

Response to the United Nations Human Rights Council's report on race and gender discrimination in sport:
An expression of concern, and a call to prioritise research

Blair R Hamilton^{1,3}, Maria Jose Martinez-Patiño⁴, James Barrett³, Leighton Seal³, Ross Tucker⁵, Theodora Papadopoulou^{6,7,8,9}, Xavier Bigard^{6,7,10}, Alexander Kolliari-Turner¹, Herbert Löllgen⁶, Petra Zupet⁶, Anca Ionescu⁶, Andre Debruyne^{6,7}, Nigel Jones^{11,12}, Juergen M. Steinacker^{6,7,13}, Karin Vonbank¹⁴, Giscard Lima^{1,15}, Federica Fagnani¹⁵, Chiara Fossati^{15,16}, Luigi Di Luigi^{7,15}, Fabio Pigozzi^{6,7,15,16}, Maurizio Casasco^{6,7,17}, Michael Geistlinger^{7,18}, Bernd Wohlfarth^{7,19}, Jane T Seto^{20,21}, Norbert Bachl^{16,7,22,23}, Richard Twycross-Lewis⁵⁰, David Niederseer²⁴, Andrew Bosch²⁵, Jeroen Swart^{7,25}, Demitri Constantinou^{7,26}, Borja Muniz-Pardos²⁷, José Antonio Casajus²⁷, Victoriya Badtieva^{7,28,29}, Irina Zelenkova^{27,28}, James L. J. Bilzon^{6,7,30}, Michiko Dohi^{7,31}, Christian Schneider^{7,32}, Sigmund Loland³³, Michele Verroken³⁴, Pedro Manonelles Marqueta³⁵, Francisco Arroyo^{7,36}, André Pedrinelli^{7,37}, Konstantinos Natsis^{6,7,38}, Evert Verhagen³⁹, William O Roberts^{7,40}, José Kawazoe Lazzoli^{7,41}, Rogerio Friedman⁴², Ali Erdogan^{7,43}, Ana V. Cintron^{7,44}, Shu-Hang Patrick Yung^{7,45}, Dina C Janse van Rensburg^{7,46}, Dimakatso A Ramagole^{7,46}, Sandra Rozenstoka^{6,7,47}, Felix Drummond^{6,7,48}, Nick Webborn⁴⁹, Fergus M Guppy^{1,2}, Yannis P Pitsiladis^{1,6,7,14}

¹ Collaborating Centre of Sports Medicine, University of Brighton, Eastbourne, UK

² Centre for Stress and Age-related Disease, University of Brighton, Eastbourne, UK

³ The Gender Identity Clinic Tavistock and Portman NHS Foundation Trust, London, UK

⁴ Faculty of Educational Sciences and Sports, University of Vigo, Galicia, Spain

⁵ World Rugby, Ireland

⁶ European Federation of Sports Medicine Associations (EFSMA), Lausanne, Switzerland

⁷ International Federation of Sports Medicine (FIMS), Lausanne, Switzerland

⁸ British Association Sport and Exercise Medicine, Doncaster, UK

⁹ Defense Medical Rehabilitation Centre (DMRC), Loughborough, UK

¹⁰ Union Cycliste Internationale (UCI), Aigle, Switzerland

¹¹ British Association Sport and Exercise Medicine, Doncaster, UK

¹² British Cycling and University of Liverpool, UK

¹³ Division of Sports and Rehabilitation Medicine, Ulm University Hospital, Ulm Germany

¹⁴ Department of Pneumology, Pulmonary Function Laboratory, Medicine Clinic (KIMII), University of Vienna, Vienna, Austria

¹⁵ Department of Movement, Human and Health Sciences, University of Rome "Foro Italico", Rome, Italy

¹⁶ Villa Stuart Sport Clinic, FIFA Medical Center of Excellence, Rome, Italy

¹⁷ Italian Federation of Sports Medicine (FMSI), Rome, Italy

35 ¹⁸ Unit International Law, Department of Constitutional, International and European Law. University of
36 Salzburg, Salzburg, Austria

37 ¹⁹ Department of Sports Medicine, Humboldt University and Charité University School of Medicine, Berlin,
38 Germany

39 ²⁰ Murdoch Children's Research Institute, The Royal Children's Hospital, Melbourne, VIC 3052, Australia

40 ²¹ Department of Paediatrics, University of Melbourne, The Royal Children's Hospital, Melbourne, VIC
41 3052, Australia

42 ²² Institute of Sports Science, University of Vienna, Vienna, Austria

43 ²³ Austrian Institute of Sports Medicine, Vienna, Austria

44 ²⁴ Department of Cardiology, University Hospital Zurich University Heart Centre, University of Zurich,
45 Zurich, Switzerland

46 ²⁵ Division of Exercise Science and Sports Medicine, University of Cape Town, Cape Town, South Africa

47 ²⁶ Centre for Exercise Science and Sports Medicine, University of the Witwatersrand, South Africa

48 ²⁷ GENU research group, Faculty of Sport and Health Sciences, Department of Physiatry and Nursing,
49 University of Zaragoza, Zaragoza, Spain

50 ²⁸ I.M. Sechenov First Moscow State Medical University (Sechenov University), Ministry of Health of
51 Russia, Moscow, Russian Federation

52 ²⁹ Moscow Research and Practical Centre for Medical Rehabilitation, Restorative and Sports Medicine,
53 Moscow Healthcare Department, Moscow, Russian Federation

54 ³⁰ Department for Health, University of Bath, Bath, UK

55 ³¹ Sport Medical Center, Japan Institute of Sports Sciences, Tokyo, Japan

56 ³² Orthopaedic Center Theresie, Munich, Germany

57 ³³ Institute of Sport and Social Sciences Norwegian School of Sport Sciences Oslo, Norway

58 ³⁴ Sporting Integrity Ltd, Stoke Mandeville, UK

59 ³⁵ Department of Sports Medicine, San Antonio Catholic University of Murcia, Murcia, Spain

60 ³⁶ FIMS Collaborating Center of Sports Medicine, Guadalajara, Mexico

61 ³⁷ Department of Orthopaedics, University of São Paulo Medical School, São Paulo, Brazil

62 ³⁸ FIMS Collaborating Centre of Sports Medicine, Thessaloniki, Greece

63 ³⁹ Amsterdam Collaboration on Health and Safety in Sports, Department of Public and Occupational Health,
64 Amsterdam UMC, Vrije Universiteit Amsterdam, Amsterdam Movement Sciences, Amsterdam, The
65 Netherlands

66 ⁴⁰ Department of Family Medicine and Community Health, University of Minnesota, Minneapolis, USA

67 ⁴¹ Biomedical Institute, Fluminense Federal University Medical School, Niterói, Brazil

68 ⁴² Universidade Federal do Rio Grande do Sul, Endocrine Unit, Hospital de Clinicas de Porto Alegre, Brazil

- ⁴³ Gloria Sports Arena, FIMS Collaborating Centre of Sports Medicine, Antalya, Turkey
- ⁴⁴ Puerto Rico Sports Medicine Federation, San Juan, Puerto Rico
- ⁴⁵ Asian Federation of Sports Medicine (AFSM), Hong Kong Center of Sports Medicine and Sports Science, Hong Kong
- ⁴⁶ Faculty of Health Sciences, University of Pretoria, Pretoria, South Africa
- ⁴⁷ FIMS Collaboration Centre of Sports Medicine, Sports laboratory, Riga, Latvia
- ⁴⁸ FIMS Collaboration Centre of Sports Medicine, Instituto de Medicina do Esporte, Porto Alegre, Brazil
- ⁴⁹ School of Sport and Service Management, University of Brighton, Eastbourne, UK
- ⁵⁰ School of Engineering & Materials Science, Queen Mary University of London, London, UK

Corresponding Author

Yannis P. Pitsiladis: y.pitsiladis@brighton.ac.uk University of Brighton, Eastbourne, UK.

ORCID iDs

Blair Hamilton: <https://orcid.org/0000-0001-7412-1188>

Maria José Martinez Patiño: <https://orcid.org/0000-0003-2721-9240>

Alexander Kolliari-Turner: <https://orcid.org/0000-0002-2469-7645>

Jürgen Steinacker: <https://orcid.org/0000-0001-8901-9450>

Fergus Guppy: <https://orcid.org/0000-0002-8526-9169>

Giscard Lima: <https://orcid.org/0000-0003-3781-952>

David Niederseer: <https://orcid.org/0000-0003-3089-1222>

Demitri Constantinou: <https://orcid.org/0000-0002-3363-7695>

Borja Muniz-Pardos: <https://orcid.org/0000-0002-9191-9033>

Christian Schneider: <https://orcid.org/0000-0003-4834-4382>

André Pedrinelli: <https://orcid.org/0000-0002-8499-7493>

Evert Verhagen: <https://orcid.org/0000-0001-9227-8234>

Rogério Friedman: <https://orcid.org/0000-0003-2802-4242>

Yannis Pitsiladis: <https://orcid.org/0000-0001-6210-2449>

Richard Twycross-Lewis: <https://orcid.org/0000-0001-9564-333X>

Author contributions

The first draft of the manuscript was written by Blair Hamilton, Fergus M Guppy and Yannis Pitsiladis. All authors commented on subsequent versions of the manuscript until all authors were able to approve the final manuscript.

103

104 **Declarations**

105 **Funding:** The writing of this manuscript was not funded.

106 **Conflict of Interest/Competing interests:** All authors declare that they have no conflict of interest or
107 competing interests.

108 **Ethics approval:** No ethics Approval was required for this manuscript.

Caster Semenya recently lost her appeal against the restriction of blood testosterone levels in female athletes [1] set by World Athletics [2, 3], requiring female athletes with “*Disorders of Sex Development*” (DSD)[4] to reduce their blood testosterone concentrations to <5 nmol/L for a period of at least six months, and then must maintain this lower blood testosterone continuously if they wish to remain eligible for events between 400 m and 1 mile. This outcome opposes resolution 40/5, on race and gender discrimination in sport published by the United Nations Human Rights Council (UNHRC) which calls for the regulations to be revoked [5].

The UNHRC [5] and World Medical Association [4] argue that World Athletics regulation [2], deny DSD women the right to participate in certain events unless they accept “*unnecessary medical intervention*”, and that athletes are being coerced into such treatment. The authors agree that there is currently no direct scientific evidence that DSD women athletes with higher testosterone levels have a performance advantage in sporting events between 400 and 1500 m [5]. This evidence will be difficult to obtain, given the low number of DSD athletes and the ethical considerations in such research. The principles that underlie a performance advantage as a result of biological differences created by male levels of testosterone have been argued by Handelsman *et. al.* [6] and are robust, but it is acknowledged that the evidence offered in support of the DSD policy creates a contradiction between the theory and evidence, since that policy requires hormonal control and applies to select events only. This selective ban is questionable, with athletes excelling in events at opposite ends of the restrictions such as American athlete Michael Johnson who held world records at 200 m and 400 m, as well as Herb McKenley, who won medals at 100, 200, and 400 m. Athletes have also performed at elite levels in the 1500 and 3000 m, the former of which is regulated by the policy, the latter is not.

Given the influence of high testosterone concentrations, there is concern that 6 months of testosterone suppression is not long enough to negate potential advantages from life-long exposure. There is growing support for the idea that development influenced by high testosterone levels may result in retained anatomical and physiological advantages [7]. One such inherent “*legacy*” effect may be the phenomenon of muscle memory [8], that has been defined as the ability to rebuild muscle mass and strength after a long intervening period of inactivity and muscle mass loss [9].

The debate over sporting fairness, highlighted by the UNHRC, is particularly pertinent in DSD athletes [1, 10-13]. The argument is that DSD athletes competing in female sports possess potentially unfair advantages created by high levels of testosterone [8, 14-19]. To have meaningful competition, our current opinion is that the much higher than the normal female range in circulating testosterone levels in DSD need to be

mitigated [17]. This action is intended to achieve a balance of fairness and safety while permitting inclusion, as reducing testosterone will reduce or eliminate the advantages conferred by androgens during puberty and development [20]. These measures are consistent with the idea that elite female competition forms a “*protected category*” with an entry that must be restricted by objective eligibility criteria.

How DSD athletes are integrated into sport will depend on the balance of three philosophical arguments - sporting fairness, safety and inclusion. The sporting fairness and safety arguments are that all athletes competing should have a chance to succeed and an injury risk which each athlete is prepared to accept. As competitors, athletes accept that a degree of unfairness is inherent to sport since the best performing athletes usually possess genetically mediated advantages like the greater height of an athlete in basketball [21, 22], or architecture of skeletal muscle that determines whether an individual has the potential to become a champion sprinter or marathon runner, but not both [22-24]. However, not all natural advantages are left unregulated or uncategorised. Rules have been created for weight and age categories to maintain fairness and for safety reasons. In the absence of such categories, sporting competitions may lose their meaning, rewarding factors such as maturity/age or size/mass, rather than the attributes that sport is intended to reward. The same is true of biological sex, necessitating the separation of those who lack the performance-enhancing effects of testosterone from those who benefit from it.

As advocates for sporting integrity and evidence-guided decision making in sport, we empathise with the viewpoint of the UNHRC. However, abandoning eligibility regulations by allowing athletes to self-identify into women’s sport risks setting a precedent for the integrity of sport, which would pose a health risk to women athletes when biologically male athletes compete in heavy contact sports such as boxing while posing a negligible safety risk to women in sports such as golf. In most running events, for instance, an advantage of 10-15% is often seen in biologically male athletes in comparison with biologically female athletes [25]. If a biologically male athlete self identifies as a female, legitimately with a diagnosis of gender dysphoria [26] or illegitimately to win medals [27], the athlete already possesses a physiological advantage that undermines fairness and safety. This is not equitable, nor consistent with the fundamental principles of the Olympic Charter [28] and could be a potential danger to the health and safety of athletes. These situations unequivocally demonstrate eligibility rules are necessary but as previously stated they need to be proportionate and evidence based.

Athletes need to be aware of the consequences and obligations of choosing to compete in a protected class and the decision to pursue the necessary therapy for eligibility in that class must belong with the athlete. If athletes are fully informed about the treatment requirements and consequences, they can make an informed

choice in what is best for them as individuals. As outlined by the UNHRC, the line between consent and coercion must not be blurred, athlete well-being must be the primary determinant of treatment and no athlete should be coerced into a choice that may harm their long term health. However, if an athlete is fully informed and consents, then it is their free choice to compete and free choice is a fundamental human right. If there were no eligibility rules, sport would lose its integrity and near-universal support, and as we have seen during the COVID-19 crisis, sport is much poorer without supporters. Without rules that are perceived as fair, sport will not engage the younger generation and likely negatively impact future participation rates in the female category, particularly with self-identification at the elite level.

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