EXHIBIT A

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MINNESOTA

Female Athletes United,

Plaintiff,

v.

Keith Ellison, in his official capacity as Attorney General of Minnesota; **Rebecca Lucero,** in her official capacity as Commissioner of the Minnesota Commission on Civil Rights; **Erich Martens,** in his official capacity as Executive Director of the Minnesota State High School League; **Willie Jett,** in his official capacity as the Minnesota Commissioner of Education; **Independent School District No. 11 School Board; Independent School District No. 192 School Board; Independent School District No. 279 School Board,**

Defendants.

Case No. 0:25-cv-02151-ECT-DLM

Expert Rebuttal Declaration of Gregory A. Brown, Ph.D.

I, Gregory A. Brown, Ph.D., pursuant to 28 U.S. Code § 1746, declare under penalty of perjury under the laws of the United States of America that the facts contained in my attached expert report are true and correct to the best of my knowledge and belief, and that the opinions expressed therein represent my own expert opinions.

Executed on: August 12, 2025

Gregory A. Brown, Ph.D.

EXPERT REBUTTAL DECLARATION OF GREGORY A. BROWN, Ph.D., FACSM

I, Gregory A. Brown, declare as follows:

1. I submitted an initial declaration to this Court dated May 12, 2025.

2. I now submit this expert rebuttal declaration based on my personal knowledge, and it reflects my expert opinions.

3. In preparing this rebuttal declaration, I have reviewed the declarations filed by the Plaintiffs, submitted by Dr. A. Kade Goepferd and Dr. Mollie T. McQuillan.

4. In this declaration, as in my previous declaration, when I use the terms "man," "boy," or "male," I am referring to biological males based on the individual's reproductive biology and genetics as determined at birth. Similarly, when I use the terms "woman," "girl," or "female," I am referring to biological females based on the individual's reproductive biology and genetics as determined at birth. When I use the term transgender, I am referring to persons who are males or females, but who identify as a member of the opposite sex. Thus, in this report the terms transwomen, transgender woman, or transgirl refer to a person whose sex is male but who identifies as a woman (if they are an adult) or girl (if they a juvenile).

NEW DEVELOPMENTS SINCE FILING MY INITIAL REPORT

5. Since the submission of my initial expert report on May 12, 2025, several significant developments have occurred among sport governing bodies concerning eligibility criteria for participation in the female category. These new developments align with the evolution of sport eligibility policies explained in ¶¶ 302-356 of my report.

6. On May 30, 2025, World Boxing, the governing body for amateur boxing recognized by the International Olympic Committee (distinct from the World Boxing Council), announced the implementation of mandatory sex testing to determine eligibility for male and female competition categories (World Boxing, 2025). This policy adopts the sex verification methodology described by my colleagues and me in Tucker et al. (2024) (see GAB Report ¶¶ 6, 32, 352). According to World Boxing, the policy was "crafted by a specially convened Working Group of the World Boxing Medical and Anti-Doping Committee, which examined data and medical evidence from an extensive range of sources and consulted widely with other sports and experts across the world." The stated motivation for adopting sex verification was to address "concerns over the safety and wellbeing of all boxers.

7. On June 18, 2025, the United States Olympic and Paralympic Committee (USOPC) issued a significant update to its Athlete Safety Policy, explicitly stating that the revision was made "to ensure that women have a fair and safe competition environment consistent with Executive Order 14201" (USOPC, 2025). The updated policy affirms that eligibility to compete in the female category is restricted to individuals whose biological sex is female. This policy applies to all national governing bodies for Olympic and Paralympic sports operating under the authority of the USOPC.

8. Following the USOPC's update, USA Fencing released a revised Transgender and Non-Binary Policy effective August 1, 2025 (USA Fencing, 2025). Under the new framework, USA Fencing–sanctioned events that are not gender-mixed will include two competition categories with the following eligibility criteria:

    - *Women's category*: "Athletes who are of the female sex, provided all other entry criteria have been met."

    - *Men's category*: "Open to all athletes not eligible for the Women's Category, including transgender women, transgender men, non-binary and intersex athletes, and cisgender male athletes, provided that all other entry criteria have been met."

9. Likewise, on July 25, 2025, USA Volleyball issued an updated policy aligning with the USOPC's directive. The revised policy specifies that participation in the female category is limited to individuals identified as female at birth. This policy is effective immediately (USA Volleyball, n.d.).

10. On July 28, 2025, the World Darts Federation announced a change in their transgender eligibility policy. The new policy states that girls' and women's competitions are only open to those who are female at birth (World Darts Federation, 2025).

11. On July 30, 2025, World Athletics (2025) reaffirmed its commitment to maintaining the integrity of the female sports category by announcing the adoption of a one-time SRY gene test for athletes seeking to compete in the female classification at the international level, effective September 1, 2025. The SRY gene, which is responsible for initiating male sex determination during embryonic development, serves as a definitive biological marker of male sex. This policy reinforces World Athletics' position that eligibility for the female category must be based on objective biological criteria rather than self-identification or gender identity. According to the organization, the measure is intended to ensure fair and meaningful competition by preserving the female category for those who are biologically female, thereby protecting the opportunities and safety of girls and women in sport.

12. These developments are highly relevant to the matter before the court. The USOPC's policy change sets a precedent to be followed by all affiliated national governing bodies, including, but not limited to, USA Track & Field, USA Softball, USA Wrestling, and USA Cycling, and will likely influence eligibility standards across club-level and scholastic sports programs. These policies reflect growing consensus among sport regulatory bodies that restricting the female category to individuals of the female sex is necessary to preserve fairness and safety in women's sports.

I. REBUTTAL OF DR. A KADE GOEPFERD

A. Overview

13. Dr. A. Kade Goepferd's expert declaration, submitted on behalf of the defendants in *Female Athletes United v. Keith Ellison*, argues against restricting participation in girls'

and women's sports to individuals whose biological sex is female. Dr. Goepferd asserts that prior to puberty, there are no meaningful biological differences in athletic capacity between boys and girls, attributing any observed disparities in prepubertal athletic performance to sociocultural factors such as gender norms, differential access to sport, and socialization, rather than to innate biological traits. Additionally, Dr. Goepferd contends that transgirls who receive puberty blockers and estrogen administration do not retain any athletic advantages associated with male development. These assertions are directly refuted in my expert report (see GAB Report), which presents substantial evidence demonstrating sex-based differences in athletic performance even prior to puberty. My report also details how existing scientific data show that males retain inherent athletic advantages over equally aged, trained, and talented females, advantages that are not eliminated by the administration of puberty blockers, testosterone suppression, or cross-sex hormones. Moreover, the use of these medical interventions in male children carries significant risks and does not reverse the biological characteristics that underpin male performance advantages.

14. Throughout the declaration, Dr. Goepferd also challenges the validity of sex-based classifications in athletic contexts, asserting that terms such as "boys" and "girls" lack precision unless gender identity is explicitly known. Dr. Goepferd further argues that the relatively small number of transgender athletes, coupled with their lower average rates of sport participation and increased exposure to stigma, undermines any meaningful concern about competitive imbalance. In support of these positions, the declaration emphasizes the claimed mental health benefits of inclusive participation for transgender youth and raises ethical objections to sex verification procedures. Dr. Goepferd ultimately concludes that restricting transgender girls from participation in female sports based on biological sex is medically unjustified and socially harmful.

15. This rebuttal report addresses Dr. Goepferd's claims by referencing the relevant sections of my original report and providing additional scientific clarification and context. In doing so, I draw upon peer-reviewed literature, empirical data, and established biological principles to demonstrate that the conclusions presented in Dr. Goepferd's declaration are inconsistent with the current scientific understanding of sex-based differences in athletic performance.

16. Within this rebuttal I have attempted to use the same subheadings and order used by Dr. Goepferd to organize my rebuttal comments.

B. Relevant Medical and Scientific Background

17. Dr. Goepferd's assertion in ¶¶ 15 through 17 of their declaration that sex is not binary or is difficult to determine is inconsistent with the scientific facts and the standards of biomedical research. As I detailed in my expert report (GAB Report ¶¶ 1–9), biological sex is a fundamental, dimorphic characteristic rooted in the production of gametes (sperm or ova), and this classification can be made at birth with 99.98% accuracy based on visual inspection of the external genitalia (GAB Report ¶ 1).

18. If sex were ambiguous or indeterminate as Dr. Goepferd suggests, it would be impossible

for biomedical research to adhere to journal requirements that mandate sex reporting in all animal and human studies (e.g. journals of the JAMA Network, American Physiological Society, Nature Portfolio, FASEB). The consistent classification of sex as male or female across numerous mammalian species in laboratory settings (e.g. mice, rats, dogs, cats, guinea pigs, sheep, goats, pigs, nonhuman primates, and so forth) contradicts any claim that human sex is unknowable or problematically difficult to determine because humans, like these others, are sexually binary and dimorphic mammalian species.

19. Dr. Goepferd's assertion that up to 2% of the population is intersex (see ¶ 17 of the report) reflects a misrepresentation of intersex prevalence and is based on an overly broad definition that includes conditions such as Klinefelter syndrome, Turner syndrome, and hypospadias since these conditions do not result in true sexual ambiguity. As noted in my report (GAB Report ¶ 1), such conditions do not result in genuine sexual ambiguity. The actual prevalence of individuals born with ambiguous genitalia is approximately 0.02% (GAB Report ¶ 1 citing Sax, 2002), and the Intersex Society of North America acknowledges true ambiguity occurs in only about 0.05% of births when using broader criteria than Sax. Moreover, this discussion is not relevant to the issue of transgirls or transwomen participating in female sports. Disorders of sex development (DSDs) are biological conditions that can be objectively diagnosed through medical testing and are appropriately addressed under distinct policies. In contrast, there is no known biological marker for transgender identity and no laboratory test that can identify an individual as transgender (see GAB Report ¶ 6). Therefore, conflating intersex conditions with transgender identity introduces confusion and undermines the scientific and policy distinctions between these categories.

20. Dr. Goepferd minimizes the biological differences between transgender girls and women and individuals whose biological sex is female. As I explain in my report (see GAB Report ¶ 3), biological sex is universally defined in the life sciences based on the organization of reproductive anatomy and physiology around gamete production. For the vast majority of the animal kingdom including humans, females are the sex whose bodies are organized to produce large gametes (ova), while males produce small gametes (sperm). This definition holds true regardless of an individual's gender identity. For example, if a sexually mature female is unable to become pregnant, medical evaluation is typically warranted to determine the underlying cause, as pregnancy is within the physiological scope of female reproductive function. By contrast, a transwoman, regardless of hormonal or surgical interventions, does not require such evaluation, because the inability to become pregnant is not a medical anomaly; it reflects the fact that their anatomy and physiology were never organized for ova production. This distinction underscores the biological differences that persist despite gender transition.

C. Pre-Pubertal Athletes: Biological, Developmental and Social Characteristics

21. Dr. Goepferd claims in ¶¶ 22 through 25 that no meaningful athletic performance differences exist between boys and girls prior to puberty. Unlike Dr. Goepferd, I have published multiple peer-reviewed studies on the very subject. (Brown et al. 2024, 2025a, 2025b, see Brown Report ¶¶ 179-182) My original research and the data cited in my

report and, ironically, the very studies Dr. Goepferd cites, all show that Dr. Goepferd's contention is incorrect. For instance, Handelsman (2017), which Dr. Goepferd references, documents that prepubertal boys swim 1.0-2.0% faster, run 3% faster and jump 5.8% farther than girls. The 2018 review by Handelsman et al., also cited by Dr. Goepferd, presents no new data and disregards these important findings (GAB Report ¶ 154).

22. The claim that boys and girls have identical performance traits prepuberty is further undermined by the Winsley et al. (2009) study cited by Dr. Goepferd in ¶ 25. That study involved children that were purposively selected and matched for lean body mass (LBM), yet still found that boys had 15% higher VO_2max and 17.5% higher arterial-venous oxygen (A-VO_2) difference, differences the authors attributed to sex-based biological factors, including muscle fiber type.

23. My expert report (¶¶ 109–202) and ongoing research detail sex-based differences in swimming, running, jumping, and throwing performance in children as young as six. Boys consistently outperform girls in youth track and swimming events, and these differences cannot be explained by socialization alone as discussed more fully in my original report and below.

24. At the 2025 Annual Meeting of the American College of Sports Medicine, I presented original analyses of youth competition data from United States regional events spanning several years. These analyses focused on children aged 10 and under and included performance data in 100–1500 meter running events as well as short- and long-course swimming across multiple distances (see GAB Report ¶ 185). The findings showed that the percent performance difference between boys and girls ranked in the same ordinal position (e.g., fastest boy vs. fastest girl) was more than twice the average percent difference between adjacent performances within the same sex (e.g., fastest vs. second-fastest girl). For example, while the top-ranked male might be approximately 4% faster than the top-ranked female, the difference between the top two females was approximately 1.7%. Although these data have not yet been published and are therefore not accessible to the broader scientific community, I reference them here because they reinforce my expert opinion that meaningful sex-based performance differences exist prior to the onset of male puberty and that these differences have clear competitive implications in youth sports.

25. Furthermore, Dr. Goepferd's assertion that a 1–5% performance difference is trivial is refuted by David Handelsman himself in a 2024 publication where he acknowledges that differences as small as 1% or less are meaningful in sports and should be considered when determining eligibility to compete in the female sporting category (see GAB Report ¶¶ 35). As noted in my report, races are often won by 0.5-0.7% or less (GAB Report ¶ 166).

26. In their rebuttal, Dr. Goepferd dismisses the role of biology in explaining prepubertal differences in athletic performance. However, my report clearly documents that biological sex differences in body composition are evident from birth. Specifically, newborn males exhibit greater lean body mass than females, a difference that persists throughout childhood and is accompanied by higher bone density, larger cardiac

dimensions, and superior pulmonary function (GAB Report ¶¶ 193–202). Furthermore, the biological basis of these differences is supported by leading experts who attribute them to factors such as the Y chromosome and the hormonal surge during minipuberty (GAB Report ¶¶ 189–191, 316). These are not novel interpretations by me, but well-supported conclusions drawn from peer-reviewed literature as cited in my report, including recent publications cited in my report by Hunter et al. (2023), Bascharon et al. (2023), Joyner et al. (2025), and Nuzzo & Pinto (2025), among others.

27. Dr. Goepferd's assertion in ¶¶ 26–37 that physical activity alone accounts for performance differences between prepubertal boys and girls is not supported by empirical evidence. As cited in my report, multiple studies (e.g., Eiberg et al., 2005; Dencker et al., 2007; GAB Report ¶¶ 144–146) demonstrate that even when physical activity levels are equivalent, boys consistently exhibit greater lean mass, lower fat mass, and higher aerobic capacity compared to girls. These findings undermine the claim that performance disparities are merely the result of differing activity patterns resulting from different socialization.

28. As explained in my report, "The scientific evidence for prepubertal male advantages in physical fitness described in the preceding paragraphs comes from countries of many different levels of economic affluence, a wide variety of cultures, and from studies across the past three or more decades. The fact that prepubertal males consistently outperform females of the same age in tests of cardiorespiratory fitness, muscular strength, muscular endurance, speed, and power across so many different cultures and have done so for the past several decades provides strong evidence that these sex-based differences are biologically based and not due to culture" (GAB Report ¶ 144). This conclusion is consistent with the emerging scientific consensus that the observed male performance advantage in youth is not a cultural artifact but rooted in innate biological differences.

29. My report also highlights that sex-based performance advantages among prepubertal males are evident in sports requiring technical skill acquisition. For example, in competitive swimming, a skill-based sport in which girls often participate at higher rates than boys, males nonetheless demonstrate a consistent performance advantage before the onset of puberty (GAB Report ¶¶ 172–173). This further supports the conclusion that such differences are not attributable to training exposure or participation rates alone.

30. Recent empirical data by Christensen and Griffiths (2025) show that boys aged 6–12 run, on average, 7.7% faster than girls in a 1600-meter race. The authors created a mathematical model "to equalize both participation and performance between the sexes" so they could "test the potential effect of female participation on the performance difference." Applying that model, they found that "in a general population of school-aged children, sex differences in aerobic performance were not influenced by the lower female participation percentage. Rather, the findings suggest that the differences are the result of physiological differences between the sexes."

31. A longitudinal study by Loenneke et al. (2024) measured grip strength in children beginning at ages 3.5 to 4.5 years and continuing through early childhood. The study found that boys were consistently stronger than girls at every measurement point, despite

no observed differences in muscle size. The authors concluded: "This indicates that something other than hormones are likely driving this difference between sexes or that the transient surge of testosterone during infancy in boys ('minipuberty') has long lasting performance effects" (Loenneke et al., 2024). These findings lend strong support to the conclusion that early-emerging sex-based performance differences are biologically driven and cannot be explained solely by differences in physical activity.

32. Finally, recent findings by Lundberg and Menickelli (2025) show that even in junior disc golf, a sport requiring technical skill and coordination, males outperform females in throwing distance, accuracy, and putting consistency at both age 10 and age 12. The authors attribute these performance differences to biological factors, including "male advantages in muscle size, stature, arm span, and fiber type composition." This further confirms that male performance advantages are evident even before puberty and are rooted in sex-based biological differences

33. In ¶¶ 38 through 44, Dr. Goepferd argues that transgirls are not advantaged in sport compared to girls because they engage less in physical activity than other males. This argument ignores fundamental biology. Male advantages in muscle mass, heart and lung volume, hemoglobin levels, and limb proportions persist regardless of activity level in adults and children (GAB Report ¶¶ 70-108, 145, 146, 193–202). Even physically inactive boys retain the capacity to build greater strength and endurance than girls of the same age and training status due to these underlying traits. Furthermore, avoidance of physical activity by transgirls and transwoman to avoid developing male pattern musculature and body composition, as noted by Oliveira et al. (2022) and Lightner et al. (2024), does not erase biological based potential for muscle growth inherent to the male sex.

34. The idea that socialization as a girl negates male biological development is unsupportable. Being raised with feminine toys or behavior does not change cardiac diameter, hemoglobin concentration, body height, limb length, muscle fiber composition, or any of the biologically based factors that endow males with greater athletic performance compared to similarly aged, trained, and talented females. As I emphasized in my report (GAB Report ¶¶ 343, 362, 363), the presence of male-bodied athletes in girls' sports negatively affects fairness and female participation.

35. Dr. Goepferd presents no empirical evidence to support the claim that raising a boy to socialize as a girl, or a girl as a boy, based on regressive gender stereotypes, eliminates the inherent biological differences between the sexes. Moreover, no data are provided to demonstrate that such socialization practices erase the well-documented differences in physical fitness or athletic performance detailed in my expert report. The suggestion that gendered upbringing can override fundamental anatomical and physiological distinctions lacks scientific support and does not withstand scrutiny in the context of competitive sport, where biological factors such as muscle mass, strength, and cardiovascular capacity play a decisive role in performance outcomes.

36. Furthermore, should a socially transitioned transgirl engage in sports and the associated strength and conditioning practices, this child would then experience male pattern muscle

development and other male typical changes that would result in athletic performance advantages just like any other male. As stated in my report (GAB Report ¶ 222) only 14% of transgender children receive any form of hormonal intervention. "Thus, advocating for all transgirls to compete in girls' sports is advocating for males with unchanged anatomy and physiology to be able to compete in the female sporting category in spite of well documented biologically based male athletic advantages before and after puberty. Advocating for transgirls to be allowed to compete in girls' sports only if puberty blockers are used is not advocating from a position based on evidence and could be considered as coercion for parents and children to make a hasty and uninformed decision to undergo potentially unsafe and ineffective medical procedures."

37. In ¶ 41 and again in ¶ 93, Dr. Goepferd argues that because transgirls and transwomen represent a numerical minority, their participation in female sports is unlikely to meaningfully affect fairness. This reasoning fundamentally misconstrues the nature of athletic advantage and the rationale for maintaining sex-based sport categories (see Pike, 2023). Athletic competition is inherently a zero-sum endeavor: roster spots, starting positions, qualifying placements, championship berths, medals, and scholarships are all limited. As such, even the inclusion of a single male athlete in the female category can displace female athletes from opportunities they would otherwise have earned (GAB Report ¶¶ 257–258, 265–266, 343, 361–363). And as my co-authors and I have noted in a recent published academic comment, this is true at all levels of sports competition, not just elite levels (Brown 2025).

38. Fairness in sport is not determined by the number of athletes with an advantage, but by whether any competitors possess unfair advantages that undermine the integrity of the competition. As Loland (2013) explains, the principle of fair play is foundational to sport. Categories exist specifically to mitigate inherent advantages that would render competition unequal. The athletic advantages conferred by male sex, such as greater speed, strength, and power, are not only thoroughly established in the scientific literature (as documented in my report), but also plainly observable to any good-faith observer comparing male and female athletic performance. It is untenable to argue that allowing a few, or even one, athlete that uses performance enhancing drugs in sports maintains fair competition. Similarly, the presence of even one male-bodied athlete in female sports is sufficient to compromise competitive fairness and deny female athletes equitable opportunity.

39. To illustrate the principle of fairness in sport, consider that it would be patently unfair for an 18-year-old to compete in a middle school track meet. Whether that 18-year-old defeats none, some, or all of the younger athletes is irrelevant; the fundamental issue is that 18-year-olds possess inherent advantages over middle school-aged competitors, which is precisely why age categories exist. Similarly, it would be clearly unfair for a 210-pound weightlifter, who properly belongs in the 215-pound category, to compete in the 175-pound class. Regardless of whether the heavier athlete is a novice or a seasoned champion, the 35-pound body weight differential confers a well-established advantage in strength-based performance, which undermines the competitive equity of the lighter category.

40. These examples underscore a key point: fairness in sport is not contingent on outcomes in individual cases but on maintaining category integrity to ensure that no athlete enters with biological advantages the category was never designed to accommodate. The same principle applies to sex-based categories, where male athletes retain performance advantages over comparably trained females due to fundamental biological differences. Age and weight categories in sport are not approached on a case-by-case basis, and neither should male and female sporting categories (GAB Report ¶¶ 291-294). Allowing athletes with known category-breaking advantages to compete in protected divisions violates the core principles of fair competition.

41. When one considers males competing in the female category, the question is about sex-based advantage. The effects of male sex, including increased muscle mass, bone mineral density, cardiorespiratory fitness, and so forth, have direct, well known, and well documented implications for competitive outcomes (see GAB Report, ¶¶ 10-233).

42. As the Court of Arbitration for Sport stated in its 2019 decision, eligibility for female categories must be based on biology, not identity. "It is human biology, not legal status or gender identity, that ultimately determines which individuals possess the physical traits which give rise to [performance] advantage" (CAS, 2019, at ¶¶ 558-559).

43. In ¶¶ 44, Dr. Goepferd asserts that my report confuses correlation with causation. This claim misrepresents the scientific basis of my conclusions. My report explicitly identifies known biological mechanisms, such as male sex-based higher levels of musculoskeletal development, increased hemoglobin concentrations, larger hearts, and sex-specific gene expression, as the causes of performance differences between males and females (see GAB, ¶¶ 1–9, 93–98, 189–193).

44. These mechanisms are not statistical artifacts but are well-documented causal relationships grounded in biology and supported by experimental, epidemiological, and performance data. For example, the relationship between testosterone and increased lean mass, strength, and oxygen-carrying capacity is both mechanistically understood and replicated in human and animal studies (see GAB Report ¶¶ 70 - 108). My analysis does not rely on assumptions of social causation but on the biological facts that underpin athletic performance.

45. In ¶¶ 45 and 46, Dr. Goepferd equates the effects of socioeconomic status (SES) with sex-based differences in athletic performance. As addressed in my report (GAB Report ¶¶ 144, 172–173), SES may influence *participation rates* in youth sport, but it does not account for the well-documented *performance gap* between males and females. Sex-based differences in speed, strength, power, and endurance are observed across all SES groups and persist even when athletes have comparable training and resources. These differences are physiological in origin, not the result of income or access.

46. The claim that sex-based categorization "cherry picks" certain traits is misplaced. Sport already uses categories such as sex, age, and weight to address systematic advantages that are large, consistent, and relevant to fairness and safety. Variations such as limb length or lactate threshold occur within sexes and have far smaller performance effects than sex. If

categories were based on such traits, the highest tiers would contain no females. In contrast, the male–female gap is universal and substantial, justifying separate categories.

47. Finally, the suggestion of "blurred lines between the sexes" is scientifically inaccurate. Human sex is binary, and rare disorders of sex development do not negate the consistent, reproducible male performance advantage.

48. Dr. Goepferd asserts (¶¶ 47–50) that excluding transgirls from female sports is harmful and unsupported by evidence. However, this framing neglects the core justification for sex-based athletic divisions: the well-established, performance-relevant biological advantages that are possessed by males. As reiterated in my report (GAB Report ¶¶ 10-202, 231-300), these advantages are measurable, consistent, and, crucially, persist despite hormonal interventions.

49. Furthermore, Dr. Goepferd suggests (¶ 50) that restricting transgirls from participating in female sports categories constitutes discrimination and harms their mental health. While the mental health of all youth should be a priority, athletic eligibility policies must also consider the rights, safety, and opportunities of female athletes. As documented in my report (GAB Report ¶¶ 343, 362–363), including biologically male athletes in female sports has demonstrable negative consequences for safety, fairness, participation, and perceived legitimacy of girls' and women's competitions. Moreover, when biologically male athletes occupy roster spots or displace female athletes from competitive opportunities, awards, and recognition, girls are deprived of the well-established mental health and developmental benefits of sport participation, an impact that Dr. Goepferd's analysis fails to acknowledge.

50. Additionally, the assertion that exclusion harms transgender youth cannot be weighed in isolation. Ethical policymaking must also consider the cumulative harm to female athletes if sex-based categories lose their integrity. As the Court of Arbitration for Sport noted in Mokgadi Cater Semenya v. IAAF (2019), the purpose of female categories is not to exclude transgender women per se, but to protect fairness by excluding bodies that have undergone male development. Identity does not negate biology.

51. Recognizing biological sex is essential not only for ensuring appropriate health and medical outcomes but also for preserving fairness and integrity in athletic competition. A robust, clearly defined system of sex-based eligibility, when properly implemented, eliminates ambiguity and protects the competitive viability of the female category (GAB Report ¶¶ 291–294, 301–356). Such systems uphold the intent and purpose of sex-segregated sport, which is to provide females with equitable opportunities for participation and success in athletic contexts where male biological advantages would otherwise render competition unfair.

52. Under recently adopted policies like that of World Athletics (2025), determining sex-based eligibility for participation in female athletic categories is a one-time process, because no matter the amount of hormonal interventions or number of surgeries, humans cannot change sex. As documented in my report, the identification of sex at birth is accurate in over 99.98% of cases (GAB Report ¶ 1). This determination should be

reflected in the athlete's medical records and handled by school or athletic officials with the same procedural care as any other information obtained during a pre-participation physical examination (PPE). Athletes whose medical conditions preclude them from participating in certain sports categories are routinely managed in accordance with established standards of care, and the same principle applies here. It is also important to note that the United Nations "Report of the Special Rapporteur on Violence Against Women and Girls, Its Causes and Consequences" explicitly supports the use of sex verification in girls' and women's sports as a safeguard for fairness and safety (GAB Report ¶ 343).

53. Although envisioned for elite-level competition, a practical and scalable model of sex verification is outlined by Tucker et al. (2024) (as cited in GAB Report ¶ 352, and on which I am a co-author) and could be adapted for use in scholastic and developmental sport systems. For female athletes, verification could be conducted early in their athletic careers through a non-invasive cheek swab test for the presence of the SRY gene, which is a well-established genetic marker of male sex development. If the SRY gene is absent, the athlete may be certified to compete in the female category. If the SRY gene is present in an individual previously assumed to be female, a confidential referral can be made to appropriate clinical specialists for further evaluation, counseling, and care. This protocol has already been adopted by international sport governing bodies such as World Athletics (GAB Report ¶ 352) and World Boxing (2025), and provides a fair, consistent, and medically grounded approach to sex-based eligibility in competitive sport. Notably, this testing is already widely used in research to verify the sex of an animal, is no more expensive than the commonly used Non-Invasive Prenatal Test (NIPT) and is over 99.99% accurate at determining sex.

D. Medical Care for Transgender Youth: Puberty Suppression and Implications for Athletics

54. My report summarizes the current body of research on the effects of puberty blockers and cross-sex hormones on body height, muscle mass, and muscle strength in children. This research demonstrates that such hormonal interventions do not fully eliminate male advantages in athletic performance when compared to similarly aged, trained, and talented females (GAB Report ¶¶ 203–214). My report also addresses concerns regarding the limited efficacy and potential harms associated with puberty blockers, testosterone suppression, and cross-sex hormones in pediatric populations. These concerns are documented in government-commissioned reports, including the Cass Review and the review conducted by the U.S. Department of Health and Human Services, as well as in multiple systematic reviews and legal proceedings (GAB Report ¶¶ 215–222). I defer a detailed rebuttal of Dr. Goepferd's discussion of medical care for transgender youth, including the use of puberty suppression and its implications for athletics (Goepferd Report ¶¶ 51–73), to medical doctors with appropriate expertise.

E. Scientific Studies of Adult Transgender Female Athletes

55. Dr. Goepferd claims in ¶¶ 74 – 87 that variation within each sex and some overlap between the sexes negates sex-based differences in athletic performance. Furthermore,

several claims are advanced concerning the athletic performance of transwomen, the effects of hormone therapy, and the purported equivalence of transwomen and female athletes. These assertions are inconsistent with a substantial body of peer-reviewed scientific literature and misrepresent the enduring biological advantages conferred by male puberty as explained throughout my report.

56. The fact that there is individual variation within each sex and some degree of overlap between male and female performance distributions does not negate the existence or relevance of sex-based differences in athletic performance. Such an overlap is normal in any biological comparison between two populations; however, in competitive sport, even small differences between comparable percentiles have meaningful implications, as outcomes often depend on fractions of a second, centimeters, or kilograms. As detailed in my expert report (GAB Report ¶¶ 23–25, 27, 71, 82, 94, 111–141), males outperform comparably rated females (e.g. comparing the 10th, 50th, and 90th percentiles of males to females) in speed, strength, and power due to well-documented advantages in muscle mass, cardiovascular capacity, and other biological factors.

57. As detailed in my report (GAB Report ¶¶ 41, 52, 264), Higerd conducted a comprehensive evaluation of hundreds of thousands of high school track and field performances in the long jump, high jump, and running events ranging from 100 meters to 3200 meters. The dataset included athletes from California, Florida, Minnesota, New York, and Washington between 2017 and 2019. Across all events, male athletes consistently outperformed female athletes in both average and peak performance measures. Notably, even in the event with the smallest sex-based disparity, the 100-meter sprint, 8.1% of males were faster than the fastest female. As shown in Figure 4.3 of Higerd's research (shown below), the average female athlete ran slower than 94.8% of male athletes, and that 36% of males recorded times equal to or faster than the top 1% of females. Furthermore, Higerd's evaluation indicates that the average 100-meter time for females was 14.76 ± 1.29 seconds, compared to 12.78 ± 1.10 seconds for males. These findings further underscore the magnitude and consistency of sex-based differences in athletic performance, even prior to elite specialization.

Figure 4.3

100 Meter Performance Distribution by Sex

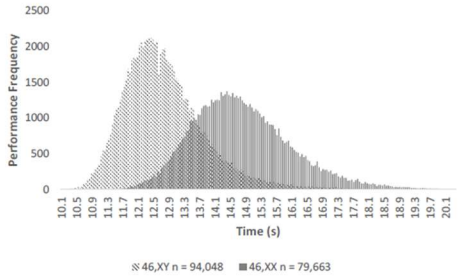
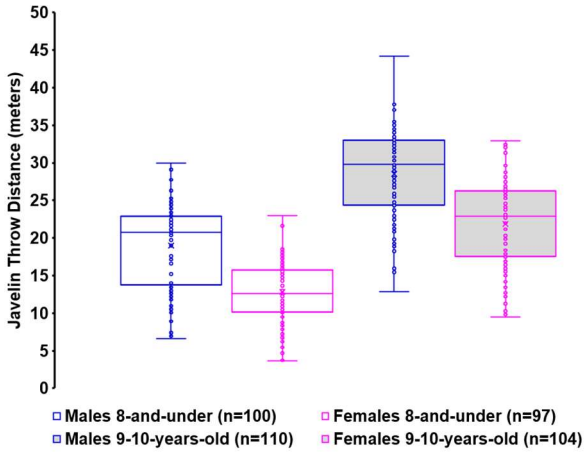


Figure 4.3 from Higerd (2021) showing the 100m race times from 2017-2019 in high school track from CA, FL, MN, NY, WA. Male performance is shown in light grey crosshatches while female data are the darker lines.

58. The data presented in the figure below further illustrates the fundamental error in Dr. Goepferd's reasoning, specifically, the misinterpretation of intra-sex variation and inter-sex overlap as evidence that sex-based performance differences are negligible or irrelevant. The box plot is derived from the dataset reported in my publication, "Sex-based differences in shot put, javelin throw, and long jump in 8-and-under and 9–10-year-old athletes" (Brown et al., 2025; see also GAB Report ¶ 182). It depicts javelin throw performances of the top eight finalists in the USA Track and Field National Youth Outdoor Championships and the USA Track and Field National Junior Olympic Championships from 2016 to 2023. Each data point (open circle) represents an individual athlete's performance; the "X" denotes the group mean; the horizontal line shows the median; boxes represent the interquartile range (i.e. 25th-75th percentiles); and whiskers extend to 1.5 times the interquartile range.

59. Despite some degree of overlap, an expected feature in any biological comparison, males significantly outperformed females in both age categories. Among 8-and-under and 9–10-year-old athletes, male javelin throw distances were statistically significantly greater than those of their female peers ($P < 0.001$), with very large effect sizes (Hedges' $g = 1.269$ and 1.169, respectively). On average, boys outperformed girls by 32.6% and 23.5% in the two age groups, and 24 boys in the younger group and 29 in the older group exceeded the farthest throw by any girl. These findings clearly demonstrate that individual-level overlap does not negate the consistent and substantial male performance advantage. Dr. Goepferd's claim to the contrary reflects a fundamental misunderstanding of statistical inference and the relevance of population-level comparisons in sport performance analysis.



Javelin throw distances for the top 8 performances in the 8-and-under and in the 9–10-year old age groups from the USA Track and Field National Youth Outdoor Championships and the USA Track and Field National Junior Olympic Championships during the years 2016–2023. $P < 0.0001$ for 8-and-under males versus females, effect size (Hedges' g) = 1.269. $P < 0.0001$ for 9–10-year-old males versus females, effect size (Hedges' g) = 1.169.

60. The data from Higerd et al. and Brown et al. highlight the flaw in Dr. Goepferd's attempt to minimize sex-based differences in athletic performance by focusing on variation within the sexes and overlap between them. While some overlap exists, the magnitude

and consistency of male performance advantages, clearly shown in these findings, demonstrate that these differences are both statistically and practically significant in competitive sport contexts.

61. Moreover, performance data from USA Track & Field and USA Swimming reveal that by ages 12–13, female athletes are no longer represented among the top 10 national performers in sprinting and swimming events, respectively. By ages 14–15, females are entirely absent from the top 100 rankings (GAB Report ¶ 184, citing James, 2025). These patterns are not anomalies but rather a reflection of the substantial and widening male performance advantage that emerges even before the completion of puberty. This advantage is so pronounced that high-performing male youth and amateur athletes routinely surpass the achievements of elite adult female athletes. For example, the women's 800-meter world record—1:53.28, set in 1983—remains untouched by any female athlete in over four decades (World Athletics, n.d.). By contrast, on August 2, 2025, 16-year-old Cooper Lutkenhaus set a new under-18 men's world record in the 800 meters with a time of 1:42.27—more than 11 seconds faster (Mull, 2025). This example underscores the magnitude and persistence of the male advantage and directly refutes any claim that such differences can be fully mitigated through training or social factors alone.

62. The presence of some overlap does not diminish the categorical relevance of sex in sport, any more than the existence of overlap in height would invalidate age or weight classifications in competitive settings. The central issue is not whether some females can outperform some males, but whether males possess competitive advantages over comparably aged, trained, and talented females due to sex-linked biological traits, an assertion overwhelmingly supported by historical records, empirical evidence, and decades of research in exercise science.

63. Within ¶¶ 74 – 87 Dr. Goepferd suggests that medical transition, including cross-sex hormone therapy, mitigates male-typical advantages in athletic performance. However, as detailed in my report (GAB Report ¶¶ 203-222, and ¶¶ 231-300), the evidence shows that even after 8 years of puberty blockers and cross sex hormones in youth, or up to 14 years of testosterone suppression with or without estrogen administration in adults, transwomen retain advantages in muscle mass, muscle strength, skeletal structure, and cardiorespiratory capacity. Studies summarized in these paragraphs demonstrate incomplete reversal of these traits and persistent gaps between transwomen and females.

64. In ¶¶ 81, Dr. Goepferd asserts that existing studies on the effects of so-called gender-affirming hormone therapy in transwomen athletes are limited, focus primarily on "elite and adult trained athletes", and may not apply to school-aged individuals. Dr. Goepferd further states that these studies reflect the effects of full male puberty and do not account for transgender high school athletes who may have experienced only partial or no masculinizing puberty.

65. As detailed in my report, males possess anatomical and physiological characteristics that confer athletic advantages over equally aged, trained, and talented females, both prior to puberty (GAB Report ¶¶ 193–202) and following the onset of puberty (GAB Report ¶¶ 70–108). These advantages include, but are not limited to, greater height and body mass,

denser and stronger bones, more favorable skeletal structure for athletic movement, larger muscle mass, higher proportions of fast-twitch muscle fibers, lower body fat relative to lean mass, and larger cardiac and pulmonary capacity. Furthermore, as thoroughly documented in my report and supported by the more than 20 peer-reviewed scientific publications that are cited, the suppression of testosterone and administration of estrogen in males do not eliminate these sex-based advantages (GAB Report ¶¶ 234–290). The persistence of these biological differences underscores the fundamental role of biological sex in athletic performance and invalidates claims that medical transition neutralizes male competitive advantage.

66. What is known about the effects of puberty blockers, testosterone suppression or cross sex-hormone use in children on factors that influence sports performance is summarized in my report (GAB Report ¶¶ 203-222, and ¶¶ 239). Briefly summarized, the use of puberty blockers, testosterone suppression, and cross sex-hormones in children does not erase male advantages in lean body mass, body height, or muscle strength (all of which are well documented to influence sports performance). To state or imply that these hormonal interventions create a level playing field between male and female athletes is not a stance that is based on the available evidence.

67. In ¶¶ 82–84 of their rebuttal, Dr. Goepferd summarizes three studies, Harper (2015), Roberts (2020), and Hamilton (2024), as evidence that testosterone suppression eliminates or substantially reduces male athletic advantages in transgender women. Each of these studies is addressed in detail in my expert report, which identifies serious methodological limitations and misrepresentations in their use as support for performance equivalence between transwomen and females (see GAB Report ¶¶ 247–263, 275–283).

68. In ¶ 82, Dr. Goepferd cites Harper (2015) to argue that testosterone suppression mitigates male athletic advantage. However, as explained in my report (GAB Report ¶¶ 259–263), and also by Pike (2023), Harper's paper is deeply flawed and unreliable as evidence. The study relies on self-reported, largely unverified race times from eight transwomen runners, with some performance comparisons spanning up to 29 years. The designation of these athletes as "elite" is wholly subjective. The study also fails to verify testosterone levels or account for confounding factors such as training history, injuries, nutrition, and competition conditions. Moreover, in a later publication, Harper concedes that male athletic advantages persist even after three years of testosterone suppression (see GAB Report ¶ 263).

69. In ¶ 83, Dr. Goepferd cites Roberts et al. (2020) to support the claim that testosterone suppression eliminates male athletic advantage. However, as detailed in my report (GAB Report ¶¶ 247–248, 255), the findings of Roberts et al. demonstrate the opposite. Transwomen retained significant performance advantages even after two years of hormone therapy. At baseline, transwomen performed 45% more push-ups, 17% more sit-ups, and ran 1.5 miles 21% faster than females during U.S. Air Force physical fitness testing; after two years of testosterone suppression, they still performed 6% more push-ups, 8% more sit-ups, and completed the 1.5-mile run 12% faster. Importantly, Roberts noted that "...transwomen weigh more than CW [cis-women]... Therefore, our study may underestimate the advantage in strength that transwomen have over CW." In practical

terms, this means that transwomen were moving more mass per repetition—indicating greater absolute strength—even when performance counts were similar. Such retained strength advantages translate directly to enhanced athletic performance, particularly in power-dependent events like throwing. This is reflected in the use of heavier implements for males in shot put (16 lbs. for men vs. 8.8 lbs. for women), discus (4.4 lbs. vs. 2.2 lbs.), javelin (≥1.76 lbs. vs. ≥1.32 lbs.), and hammer throw (16 lbs. vs. 8.8 lbs.), despite which male athletes still achieve greater distances (World Athletics, n.d. GAB Report ¶¶ 55-62). As noted in my report (GAB Report ¶ 25, citing Handelsman, 2024), even a 1% categorical advantage can meaningfully affect outcomes in competitive sport.

70. In ¶ 84, Dr. Goepferd cites Hamilton et al. (2024), which I also reviewed in my expert report (GAB Report ¶¶ 275, 278, 283). As noted in my analysis, this cross-sectional study is methodologically weak and does not support the claim that transwomen lose male performance advantages. The authors provide minimal information regarding participants' training volume or athletic background, making it impossible to determine whether the transwomen represented competitive athletes. Despite this lack of training data, the female comparison group exhibited exceptionally high fitness levels, ranking in the 80th to 99th percentiles for strength, body composition, and aerobic capacity. Importantly, the transwomen were, on average, 7.9 inches taller, 51.4 pounds heavier, and had 26.7 pounds more fat-free mass than the females. They also demonstrated 18% greater handgrip strength, 15% more jumping power, 14% higher absolute VO_2max, and 20–31% greater lung function than the highly fit female comparison group.

71. Dr. Goepferd emphasizes that females in the Hamilton et al. (2024) study had a higher average vertical jump height than transwomen (16.0 inches vs. 14.3 inches) yet fails to acknowledge that the transwomen were nearly 8 inches taller on average. This anatomical difference results in greater total vertical reach, which is what matters in sports like basketball or volleyball. In such contexts, a 5'11" transwoman jumping 14 inches will reach higher than a 5'3" woman jumping 16 inches. Using jump height alone, without accounting for standing height, misrepresents the competitive implications of male-bodied advantages. It is akin to arguing that a 6'3" NCAA Division I point guard should be expected to win a tip-off against a 6'10" center simply because the guard can jump two inches higher—while ignoring the decisive advantage conferred by the center's greater standing reach and limb length.

72. Hamilton et al. also sought to minimize the observed male performance advantages in transwomen by scaling strength and endurance metrics relative to body size. However, such ratio-based adjustments are irrelevant in competitive sport, where outcomes are determined by absolute, not size-normalized, performance. In athletic competition, the athlete who runs faster, jumps higher, or produces more power wins, regardless of body size or proportional efficiency. For example, in softball, the distance between bases, the size of the ball, and the placement of the outfield fence remain fixed for all players; these parameters do not adjust based on an athlete's height, limb length, or hand size. Thus, an athlete who generates more absolute power—regardless of body size—has a competitive advantage. Similarly, as detailed in my report (GAB Report ¶¶ 10–62), even when throwing implements are scaled heavier for males than for females, male athletes consistently throw farther. While ratio-scaling may be informative for certain academic

analyses, it fails to reflect the practical realities of sport performance and should not be used to obscure the persistence of male physical advantages.

73. Dr. Goepferd does not acknowledge the information presented in my report from a second study of US Air Force personnel (Chiccarelli et al. 2022, see GAB Report ¶¶ 235, 249–250), which found that transwomen retained significant performance advantages over females in push-ups and sit-ups after four years of testosterone suppression. While the study has important limitations, chiefly, a 94% attrition rate from baseline to follow-up, it nonetheless contributes to the growing body of evidence that male performance advantages persist even after prolonged hormone treatment.

74. A more recent study than Hamilton et al. was published by Alvares et al. (2025), and it is frequently touted by proponents of transwomen's inclusion in female sports. Although the authors conclude that "transwomen athletes displayed similar exercise performance" to female athletes, this claim is extremely misleading. As detailed in a published critique by Kirk et al. (2025), on which I am a co-author, the study compared seven transwomen volleyball players who were, on average, 5'8" tall and weighed 147.9 pounds, to eight female volleyball players who were 5'10" tall and weighed 165.1 pounds. Moreover, the female athletes reported an average training volume of 13.9 hours per week, compared to only 4.1 hours per week in the transwomen.

75. These discrepancies in height, body mass, and training volume render the groups non-comparable. Given that male-bodied individuals typically are taller and weigh more than females, these groups can hardly be considered representative samples of any known population. Further, comparing undertrained transwomen to well-trained female athletes introduces a substantial bias. In essence, these authors compared apples to oranges and claimed to find no difference. The study's design effectively contrasts recreational-level transwomen with competitively trained females, yet still reported no performance differences, a finding that, rather than supporting performance parity, underscores the persistence of male performance advantages. These methodological flaws are serious and should have precluded publication. (Note: this paper is not cited by Dr. Goepferd or in my expert report.)

76. In summary, the three studies cited by Dr. Goepferd in ¶¶ 82–84 as evidence that testosterone suppression eliminates male athletic advantage, Harper (2015), Roberts (2020), and Hamilton (2024), are each addressed in detail in my report and shown either to confirm the persistence of male athletic advantages or to suffer from methodological flaws so severe that they cannot credibly support claims of performance equivalence between transwomen and biologically female athletes (see GAB Report ¶¶ 247–248, 255, 275, 278, 283). My report includes a fourth study of athletic transwomen that also confirms retained male advantages (Chiccarelli et al. 2022, see GAB Report ¶¶ 235, 249–250). In this rebuttal, I have also included a fifth study, Alvares et al. (2025), which some may attempt to cite to support claims that testosterone suppression reduces male athletic advantages. However, as detailed above, this study is so fundamentally compromised in its design and comparability that it offers no meaningful evidence that testosterone suppression reduces male performance advantages.

77. As detailed in the five studies discussed above, as well as in the broader body of literature cited in my initial report (GAB Report ¶¶ 234–300), suppression of testosterone in adult males does not alter height and results in only a modest (~5%) reduction in lean body mass. While testosterone suppression may lead to some decrease in muscle strength, available evidence indicates that such reductions are insufficient to eliminate the well-documented male advantage in strength-related performance metrics. Moreover, resistance training can mitigate or even prevent strength loss during hormone suppression. Although VO_2max may also decline to some extent, the reduction is not sufficient to close the performance gap between males and females. In sum, the current scientific literature overwhelmingly demonstrates that testosterone suppression in males who have undergone male puberty does not eliminate the biological advantages conferred by exposure to male levels of testosterone during development. Claims that such advantages are erased by hormone therapy are based on studies with serious methodological limitations that preclude such conclusions.

78. Furthermore, a recent systematic review and meta-analysis published on May 16, 2025, (Norlund et al. 2025) examined the effects of testosterone suppression and estrogen administration on muscle strength in transwomen using the same studies reviewed in my report. The authors concluded that transwomen had greater muscle mass and muscle strength than women before hormonal intervention. The authors further concluded that while testosterone suppression and estrogen administration result in some reductions in muscle strength, transwomen generally retain strength levels that remain significantly higher than those of comparably aged females, even after one to three years of treatment. The magnitude of strength loss was modest and insufficient to eliminate the typical male advantage. These findings reinforce the conclusions in my report that are drawn from the same sources included in the Norlund paper (GAB Report ¶¶ 231-290) that testosterone suppression does not neutralize the biological athletic advantages conferred by male sex.

79. Although testosterone suppression does not eliminate the biologically based athletic advantages conferred by male sex, some continue to argue that it does (e.g. World Triathlon, GAB Report ¶ 347), and propose an upper threshold of 2.5 nmol/L for female eligibility, a value that represents the extreme upper limit of testosterone concentrations in women. However, as reported by Miro et al. (2024), approximately 25% of trans women fail to maintain serum testosterone concentrations below this threshold. This finding underscores the need for frequent, random, and rigorous testing protocols to ensure compliance if serum testosterone is to be used as an eligibility criterion for the female category. Without such monitoring, enforcement of these standards would be unreliable and ineffective.

80. In ¶¶ 85–86, Dr. Goepferd asserts that sport-specific research is necessary to determine whether transwomen retain male athletic advantages. This claim reflects a fundamental misunderstanding of the well-established anatomical and physiological determinants of athletic performance. The suggestion that separate empirical studies must be conducted for each individual sport in order to justify sex-based eligibility standards is scientifically untenable and analogous to requiring separate studies for every sport to justify age-group divisions, a standard that is both impractical and unnecessary. As extensively documented in my expert report (GAB Report ¶¶ 70–108, 193–202), males possess inherent

anatomical and physiological characteristics that confer athletic advantages over comparably aged, trained, and talented females. These include greater lean body and muscle mass, lower body fat percentage, larger cardiac and pulmonary dimensions, taller stature, and a host of other attributes. These traits are universally recognized in the field of exercise physiology as key determinants of athletic performance, and they contribute directly to superior speed, strength, endurance, and power. As noted in my report, "Because running, jumping, and throwing are foundational elements for many sports, this evidence is undoubtedly generalizable to sports and athletic events that require these elements as a part of the overall success in performance" (GAB Report ¶ 192, citing Joyner et al., 2025). For example, we do not need separate studies comparing the act of throwing a shot put, discus, softball, baseball, football, rugby ball, or javelin—or striking a hockey puck or spiking a volleyball—to understand that the greater lean body mass and upper body strength inherent to the male sex confers performance advantages in all of these tasks. The advantages of greater lean body mass and strength are not sport-specific; they are performance-enhancing across virtually all athletic domains and are among the very factors that underpin the rationale for sex-segregated competition in sport.

81. Dr. Goepferd appears to concede that there is no clear scientific evidence showing that male performance advantages are fully eliminated by hormonal intervention. That absence of evidence is not a justification for including males in female sports; instead it is a compelling argument that such research should have been completed before ever allowing male athletes (i.e., transgirls and transwomen) to compete in the female category. To have initially proceeded without such evidence, and to continue to do so, disregards basic principles of fairness and scientific due diligence in sport policy.

82. In ¶ 87 Dr. Goepferd's report dismisses concerns about fairness in female sports in several way. First, by comparing the effects of DNA polymorphisms that can be advantageous to sports performance to the biologically sex-based differences. This is addressed in my report (GAB Report ¶¶ 7 and 8), in which I quote Skaletsky et al. (2003) who states that the effects of the "common substitution of the Y chromosome for the second X chromosome dwarfs all other DNA polymorphism in the human genome." If we were to, as Dr. Goepferd implies, have sports categories based on the presence of DNA polymorphisms that differentiate based on VO_2max, muscle mass, cardiac output, or body height, there would still be no females in the highest of any of these categories.

83. Then, in ¶ 87 Dr. Goepferd once again tries to dismiss the concern of including males (i.e. transgirls and transwomen) by reiterating the small number of transwomen who might participate in female sports, which is previously addressed in this rebuttal.

F. Benefits of Sports Participation For Youth, Including Transgender Youth

84. Paragraphs 88 through 91 of Dr. Goepferd's declaration emphasize the well-documented physical, mental, and social benefits of youth sports participation, a point that is widely accepted and not in dispute. The physical benefits of athletic activity, including improved cardiovascular health, stronger musculoskeletal development, and healthier lifestyle habits, are supported by decades of pediatric and exercise science research. Similarly, the psychological benefits, such as reduced anxiety and depression, improved academic

outcomes, and stronger social connectedness, are well established in the literature and acknowledged in my own report. However, the key issue in this case is not whether participation in youth sports is beneficial, but under what eligibility conditions participation should occur, particularly in sex-designated categories designed to ensure fair and safe competition for female athletes.

85. Dr. Goepferd's declaration fails to acknowledge that female athletes also rely on sports for physical and mental health benefits, as well as for educational opportunities, scholarships, and social inclusion. These benefits are significantly compromised when females are displaced from team rosters, podium finishes, and scholarship eligibility due to the inclusion of biologically male athletes in female categories. As documented in my expert report (see GAB Report ¶¶ 343, 362–363), such displacement undermines competitive fairness, reduces participation incentives, and negatively affects the legitimacy of girls' and women's sport. Denying the reality of sex-based performance advantages in order to promote inclusion for one group necessarily results in exclusion and harm to another, in this case, female athletes.

86. While Dr. Goepferd cites data from The Trevor Project (2020) and other sources suggesting that sports participation may benefit transgender and gender-diverse youth, these benefits are not contingent on participation in the female category. The physical and psychosocial health benefits of regular physical activity—including sport, group exercise, and individual activity—are well established across populations and are not exclusive to a particular competition category (U.S. Department of Health and Human Services, 2018, World Health Organization, 2022, Bengtsson et al., 2025). Like all youth, transgender individuals can experience these benefits through personal fitness, coeducational physical activity programs, open-category events, or participation on male teams when appropriate. The claim that mental health benefits are uniquely dependent on inclusion in female sport lacks empirical support and is inconsistent with the purpose of sex-based competition. The female category exists to ensure fair and meaningful opportunities for female athletes—not to serve as a therapeutic intervention for individuals experiencing gender dysphoria.

G. Dr. Geopferd's Conclusion

87. In ¶ 95 Dr. Goepferd's criticizes my consistent use of terms such as "boys," "men," and "biological male" when referring to individuals who identify as transgender girls or women. Dr. Goepferd asserts that this language is dehumanizing and implies deception. This criticism mischaracterizes both the intent and function of my language. In scientific, medical, and legal contexts, the use of sex-specific terms based on biological reality is both standard and necessary.

88. My report uses the terms "male" and "female" as descriptors of biological sex, not as denials of anyone's gender identity (O'Connor 2023). These terms are consistent with long-standing conventions in biology, medicine, and sport science, where biological sex is a key variable affecting anatomy, physiology, and performance (GAB Report ¶¶ 1–9, 203–222). The use of terms such as "biological male" or "male-bodied" is not rhetorical, it is a factual reference to the presence of male sex characteristics relevant to athletic

performance, including larger heart and lung size, greater muscle mass, longer limb length, and increased bone density.

89. Courts, governing bodies, and scholarly journals routinely use terms like "biological male" and "biological female" to distinguish sex from gender identity when discussing eligibility in sex-separated activities. The Court of Arbitration for Sport (2019), for example, acknowledged that it is human biology, not legal status or gender identity, that ultimately determines which individuals possess physical traits conferring insuperable advantages in sport (CAS, 2019, ¶¶ 558–559).

90. Criticism of my use of plain-language descriptors such as "boys" and "girls" disregards the scientific, legal, and practical necessity of distinguishing between male and female participants in sex-separated athletic competition. Across historical and contemporary contexts, including many sources cited in my report (e.g., AAHPER, the President's Fitness Test, Tomkinson et al., 2017; Fühner et al., 2021), the term "boy" refers to a juvenile human male, and "girl" to a juvenile human female. Using these terms consistently ensures clarity when describing sex-based performance differences in youth sports.

91. Referring to trans-identified males (i.e., "transgirls") simply as "girls," without clarifying their biological sex, risks misleading readers, particularly in discussions of physical development and athletic performance. My usage of "boy" and "girl" aligns with definitions established in Executive Order 13999, issued on January 20, 2025, which states: "'Women' or 'woman' and 'girls' or 'girl' shall mean adult and juvenile human females, respectively" (Office of the Press Secretary, 2025). As noted in my report (GAB ¶ 354), the United Kingdom Supreme Court has also affirmed that sex-based terminology in law and public policy refers to biological sex. Furthermore, the Sex and Gender Equity in Research (SAGER) guidelines specify that when sex-based terms are used in scientific reporting, they should be operationally defined (Heidari et al. 2016), something I have done explicitly in the Purpose section of my report.

92. The suggestion that my report dehumanizes anyone (as alleged by Goepferd ¶ 95) is both inaccurate and unsubstantiated. My analysis does not target individuals but instead focuses on categories relevant to fairness in sport. The biological sex of an athlete is pertinent to their capacity for performance, injury risk, and fair competition. Discussing these matters using clear, historically and biologically grounded terminology is essential to maintaining clarity, scientific accuracy, and legal coherence.

93. Finally, when Dr. Goepferd appeals to emotion, framing this issue solely in terms of transgender youth wanting to "play with their friends", it fails to address the legitimate concerns of the female athletes who are displaced, disadvantaged, or discouraged by policies that disregard the physical advantages of male sex. Protecting fairness and opportunity for females in sport is not an act of discrimination; it is the original purpose of sex-based athletic categories under Title IX and similar laws.

H. Summary

94. Dr. Goepferd's declaration relies on speculative reasoning, omits key data, misrepresents the scientific literature, and conflates gender identity with biological sex. The declaration minimizes the well-documented and biologically grounded performance advantages associated with male sex and fails to account for the negative consequences that result when male-bodied athletes are included in female sports. In contrast, my report is grounded in decades of empirical research in biology and exercise physiology, as well as long-standing practice in sex-based sport categorization. It provides robust evidence that male athletic advantages emerge before puberty, persist throughout the lifespan, and are not eliminated by transgender identification or by hormonal or surgical interventions commonly described as "gender-affirming care."

95. Policy decisions regarding youth and women's sports must be based on biological reality and empirical evidence, not ideological assertions, emotional appeals, or untested social theories. Ensuring fairness and safety in female athletic competition requires adherence to the principle of sex-based eligibility.

II. REBUTTAL TO REPORT BY DR. MCQUILLAN.

A. Overview

96. Dr. Mollie McQuillan's expert declaration, submitted on behalf of the defendants in Female Athletes United v. Keith Ellison, focuses on the purported psychosocial consequences of requiring transgender and gender-diverse youth to participate in school-based sports based on their biological sex. Drawing on her background in education policy and citing select literature, Dr. McQuillan contends that policies restricting transgender-identifying males from competing on female sports teams constitute discrimination and contribute to social isolation, mental health challenges, and educational disengagement. She advocates for policies that affirm a student's gender identity and asserts that failure to do so causes psychological harm. However, her report entirely omits consideration of the effects such policies have on female athletes—specifically, the loss of team roster spots, reduced competitive opportunities, and diminished access to awards and recognition when biologically male athletes are permitted to compete in the female category.

97. Rather than engaging with the biological and sport science evidence regarding sex-based performance differences presented in my report, Dr. McQuillan instead critiques what she characterizes as "essentialist" and "ideological" views of sex and gender. She questions the relevance of biological and performance data derived from adult or elite athletes to youth sports contexts, disregarding the copious youth data included within my report, and claims that sex-based classifications often reflect stereotypes rather than empirically grounded criteria. Her argument prioritizes identity affirmation and psychosocial inclusion, framing school-based athletic participation primarily as an educational and developmental activity. In doing so, she disregards the fundamental importance of competitive fairness and biological reality in sport. While asserting that psychological and sociological factors should guide policy, she provides no empirical data or scientific evidence demonstrating that these factors negate the performance advantages associated with male sex.

98. In sum, Dr. McQuillan's declaration does not present any scientific evidence that contradicts or refutes the core findings of my report: (A) that there are well-established biological differences between males and females; (B) that these differences confer inherent and durable athletic advantages to males over equally aged, trained, and talented females; and (C) that neither puberty suppression, testosterone reduction, nor cross-sex hormone therapy eliminates these advantages. Although framed in an educational policy context, her arguments do not meaningfully engage with the relevant sports science literature or the biological basis for sex-based athletic eligibility criteria, and therefore do not undermine the evidence-based conclusions I have presented.

99. This rebuttal addresses Dr. McQuillan's claims by referencing relevant sections of my original report and, where appropriate, providing additional clarification and updated evidence. In doing so, I draw upon peer-reviewed scientific literature, empirical performance data, professional organizations, and established biological and sport science principles to demonstrate that the conclusions offered in Dr. McQuillan's declaration are inconsistent with the prevailing scientific understanding of sex-based athletic differences.

100. Within this rebuttal I have attempted to use the same subheadings and order used by Dr. McQuillan to organize my rebuttal comments.

B. Discrimination and Rejection Negatively Impacts Transgender and Gender Nonconforming Youth

101. In ¶ 20-23 Dr. McQuillan claims that requiring transgender youth to compete in the sport category that align with their biological sex constitutes discrimination and harms their mental health. While the mental health of all youth should be a priority, athletic eligibility policies must also consider the rights, safety, and opportunities of female athletes. As documented in my report (GAB Report ¶¶ 343, 362-363), including biologically male athletes in female sports has demonstrable negative consequences for fairness, participation, and perceived legitimacy of girls' and women's competitions.

102. It is important to note that allowing only those who are biologically female to participate in girls and women's sports is not a ban from sports participation for anyone. This simply requires participants to compete in the category of their biological sex. This is a simple and much more straightforward classification than weight categories or age categories. A child who is born on a certain date may be required to compete in an older age category than a child who is born one day later, and the differences between the sexes are much more pronounced than the differences between age groups (as specifically explained my report ¶ 46).

C. Transgender Youth Have Lower Rates of Physical Activity Compared to Cisgender Youth

103. ¶¶ 24-27 of Dr. McQuillan report asserts that transgirls are not advantaged in sport compared to girls because they engage less in physical activity than other males, similar to Dr. Goepferd. These comments are previously addressed in this report in my rebuttal of Dr. Geopferd's report (¶¶ 33-36).

D. Social Support and the Benefit of Social Belonging for Trans Students and Benefits of Participation in School-Based Sports Teams for Transgender Youth

104. In ¶¶ 28-33 Dr. McQuillan also attempts to argue that transgirls need to compete in female sports to improve their mental and social health, similar to Dr. Goepferd. These comments are previously addressed in this report in my rebuttal of Dr. Goepferd's report (¶ 45-50).

E. Leading Medical Organizations Agree that Trans-Inclusive Athletic Policies are Beneficial

105. In ¶¶ 34–37, Dr. McQuillan cites position statements from the American Medical Association (AMA), American Psychological Association (APA), and American Academy of Pediatrics (AAP) to suggest a scientific consensus supporting the inclusion of transgender females in female sports. However, these position statements are rooted primarily in psychosocial advocacy and do not represent systematic reviews of exercise physiology or sports medicine literature. Notably, none of these organizations have issued evidence-based guidance that contradicts the well-documented biological performance advantages conferred by male sex (see GAB Report, ¶¶ 70–108, 227-230).

106. As discussed in the Cass Review (see GAB Report, ¶ 215), the policies adopted by the AMA, APA, and AAP have been heavily shaped by the World Professional Association for Transgender Health (WPATH). WPATH has been criticized for prioritizing ideological advocacy over scientific rigor, and its influence raises serious concerns regarding the objectivity and evidentiary basis of the guidance issued by these organizations (see GAB Report, ¶¶ 216, 221).

107. By contrast, sports governing bodies such as World Athletics, World Aquatics, and World Rugby have adopted sex-based eligibility rules grounded in peer-reviewed scientifically robust research (see GAB Report, ¶¶ 301-356).

F. Tran-Inclusive Policies Do Not Harm Cisgender Youth or Decrease Participation.

108. In ¶ 38, Dr. McQuillan states, "I am not aware of evidence—beyond anecdotal stories—that indicate that including trans athletes in high school athletics harms cisgender athletes." This assertion is both incorrect and misleading. The record includes multiple documented instances of harm to female athletes resulting from the inclusion of biological males (i.e., transgirls and transwomen) in female athletic competitions. These harms include physical injury (see GAB Report ¶¶ 69, 343), loss of competitive opportunities (see GAB Report ¶¶ 257, 258, 265-266), and withdrawal from competition due to fundamentally unfair conditions (see GAB Report ¶ 362). These instances are not merely anecdotal; they are supported by factual evidence and consistent with longstanding, peer-reviewed research on sex-based differences in athletic performance.

109. The website *HeCheated.org* (n.d.), self-described as "a record of males who have robbed female athletes of success and opportunities in sport, and the organizations who have helped them do so", documents numerous instances in which biologically male athletes have displaced female competitors in women's sports. The site includes verified

records of female athletes who have sustained injuries as a result of competing against male athletes, as well as a running tally of female podium placements lost to males. As of the date of this report, the site reports that in 2025 alone, male athletes have taken over 297 first-place, 482 top three, in 955 total events from female athletes in girls' or women's competitions. While Dr. McQuillan may seek to dismiss this source on the grounds that it is not peer-reviewed, the data presented are drawn from publicly available news coverage and official sports result databases, which are cited directly on the site and can be independently verified.

110. Similarly, *SheWon.org* (n.d.) maintains an archive of female athletes who have been displaced by male competitors in women's sports and other female-only competitions. According to its records, as of the end of 2024, 2,743 female athletes have lost access to 3,967 medals, records, scholarships, or other competitive opportunities across 1,675 events spanning 47 sports. Like *HeCheated.org*, this site compiles data from publicly available news articles and official results, all of which are clearly cited and independently verifiable. While not peer-reviewed in the academic sense, these sources offer a valuable record of the tangible consequences of male participation in female categories, consequences that are well-documented, factual, and cannot be ignored.

111. In ¶¶ 38–40 of her declaration, Dr. McQuillan cites national and state-level participation data (e.g., Goldberg, 2021) to argue that no harm has occurred from inclusive policies, claiming that overall girls' participation in high school sports has increased. However, this line of reasoning is both methodologically flawed and misleading. The data provided in ¶ 39 show that the largest increases in girls' participation occurred prior to the adoption of gender identity–based inclusion policies by the Minnesota State High School League (MSHSL), and the rate of increase slowed afterwards. The table below is developed from the figure provided by Dr. McQuillan.

Academic Year	MSHL Girls Participation	% Increase From Previous Year	Notes
2012-2013	110,312		
2013-2014	112,843	2.29%	
2014-2015	114,216	1.22%	
2015-2016	115,759	1.35%	MSHL Adopts Trans-Inclusive Policy
2016-2017	117,020	1.09%	
2017-2018	117,838	0.70%	
2018-2019	117,885	0.04%	
2019-2020	98,133	-16.76%	COVID-19 Pandemic
2020-2021	99,742	1.64%	
2021-2022	98,133	-1.61%	
2022-2023	99,742	1.64%	
2023-2024	101,441	1.70%	

These data also show a drastic reduction in participation during the COVID-19 pandemic,

and participation levels have yet to return to pre-pandemic levels. As a result, it is impossible to attribute the recent gradual increases in participation to inclusive policy effects, as they are more plausibly explained by a slow recovery towards baseline rather than evidence of growth stimulated by those policies. Dr. McQuillan's interpretation fails to account for these broader temporal trends, does not account for any number of factors that might influence sports participation by youth, and does not support the conclusion that gender inclusive eligibility standards increase the participation of female athletes.

112. Furthermore, aggregate participation trends do not capture the displacement of individual female athletes from team rosters, podiums, or qualifying rounds, nor do they reflect the chilling effect on participation when girls perceive that they cannot compete on fair terms. Participation statistics cannot disprove the existence of harm when the nature of that harm involves unequal opportunity, unfair competition, or increased physical risk. These harms are individual, measurable, and material, regardless of whether they are reflected in total enrollment figures.

113. In ¶ 41, Dr. McQuillan references public opinion data from the Pew Research Center, suggesting that knowledge of transgender individuals correlates with increased support for inclusion. In this assertion Dr. McQuillan is overextending the findings of this survey to include sports when no such data are in this report. Further, this claim is clearly countered by public opinion data showing that the vast majority of Americans oppose allowing transwomen to compete in the female category (79%, as of January 2025, see GAB Report ¶ 358).

G. Trans-Participation Bans Harm Cisgender Youth

114. In ¶ 42, Dr. McQuillan asserts that enforcing sex-based sporting categories amounts to banning transgender youth from participating in sports. This claim is inaccurate. Sex-based categories do not exclude anyone from competition; rather, they require athletes to compete in the category corresponding to their biological sex—just as athletes are required to compete within appropriate age or weight categories. It is therefore misleading to characterize such eligibility criteria as a "ban." For example, a high school athlete is not banned from sport simply because they are ineligible to compete in a middle school division. The same principle applies to sex-based categories, which exist to ensure fairness and safety in competition.

115. In ¶¶ 43–44 Dr. McQuillan claims that sex-based sporting categories are equivalent to "gender policing" conflates the existence of sex-based categories with the inappropriate or abusive enforcement of such categories, similar to Dr. Goepferd. These comments are previously addressed in this report in my rebuttal of Dr. Goepferd's report (¶¶ 46-50).

116. Dr. McQuillan's argument in ¶ 45, that attention to transgender inclusion detracts from more pressing issues in women's sports, is a false dichotomy. Addressing unequal funding, media coverage, or coaching abuses does not preclude addressing the harms caused by unfair competition. To the contrary, allowing biological males to compete in female categories exacerbates existing inequities by displacing female athletes from

recognition, advancement, and scholarship opportunities within their own sporting category.

H. Inclusive Policies Further the Goals of Youth Athletics

117. In ¶¶ 48- 49 Dr. McQuillan's appeal to the National Federation of High School Associations (NFHS) mission and statements from pre-2015 sources (e.g., Griffin, 2015) does not reflect current scientific understanding or legal standards. As noted by Dr. McQuillan, NFHS has not issued a policy requiring the inclusion of transgender-identifying males in female categories, and general statements about inclusion must be balanced against the organization's equally important commitments to safety, fairness, and integrity.

118. Furthermore, the NFHS in its 2022 Title IX Frequently Asked Questions webpage (NFHS 2022), notes that the vast majority of legal cases have not allowed boys to participate on girls' teams due to the height, weight, and strength advantages associated with male biology, even in instances where no comparable boys' team is available. This reflects not only consistent legal precedent but also sound policy rationale: that permitting biologically male athletes to compete in female categories undermines the purpose of sex-separated sports by introducing inherent physical advantages rooted in biological sex. The NFHS guidance reinforces the long-standing recognition that male performance advantages are relevant, material, and incompatible with the goal of providing equal athletic opportunities for females under Title IX.

119. In ¶ 50, Dr. McQuillan claims that restricting transgender participation creates a "two-tier system" and violates the principle of equal opportunity. This claim misrepresents the legal and biological rationale for sex-based sports categories. Title IX and the Minnesota State High School League (MSHSL) rules are premised on the recognition that male and female athletes are biologically different in ways that materially affect athletic performance. Maintaining separate categories based on biological sex is not discriminatory, it is necessary to ensure meaningful participation for female athletes.

120. Overall, Dr. McQuillan's assertions in ¶¶ 38–50 are not grounded in the peer-reviewed literature on sex-based athletic performance, nor do they address the material and documented harms experienced by female athletes. The inclusion of biological males in female sport, especially in scholastic settings, undermines the intent and function of sex-separated categories. These policies, far from promoting equity, compromise the safety, fairness, and opportunity that Title IX was designed to protect.

I. Synthesizing Medical, Health and Social Science Evidence

121. In ¶ 51, Dr. McQuillan asserts that my report "selectively us[es] data or studies to support… pre-determined conclusions about trans athletes," and claims that such an approach is "ethically problematic and violates scientific integrity." She further introduces herself as a "scholar with rigorous methodological training." While I respect Dr. McQuillan's academic background, it is important to clarify that none of her degrees,

professional training, or current academic appointment are in exercise physiology or any related discipline concerned with human performance (McQuillan ¶¶ 5–6). Her academic credentials—a bachelor's degree in political science, two master's degrees (one in teaching and one in human development and social policy), and a PhD in human development and social policy with a concentration on K–12 education and LGBTQ+ health—are not in fields that produce expertise in the biological determinants of athletic performance.

122. By contrast, my expertise is directly relevant to the subject matter of this case. I hold a master's degree in exercise science with an emphasis in exercise physiology, and a PhD in the biological basis of health and human performance. I have authored or co-authored over 60 peer-reviewed publications and more than 70 scholarly presentations in this field, including original research on sex-based physiological differences in athletic performance—among both adults and prepubertal children. I also serve as a peer reviewer for approximately two dozen scientific manuscripts in this field each year.

123. My report does not rely on selective or ideologically motivated citations. It draws upon nearly 200 peer-reviewed sources, including primary research articles, review papers, meta-analyses, consensus statements, and position papers by recognized authorities in exercise physiology and sports science. In addition, I cite publicly available athletic performance records and policy statements from national and international sports governing bodies. These data collectively provide clear, consistent, and well-documented evidence that:

(1) there are biologically based performance differences between males and females;

(2) these differences confer competitive advantages to male athletes over comparably aged, trained, and talented female athletes—even prior to puberty; and

(3) these advantages are not eliminated by transgender identity or by hormonal or surgical interventions.

To characterize this synthesis of evidence as a violation of scientific integrity is both inaccurate and inappropriate.

124. In ¶ 52 Dr. McQuillan asserts that I give undue evidentiary weight to opinion articles and advocacy-group publications. Dr. McQuillan claims that my report "treats editorials and advocacy-group statements as if they carry the same evidentiary weight as peer-reviewed studies," and further asserts that this "blurs the hierarchy of evidence and is misleading about the strength and nature of the data." This mischaracterizes both the structure and intent of my report.

125. Again, my report cites nearly 200 peer-reviewed articles in addition to other types of literature and my own original research, all of which are categorized accordingly in my bibliography. Dr. McQuillan's report cites fewer than 100 sources total, many of which are not peer-reviewed research. So, the criticism that I've not sufficiently relied on the peer-reviewed literature is puzzling.

126. In addition, peer-reviewed publications are not the sole, nor always the most

timely or appropriate, source of factual evidence, particularly in applied domains such as sport performance outcomes, eligibility standards, and legal frameworks. Peer-reviewed studies often involve limited sample sizes, narrow research designs, and delayed publication timelines, which can make them less responsive to rapidly evolving policy environments. Moreover, the peer-review process is a mechanism for assessing academic rigor, not a definitive marker of factual accuracy (Smith, 2006; Tennant & Ross-Hellauer, 2020; Hale, 2020; Kusumoto et al., 2023).

127. The current socio-political climate has created a chilling effect on open academic and scientific discourse regarding biological sex and sex-based athletic eligibility. This climate has impeded the publication of peer-reviewed research supporting sex-based differences in sports performance and categories. As noted in the Cass Review (2024; see GAB Report ¶¶ 215, 221), many scholars and practitioners now self-censor or avoid publicly endorsing the importance of biological sex due to fear of professional or social repercussions. For example, Dr. Carole Hooven's faculty appointment at Harvard University was terminated following a media appearance in which she discussed fundamental biological differences between males and females (Hooven, 2023). Such incidents have had a chilling effect on scholarly engagement with sex-related issues in academe (Pfaus, 2023).

128. I have experienced this suppression firsthand. In collaboration with 25 international scholars, I co-authored a manuscript that was rejected from a scientific journal, in part due to our use of the term transwomen (one word) rather than trans women (two words), a terminological distinction unrelated to the paper's scientific content. The same manuscript was later accepted and published in another peer-reviewed journal (Lundberg et al., 2024; see GAB Report ¶ 318). This experience reflects how ideological sensitivities, rather than academic merit, can influence publication decisions and limit open inquiry into contested scientific topics.

129. This suppression of viewpoint diversity is also reflected in the academic literature cited by Dr. McQuillan, which includes numerous peer-reviewed articles exploring the mental health implications of sex-based eligibility policies for transgender-identified students, yet there is a conspicuous absence of comparable research addressing the psychological or educational effects on female athletes who have been displaced by biologically male competitors. As noted in ¶¶ 360–363 of my initial report, this gap persists despite significant media coverage of such events, suggesting an asymmetrical academic focus shaped by ideological pressure rather than neutral scientific inquiry.

130. My report cites 193 peer-reviewed papers to support conclusions regarding the biological differences between males and females, the athletic advantages conferred by male biology, and the persistence of those advantages in transgender-identifying males, regardless of hormone intervention. In addition, I incorporated sources such as official documents from sports governing bodies (e.g., World Athletics, IOC, NCAA), court rulings, publicly available competition results, and media reports to supplement the empirical record, particularly where peer-reviewed literature is incomplete or lacking practical context.

131. Opinion pieces and advocacy-group publications were cited selectively and for clearly defined purposes: to illustrate prevailing narratives, policy rationales, and public responses, not as substitutes for empirical data. At no point were such sources presented in lieu of peer-reviewed research. Rather, they provided contextual insight into how scientific, legal, and ethical questions are framed and interpreted in the real world.

132. To suggest that my report blurs the hierarchy of evidence is inaccurate. The distinction between empirical data, policy documents, and commentary is clearly maintained. My approach reflects a multidisciplinary evidentiary framework, consistent with accepted practices in applied sport science and policy analysis. Excluding practical evidence, such as who won a race, how athletes responded to policy changes, or how eligibility standards are enforced, simply because it does not appear in a peer-reviewed journal, would ignore critical real-world information.

133. As a practical matter, one does not need a peer-reviewed study to know which athlete ran faster, jumped farther, or placed higher. These outcomes are matters of public record and directly relevant to evaluating fairness in sport. Peer-reviewed literature is essential, but it is only one component of a broader, more comprehensive evidentiary landscape.

134. In her report, Dr. McQuillan alleges that my conclusions are rooted in "essentialist, sex-based stereotypes" (McQuillan Report, ¶ 53). This misrepresents the foundation of my analysis. My report cites 193 peer-reviewed papers, including large-scale meta-analyses and expert consensus reviews, documenting well-established biological differences between males and females that are relevant to athletic performance.

135. As I detailed in my expert report (GAB Report ¶¶ 1–9), biological sex is a fundamental, dimorphic characteristic rooted in the production of gametes (sperm or ova).

136. As further explained in my report (see GAB Report ¶ 3), biological sex is universally defined in the life sciences based on the organization of reproductive anatomy and physiology around gamete production. For the vast majority of the animal kingdom including humans, females are the sex whose bodies are organized to produce large gametes (ova), while males produce small gametes (sperm). This definition holds true regardless of an individual's gender identity. For example, if a sexually mature female is unable to become pregnant, medical evaluation is typically warranted to determine the underlying cause, as pregnancy is within the physiological scope of female reproductive function. By contrast, a transwoman, regardless of hormonal or surgical interventions, does not require such evaluation, because the inability to become pregnant is not a medical anomaly; it reflects the fact that their anatomy and physiology were never organized for ova production. This distinction underscores the biological differences that persist despite gender transition.

137. These differences include lean body mass, muscle mass, muscle cross-sectional area, skeletal muscle fiber type composition, skeletal structure, hemoglobin

concentration, and anaerobic and aerobic power, factors mechanistically linked to male sex. These are not speculative or ideological claims but demonstrable, reproducible biologically based phenomena recognized throughout the scientific literature.

138. Furthermore in ¶ 53 Dr. McQuillan has cited various health policy statements and publications, including those from the American College of Sports Medicine (Hunter et al., 2023), the European Commission (2020), the National Institutes of Health (Barr et al., 2023), and the National Academies of Sciences, Engineering, and Medicine (2025), to suggest that there is such extensive biological and contextual variability within sex-based research that sex cannot serve as a meaningful category in sports policy. This interpretation is both scientifically inaccurate and inconsistent with the purpose and content of the cited sources.

139. The referenced reports call for increased inclusion of females and, in some cases, gender-diverse individuals in biomedical research precisely because biological sex exerts a powerful and under-investigated influence on health and performance outcomes. These calls for inclusion are a response to the historical underrepresentation of females, not a repudiation of sex as a meaningful biological variable. In fact, each of these reports affirms that biological sex is a critical factor influencing cardiovascular, endocrine, musculoskeletal, and metabolic function, domains highly relevant to athletic performance.

140. For example, the ACSM Position Stand (Hunter et al., 2023) identifies sex-based differences in strength, power, endurance, substrate metabolism, and fatigue resistance, and calls for greater research to ensure exercise guidance is appropriate for both sexes. Similarly, the National Academies of Sciences (2025) and NIH policy mandate the inclusion of sex as a biological variable (SABV) in all federally funded research due to consistent evidence of systematic sex differences that affect outcomes across biomedical domains. These policies reaffirm the need to treat male and female biology as distinct in research and clinical application.

141. The continued importance of biological sex as a variable in exercise science research is underscored by several recent peer-reviewed studies. Loenneke et al. (2024), Christensen and Griffiths (2025), and Lundberg and Menickelli (2025)—as discussed in my rebuttal to Dr. Goepferd (¶¶ 30–32), each of which report statistically significant sex-based differences in athletic performance. Specifically, these studies document male advantages in muscle strength in 3.5-4.5 year old children, 1600-meter running performance in 6-12 year old children, and disc golf performance across the developmental spectrum from youth to adulthood, respectively. In addition, ACSM has issued an active call for papers on sex differences in biological responses to exercise for its journal *Exercise, Sport, and Movement* (ACSM, 2024), further demonstrating that biological sex remains a critical and timely focus in the field of exercise science.

142. Moreover, the assertion that "contextual variability" invalidates sex-based eligibility policies in sport is unsupported by scientific evidence. Biological sex, particularly the effects of male sex, remains the single most significant determinant of physical performance potential in competitive sport. The male advantage in skeletal

structure, lean muscle mass, hemoglobin levels, aerobic and anaerobic power, and so on has been well documented (GAB Report ¶¶ 10-108) and persists even after testosterone suppression in transgender-identifying males (GAB Report ¶¶ 231-300). These differences confer a substantial and durable performance advantage that materially affects fairness and safety in female competition.

143. To the extent that Dr. McQuillan relies on studies such as Joel et al. (2015) to argue that sex is not binary or is irrelevant to sport, this is an interpretation that is misleading and scientifically unsupported. Joel et al.'s work on brain "mosaics" addresses psychological traits and brain imaging findings, not biological parameters related to strength, speed, power, and endurance. This study does not challenge the reality of aggregate and functionally meaningful sex differences in athletic contexts.

144. The paper by Joel et al. (2015) does, however, effectively refute the commonly asserted notion that hormones "match" a transgender person's "brain with [their] body." (Wisconsin Public Radio, 2025). Rather than supporting this concept, Joel et al. demonstrates that the human brain exhibits substantial individual variability and that brain structure and function can be influenced by a wide range of behavioral, environmental, and developmental factors. As a result, it can be concluded that it is not scientifically valid to use brain imaging to diagnose or confirm a transgender identity. This finding undermines claims that neuroanatomy provides a biological justification for the inclusion of males in female sports categories.

145. In ¶ 53 Dr. McQuillan alleges that my expert declaration uses "selective citations" and thus implies cherry-picking. This claim is unfounded and mischaracterizes both the scope and methodological rigor of the report. The sources cited throughout my expert declaration reflect the preponderance of evidence from peer-reviewed literature in biology, exercise physiology, sports medicine, pediatric development, and related biomedical disciplines. Notably, the recent systematic review and meta-analysis by Norlund et al. (2025) on testosterone suppression in transwomen, drawing on the same peer-reviewed sources cited in my report (GAB Report ¶¶ 234–290), reached the same conclusion: transwomen retain male athletic advantages even after lengthy testosterone suppression. This directly reinforces the thorough and systematic nature of my report's sourcing and conclusions.

146. The report draws from more than 300 distinct sources, including review articles, original empirical studies, consensus position stands from leading scientific organizations (e.g., the American College of Sports Medicine, the Endocrine Society, the Fédération Internationale de Médecine du Sport), and official reports from sport governing bodies. These sources include both historical and contemporary studies from diverse populations and across multiple athletic disciplines. The criteria for selection were relevance, methodological quality, and direct applicability to the questions of sex-based athletic performance differences, developmental trajectories in youth sport, and the biological consequences of male puberty.

147. The report does not omit or suppress contradictory evidence. Rather, it addresses the limited and methodologically constrained studies that claim minimal or no male

advantage post-transition, such as small-sample transgender inclusion studies that lack control groups or long-term outcome data. When such studies are cited or discussed in broader literature, they are explicitly addressed and rebutted based on their limitations. This constitutes critical analysis, not cherry-picking.

148. Moreover, the consistent findings across multiple domains, VO_2max, muscle mass, hemoglobin levels, strength, and performance metrics in running, swimming, and throwing, demonstrate that the conclusions of this report are not derived from isolated studies but from a converging body of scientific evidence. Where gaps or limitations in the literature exist, they are acknowledged explicitly.

149. The term "cherry-picking" implies the intentional omission or misrepresentation of evidence that would materially affect a report's conclusions. No such evidence exists regarding my report. Dr. McQuillan fails to cite any specific example of relevant, methodologically sound primary research that was excluded and that would undermine the central findings of my report, namely, that male biological advantages remain significant and consequential for athletic performance across the lifespan, even after hormonal suppression, and that these advantages are incompatible with fairness and safety in female sport.

150. To illustrate the thoroughness of my approach, one key section of my report has the subheading "Boys exhibit advantages in athletic competition even before puberty." In that section, I have cited every peer-reviewed study known to me that provides statistical comparisons of prepubertal male and female performance in track & field and swimming competitions, and I have supplemented these sources with objectively verifiable data drawn transparently from recent athletic competitions (see GAB Report ¶¶ 154–192). This reflects a comprehensive and balanced review of the available evidence, not selective reporting.

151. In short, my report is grounded in the principles of scientific transparency, evidentiary relevance, and disciplinary expertise. The accusation of selective citation is not supported by any demonstrable omission or misrepresentation and appears to be a rhetorical attempt to discredit conclusions that are otherwise well-supported by the current body of scientific literature.

152. In summary, the literature cited by Dr. McQuillan in ¶ 53 does not undermine the rationale for sex-based categories in sport. On the contrary, it affirms the necessity of accounting for biological sex in order to ensure equitable and evidence-based practice. Recognition of gender diversity in society does not negate the biological reality that male and female athletes differ in ways that directly affect competitive fairness and safety. Sex-based athletic eligibility policies are not only scientifically justified, they are essential to the continued protection of opportunities for female athletes under Title IX and comparable state and federal civil rights frameworks.

153. In ¶¶ 53-54 Dr. McQuillan references the 2023 American College of Sports Medicine (ACSM) consensus statement (Hunter et al., 2023) to argue that sex-based health and performance data are too variable to support strong conclusions regarding

male athletic advantage. She cites this document in support of her claim that my report relies on selective citations and outdated or "essentialist" views of sex-based differences, a claim addressed earlier in this rebuttal.

154. This interpretation misrepresents both the content and intent of the ACSM consensus statement. As I explain in my original report (GAB Report ¶¶ 132–135 and 350–353), the ACSM statement advocates for greater inclusion of females in research and improved sex-specific analysis; it does not deny the existence of biologically based sex differences. On the contrary, the statement acknowledges that sex-linked anatomical and physiological characteristics influence health and performance outcomes and calls for more precise disaggregation of data by sex in both scientific research and applied sport contexts.

155. My report explicitly addresses variability within sexes while emphasizing robust, replicable, and causally linked population-level differences between males and females, differences that are rooted biologically in male sex. These include, among others, higher hemoglobin concentrations, greater muscle cross-sectional area, longer skeletal levers, and faster reaction times. These characteristics are widely recognized by organizations such as the ACSM, World Rugby, World Athletics, and World Aquatics as key determinants of athletic performance.

156. I do not cite the ACSM consensus statement as support for categorical bans on male participation in female sports. Rather, I reference it to illustrate that the scientific community acknowledges the need for sex-disaggregated research and recognizes the biological distinctions between males and females that are relevant to sport. Dr. McQuillan's claim that I misuse or overstate the ACSM's position fails to account for my explicit and nuanced treatment of the document's scope and limitations.

157. Notably, Dr. McQuillan and I appear to agree that the ACSM consensus statement does not adequately address sex-based performance differences prior to puberty. I discuss this limitation in my original report at ¶¶ 149–153.

158. Finally, it is important to note that the ACSM has not taken any position rejecting the existence of male performance advantages or opposing sex-based eligibility standards in sport. Using the consensus statement as evidence against biologically based performance distinctions misrepresents both its content and intent. As further evidence that the ACSM acknowledges the importance of biological sex in health, fitness, and athletic performance, my report includes multiple examples from the 2025 edition of ACSM's Guidelines for Exercise Testing and Prescription (see GAB Report ¶¶ 23, 25, 27, 49, 94, 241, 243).

159. In ¶ 55 Dr. McQuillan claims that my report somehow presents data and conclusions that do not adequately represent the youth athletes of Minnesota. The claim that my report improperly generalizes findings from elite or adult athletic populations to high school athletes fundamentally mischaracterizes the content and structure of my report and the nature of the scientific evidence on sex-based performance differences. While it is true that inferential statistics require caution in generalizing from a sample to a

broader population, Dr. McQuillan's critique overlooks several key points.

160. First, contrary to any implication that my report relies exclusively on data from elite or adult athletes, it draws extensively on peer-reviewed research and normative physical fitness standards that specifically assess prepubertal and adolescent performance (see GAB Report ¶¶ 111–153). These data encompass boys and girls of comparable age, training, and talent levels, and come from both U.S. and international sources. In addition, my report presents empirical sports competition data across multiple athletic domains, running, jumping, swimming, and throwing, relevant to school-aged athletes (GAB Report ¶¶ 154–186). This includes objectively verifiable results from state-level competitions demonstrating male performance advantages well before and during high school. For example, the report cites Higerd's analysis of high school track and field records from five U.S. states (California, Florida, Minnesota, New York, and Washington) over a three-year period (2017–2019), which includes specific data from Minnesota (see GAB Report ¶¶ 41, 52, 264).

161. Second, the use of data from elite or adult populations is methodologically appropriate when the underlying biological mechanisms driving performance differences, such as muscle mass, bone structure, hemoglobin concentration, and limb length, are well-established, causally linked to male sex, and persist across all levels of sport (as explained by Hunter 2024, see GAB Report ¶ 155). The biological advantages conferred by male sex are not specific to elite athletes; rather, they are scalable and consistent across the performance spectrum, from recreational to elite competition. As such, the use of adult or elite data is not a matter of inappropriate generalization, but of illustration: these data serve to underscore the magnitude and durability of sex-linked performance differentials that begin at puberty and persist into adulthood.

162. Third, the suggestion that only data from "cisgender and transgender girls" in high school sports are appropriate for evaluating sex-based eligibility policies misunderstands the relevant scientific question. The issue is not identity, but biological sex and specifically the biological advantages conferred by male sex, a process that confers well-documented athletic advantages that are not eliminated by gender identity or mitigated meaningfully by puberty blockers, testosterone suppression, or cross-sex hormone use, as discussed in multiple sources cited in my report (see GAB Report ¶¶ 203-222, 231–300).

163. Finally, I do qualify my findings with appropriate context, acknowledging both the limitations and scope of the research. I explicitly distinguish between prepubertal and post-pubertal athletes, address interindividual variation, and clearly state when the evidence is drawn from elite or youth-level populations. My report is transparent in its citations and appropriately cautious in its inferences, unlike Dr. McQuillan's declaration, which largely ignores the biological evidence base in favor of psychosocial considerations.

164. In sum, the critique that my report does not rely on appropriate representative data misunderstands the nature of inferential reasoning in biology and sport science, where causal biological mechanisms, not identity-based sampling frames, drive performance

outcomes. The relevant population in this case is not "transgender girls," but biological males competing in the female sports category, and the empirical record is clear that males have substantial and meaningful advantages across all levels of sport when similarly aged, trained, and talented males and females are compared, including middle and high school, and those advantages are not erased by a transgender identity with or without hormonal intervention.

I. Summary

165. Dr. McQuillan does not engage with or refute the core biological claims presented in my report. She provides no data showing that male sex does not confer lasting performance advantages when similarly aged, trained, and talented males and females are compared, nor does she present counter-analyses to the cited peer-reviewed literature. The absence of such rebuttal supports the validity of my conclusions.

166. Dr. McQuillan's report focuses on mental health and inclusion policy but does not directly address the issue at hand: whether the inclusion of male bodied individuals compromises fairness and safety in female athletic competition.

167. My conclusions are based on a thorough review of peer-reviewed scientific literature, objective performance data, and internationally recognized standards of sport governance. I respectfully submit that my analysis remains scientifically valid, policy-relevant, and legally sound.

III. Overall Summary.

168. In conclusion, the rebuttals submitted by Dr. Goepferd and Dr. McQuillan do not undermine the core scientific and evidentiary foundations of my original expert declaration. The central conclusions remain unchanged: that there are well-established biological differences between males and females; that these differences confer inherent athletic advantages to males; and that such advantages are not eliminated by a transgender identity, with or without hormonal intervention. Both rebuttals rely heavily on selective and often misleading interpretations of psychosocial literature, mischaracterize the rationale for sex-based eligibility standards, and minimize or ignore the robust body of empirical research documenting male biological advantages in sport. In contrast, my original declaration and this rebuttal are firmly grounded in the preponderance of evidence from exercise physiology, performance data, and the evolving landscape of international sport policy, much of which continues to reinforce the necessity of sex-based eligibility criteria. The inclusion of biological males in female sport categories compromises both competitive fairness and athlete safety. Neither Dr. Goepferd nor Dr. McQuillan has presented a credible scientific or legal basis to justify a departure from this conclusion. As documented in my May 12, 2025 expert declaration and reiterated here, a growing number of national and international sports organizations are adopting policies that limit participation in the female category to individuals whose biological sex is female. I affirm all prior findings expressed in my May 12, 2025 declaration and submit this rebuttal in continued support of those conclusions.

Bibliography of sources cited in this rebuttal, that are not cited in my expert report

Alvares, L. A., Dos Santos Quaresma, M. V., Nakamoto, F. P., Santos, L. M., Navarro, L. S., Navarro, G. S., Orozco, B. M. M., Sa, B. M. C., Achkar, G. B., Marques, C. G., Barbosa, R. C. C., & Ferreira, R. E. S. (2025). Body composition, exercise-related performance parameters and associated health factors of transgender women, cisgender women and cisgender men volleyball players. Br J Sports Med, 59(15), 1073-1085. https://doi.org/10.1136/bjsports-2024-108601

American College of Sports Medicine. (2024, December). *ESM 2025 call for papers: Sex differences in response to exercise* [PDF]. *Exercise, Sport and Movement*. Retrieved July 25, 2025, from https://acsm.org/wp-content/uploads/2024/12/ESM-2025-sex-differences-call.pdf

American Medical Association. (n.d.). Instructions for authors. In *JAMA Network Journals*. Retrieved July 25, 2025, from https://jamanetwork.com/journals/jama/pages/instructions-for-authors

American Physiological Society. (n.d.). Author instructions. In *American Physiological Society Journals*. Retrieved July 25, 2025, from https://journals.physiology.org/author-info

Bengtsson, D., Svensson, J., Wiman, V., Stenling, A., Lundkvist, E., & Ivarsson, A. (2025). Health-related outcomes of youth sport participation: A systematic review and meta-analysis. *International Journal of Behavioral Nutrition and Physical Activity, 22*(1), 89. https://doi.org/10.1186/s12966-025-01792-x

Brown GA, Shaw B, Shaw I, Joyner MJ, Hunter SK, Senefeld JW, Tucker R, Hilton E, Lundberg TR, Carlson C, Kirk C. Comment on "Biology and Management of Male-Bodied Athletes in Elite Female Sports" by Handelsman and Bermon. Drug Test Anal. 2025 Aug 7. doi: 10.1002/dta.3916. Epub ahead of print. PMID: 40774828.

Christensen, M. W., & Griffiths, C. M. (2025). Sex Differences in 1600-m Running Performance and Participation for Children Aged 6–12 yr. Exercise, Sport, and Movement, 3(3), e00051. https://doi.org/10.1249/esm.0000000000000051

Court of Arbitration for Sport. (2019). *CAS 2018/O/5794 Mokgadi Caster Semenya v. International Association of Athletics Federations*. Lausanne, Switzerland. Retrieved July 25, 2025, from https://www.tas-cas.org/fileadmin/user_upload/CAS_Award_-_redacted_-_Semenya_ASA_IAAF.pdf

FASEB Journal. (n.d.). Instructions for authors. Retrieved July 25, 2025, from https://faseb.onlinelibrary.wiley.com/hub/journal/15306860/homepage/author-guidelines

Hale, J. Peer review: The limitations and the progress of science. (2020). Center for Inquiry. Retrieved July 25, 2025, from https://centerforinquiry.org/blog/peer-review-the-limitations-and-the-progress-of-science/

HeCheated.org. (n.d.). *Home* — They cheated: A record of males who have robbed female athletes of success and opportunities in sport. Retrieved August 8, 2025, from https://hecheated.org/ hecheated.org

Heidari, S., Babor, T.F., De Castro, P. *et al.* Sex and Gender Equity in Research: rationale for the SAGER guidelines and recommended use. *Res Integr Peer Rev* **1**, 2 (2016). https://doi.org/10.1186/s41073-016-0007-6

Hooven, C. K. (2023). Academic Freedom Is Social Justice: Sex, Gender, and Cancel Culture on Campus. *Arch Sex Behav*, *52*(1), 35-41. https://doi.org/10.1007/s10508-022-02467-5

Intersex Society of North America. (n.d.). *How frequent is intersex?* Retrieved July 25, 2025, from https://isna.org/faq/frequency/

Joel, D., Berman, Z., Tavor, I., Wexler, N., Gaber, O., Stein, Y., Shefi, N., Pool, J., Urchs, S., Margulies, D. S., Liem, F., Hänggi, J., Jäncke, L., & Assaf, Y. (2015). Sex beyond the genitalia: The human brain mosaic. *Proceedings of the National Academy of Sciences of the United States of America, 112*(50), 15468–15473. https://doi.org/10.1073/pnas.1509654112

Kirk C, McGawley K, Abt G, Lundberg T, Devine C, Brown G, Carneiro E. Concerns regarding the research design, participant selection, and data interpretation of 'Body composition, exercise-related performance parameters and associated health factors of transgender women, cisgender women and cisgender men volleyball players' BJSM Rapid Response. May 20, 2025 https://bjsm.bmj.com/content/early/2025/02/17/bjsports-2024-108601.responses Full text available at: https://doi.org/10.51224/SRXIV.547

Kusumoto, F. M., Bittl, J. A., Creager, M. A., Dauerman, H. L., Lala, A., McDermott, M. M., Turco, J. V., Taqueti, V. R., & Fuster, V. (2023). Challenges and controversies in peer review: JACC review topic of the week. Journal of the American College of Cardiology, 82(21), 2054–2062. https://doi.org/10.1016/j.jacc.2023.08.056

Lightner, J. S., Schneider, J., Grimes, A., Wigginton, M., Curran, L., Gleason, T., & Prochnow, T. (2024). Physical activity among transgender individuals: A systematic review of quantitative and qualitative studies. PLoS One, 19(2), e0297571. https://doi.org/10.1371/journal.pone.0297571

Loenneke, J. P., Abe, A., Yamasaki, S., Tahara, R., & Abe, T. (2024). Sex differences in strength during development: Implications for inclusivity and fairness in sport. *American Journal of Human Biology, 36*, e24152. https://doi.org/10.1002/ajhb.24152

Loland, S. (2002). *Fair play in sport: A moral norm system*. (1st ed) Routledge.

Lundberg, T.R. and Menickelli, J. (2025), Sex Differences in Disc Golf Performance: Implications for Eligibility Criteria for Women's Competitions. Eur J Sport Sci, 25: e70008. https://doi.org/10.1002/ejsc.70008

Miro EW, Rizzone K, Ford K, Ho TF, Sullivan E, Mark B, Teramoto M, Cushman D. (2025) Testosterone Levels in Transgender Women Undergoing Gender-Affirming Hormone Therapy. Cureus 17: e83365. https://doi:10.7759/cureus.83365

Mull, C. (2025, August 3). *16-year-old Cooper Lutkenhaus shocks the nation and qualifies for worlds*. *Runner's World*. Retrieved August 8, 2025, from https://www.runnersworld.com/news/a65585195/cooper-lutkenhaus-2nd-800-usas-2025/

NFHS. (2022, May 12). *Title IX compliance – Part IV: Frequently asked questions*. NFHS. Retrieved August 8, 2025, from https://nfhs.org/stories/title-ix-compliance-part-iv-frequently-asked-questions

Norlund, M. K., Christensen, L. L., Andersen, M. S., Kristensen, T. T., Frystyk, J., Mathiesen, J., Nielsen, J. L., & Glintborg, D. (2025). Muscle strength changes and physical activity during gender-affirming hormone therapy: A systematic review. Andrology. https://doi.org/10.1111/andr.70058

O'Connor MI. (2023) Reply to the Letter to the Editor: Equity360: Gender, Race, and Ethnicity: Sex and Fairness in Sports. Clin Orthop Relat Res. 481(10):2064-2067. https://doi:10.1097/CORR.0000000000002843

Office of the Press Secretary. (2025, January 20). *Defending women from gender ideology extremism and restoring biological truth to the Federal Government*. The White House. Retrieved July 27, 2025, from https://www.whitehouse.gov/presidential-actions/2025/01/defending-women-from-gender-ideology-extremism-and-restoring-biological-truth-to-the-federal-government/

Oliveira, J., Frontini, R., Jacinto, M., & Antunes, R. (2022). Barriers and Motives for Physical Activity and Sports Practice among Trans People: A Systematic Review. *Sustainability*, *14*(9), 5295. https://doi.org/10.3390/su14095295

Pfaus JG. The Cancer of Cancel Culture: Spreading "Correct" Scientific Ideologies Across North American Academia. Arch Sex Behav. 2023 Jan;52(1):43-47. https://link.springer.com/article/10.1007/s10508-022-02452-y

Pike, J. (2023). Why 'Meaningful Competition' is not fair competition. J Phil Sport, 50(1), 1-17. https://www.tandfonline.com/doi/full/10.1080/00948705.2023.2167720

SheWon.org. (n.d.). *She Won*. Retrieved August 8, 2025, from https://www.shewon.org/

Smith, R. (2006). Peer review: A flawed process at the heart of science and journals. *Journal of the Royal Society of Medicine, 99*(4), 178–182. https://doi.org/10.1177/014107680609900414

Springer Nature. (n.d.). Submission guidelines and editorial policies. In *Nature Portfolio Journals*. Retrieved July 25, 2025, from https://www.nature.com/nature-portfolio/for-authors

Tennant, J. P., & Ross-Hellauer, T. (2020). The limitations to our understanding of peer review. *Research Integrity and Peer Review, 5*(6). https://doi.org/10.1186/s41073-020-00092-1

United States Olympic & Paralympic Committee. June 18, 2025. *USOPC athlete safety policy* [Policy]. Retrieved July 22, 2025, from https://assets.contentstack.io/v3/assets/blt9e58afd92a18a0fc/bltf456568858cc9c12/USOPC_Athlete_Safety_Policy.pdf

USA Fencing. June 18, 2025. *Transgender and non-binary policy*. Retrieved July 22, 2025, from https://www.usafencing.org/transgender-and-nonbinary-policy

USA Volleyball. (n.d.). Gender competition policy. USA Volleyball. Retrieved July 26, 2025, from https://usavolleyball.org/about/gender-guidelines/

U.S. Department of Health and Human Services. (2018). *Physical activity guidelines for Americans* (2nd ed.). Retrieved August 8, 2025, from https://health.gov/sites/default/files/2019-09/Physical_Activity_Guidelines_2nd_edition.pdf

Wisconsin Public Radio. (2025, February *[exact date if available]*). *Wisconsin parent worries about federal order targeting care for transgender kids*. Wisconsin Public Radio. Retrieved August 8, 2025 from https://www.wpr.org/news/wisconsin-parent-worries-federal-order-transgender-kids

Winsley, R. J., Fulford, J., Roberts, A. C., Welsman, J. R., & Armstrong, N. (2009). Sex difference in peak oxygen uptake in prepubertal children. J Sci Med Sport, 12(6), 647-651. https://doi.org/10.1016/j.jsams.2008.05.006

World Athletics. (2025, July 30). *World Athletics introduces SRY gene test for athletes wishing to compete in the female category* [Press release]. World Athletics. Retrieved August 8, 2025 from https://worldathletics.org/news/press-releases/sry-gene-test-athletes-female-category

World Athletics. (n.d.). *Throws*. Retrieved August 8, 2025 from https://worldathletics.org/disciplines/throws/shot-put

World Athletics. (n.d.). *Women's 800 metres – Senior – All-time top list (outdoor)*. World Athletics. Retrieved August 6, 2025, from https://worldathletics.org/records/all-time-toplists/middlelong/800-metres/outdoor/women/senior nauathletics.com

World Boxing. (2025) Press Release. World Boxing to introduce mandatory sex testing for all boxers. May 30, 2025. Retrieved August 8, 2025 fromhttps://worldboxing.org/world-boxing-to-introduce-mandatory-sex-testing-for-all-boxers/

World Darts Federation**.** (2025, July 28). *WDF eligibility criteria announcement*. DartsWDF. Retrieved July 28, 2025, from https://dartswdf.com/news/wdf-eligibility-criteria-announcement

World Health Organization. (2022). *Guidelines on physical activity and sedentary behaviour*. Retrieved August 8, 2025 from https://www.who.int/publications/i/item/9789240015128

Respectfully submitted,

Gregory A. Brown, Ph.D., FACSM

Professor of Exercise Science University of Nebraska Kearney

August 12, 2025