
Consultation - Recommendations to the eligibility conditions for the Female Category

1. Preamble

Prior to adopting the current Eligibility Regulations for the Female Category (Athletes with Differences of Sex Development) ('the DSD Regulations') and the Eligibility Regulations for Transgender Athletes ('the TG Regulations') in March 2023, World Athletics ran a consultation process. The DSD and the TG Regulations were based on the science available at the time with the goal of maintaining a level-playing field in the Female Category. Preserving the integrity of competition in the Female Category is a fundamental principle of the sport of Athletics.

In March 2023, when the Council approved the current DSD and TG Regulations¹ it established a Working Group on Gender Diverse Athletes² charged with keeping abreast of developments in law, science, sports and society regarding gender diverse athletes. The Working Group's mission was to enable World Athletics to be thorough and considered about the implications of any such developments for its programming, eligibility rules, and educational initiatives as the organisation upholds its core commitments to its elite global community. The Working Group was additionally charged with providing advice and recommendations to the World Athletics Council on the following points:

- How Transgender and DSD athletes can compete in Athletics, including at elite level;
- How the TG Regulations impact transgender and other gender diverse athletes, and steps that can be taken to mitigate those impacts;
- How female gender affirming hormone treatment (GAHT) or testosterone suppression affects athletic performance.

In the course of its work through 2024, the Working Group learnt of key scientific developments that, in light of its core commitments to its elite global community, make it appropriate to amend the DSD and TG Regulations.³

Any new DSD and TG Regulations will be implemented with the following standing commitments:

- World Athletics does not judge or question gender identity;
- World Athletics respects and preserves the dignity and privacy of individuals;
- World Athletics strictly observes confidentiality obligations and complies with data protection laws;
- World Athletics never has and never would impose any obligation to undergo surgery.

¹ The 2023 regulations can be found on [the website](#).

² <https://worldathletics.org/news/press-releases/decisions-made-233rd-world-athletics-council-meeting-monaco>

³ The current DSD and TG Regulations are subject to periodic reviews to take account of any relevant scientific or medical developments allowing for amendments to be made from time to time as appropriate (Regulation 1.2).

2. Background to the Current Regulations

Both the Male Category and Female Category are central to how the sport is designed and structured.⁴ At the time of the 2019 regulatory revisions, following decades of research and observations from the field of play, the scientific knowledge supported the conclusion that 46 XY⁵ athletes who are androgen sensitive and produce male levels of testosterone have a significant performance advantage in Athletics, making it unfair for them to compete against 46 XX⁶ athletes who do not enjoy that advantage. It was also recognised that these principles apply equally to all androgen sensitive 46 XY athletes whose testosterone levels are outside the female range, including transgender women and XY DSD athletes.

The updated scientific knowledge provided with the consultation in early 2023 recognised several key points regarding the effects of testosterone suppression or female gender affirming hormone therapy (GAHT) on the physiology and athletic performance of 46 XY athletes.

Muscle Mass and Strength:

The evidence was that female GAHT in transgender women leads to a decrease in muscle mass. Despite this decrease, however, transgender women retained an advantage in muscle mass, volume, and strength over females after 12 months of GAHT. It was recognised that the time and extent of performance decrease, due to GAHT, are critical.

Muscle Performance:

Experimental data showed that female GAHT results in only slight changes in muscle performance. Pre-treatment differences in muscle strength and power between transgender women and females continued beyond 12 months of GAHT.

Athletic Advantage:

Athletics disciplines require muscle mass, strength, and power. It was recognised that transgender women are likely to retain an overall physical advantage after 12 months of testosterone-lowering treatment, even if serum testosterone levels were maintained below the then applicable 5 nmol/L threshold.

⁴ See Technical Rules 3.3 to 3.6 [available on the website](#). See C1.1 & C2.1.

⁵ Athletes with typical male chromosomes.

⁶ Athletes with typical female chromosomes.

Differences in the body:

Exposure to testosterone during male puberty results in sex differences in height, wingspan, pelvic and lower limb architecture (the quadriceps angle – i.e. how the thigh muscles align with the knee). It was recognised that these body differences provide XY athletes with an advantage, especially in certain events, and that the differences do not respond to suppression of blood testosterone levels in XY athletes after puberty. The extent to which these differences represent a persistent and unfair advantage in trained XY athletes on testosterone-lowering treatment was not well understood at the time, and it was recognised that further studies were necessary to better understand these advantages.

3. Key Developments since 2023⁷

Since the 2023 consultation and implementation of the current DSD and TG Regulations, through its Working Group on Gender Diverse Athletes, World Athletics has learnt the following:

- a. New evidence has clarified that testosterone suppression in 46XY DSD and 46XY transgender individuals can only ever partly mitigate the overall male advantage in the sport of Athletics.
- b. Evidence has accumulated that makes clear that an exclusive focus on male puberty is wrong:
 - i. New evidence clarifies that there is already an athletically significant performance gap before the onset of puberty. The childhood or pre-pubertal performance gap in the sport of Athletics specifically is 3 to 5% in running events, and higher in throwing and jumping events.
 - ii. New evidence establishes that athletic disadvantages associated with female body structure and physiology contribute to the performance gap.
- c. There is no new countervailing evidence that would suggest that transgender women and androgen sensitive XY DSD athletes are biologically different to each other in relation to the design and goals of the Female Category.
- d. There has been some opposition to testosterone suppression as a condition for eligibility in the Female Category.
 - i. Some XY DSD athletes and medical ethicists are concerned about the medical risk-benefit calculus for athletes with XY DSD who do not experience gender dysphoria and would not undergo treatment if it was not to comply with the sport's testosterone suppression requirements.

⁷ For the Working Group's Science Bibliography see Appendix 1.

- ii. Some human rights experts are concerned about the cost-benefit calculus of undergoing T suppression treatment, both medically and competitively, for XY DSD athletes.
- e. Some human rights experts have also become concerned about the human rights of female athletes. For example, the October 2024 Special Rapporteur’s report to the UN General Assembly was unambiguously *against* testosterone suppression requirements and expressly *supportive* of an exclusive Female category to protect female athletes’ rights to one-for-one equality and a level playing field. To address the rights of female athletes, the report recommends a “*dignified, swift, non-invasive and accurate sex screening method (such as a cheek swab) or, where necessary for exceptional reasons, genetic testing*”.
- f. Available surveys of both the general population and elite female athletes show strong opposition, either steady or growing, to XY athletes competing in the Female Category.⁸

4. Recommendations of the Working Group on Gender Diverse Athletes

Taking into consideration that (a) the key developments summarised immediately above, (b) World Athletics’ core commitments to its elite global community, including the fundamental principle of World Athletics to preserve the integrity of the Female Category, and (c) its charge from the Council to account for developments in law, science, sports, and society, the Working Group submitted the following five recommendations to Council.

Recommendation 1: Formally affirm the design of and goals for the Female Category.

This recommendation proposes that World Athletics affirm both its longstanding design for its Female Category as a space where XX athletes can compete only against each other, and its modern goals for its Female Category as:

- a. equality and fairness for female athletes,
- b. growing the commercial value of the category, and
- c. using the category as a vehicle to empower females within Athletics and throughout society.

⁸ Examples of surveys include: [New York Times January 2025](#) ; [BBC March 2024](#) ; [Journal of Sports Sciences April 2024](#) ; [Gallup June 2023](#) ; [Irish Independent July 2022](#).

Recommendation 2: Revise the eligibility regulations so that they are consistent with the design and goals.

This recommendation proposes that World Athletics revise the eligibility rules and regulations to be consistent with the design and goals affirmed in Recommendation 1, clarifying that:

- a. eligibility for its Female Category is restricted to athletes whose biological sex is female; and
- b. athletes whose biological sex is male should be ineligible for competition in its Female Category unless they are completely insensitive to androgens.

Recommendation 3: Merge the DSD and Transgender Regulations and, if the effect is to restrict opportunities for DSD athletes, adopt measures to address the reasonable reliance interests of those who are currently in the pipeline.

This recommendation proposes that, in its eligibility rules for the Female Category, World Athletics treat alike all androgen-sensitive XY athletes. The current TG Regulations exclude transgender women who have experienced male puberty, while the DSD Regulations provide that XY DSD athletes with the same experience are included.

The Working Group also proposes the adoption of measures to address any reasonable reliance interests DSD athletes may have as a result of new restrictions.

Recommendation 4: Adopt a pre-clearance requirement for all athletes competing in the Female Category.

This recommendation proposes that in advance of and as a pre-condition for any athlete's competition in the Female Category at elite level, World Athletics should be in possession of test results that establish their eligibility. The required test will be for the SRY gene and, if required, testosterone levels, either via cheek swab with any necessary follow-up or via dry blood spot analysis. In this context the SRY gene, which is almost always on the Y chromosome, is used as a highly accurate proxy for biological sex but makes room for an additional diagnostic process at the athlete's discretion.

Consistent with how it understood its twin charges to be mindful of World Athletics' core commitment to its elite global community and to focus on competition including at elite level, the Working Group used the term *elite level* to mean global competition, for example the World Championships, Olympic Games, Area Championships, and Diamond League events.⁹ It used the term *elite athlete* to mean an athlete who is eligible for competition at elite level by virtue of being ranked among the best in the world according to their age, biological sex, and skill.

If adopted, the effect of this recommendation would be to require every athlete who wishes to compete in the Female Category at elite level to provide evidence of eligibility to World Athletics once in their career.

⁹ Included are qualifying events for global competitions.

Recommendation 5: Consider forward initiatives, including to support elite gender diverse XY Athletes.

This recommendation proposes initiatives aimed at supporting all elite athletes, including gender diverse athletes, and at ensuring that World Athletics' eligibility rules are understood by all stakeholders and by the public.

The recommended initiatives would ensure that stakeholders and the public are educated about the sport's events and competition categories in general, with a focus on the Female Category, including on the reasons it exists and why the eligibility rules are necessary to meet World Athletics' goals.

The initiatives would also ensure that elite gender diverse athletes – those who, like all elite athletes, are among the best in the world according to their age, biological sex, and skill – are supported as they compete in their designated Categories.

Finally, the initiatives would ensure that World Athletics continues to monitor innovations in programming, to examine the viability of open or mixed-sex categories in out-of-stadium events, and to encourage other organisations with Athletics-related programming to be sex-based or sex-exclusive only when doing so is necessary to meeting their own institutional goals. The aspect of the sport of Athletics that is elite competition properly draws lines on the basis of biological sex, but the sport as a whole, for example at the non-elite and recreational levels, has a place for everyone.

5. Action by the World Athletics Council

In December 2024 the World Athletics Council approved the Working Group's recommendations and passed them on for stakeholder consultation.

6. Questions for Consultees

World Athletics is keen to consult with representatives of relevant stakeholders on the recommendations to the eligibility conditions for the Female Category. To that end, we look forward to receiving your responses to the following questions.

Please make clear in your responses if your answers apply to either XY DSD athletes or transgender athletes or both groups.

- a. How will the new eligibility conditions impact you or the interests of athletes with whom you are affiliated? We want to learn about both positive and negative impacts from all consultees.
- b. Are there ways to minimise or remedy the adverse impacts of the new eligibility conditions, such as approaches to addressing reasonable reliance interests or the type of support that could be offered as Athletes go through the testing and compliance processes?
- c. For the preclearance requirement, which requires that World Athletics have on file both the athlete's genetic and hormonal status, please share whether you have a preference between

(a) the cheek swab and (b) a dry blood spot test. The cheek swab would provide genetic information but not hormonal status and so would require follow-up in rare cases where the athlete is SRY positive. Dry blood spot tests can provide both genetic and hormone status.

- d. What is your sense of the public's understanding of the reasons athletes are divided in competition by sex?
- e. How can World Athletics best educate the public about its biological sex-exclusive design for the Female Category?
- f. Is there anything not mentioned in Recommendation 5 that the organisation can do to support transgender and DSD Athletes?
- g. Are there other athlete populations – in addition to gender diverse athletes – World Athletics should consider as it contemplates its programming?

7. How to Provide Your Feedback?

Please submit your answers to the questions above by completing this form: <https://forms.office.com/e/wFnU6UHSyt>

If you have difficulties completing the form you can send your answers to the questions above to: consultation@worldathletics.org by **18:00 (CET) on Wednesday 05 March 2025**.

We will confirm receipt of and review all feedback.

The results of the consultation concerning the eligibility conditions for the Female Category will be considered by the World Athletics Council at its next meeting at the end of March 2025.

APPENDIX 1

WORKING GROUP ON GENDER DIVERSE ATHLETES
SCIENCE BIBLIOGRAPHY
up to date as of 6 February 2025

This bibliography is designed to contribute to the fulfilment of the Working Group’s charge to understand and keep World Athletics up to date on scientific knowledge and developments relevant to the eligibility rules and regulations for the female category. It will continue to be updated from time-to-time as new relevant papers are published.

Afifi T, Barrack MT, Casey E, Huddle M, Kliethermes SA, Kraus E, Toresdahl BG, Wasfy MM, Tenforde AS. Infographic. Head to toe considerations for the postpartum endurance athlete. *Br J Sports Med* 58: 630–632, 2024. <https://doi.org/10.1136/bjsports-2023-107624>

Atkinson MA, James JJ, Quinn ME, Senefeld JW, Hunter SK. Sex Differences in Track and Field Elite Youth. *Medicine & Science in Sports & Exercise* 56: 1390–1397, 2024. <https://doi.org/10.1249/mss.0000000000003423>

Baker FC, Sibozza F, Fuller A. Temperature regulation in women: Effects of the menstrual cycle. *Temperature* 7: 226–262, 2020. <https://doi.org/10.1080/23328940.2020.1735927>

Bermon S. Androgens and athletic performance of elite female athletes. *Current Opinion in Endocrinology, Diabetes & Obesity* 24: 246–251, 2017. <https://doi.org/10.1097/med.0000000000000335>

Bermon S, Garnier PY, Hirschberg AL, Robinson N, Giraud S, Nicoli R, Baume N, Saugy M, Fénichel P, Bruce SJ, Henry H, Dollé G, Ritzen M. Serum Androgen Levels in Elite Female Athletes. *The Journal of Clinical Endocrinology & Metabolism* 99: 4328–4335, 2014. <https://doi.org/10.1210/jc.2014-1391>

Bermon S, Hirschberg AL, Kowalski J, Eklund E. Serum androgen levels are positively correlated with athletic performance and competition results in elite female athletes. *Br J Sports Med* 52: 1531–1532, 2018. <https://doi.org/10.1136/bjsports-2018-099700>

Bowman-Smart H, Savulescu J, O’Connell M, Sinclair A. World Athletics regulations unfairly affect female athletes with differences in sex development. *Journal of the Philosophy of Sport* 51: 29–53, 2024. <https://doi.org/10.1080/00948705.2024.2316294>

Brar TK. Effect of Different Phases of Menstrual Cycle on Heart Rate Variability (HRV). *Journal of Clinical and Diagnostic Research* 9(10): CC01–CC04, 2015. <https://doi.org/10.7860/jcdr/2015/13795.6592>

Consultation: 10 February – 05 March 2025

Brown GA, Shaw BS, Shaw I. Sex-based differences in track running distances of 100, 200, 400, 800, and 1500m in the 8 and under and 9–10-year-old age groups. *European Journal of Sport Science* 24: 217–225, 2024. <https://doi.org/10.1002/ejsc.12075>

Brown GA, Shaw BS, Shaw I. Sex-based differences in shot put, javelin throw, and long jump in 8-and-under and 9–10-year-old athletes. *European Journal of Sport Science* 25: e12241, 2025. <https://doi.org/10.1002/ejsc.12241>

Brown GA, Shaw BS, Shaw I. Sex-based differences in swimming performance in 10-years-old-and-under athletes in short course national competition. *European Journal of Sport Science* 25: e12237, 2025. <https://doi.org/10.1002/ejsc.12237>

Canadian Centre for Ethics in Sport. Transgender Women Athletes and Elite Sport: A Scientific Review [Online]. Published between 2011 and 2021. <https://cces.ca/sites/default/files/content/docs/2024-01/transgender-women-athletes-and-elitesport-a-scientific-review-en.pdf>

Davis SM, Kaar JL, Ringham BM, Hockett CW, Glueck DH, Dabelea D. Sex differences in infant body composition emerge in the first 5 months of life. *Journal of Pediatric Endocrinology and Metabolism* 32: 1235–1239, 2019. <https://doi.org/10.1515/jpem-2019-0243>

Gau C-C, Yao T-C, Gan S-T, Lin S-J, Yeh K-W, Chen L-C, Ou L-S, Lee W-I, Wu C-Y, Huang J-L. Age, gender, height and weight in relation to joint cartilage thickness among school-aged children from ultrasonographic measurement. *Pediatr Rheumatol* 19: 71, 2021. <https://doi.org/10.1186/s12969-021-00554-w>

Groeneveld JM, Ballering AV, Van Boven K, Akkermans RP, Olde Hartman TC, Uijen AA. Sex differences in incidence of respiratory symptoms and management by general practitioners. *Family Practice* 37: 631–636, 2020. <https://doi.org/10.1093/fampra/cmaa040>

Hamilton B, Brown A, Montagner-Moraes S, Comeras-Chueca C, Bush PG, Guppy FM, Pitsiladis YP. Strength, power and aerobic capacity of transgender athletes: a cross-sectional study. *Br J Sports Med* 58: 586–597, 2024. <https://doi.org/10.1136/bjsports-2023-108029>

Hamilton BR, et al. Integrating Transwomen and Female Athletes with Differences of Sex Development (DSD) into Elite Competition: The FIMS 2021 Consensus Statement. *Sports Med* 51: 1401–1415, 2021. <https://link.springer.com/article/10.1007/s40279-021-01451-8>

Handelsman DJ. Sex differences in athletic performance emerge coinciding with the onset of male puberty. *Clinical Endocrinology* 87: 68–72, 2017. <https://onlinelibrary.wiley.com/doi/10.1111/cen.13350>

Handelsman DJ. Toward a Robust Definition of Sport Sex. *Endocrine Reviews* 45: 709–736, 2024. <https://doi.org/10.1210/edrev/bnae013>

Consultation: 10 February – 05 March 2025

Handelsman DJ, Hirschberg AL, Bermon S. Circulating Testosterone as the Hormonal Basis of Sex Differences in Athletic Performance. *Endocrine Reviews* 39: 803–829, 2018.

<https://doi.org/10.1210/er.2018-00020>

Harper J, O'Donnell E, Sorouri Khorashad B, McDermott H, Witcomb GL. How does hormone transition in transgender women change body composition, muscle strength and haemoglobin? Systematic review with a focus on the implications for sport participation. *Br J Sports Med* 55: 865–872, 2021. doi: 10.1136/bjsports-2020-103106.

<https://bjsm.bmj.com/content/55/15/865>

Harper, J. *Sporting Gender: the History, Science, and Stories of Transgender and Intersex Athletes*. Rowman & Littlefield Publishers (2019) ISBN: 9781538112960 (hardback) / ISBN; 9781538112977 (e-book).

Hilton EN, Lundberg TR. Transgender Women in the Female Category of Sport: Perspectives on Testosterone Suppression and Performance Advantage. *Sports Med* 51: 199–214, 2021.

<https://doi.org/10.1007/s40279-020-01389-3>

Hunter SK, S. Angadi S, Bhargava A, Harper J, Hirschberg AL, D. Levine B, L. Moreau K, J. Nokoff N, Stachenfeld NS, Bermon S. The Biological Basis of Sex Differences in Athletic Performance: Consensus Statement for the American College of Sports Medicine. *Medicine & Science in Sports & Exercise* 55: 2328–2360, 2023. <https://doi.org/10.1249/MSS.0000000000003300>

Hunter SK, Senefeld JW. Sex differences in human performance. *The Journal of Physiology* 602: 4129–4156, 2024. <https://doi.org/10.1113/jp284198>

Iuliano-Burns S, Hopper J, Seeman E. The Age of Puberty Determines Sexual Dimorphism in Bone Structure: A Male/Female Co-Twin Control Study. *The Journal of Clinical Endocrinology & Metabolism* 94: 1638–1643, 2009. <https://doi.org/10.1210/jc.2008-1522>

Joyner MJ, Hunter SK, Senefeld JW. Evidence on sex differences in sports performance. *Journal of Applied Physiology* 138: 274–281, 2025. <https://doi.org/10.1152/jappphysiol.00615.2024>

Lanciotti L, Cofini M, Leonardi A, Penta L, Esposito S. Up-To-Date Review About Minipuberty and Overview on Hypothalamic-Pituitary-Gonadal Axis Activation in Fetal and Neonatal Life. *Front Endocrinol* 9: 410, 2018. <https://doi.org/10.3389/fendo.2018.00410>

Levine BD, Joyner MJ, Keith NR, Baggish AL, Pedersen BK, Schmidt W. The Role of Testosterone in Athletic Performance, *Duke Law Center for Sports Law & Policy*, January 2019, https://law.duke.edu/sites/default/files/centers/sportslaw/Experts_T_Statement_2019.pdf

LoMauro A, Aliverti A. Sex differences in respiratory function. *Breathe* 14: 131–140, 2018.

<https://doi.org/10.1183/20734735.000318>

Consultation: 10 February – 05 March 2025

Lundberg TR, Tucker R, McGawley K, Williams AG, Millet GP, et al. The International Olympic Committee framework on fairness, inclusion and nondiscrimination on the basis of gender identity and sex variations does not protect fairness for female athletes. *Scandinavian Med Sci Sports* 34: e14581, 2024. <https://doi.org/10.1111/sms.14581>

McLarnon M, Thornton J, Knudson G, Jones N, Glover D, Murray A, Cummings M, Heron N. A Scoping Review of Transgender Policies in the 15 Most Commonly Played UK Professional Sports. *IJERPH* 20: 3568, 2023. <https://doi.org/10.3390/ijerph20043568>

Medina-Gomez C, Heppe DH, Yin J-L, Trajanoska K, Uitterlinden AG, Beck TJ, Jaddoe VW, Rivadeneira F. Bone Mass and Strength in School-Age Children Exhibit Sexual Dimorphism Related to Differences in Lean Mass: The Generation R Study. *Journal of Bone and Mineral Research* 31: 1099–1106, 2016. <https://doi.org/10.1002/jbmr.2755>

Imbrisevic, M, et al. When Ideology Trumps Science, A response to the Canadian Centre for Ethics in Sport’s Review on Transwomen Athletes in the Female Category.” *Nordic Sports Science Forum*, Vol. 11, pp. 1-18 (2022). <https://philpapers.org/rec/IMBWIT>

Nokoff NJ, Scarbro SL, Moreau KL, Zeitler P, Nadeau KJ, Reirden D, Juarez-Colunga E, Kelsey MM. Body Composition and Markers of Cardiometabolic Health in Transgender Youth on Gonadotropin-Releasing Hormone Agonists. *Transgender Health* 6: 111–119, 2021. <https://doi.org/10.1089/trgh.2020.0029>

Nuzzo, J. Sex Differences in Grip Strength from Birth to Age 16. Posted by Author Preprint Server, August 2024, <https://doi.org/10.51224/srxiv.441>

Pataky MW, Dasari S, Michie KL, Sevits KJ, Kumar AA, Klaus KA, Heppelmann CJ, Robinson MM, Carter RE, Lanza IR, Nair KS. Impact of biological sex and sex hormones on molecular signatures of skeletal muscle at rest and in response to distinct exercise training modes. *Cell Metabolism* 35: 1996-2010.e6, 2023. <https://doi.org/10.1016/j.cmet.2023.10.010>

Patel J, Chen S, Katzmeyer T, Pei YA, Pei M. Sex-dependent variation in cartilage adaptation: from degeneration to regeneration. *Biol Sex Differ* 14: 17, 2023. doi: 10.1186/s13293-023-00500-3. <https://doi.org/10.1186/s13293-023-00500-3>

Peek K, Ford KR, Myer GD, Hewett TE, Pappas E. Effect of Sex and Maturation on Knee Extensor and Flexor Strength in Adolescent Athletes. *Am J Sports Med* 50: 3280–3285, 2022. <https://doi.org/10.1177/03635465221118081>

Renault CH, Aksglaede L, Wøjdemann D, Hansen AB, Jensen RB, Juul A. Minipuberty of human infancy – A window of opportunity to evaluate hypogonadism and differences of sex development? *Ann Pediatr Endocrinol Metab* 25: 84–91, 2020. <https://doi.org/10.6065/apem.2040094.047>

Consultation: 10 February – 05 March 2025

Ripoll JG, Guo W, Andersen KJ, Baker SE, Wiggins CC, Shepherd JRA, Carter RE, Welch BT, Joyner MJ, Dominelli PB. Sex differences in paediatric airway anatomy. *Experimental Physiology* 105: 721–731, 2020. <https://doi.org/10.1113/ep088370>

Roberts TA, Smalley J, Ahrendt D. Effect of gender affirming hormones on athletic performance in transwomen and transmen: implications for sporting organisations and legislators. *Br J Sports Med* 55: 577–583, 2021. <https://doi.org/10.1136/bjsports-2020-102329>

Rohayem J, Alexander EC, Heger S, Nordenström A, Howard SR. Mini-Puberty, Physiological and Disordered: Consequences, and Potential for Therapeutic Replacement. *Endocrine Reviews* 45: 460–492, 2024. <https://doi.org/10.1210/endrev/bnae003>

Rohrer D. Researcher bias and the enduring gap between the world’s fastest men and women. *Front Physiol* 15: 1360731, 2024. <https://doi.org/10.3389/fphys.2024.1360731>

Senefeld JW, Hunter SK. Hormonal Basis of Biological Sex Differences in Human Athletic Performance. *Endocrinology* 165: bqae036, 2024. <https://doi.org/10.1210/endocr/bqae036>

Snijders T, Aussieker T, Holwerda A, Parise G, Van Loon LJC, Verdijk LB. The concept of skeletal muscle memory: Evidence from animal and human studies. *Acta Physiologica* 229: e13465, 2020. <https://doi.org/10.1111/apha.13465>

Special Rapporteur on violence against women and girls, its causes and consequences. Review of A/79/325: *Report of the Special Rapporteur on Violence against Women and Girls, Its Causes and Consequences - Violence against Women and Girls in Sports Published 27 August 2024. Www.ohchr.org. www.ohchr.org: United Nations Human Rights Office of the High Commissioner.* <https://www.ohchr.org/en/documents/thematic-reports/a79325-report-special-rapporteur-violence-against-women-and-girls-its>

Tucker R, Hilton EN, McGawley K, Pollock N, et al. Fair and Safe Eligibility Criteria for Women’s Sport. *Scandinavian Med Sci Sports* 34: e14715, 2024. <https://doi.org/10.1111/sms.14715>

Zhang F, Bi C, Yin X, Chen Q, Li Y, Liu Y, Zhang T, Li M, Sun Y, Yang X. Physical fitness reference standards for Chinese children and adolescents. *Sci Rep* 11: 4991, 2021. <https://doi.org/10.1038/s41598-021-84634-7>