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Reply to Williams et al: Fair and Safe Eligibility Criteria for Women's Sport

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Abstract

N/A

Body text

We thank Williams and colleagues (1) for recent comments reiterating our concerns about targeted sex verification based on allegation and suspicion, which motivated our initial submission (2). It was intended as a first proposal for more *ethical* and *equitable* regulation of eligibility for women's sport, and we welcome the confirmation that several of the Williams et al. authors concur that the International Olympic Committee's (IOC's) Framework does not protect fairness for female athletes.

In Lundberg et al. (3), we (including authors from Williams et al.) explained that developmental androgenisation, driven by testes-derived testosterone, underpins male athletic advantage, necessitating sex-based categories in sport. We further argued that the IOC's 'no presumption of advantage' (4) is logically flawed and that exclusion of a presumed male performance advantage should be the default position.

Williams et al. appear to apply a 'no presumption of advantage' principle to athletes with XY DSDs, when evidence shows that athletes with certain XY DSDs have (5,6):

- a) male gonads (testes) and testosterone levels within the male range;
- b) sensitivity to male-range testosterone, driving developmental androgenisation;
- c) a prevalence 140 times higher in female sports than in the general population; and
- d) performance that is reduced with testosterone suppression.

It thus follows that athletes with these XY DSDs hold male performance advantages. Since many authors of the commentary have acknowledged that male performance advantages result from developmental androgenisation (3), that androgenisation is a feature of certain XY DSDs (7), and that male androgenisation justifies ineligibility in a protected female category (3), Williams et al.'s rejection of our proposal as unjustified on scientific grounds is contradictory.

Williams et al. inappropriately 'strawman' our position to criticise an assumed screening of minors. Our proposal does not advocate for this, nor do we set a target age. Rather, we believe eligibility screening should occur early enough in an athlete's career to protect their privacy and dignity and avoid the ethical failures of the past (8).

Furthermore, Williams et al. overlook the reality that sex verification procedures are already used in many sports, but routinely applied in an *ad hoc* manner that lacks standardisation and is targeted based on suspicion. Notably, World Aquatics have introduced a cohort-wide requirement for athletes to certify their chromosomal sex to meet international eligibility. We are not, then, proposing novelty, but arguing for a more *ethical approach* that improves fairness and equitable treatment of all athletes. Maintaining the status quo enables the problems we have already seen to persist, and *will continue to result in significant harm to athletes*.

We propose that atypical screen results prompt immediate referral to clinical specialists, who typically conduct extensive anatomical, genetic and endocrinological tests within established medical workflows to secure a diagnosis (9). As this “standard medical care” is beyond the remit of sports federations, it is clinical specialists who must address the ethical challenges of delivering “invasive” and “potentially humiliating” care. As a final point on ethics, also misleading is Williams et al.’s characterisation of screening as a coercive offer. Were this true, it would rule out eligibility or doping tests of any kind.

Williams et al. raise concerns that cohort-wide sex screening would be costly and impractical. However, technological advances mean a simple sex screen would be inexpensive, require minimal equipment and could be completed in under 60 minutes. Implementation could be stratified and phased appropriately to spread cost, as has already been done in anti-doping programs.

As we noted (2), cohort-wide screening is supported by 82% of female athletes (8), and ultimately, sport organisations have a duty to respect the internationally-recognised human rights of girls and women to equality and non-discrimination in sport on the basis of sex (10). We look forward to constructive discourse between scientists, sports associations, and other key stakeholders on this topic, including proposals from Williams et al. for alternative approaches that protect the integrity of female sport. We believe that a broader screening process with follow-up examinations in rare cases is scientifically-sound, ethically-justifiable and operationally-feasible.

Ethics Statement

The authors have nothing to report.

Conflicts of Interest

The authors would like to make a joint conflict of interest statement in which we declare the following: Several authors have received payment to provide expert testimony related to this topic. Several authors have received payment for their consultancy work with sports organizations and/or companies. Several authors have received travel and accommodation expenses for speaking engagements related to this topic. Several authors have spoken in the mainstream media on this topic. Three authors (E.N.H., C.D., and J.P.) are unpaid advisors to advocacy organizations.

Data Availability Statement

The authors have nothing to report.

References

- 1) Williams A, Heffernan S, Herbert A et al. Fair and safe eligibility criteria for women's sport: The proposed testing regime is not justified, ethical or viable. *Scandinavian Journal of Medicine & Science in Sports*. 2024.
- 2) Tucker R, Hilton EN, McGawley K, et al. Fair and safe eligibility criteria for women's sport. *Scandinavian Journal of Medicine & Science in Sports*. 2024;34(8):e14715.

- 3) Lundberg TR, Tucker R, McGawley K, 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 Journal of Medicine & Science in Sports*. 2024;34(3):e14581.
- 4) Martowicz M, Budgett R, Pape M, et al. Position statement: IOC framework on fairness, inclusion and non-discrimination on the basis of gender identity and sex variations. *Br J Sports Med*. 2023; 57(1): 26-32. doi:10.1136/bjsports-2022-106386
- 5) Handelsman DJ. Toward a robust definition of sport sex. *Endocrinology Reviews*. 2024;45(5):709-736.
- 6) Bermon S. Androgens and athletic performance of elite female athletes. *Current Opinion in Endocrinology & Diabetes and Obesity*. 2017;24(3):246-251.
- 7) Stebbings GK, Herbert A, Heffernan SM, et al. The BASES Expert Statement on Eligibility for Sex Categories in Sport: DSD Athletes. *The Sport and Exercise Scientist*. 2021;68.
- 8) Elsas LJ, Ljungqvist A, Ferguson-Smith MA, et al. Gender verification of female athletes. *Genetics in Medicine*. 2000;2(4):249-254.
- 9) Cools M, Nordenström A, Robeva R, et al. Caring for individuals with a difference of sex development (DSD): a Consensus Statement. *Nature Reviews Endocrinology*. 2018;14(7):415-429.
- 10) Alsalem R. Report of the Special Rapporteur on violence against women and girls, its causes and consequences - Violence against women and girls in sports [online]. *United Nations*. 2024;A/79/325. <https://www.ohchr.org/en/documents/thematic-reports/a79325-report-special-rapporteur-violence-against-women-and-girls-its> [last accessed 8th October 2024].