocoa producers, Côte d'Ivoire thrived from the prosperity cocoa production brought upon its economy. This economic prosperity could be attributed to former President Félix Houphouët-Boigny's promotion of ethnic forbearance that allowed non-citizens to reside and conduct business within the country's borders. Upon Houphouët-Boigny's succession by Henri Konan Bédié as former president of

610 The *Ogiek community* case (note 609 above).
611 The *Ogiek community* case (note 609 above).
612 African Commission on Human and Peoples' Rights, *Open Society Justice Initiative v. Côte d'Ivoire*, Application no. 318/06, Available at: https://www.achpr.org/sessions/descions?id=228 (accessed on 02 January 2022) [hereinafter referred to as the '*Côte d'Ivoire* case'].

Côte d'Ivoire, however, political quarrels put an end to the ethnic tolerance policies that resulted in trade and citizenship regulations. Thusly, only Ivorian born individuals, born of two Ivorian citizens, would be classified as citizens and accordingly eligible to trade within the country.[613] This significant shift of policies resulted in possible unemployment and/or deportment of at least 30% of the Ivorian population, inclusive of those who were born in the country but who fail to meet the newly imposed regulations. The Complainant, as a member of the Dioula ethnic community who has resided within the country for generations, was removed from public office due to a challenge of his nationality in terms of the new policy change. The Commission confirmed that the new policy's denial of nationality constituted a violation of Article 15 of the Charter and further classifies the Diola ethnic group as a vulnerable group of Côte d'Ivoire in alignment with the discrimination they face in access to nationality.[614] It additionally recommended that the Republic of Côte d'Ivoire reconsider its birth registration system to provide for all ethnic groups within its borders.

In *Doebbler v Sudan*, the complainant was a member of an Ethiopian refugee group that fled to Sudan between the years 1980 and 1990 in avoidance of political unrest that resulted in violence.[615] In 1999, the Respondent together with the United Nations High Commission for Refugees (UNHCR) passed policies that rendered the complainant and all other Ethiopian refugees who took refuge in Sudan victims of forced repatriation.[616] The complainant alleges that members of the Ethiopian People's

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613 The *Côte d'Ivoire* case (note 612 above).

614 The *Côte d'Ivoire* case (note 612 above).

615 African Commission on Human and Peoples' Rights, *Doebbler v Sudan*, Communication No. 235/2000, ACHPR 103, Judgment of 25 November 2009, Available at: https://africanlii.org/afu/judgment/african-commission-human-and-peoples-rights/2009/103 (accessed on 02 January 2022) [hereinafter referred to as the '*Sudan* case'].

616 As above.

Revolutionary Party (EPRF) have become the Respondent state's "target of repression" through the 1999 decision taken by the Respondent State and the UNHCR that would result in the loss of employment and social assistance of all Ethiopian refugees in Sudan. In response to the Complainants plea, the African Commission concocted the applicant's point of view and nominated the Ethiopian refugees of Sudan as an "extremely" vulnerable group of individuals that have been deprived of their protection by the respondent State.[617]

The concept of vulnerability as a legal principle has since appeared in many other jurisdictions and legal systems besides that of the African or European descent, including Russia in the *Kiyutin v Russia* case.[618] Although born in the Uzbek Soviet Socialist Republic (SSR) of the Soviet Union, the Applicant received Uzbekistani citizenship upon the dissolution of the Union of Soviet Socialist Republics (USSR). The Applicant's brother attained property in Uzbekistan in 2002 to which the Applicant and his family relocated in the following year. While awaiting the outcome of his application for Russian residency, the Applicant married a Russian national and had a daughter. In terms of the requirements for a Russian residence permit, the Applicant was required to undergo a medical examination that returned an HIV positive result. Based on his HIV status, the Applicants application was denied, and an appeal was refused by the Oryol Regional Court. Concentrating on existing case law, the court determined a loose definition of vulnerable groups as minority groups who succumbed to differential treatment due to their "sex, sexual orientation, race or ethnicity or

617 The *Sudan* case (note 615 above).

618 European Court of Human rights, *Kiyutin v Russia*, Application no. 2700/10, Judgment of 10 March 2011, Available at: https://hudoc.echr.coe.int/Eng#{%22itemid%22:[%22001-103904%22]} (assessed on 02 January 2022) [hereinafter referred to as the '*Russian'* case].

disability".[619] The court further determined that individuals diagnosed with HIV fall within a particularly vulnerable group and, in the absence of reasonability, found that the Respondent State was guilty of unfair discrimination against a vulnerable group of individuals, violating both Article 14 and 8 of the European Convention.[620]

Considering the above, it seems appropriate to conclude that both the European and African courts' applications of the vulnerability principle are based on communal discrimination based on a particular group such as the Gypsy community of the UK or the Ogiek community of Kenya. The applicants in vulnerability cases hence stand as representatives of a broader community that suffer equivalent forms and degrees of discrimination to that faced by the applicant. To date, a composition of judgments in African and European case law has identified a vulnerability in the following groups, including children, victims of crime, refugees, HIV positive individuals, asylum seekers, women both with and without children, homeless persons, indigenous groups, and those suffering from disabilities and mental illnesses.[621] Given that the concept of vulnerability is globally accredited in its use, it remains unexplained why the UN or similar organisations have not advanced the concept to statute with a clear-cut definition. Some propose that regulatory bodies are still uncertain of the concepts' role or the absolute necessity thereof from a human rights point of view.[622] What is undebatable, however, is the positive impact that the vulnerable groups' principle has had on the lives of the most vulnerable groups of society and the fact that its removal

619 The *Russian* case (note 618 above).
620 The *Russian* case (note 618 above).
621 Heikkilà (note 599 above).
622 Heikkilà (note 599 above).

from court procedure would leave a void in the special protection desperately depended on by certain groups.

8.4.2. Defying a Robust Definition of 'Vulnerability'

Irrespective of the extensive list of case law concerning vulnerability and its application in the various legal systems, no definite definition has been identified by courts to ensure paralleled application amongst variant legal systems. The United Nations Committee on Economic, Social and Cultural Rights (CESCR) has expressed the importance of the incorporation of vulnerability in consideration of minority groups, however, fails to communicate a lucid definition of the concept.[623] In many cases courts are inclined to draw reverence to "particularly vulnerable groups" as opposed to the simplified concept of "vulnerable groups", suggesting that the term is defined by the particularity and severity of the vulnerable state suffered.[624] Additionally, the term is identified as one of a grouped nature in that the vulnerability is inherited by the status of all who fall within the spectrum of a particular group instead of individually. Despite this inherent definition of 'vulnerable groups', concerns have been raised regarding the absence of a robust interpretation of the principality. The complication of not determining a standard criterion in identifying which groups may be quantified as 'vulnerable' lies in the infrequent application or the likelihood of recurrent application even in inappropriate circumstances.[625]

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623 Chapman *et al* (note 594 above).

624 Peroni, L., & Timmer, A., 2013, 'Vulnerable groups: The promise of an emerging concept in European Human Rights Convention law'*, International Journal of Constitutional Law*, Vol 11, Issue 4, p 1056–1085, Available at: https://doi.org/10.1093/icon/mot042 (accessed on 02 January 2022).

625 Chapman *et al* (note 594 above).

Some argue that if every minority or disadvantaged group, such as "women, children, the elderly, aliens, people with disabilities or suffering from illnesses, people living in poverty, and people belonging to racial, ethnic, religious, or sexual minorities" are recognised as vulnerable by definition, collectively the vulnerable groups of society will compose the majority of any countries population.[626] This suggests that, by way of the very same definition, all who do not fall within a vulnerable group form a new minority group that arguably also qualify for vulnerability status. If all who live within the borders of a state qualify for special protection from the state, the concept of 'vulnerable groups' becomes futile.[627] Further apprehension related to the concept entails the CESCR's vague delineation of what protection is to be afforded to vulnerable groups as well as what measures must be taken to improve the disadvantage experienced by these minorities.[628]

Chapman *et al* recognises the above concerns, adding that, by placing the 'vulnerability' title on minority groups, courts may in actuality be accelerating the group's vulnerability by "essentialising, stigmatising, victimising, and paternalizing" them further.[629] While these concerns are noted, Chapman *et al* fully supports the application of the 'vulnerable groups' principle, arguing that none of the concerns raised should be problematic as long as each case is judged on its specific merits of vulnerability. The key to the successful application of the vulnerability concept thus lies with the courts to ensure that it is satisfied that extraordinary circumstances exist

626 Bossuyt, M., 2016, 'Categorical Rights and Vulnerable Groups: Moving away from the universal human being', *The George Washington International Law Review,* Vol 48, p 717 – 742, Available at: https://gwilr.org/wordpress/wp-content/uploads/2017/02/ILR-Vol-48.4_Marc-Bossuyt.pdf (accessed on 2 January 2022).
627 As above.
628 Chapman *et al* (note 594 above).
629 Chapman *et al* (note 594 above).

in establishing vulnerability status for both the minority group as well as the individual applicant in the instant case.[630] This naturally creates a twofold requirement test in order to call upon the vulnerability principle, one on an individual basis and the other collectively.[631] The Court is accordingly liable to safeguard the exceptional use of the 'vulnerable groups' concept as an extension of human rights disputes. This exclusivity will ensure that only the most vulnerable groups facing the harshest discrimination due to their vulnerability in society will be eligible to invoke vulnerability, eliminating the possibility of overuse. Another advantage of the twofold test is that it simplifies the court's vetting of vulnerability as it is only obligated to deliver judgment on the position of the minority group rather than focusing on the facts of the matter.[632]

Others suggest that two separate categories exist within the vulnerability principle being inherent vulnerability and situational vulnerability.[633] Inherent vulnerability arises by when characteristics innate to humanity naturally and unchangeably lead to vulnerability, for example, age, race, disability, sex and health. Whereas situational vulnerability arises from particular social standing like religion, and political orientation.[634] With such a wide array of vulnerability within society, the focus must be placed on the circumstances leading to the vulnerability of specific groups rather than groups that are merely considered vulnerable due to their inherited characteristics.[635] Applying the vulnerability principle in this manner could bypass the possibility of watering down the protection afforded to those who need it the most by avoiding automated vulnerability by association. Another tactic derived by the courts in their

630 Chapman *et al* (note 594 above).
631 As above.
632 As above.
633 Heikkilà *et al* (note 599 above).
634 As above.
635 As above.

attempt to avert watering down the principle is the unofficially claimed classification process of vulnerable groups.[636] In order to ascertain whether a specific social group can be classified as 'vulnerable', they must have experienced a considerable amount of discrimination in the past.

While the risk of overreaching exists, it is accepted that, should the courts correctly apply the vulnerability principle its increased use will prove beneficial in the development of substantive equality.[637]

8.4.3. Vulnerability to Female Athletes with DSD as Opposed to Females in Sport

Several years of invoking the vulnerability principality in courts have led to the specification of 'women' as a vulnerable group in need of protection. However, as above mentioned, overreaching the principle remains a risk that may lead to diminishing the effectiveness thereof. Although women have for generations faced constant scrutiny, exclusion and discrimination based on their gender group, they also make up 50% of the world's population and for this reason, should not be classified as a 'vulnerable' group per se.

Women, amongst other groups identified for facing discrimination, have enjoyed the recognition and protection from institutions such as the UN through its development of special regimes to help combat the injustices suffered, such as the Convention on the Rights of the Child and the Convention on all Forms of Discrimination against Women.[638] The Convention on the Elimination of All Forms of Discrimination against

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636 Peroni *et al* (note 624 above) p 12.
637 Chapman case (note 601 above).
638 United Nations, 'International Norms and Standards Relating to Disability: Part V. Persons with disabilities and multiple discrimination - Rights of special groups', *United Nations*, Available at: https://www.un.org/esa/socdev/enable/comp500.htm (accessed on 02 January 2022).

Women's preamble suggests that women in poverty are at the most vulnerable state within society, indicating that such women struggle with access to adequate health care, food, education and employment opportunities.[639] The Convention indicates that their unequal footing to men leads to discrimination and violates their human rights and respect for their dignity.[640] While the validity of the vulnerability of women in society subsists, many policies and programmes have been adopted in honour to combat the discrimination faced by women. Another such programme is the Copenhagen Declaration and Programme of Action, an initiative that commits its efforts to promote equality between men and women by advocating for "changes in attitudes, structures, policies, laws and practices in order to eliminate all obstacles to human dignity, equality and equity in the family and in society, and promote full and equal participation of urban and rural women and *women with disabilities* in social, economic, and political life, including in the formulation, implementation and follow-up of public policies and programmes…".[641] These existing protections relate to women as a collective, rendering them ineligible to qualify for further protection in terms of the vulnerability principle.

With that said, there are subgroups falling within the 'women' collective that remain susceptible to discrimination, despite the protection afforded to the female gender. This is specifically noticeable with the women who do not benefit in an equal fashion to the 'ideal' women of society, as can be seen in the *V.C. v Slovakia* case. In this case, amongst Italian local women, Roma women were frowned upon for their high

639 United Nations High Commissioner for Refugees, 1981, 'Convention on the Elimination of All Forms of Discrimination against Women', *United Nations*, Available at: https://www.ohchr.org/en/professionalinterest/pages/cedaw.aspx.

640 United Nations High Commissioner for Refugees (note 639 above).

641 United Nations, 1995, The Copenhagen Declaration and Programme of Action: World Summit for Social Development, *United Nations*, Available at: https://digitallibrary.un.org/record/204669?ln=en (accessed 02 January 2022).

fertility and childbearing statistics in relation to Italian locals and consequently succumbed to discrimination in the form of forced sterilization.[642] Roma women thus formed a vulnerable group within the women collective. Likewise, females with DSD (especially in the sports scene) do not have the privilege of enjoying special protection over and above the 'women' collective, often experiencing discrimination from their fellow female peers.

Based on the recent prejudice suffered by a number of female athletes with DSD, it is suggested that female athletes with DSD in particular should be classified as a vulnerable group and be afforded the necessary protection from courts accordingly.

This suggestion is warranted by the recent exposure of intimidation from bigger organizations such as World Athletics upon female athletes with DSD to refrain from competing. With limited, or in some cases, no knowledge of their rights, most of these athletes quietly disappear. It was only recently that Indian athlete *Dutee Chand* made the career defying pursuit to advocate against World Athletics in standing firm to protect her rights, as well as the rights of other female athletes with DSD. Since then, World Athletics' public identification of other female athletes with DSD has given rise to a prominent minority within the female category of elite competition.

In support of the notion that vulnerability vests not in a single individual alone, but rather in a wider social circumstance, it is proposed that vulnerability may be the ideal solution for the ill-treatment of DSD athletes and how courts should approach regulations pertaining thereto. DSD athletes are constantly susceptible to harm and

642 *V.C. v Slovakia* (note 534 above).

discrimination by society and for this reason, it is believed that courts should apply special protection and consideration to DSD cases.

8.5. Concluding Statement

In conclusion, this study has, throughout its assessment of DSD and the regulation of athletes with DSD in sport, made an original contribution to the understanding of the complex associations between human rights and sport and the absolute need for court intervention when fundamental rights are limited through sport regulations. This contribution is achieved by way of the study's findings, conclusion and recommendations.

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List of Legal Abbreviations

AIOWF	Association of International Olympic Winter Sports Federations
ANOC	Association of National Olympic Committees
ASOIF	Association of the Summer Olympic International Federations
BJSM	British Journal of Sport Medicine
CAS	Court of Arbitration in Sport
ECHR	European Convention on Human Rights
ECtHR	European Court of Human Rights
GAL	Global Administrative Law
IAAF	International Association of Athletics Federations
ICAS	International Council of Arbitration for Sport
IOC	International Olympic Charter
ISTUE	International Standard for Therapeutic Use Exemption
KAP	Kazan Action Plan
TUE	Therapeutic Use Exemption
UDHR	Universal Declaration of Human Rights
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNHRC	United Nations Human Rights Council
WADA	World Anti-Doping Agency

List of Medical Abbreviations

5-DIOL	17 β-diol
A4	Androstenedione
ARE	Androgen Response Elements
BMD	Bone Mineral Density
DNA	Deoxyribonucleic acid
DHEA	Dehydroepiandrosterone
DHT	Dihydrotestosterone
DSD	Differences of Sex Development
Etio-G	Etiocholanolone glucuronide
FAI	Free androgen index
GnRH	Gonadotropin-releasing hormone
hAR	Human Androgen Receptors
LBD	Ligand-binding domain
LBLMI	Lower body lean mass index
LMI	Lean Mass Index
NTD	N-terminal domain
PCOS	Polycystic ovary syndrome
PCR	Polymerase Chain Reaction
SHBG	Sex hormone binding globulin
T	Testosterone
TT	Total testosterone
UBLMI	Upper body lean mass index

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Declaration

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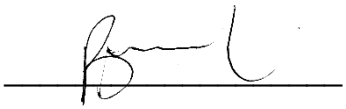
SIGNATURE OF STUDENT: 

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