

“We know who’s going to win the race before it even begins...It just seems like all our hard work is going down the drain.”

ALANNA SMITH
Danbury, CT



Males **jump** approximately **25% higher** than females



Males **throw** about **25% further** than females



Males **run** approximately **11% faster** than females



Males **accelerate** around **20% faster** than females



Males **punch 30–162% harder** than females



Males are around **30% stronger** than females of equivalent stature and mass

female strength differential is so great that even untrained males are stronger than athletically trained females.⁹⁰

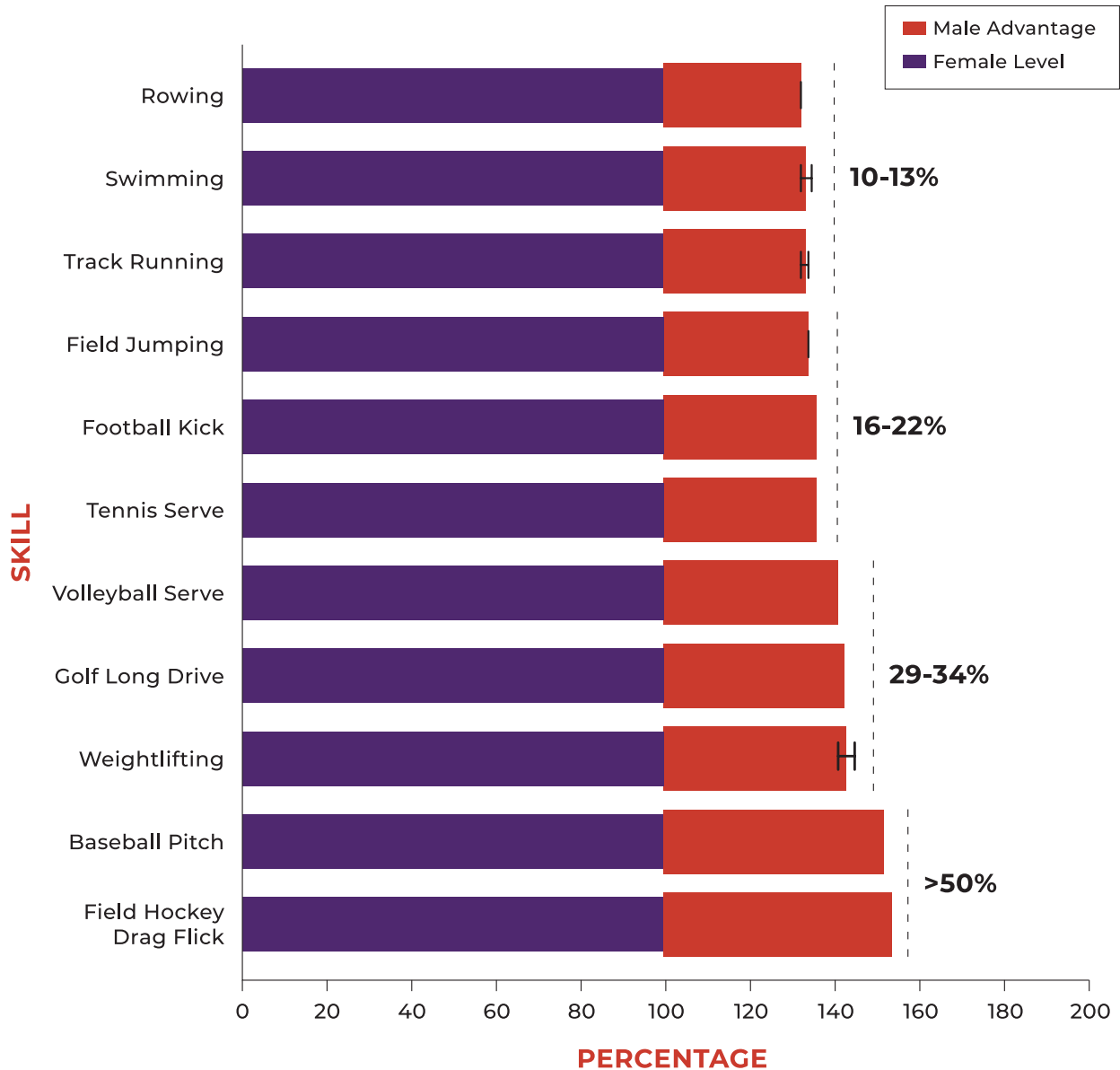
With regard to **specific skills**, studies indicate that post-pubescent males can jump (25%) higher than females,⁸³ throw (25%) further than females,⁸⁴ run (11%)⁸⁵ faster than females, and accelerate (20%)⁸⁶ faster than females.

Perhaps the largest performance gap is seen in the area of strength. Some studies show that males are able to lift 30% more than females of equivalent stature and mass.⁸⁷ Males can also punch significantly harder than females. Andrew Langford, a performance scientist, strength & conditioning coach, and an associate lecturer at Sheffield Hallam University in England, estimates that men can punch with 30% greater force than women.⁸⁸ But at least one study has found that “even with roughly uniform levels of fitness, the males’ average power during a punching motion was 162% greater than females, with the least-powerful man still stronger than the most powerful woman.”⁸⁹ **The male-**

In addition to these significant performance gaps, studies indicate that males are much less prone to **sports-related injuries** than females.⁹¹ Gaps in injury rates, as well as in numerous individual athletic functions, contribute to significant performance gaps across sporting events and across various levels of athletic competition.

For example, British biologist Emma Hilton and Swedish researcher Tommy Lundberg reviewed performance gaps in a variety of specific athletic activities and found disparities of more than 50% in activities, such as a baseball pitch or a field hockey drag flick, where upper body effort plays a significant role.⁹²

Male Advantage for Particular Sport-related Skills

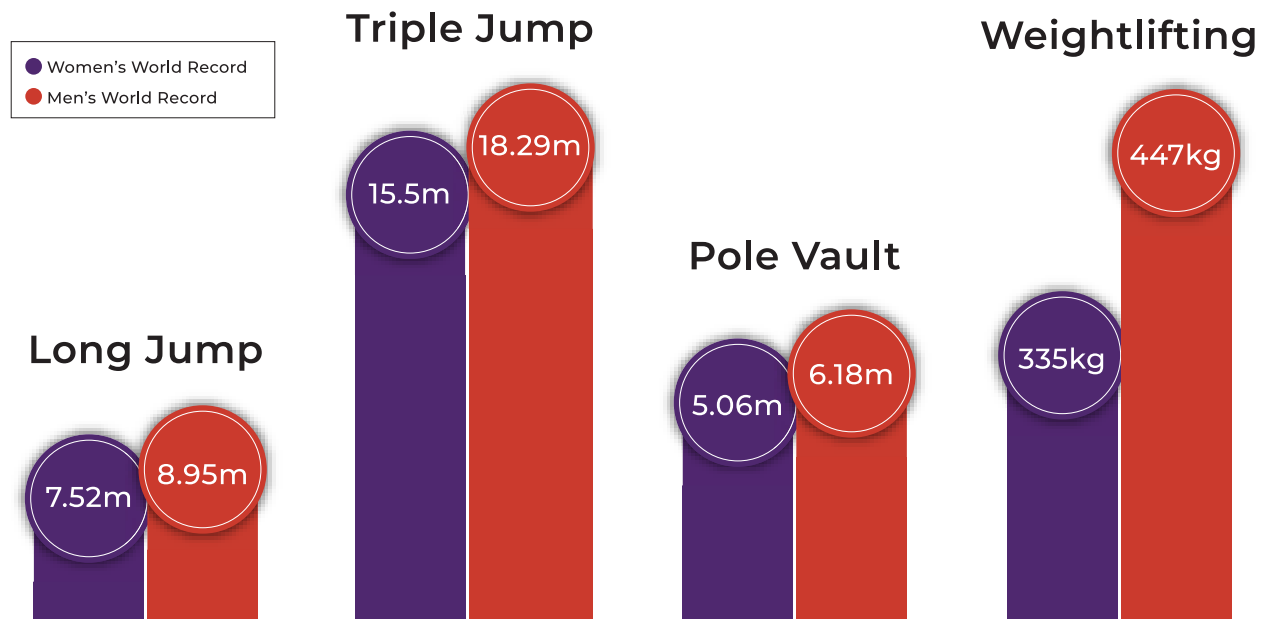
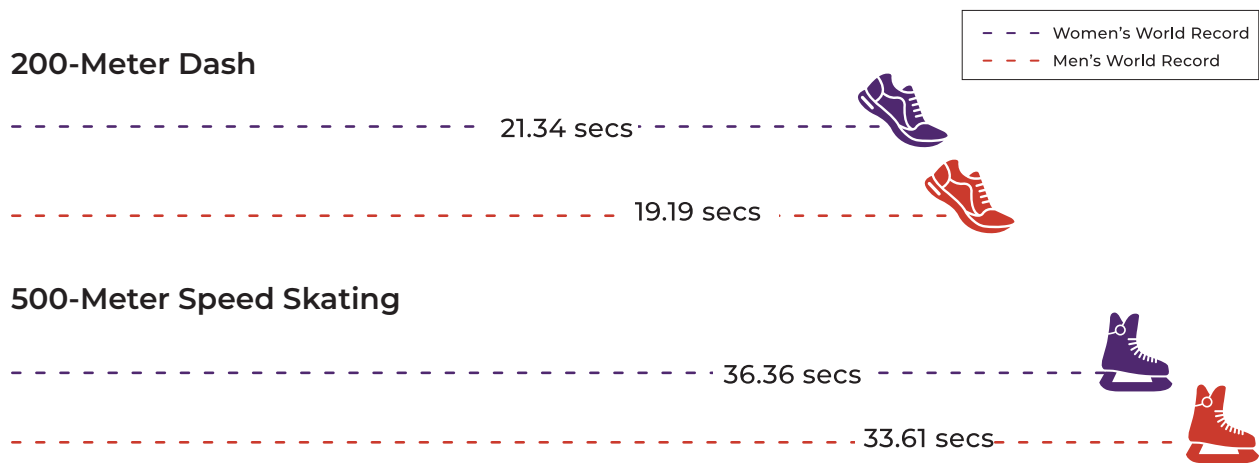


Source: Emma N. Hilton and Tommy R. Lundberg, *Transgender Women in the Female Category of Sport: Perspectives on Testosterone Suppression and Performance Advantage*, 51 *SPORTS MEDICINE* 199, 202-203 (2021), <https://link.springer.com/article/10.1007/s40279-020-01389-3> (data demonstrating the male performance advantage over females in selected sporting disciplines with the female level set to 100%).

C. Differences in Men's and Women's Athletic Performance

In terms of overall performance, males have a significant—and, indeed, insurmountable—athletic advantage over females.⁹³ Not surprisingly, then, we see significant disparities in men's and women's **world records** across events. In running, to take just one example, the gap between men's and women's world-record times is 9-10% at every distance up to the marathon.⁹⁴ The chart below makes the point clearly:

Men's and Women's World Records



Source: worldathletics.org

Even the most talented female athletes cannot beat the top male athletes in their sport. For example,

- **Allyson Felix** is the most decorated U.S. track and field athlete in Olympic history. She has competed in five Olympic Games, winning 11 medals (one more than Carl Lewis). Seven of her medals are Gold.⁹⁵ And, yet, Felix's best 400-meter speed (49.26 seconds)⁹⁶ is four seconds slower than Usain Bolt's personal best (45.28 seconds)⁹⁷ and more than six seconds slower than Wayde van Niekerk's world record (43.03 seconds).⁹⁸

- **Florence Griffith Joyner** ("Flo-Jo")⁹⁹ died in 1998, but she still holds the women's world record in both the 100-meter (10.49 seconds) and 200-meter (21.34 seconds).¹⁰⁰ Compare this to Usain Bolt's 100-meter world record of 9.58 seconds.¹⁰¹ Bolt also holds the men's world record for the 200-meter race, which he ran in 19.19 seconds¹⁰²—2.15 seconds faster than Flo-Jo.



- At the 2020 Tokyo Olympics (held in 2021), American **Sydney McLaughlin** broke the women's world record in the 400-meter hurdles with a time of 51.46 seconds; Karsten Warholm of Norway broke the men's world record in the same event with a time of 45.94 seconds.¹⁰³
- Great Britain's **Bethany Shriever** won a Gold medal in women's BMX racing in Tokyo with a time of 44.538 seconds.¹⁰⁴ The winner of the men's event in Tokyo, Niek Kimmann of the Netherlands, finished with a time of 39.053 seconds.¹⁰⁵
- American swimmer **Lydia Jacoby** earned a Gold medal in the 100-meter breaststroke in Tokyo with an impressive time of 1:4.95.¹⁰⁶ Meanwhile, American Adam Peaty, the men's 100-meter breaststroke Gold medal winner in Tokyo, finished with a time of 57.37 seconds.¹⁰⁷



Lydia Jacoby, 100-meter, 1:4.95
PHOTO BY MADDIE MEYER VIA GETTY IMAGES



Adam Peaty, 100-meter, 57.37
PHOTO BY IAN MACNICOL VIA GETTY IMAGES

- Even among athletes that are basically the same size, sex matters significantly. As Duke Law Professor Doriane Lambelet Coleman explains, Olympic swimmers **Missy Franklin** and Ryan Lochte are both about the same height (6'2") and have approximately the same wingspan (6'4"). And yet Franklin's record in the 200-meter backstroke is 2:04.06, while Lochte's world record is 1:53.94—a full nine seconds faster. Writes Coleman,

*If Franklin had been in [Lochte's] race, at her best she would have been about half a lap behind Lochte when he finished . . . Franklin would not have had a world record; she would not have been on the podium; in fact, she would not have made the team. In those circumstances, we might not even know her name.*¹⁰⁸

But it is not just the top male athletes who can beat the world's best females:

- Tennis player **Serena Williams** is widely regarded as one of the greatest athletes of all time. Yet, in 1998, the 203rd-ranked men's player, Karsten Braasch, beat both Serena and her sister Venus.¹⁰⁹



Serena Williams
PHOTO BY AELTC/JED LEICESTER - POOL
VIA GETTY IMAGES



Karsten Braasch
PHOTO BY OLIVER HARDT/AFP
VIA GETTY IMAGES

- In the USA Swimming Speedo Junior National Championships in 2019, **nine U19 boys** swam the 1500-meter faster than the women's Gold medal winner in the same event at the 2019 FINA World Championships.¹¹⁰ The boy who came in first swam the race in 15:16.97¹¹¹—over a minute and a half faster than the women's champion.¹¹²
- In 2019, **high school student Matthew Boling** ran a 100-meter race in just 9.98 seconds—0.51 seconds faster than **FloJo's world record**.¹¹³ In fact, in 2018, the man now ranked 5,606th in the world ran a 100-meter race in the same time as FloJo (10.48 seconds).¹¹⁴

Comparison of 2017 Track & Field Performances

Event	Best Women's Result 2017	Best Men's Result	Instances of Men Out-Performing
100 Meters	10.71	9.69	10,009
200 Meters	21.77	19.77	8,993
400 Meters	49.46	43.62	10,898
800 Meters	1:55.16*	1:43.10	12,285+
1500 Meters	3:56.14	3:28.80	8,251
3000 Meters	8:23.14	7:28.73	1,784
5000 Meters	14:18.37	12:55.23	2,140
High Jump	2.06 meters	2.40 meters	2,981
Pole Vault	4.91 meters	6.00 meters	2,981
Long Jump	7.13 meters	8.65 meters	4,801
Triple Jump	14.96 meters	18.11 meters	3,440

Source: Doriane Lambelet Coleman & Wickliffe Shreve, Comparing Athletic Performance of the Best Elite Women to the Boys and Men, Duke Center for Sports Law & Pol'y (Summer 2017), <https://law.duke.edu/sports/sex-sport/comparative-athletic-performance/>.

In many events, *males outperform the best female athletes thousands of times a year*.¹¹⁵ For example, Duke Law professors Doriane Coleman and Wickliffe Shreve found that in 2017 alone, men and boys around the world beat Allyson Felix's best time in the 400-meter dash more than 15,000 times.¹¹⁶ Coleman and Shreve put it simply: men and boys beating the world's best female athletes "is far from the exception. It's the rule."¹¹⁷

Because of the significant male athletic advantage, it is common for elite women's teams to prepare for top competition by scrimmaging against younger boys' teams. For example, in 2013 and 2014, the **U.S. Women's National Ice Hockey Team** prepared for the 2014 Winter Olympics in Sochi by facing off against top-ranked male high school hockey teams—and losing 6-3 to Dexter Southfield in Massachusetts and 3-1 to the Salisbury School in Connecticut.¹¹⁸ Even the celebrated **U.S. Women's National Soccer Team**, which won the 2019 FIFA Women's World Cup, has prepared for competition by scrimmaging top boys' teams—and losing 5-2 to FC Dallas' U-15 team.¹¹⁹

The male-female athletic gap also exists at ordinary levels of competition between male and females.¹²⁰ Indeed, according to World Rugby, "there is no overlap in performance between males compared to females at all matched levels of competition."¹²¹

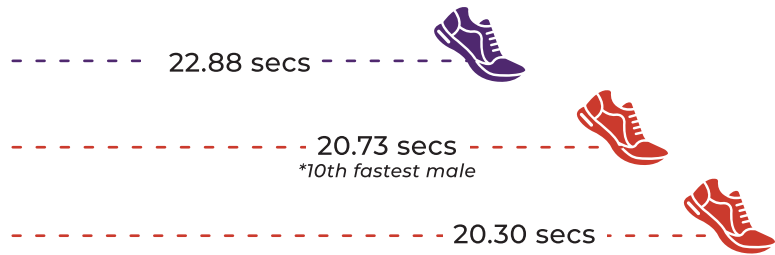


***In 2017, men and boys
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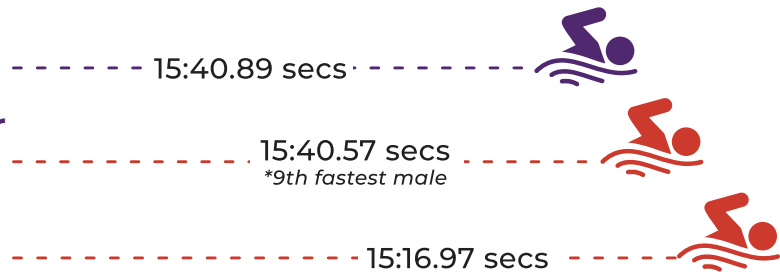


This is true even at the high school level. A review of the best times in the nation across high school track and swimming events during 2019 is illustrative. In the 200-meter dash, the high school male with the tenth-fastest time still beat the top high school female.¹²² Likewise, the 9th fastest male high school swimmer beat the top female high school swimmer in the 1500-meter.¹²³

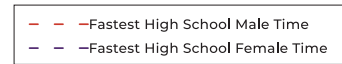
2019 High School Outdoor 200 Meter Track Speeds



2019 High School Swimming 1500 Meter



Sources: athletic.net/TrackAndField/Division/; USASwimming.org



The male-female athletic gap is also evident in individuals who are not athletically-trained at all.¹²⁴

D. What Role Does Testosterone Suppression Play?

Some activists and state athletic associations take the position that male-bodied athletes should be allowed to participate in women's sports even if they have not undergone a period of hormone therapy.¹²⁵ The IOC and the NCAA, by contrast, require a period of testosterone suppression before natal males can participate in women's competitions.¹²⁶ In fact, for some athletic regulatory bodies, testosterone levels are dispositive in determining whether someone is eligible to compete as a female.¹²⁷

So does hormone therapy meaningfully eliminate the male athletic advantage? And do current testosterone levels accurately predict performance? The answer, it turns out, is no.

After two years of testosterone suppression, college athlete CeCe (formerly Craig) Telfer ran the indoor 200-meter dash in 24.45 seconds—faster than Telfer's 2017 pre-transition time of 24.64.

Although the significant increase in circulating testosterone that occurs during male puberty is, indeed, the primary biological basis for the male athletic advantage,¹²⁸ it is not the only basis. There are, for example, over 3000 genes that contribute to muscle differences between human males and females.¹²⁹ **Genetic differences**, of course, cannot be eliminated by reducing testosterone,¹³⁰

and these differences may create different muscle responses to training between even those men and women who have the same concentrations of testosterone.¹³¹

Moreover, many of the changes brought about by increased levels of testosterone during male puberty (such as changes to skeletal architecture) are **permanent and unalterable** by testosterone reduction later in life.¹³² Testosterone suppression will not, for example, make a person shorter or reduce a person's wingspan.

Consider the following:

- **Bone Density and Size** — According to a review of the literature by Hilton and Lundberg, transgender individuals who were born male **maintain bone mineral density over a median of 12.5 years of testosterone suppression.**¹³³ Testosterone suppression does not alter height, limb length, or other skeletal parameters. Thus, transgender athletes who were born male and begin testosterone suppression after the onset of male puberty are likely to retain an athletic advantage in sports, such as basketball, volleyball, handball, where **height, limb length, and handspan** are relevant. Moreover, male-bodied athletes are likely to continue to be less injury-prone than their female counterparts even after years of testosterone suppression and hormone therapy.¹³⁴
- **Muscle Size** — Hilton and Lundberg also found that, while testosterone suppression reduces muscle size, *it does not reverse muscle size to female levels.*¹³⁵ Hilton and Lundberg reviewed twelve longitudinal studies that collectively suggest that 12 months of testosterone suppression to female-typical levels results in **only about a 5% loss of lean body mass or muscle size.**¹³⁶ They concluded that, "given the large baseline differences in muscle mass between males and females, the reduction achieved by 12 months of testosterone suppression can be reasonably assessed as small."¹³⁷

- **Muscle Strength** — Studies on the effect of testosterone suppression on muscle strength (as opposed to size) indicate that **testosterone reduction removes about 5-10% of strength advantages.**¹³⁸ Even after years of testosterone suppression, natal males remain stronger than most females.¹³⁹ And it is possible that even these decreases in strength can be made up by rigorous athletic training on the part of the athlete whose testosterone is suppressed.¹⁴⁰
- **Endurance** — The most significant reduction in athletic advantage after hormone therapy seems to be in **hemoglobin counts**, with a 11-14% change.¹⁴¹ Although further study is needed, it is possible that testosterone suppression brings transgender athletes who were born male closer to the female baseline for endurance sports than for sports that depend on strength or explosive power.¹⁴²
- **Speed** — A study published in the British Journal of Sports Medicine found that transgender women (natal males) in the United States Air Force maintained a **significant advantage in speed** over biological females after a year of hormone therapy.¹⁴³ It is perhaps not surprising, then, that two years after undergoing hormone suppression treatment, college athlete **CeCe (formerly Craig) Telfer** ran the indoor 200-meter dash in 24.45 seconds—faster than Telfer's 2017 pre-transition time of 24.64.¹⁴⁴


Hormone therapy does not come close to leveling the proverbial playing field.

An individual's current testosterone levels are not, therefore, precise predictors of performance. And hormone therapy does not come close to leveling the proverbial playing field.¹⁴⁵

Some transgender athletes acknowledge as much. International Olympic Committee advisor **Joanna Harper**, a natal male, says that, despite more than 15 years of hormone therapy, she “carr[ies] more muscle mass than a woman [her] size, absolutely.”¹⁴⁶

And former tennis player and transgender pioneer **Renee Richards** (formerly Richard Raskin) now admits that biology provided her an advantage over her female competitors. Richards, who won her own legal battle for the right to play in the female category of the U.S. Open,¹⁴⁷ now says that transgender athletes who are natal males should not participate in competitive women's sports.





“I knew that I was the fastest girl here, one of the fastest in the state...Then, the gun went off. And I lost.”

CHELSEA MITCHELL
Canton, CT

Lost four state championships, two all-New England awards, and additional other honors to male-bodied competitors.

“Having lived for the past 30 years,” Richards says, “I know if I’d had surgery at the age of 22, and then at 24 went on the tour, no genetic woman in the world would have been able to come close to me.”¹⁴⁸

What about natal males who take puberty blockers from an early age and, therefore, never experience male puberty?¹⁴⁹ Would this intervention meaningfully reduce or eliminate the male athletic advantage? Unclear, particularly since not all male-female differences are testosterone driven and also because males experience some degree of heightened exposure to testosterone even prior to puberty—both in the womb and shortly after birth.¹⁵⁰ Indeed, Hilton reports that at least one study of males treated with puberty blockers as young as 12, followed by hormone treatment at 16, found that early intervention did *not* reduce height, lean body mass, or grip strength to age-matched female levels.¹⁵¹

IV. WHAT’S THE HARM?

The inclusion of male-bodied athletes in women’s sports harms female athletes by: **(a)** decreasing the chances of female athletic success; **(b)** taking away roster spots, playing time, and potential scholarships from female athletes; and **(c)** (in some sports) increasing the chances of injury.

Supporters of inclusion often argue that, because the number of natal males seeking to compete in women’s sports is relatively small, the harm to natal females as a group is negligible.¹⁵² But to the individual female athletes who lose to male-bodied athletes, the harm feels quite substantial. Moreover, even a small number of natal male athletes have the potential to deny numerous females opportunities to reach the podium.

For example, in just a few short years, two natal males, Terry Miller and Andraya Yearwood, set 17 Connecticut track meet records¹⁵³ and captured 15 women’s State Championship titles previously held by girls. **Chelsea Mitchell**, who ran for Canton High School in Connecticut, lost four state championships, two all-New England awards, and various other honors to Miller and/or Yearwood.¹⁵⁴



Andraya Yearwood (L) and Terry Miller (R)

“That’s a devastating experience,” Mitchell wrote for USA Today in 2021. “It tells me that I’m not good enough; that my body isn’t good enough; and that no matter how hard I work, I am unlikely to succeed, because I’m a woman.”¹⁵⁵

The participation of even a small number of natal males in women’s sports has the potential to deny numerous female athletes repeated opportunities to win.

In some cases, the participation of male-bodied athletes in female sports is so demoralizing that it decreases the desire of girls and women to compete at all. Cynthia Monteleone, who coaches track and field, in addition to competing herself, said the prospect of racing against a male-bodied

competitor was so devastating for one of her female athletes that the young woman “didn’t even want to run track for the rest of the season.”

“What was the point?” Monteleone recalls her athlete saying. “I trained so hard for my events and I have no chance of winning the conference championship.”¹⁵⁶

Female college students have also lost numerous competitions to male-bodied athletes. During the 2019-20 school year, for example **Juniper (formerly Jonathan) Eastwood**¹⁵⁷ took away wins from multiple female competitors, including Southern Utah University sophomore **Haley Tanne**, who lost to Eastwood in the open mile, the distance mile medley, and the cross country Big Sky conference races.

“I just remember being so confused and not even knowing how to feel, just like, how is this happening?” Tanne told Independent Women’s Forum.¹⁵⁸

The world of professional sport is also beginning to see natal males beat female athletes. **Rachel McKinnon**, a transgender athlete/natal male, who has lived under various names including Rhys¹⁵⁹ and now Veronica Ivy,¹⁶⁰ has taken cycling awards from numerous women, including **Dawn Orwick**, who would have earned Gold in the 2019 Masters Worlds sprint (35-39 age category), had McKinnon not taken that top spot.¹⁶¹



PHOTO BY OLI SCARFF/AFP VIA GETTY IMAGES

When asked about her loss to transgender/natal male cyclist Jillian Bearden at the 2016 El Tour de Tucson,¹⁶² third place finisher **Suzanne Sonye** remarked, “I feel bad about saying it but, no, I do not think it’s fair play and I question her integrity knowing that she’s going into these events knowing that she is going to be stronger.”¹⁶³

As disappointing as it is for a female athlete to lose a competition to a male-bodied competitor, it is perhaps even more frustrating to lose the chance to compete at all. Yet, when natal males are selected for limited-roster teams or advanced to the next level of head-to-head competition, **female athletes lose opportunities to compete.**



PHOTO BY DAN MULLAN VIA GETTY IMAGES

New Zealand Weightlifter **Laurel (formerly Gavin) Hubbard** made history as the first transgender athlete to compete in an individual event at the Tokyo Summer Olympics.¹⁶⁴ At the age of 45, Hubbard competed in the over-87-kilogram division, but finished last in the competition after being eliminated without registering a single lift.¹⁶⁵ But that does not make Hubbard’s selection less problematic—when the New Zealand team added Hubbard to its Olympic delegation, a female weightlifter lost a chance to compete in Tokyo.

According to Tasmanian Senator Claire Chandler, that weightlifter was **Roviel Detenamo**. “Eighteen-year-old Roviel Detenamo could have become the first woman in 20 years to qualify to represent Nauru at the Olympic Games,” Sen. Chandler said in August, 2021.

“She could have been in Tokyo proving that, if you have the talent and the work ethic, even a teenager from a nation of 12,000 people can make the Olympics and compete on the same stage as world champions from China and the USA. But we didn’t witness that, because Roviel was denied the opportunity to become an Olympian, one of the most celebrated and respected titles in the world.”¹⁶⁶

Former New Zealand weightlifter **Tracey Lambrechts** understands this frustration all too well. Lambrechts held several New Zealand national records before

Hubbard began competing in the women's division. To avoid losing her spot on New Zealand's national team, Lambrechts lost nearly 40 pounds in three months and entered a different weight class. Ultimately, Lambrechts retired in response to how her league handled the matter.¹⁶⁷

While Hubbard's participation in women's sports garnered international attention, it is easy to overlook similar outcomes at the high school level, which usually go unreported. In Maui, Hawaii, for example, when a natal male who had previously competed on the school's men's volleyball team joined the women's team, biological girls lost the opportunity to start for their team.¹⁶⁸ And in jurisdictions where males are allowed to compete on women's high school teams without male counterparts, males inevitably take varsity spots and playing time from girls. This, of course, directly undermines Title IX, the purpose of which is to increase opportunities for women and girls—not limit them.


Male participation on limited roster teams inevitably takes spots and playing time from girls.

In some sports, allowing natal males to compete with and against female athletes increases the chance of injury. For example, in her first fight as a woman, MMA fighter **Fallon Fox** fractured Tamikka Brents's orbital bone.

Not surprisingly, Brents said she felt "overwhelmed" in the fight by Fox's power.¹⁶⁹ At the high school level, injuries caused by natal males in women's sports are unlikely to be widely reported. Thus, while a teammate of the volleyball player from Hawaii reports that the natal male athlete injured at least one girl and caused a concussion in another, the mainstream press did not report the incidents.¹⁷⁰

Because of the obvious potential for injury, **World Rugby** in October 2020 established a rule banning the participation of natal males on women's teams. After consulting with numerous experts from the fields of medicine, physiology, and psychology, as well as with players, transgender representatives, and rugby experts, the organization concluded that the "size, force- and power-producing advantages" that male-bodied individuals enjoy over female athletes translate into ***an unacceptable risk to player safety.***¹⁷¹

As World Rugby understands, the harm to female athletes isn't just hypothetical. It's real. Allowing male-bodied athletes to play with and against females transforms women's sport into co-ed sport, elevating the risk of injury and undermining equal opportunity for female athletes.

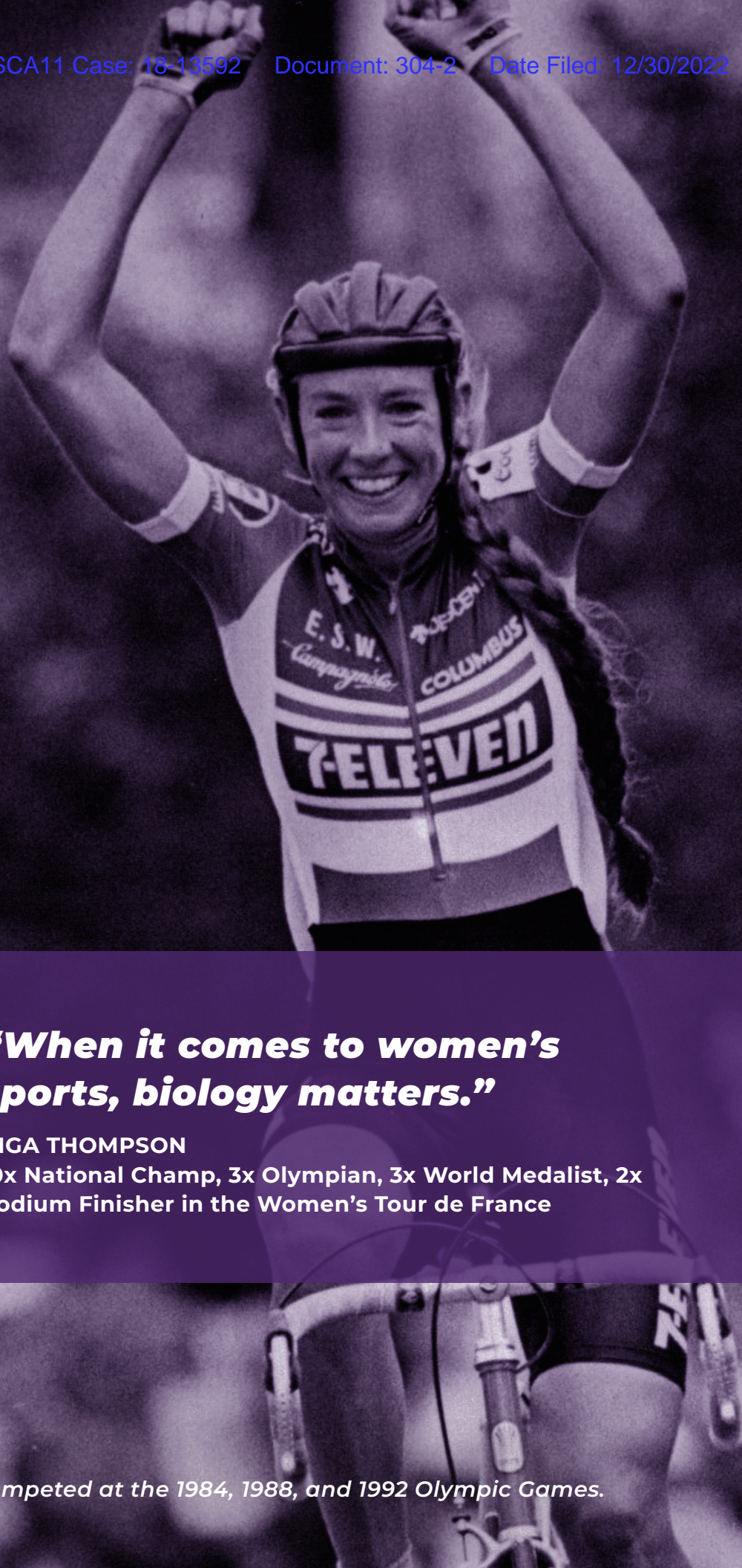


“Coaches at the collegiate level are rewarded for winning, so these coaches will choose biological males in order to remain competitive in their conference. Where are the spaces for biological females then? What does this mean for equal opportunity for women?”

CYNTHIA MONTELEONE

Team USA Masters Track Athlete, Coach, and Metabolic Practitioner

Competed against transgender athlete Yanelle Del Mar Zape of Colombia while representing Team USA in the 2018 women’s World Masters Athletics Championships in Málaga, Spain.



“When it comes to women’s sports, biology matters.”

INGA THOMPSON

10x National Champ, 3x Olympian, 3x World Medalist, 2x Podium Finisher in the Women’s Tour de France

Competed at the 1984, 1988, and 1992 Olympic Games.

CONCLUSION

Despite evidence that hormone therapy cannot eliminate the male-female performance gap, some supporters of transgender inclusion in women's athletics continue to insist that natal males who suppress their testosterone should be allowed to compete as women. Others, particularly those who support the participation of boys in sports such as field hockey and women's volleyball, do not deny the male athletic advantage, but simply argue that inclusion is more important than fairness.¹⁷²

The fact remains, however, that (even at the high school level) the world of competitive sport is a zero-sum game where some athletes make the team and others do not; where someone wins and someone loses. And in a zero-sum competition, the inclusion of male-bodied athletes in women's sport inevitably means that females lose out.

**Congress enacted Title IX
to expand opportunities for
women and girls, not limit them.**

In the short term, inclusion of natal males in women's sports hurts individual female athletes. But in the long run, the logic of allowing male participation in women's events and on women's teams could be used to eliminate sex-specific sport altogether.¹⁷³ As we approach the 50th anniversary of Title IX, we must resist calls for "inclusion" that result in the *exclusion* of any female athlete from competitive sport.



“[When it comes to competitive athletics,] sex segregation is the only way to achieve equality for girls and women.”

MARTINA NAVRATILOVA
Winner of 18 Grand Slam Tennis Singles Titles

ENDNOTES

- 1 See Kelsey Bolar, *After Competing Against Transgender Athletes, Mom and Daughter Fight for Fairness in Women's Sports*, THE DAILY SIGNAL (June 15, 2021) (hereinafter *Fight for Fairness*), <https://www.dailysignal.com/2021/06/15/after-competing-against-transgender-athletes-mom-and-daughter-fight-for-fairness-in-womens-sports/>; see also Kelsey Bolar & Elizabeth Tew, *A Mom & Daughter Fight For Fairness In Women's Sports*, INDEPENDENT WOMEN'S FORUM (June 15, 2021), <https://www.iwf.org/2021/06/15/a-mom-daughter-fight-for-fairness-in-womens-sports/> (video).
- 2 20 U.S.C. § 1681(a).
- 3 See *Neal v. Bd. of Trs. of Cal. State Univs.*, 198 F.3d 763, 766 (9th Cir. 1999) (explaining that Title IX was designed to eliminate significant “discrimination against women in education”).
- 4 According to Senator Birch Bayh, one of Title IX’s primary sponsors, the statute promised women “an equal chance to attend the schools of their choice, to develop the skills they want, and to apply those skills with the knowledge that they will have a fair chance to secure the jobs of their choice with equal pay for work.” 118 Cong. Rec. 5808 (1972).
- 5 Pub. L. No. 93-380, § 844, 88 Stat. 484, 612 (1974) (hereinafter the Javits Amendment); see also *McCormick ex rel. McCormick v. Sch. Dist. of Mamaroneck*, 370 F.3d 275, 287 (2d Cir. 2004) (explaining the history of the Javits Amendment and the regulations promulgated thereunder).
- 6 34 C.F.R. § 106.41(b).
- 7 *Id.*; see also *O'Connor v. Bd. of Ed. of Sch. Dist. 23*, 449 U.S. 1301 (1980) (refusing to vacate a stay that prohibited a female student from trying out for the boys’ basketball team where the school also had a girls’ team).
- 8 34 C.F.R. § 106.41(b).
- 9 The Equal Protection Clause of the United States Constitution forbids arbitrary discrimination on the basis of sex, but it does not presumptively prohibit separation of the sexes in the same way that it forbids racial segregation. See *Craig v. Boren*, 429 U.S. 190 (1976) (outlining the “intermediate scrutiny” standard for sex-based classifications). The reason that courts scrutinize racial classifications more strictly than they scrutinize sex-based classifications is that biological sex differences sometimes provide relevant grounds for distinction, whereas racial classifications do not. By recognizing the inherent difference between race and sex, courts have carved out space to accommodate legitimate distinctions between males and females, while still prohibiting unjust discrimination. See e.g., Brief of Independent Women’s Law Center as Amicus Curiae, *Equal Means Equal v. Ferriero*, No. 20-1802 at 21-22 (U.S. Ct. App., 1st Cir. Feb. 2021), https://www.iwf.org/wp-content/uploads/2021/02/EqualandEqual_vs_Ferriero_Amicus_Brief_of_IndependentWomensLawCenter.pdf; see also Kim Forde-Mazrui, *Tradition as Justification: The Case of Opposite-Sex Marriage*, 78 U. CHI. L. REV. 281, 321 (2011) (noting that “‘real differences’ between the sexes make it more likely that there are legitimate reasons to differentiate on the basis of sex than on the basis of race”).
- 10 34 C.F.R. § 106.41(c) (emphasis added).
- 11 14 CFR § 1253.125(c) (“The obligation to comply with these Title IX regulations is not obviated or alleviated by any rule or regulation of any organization, club, athletic or other league, or association that would render any applicant or student ineligible to participate or limit the eligibility or participation of any applicant or student, on the basis of sex, in any education program or activity operated by a recipient and that receives Federal financial assistance.”).
- 12 Women’s Sports Found., *Title IX and the Rise of Female Athletes in America* (Sept. 2, 2016), <https://www.womenssportsfoundation.org/education/title-ix-and-the-rise-of-female-athletes-in-america/>; see also Fred Bowen, *Title IX Has Helped Encourage Many Girls To Play Sports*, WASH. POST (June 20, 2012) (in 1972, 295,000 girls and 3.67 million boys competed in high school sports; for the 2010-2011 academic year, 3.2 million high school girls and 4.5 million high school boys participated in school athletics).

- 13 Protect Title IX, *Title IX: History, Influence and More*, <https://www.protecttitleix.com/history-1> (last visited Aug. 11, 2021).
- 14 *Executive Summary: Sponsorship and Participation of NCAA Championship Sports (2019-2020)*, NCAA SPORTS SPONSORSHIP AND PARTICIPATION RATES DATABASE, <https://www.ncaa.org/about/resources/research/ncaa-sports-sponsorship-and-participation-rates-database>.
- 15 *United States at the 1972 München Summer Games*, SR/Olympic Sports, <https://web.archive.org/web/20200417043419/https://www.sports-reference.com/olympics/countries/USA/summer/1972/>.
- 16 Greg Myre, *U.S. Women Are The Biggest Winners At The Rio Olympics*, NPR (Aug. 21, 2016), <https://www.npr.org/sections/thetorch/2016/08/21/490818961/u-s-women-are-the-biggest-winners-in-rio-olympics>.
- 17 Steve Keating, *U.S. To Send Second Biggest Team Ever To Tokyo Games*, REUTERS (July 13, 2021), <https://www.reuters.com/lifestyle/sports/us-send-second-biggest-team-ever-tokyo-games-2021-07-13/>.
- 18 NATIONAL WOMEN'S LAW CENTER, *THE BATTLE FOR GENDER EQUITY IN ATHLETICS IN COLLEGES AND UNIVERSITIES*, Aug. 2011, https://www.nwlc.org/sites/default/files/pdfs/2011_8_battle_in_college_athletics_final.pdf.
- 19 *Number Of College Sport Scholarships Available In The United States In 2019/20, By Gender*, Statista (May 2020), <https://www.statista.com/statistics/1120037/college-sport-scholarships-by-gender/>.
- 20 Samantha Pell, *Girls Say Connecticut's Transgender Athlete Policy Violates Title IX, File Federal Complaint*, WASH. POST (June 19, 2019).
- 21 A guidance produced and distributed by the ACLU, GenderSpectrum, the Human Rights Campaign, the National Center for Lesbian Rights, and the National Education Association urges schools to permit male students to play on female athletic teams *even if they have not begun hormone therapy or taken any medical steps to alter their male physiology*. Asaf Orr, et al., *Schools In Transition: A Guide For Supporting Transgender Students In K-12 Schools* 29-29 (July 2016) (hereinafter *SCHOOLS IN TRANSITION*), <https://hrc-prod-requests.s3-us-west-2.amazonaws.com/files/assets/resources/Schools-In-Transition.pdf?mtime=20200713142742&focal=none> (asserting that it is "inappropriate" for schools to require transgender students to begin any form of medical transition prior to participating in sports according to their gender identity).
- 22 NCAA, *Inclusion Of Transgender Student-athletes* at 13, August 2011, https://ncaaorg.s3.amazonaws.com/inclusion/lgbtq/INC_TransgenderHandbook.pdf. The NCAA allows a female who is taking testosterone to compete on a men's team, but a female who is taking testosterone "is no longer eligible to compete on a women's team without changing that team status to a mixed team." *Id.*
- 23 Jo Yurcaba, *NCAA Backs Transgender Athletes, Says Events Will Be In Places 'Free Of Discrimination'*, NBCNEWS.com (Apr. 12, 2021), <https://www.nbcnews.com/feature/nbc-out/ncaa-backs-transgender-athletes-says-events-will-be-places-free-n1263879>.
- 24 IOC CONSENSUS MEETING ON SEX REASSIGNMENT AND HYPERANDROGENISM at 2, July 14, 2021 (hereinafter *IOC Consensus*) https://stillmed.olympic.org/Documents/Commissions_PDFfiles/Medical_commission/2015-11_ioc_consensus_meeting_on_sex_reassignment_and_hyperandrogenism-en.pdf. The IOC allows athletes who transition from female to male to compete in the male category without restriction, meaning without undergoing medical transition. *Id.*
- 25 Sarah Farrell, *How Do IAAF Regulations Affect Female Athletes With High Testosterone Levels?*, GLOBAL SPORT MATTERS (Nov. 15, 2019), <https://globalsportmatters.com/health/2019/11/15/iaaf-regulations-for-female-athletes-with-high-testosterone/>.
- 26 *Executive Order on Preventing and Combating Discrimination on the Basis of Gender Identity or Sexual Orientation* (E.O. 13988) (Jan. 20, 2021), <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/executive-order-preventing-and-combating-discrimination-on-basis-of-gender-identity-or-sexual-orientation/>.
- 27 590 U.S. ___, 140 S. Ct. 1731 (2020).

- 28 Federal Register Notice of Interpretation: Enforcement of Title IX of the Education Amendments of 1972 with Respect to Discrimination Based on Sexual Orientation and Gender Identity in Light of *Bockstock v Clayton County*, DOE (June 2021), <https://www2.ed.gov/about/offices/list/ocr/docs/202106-titleix-noi.pdf>; see also U.S. Department of Education, Press Release, U.S. Department of Education Confirms Title IX Protects Students from Discrimination Based on Sexual Orientation and Gender Identity (June 16, 2021), <https://www.ed.gov/news/press-releases/us-department-education-confirms-title-ix-protects-students-discrimination-based-sexual-orientation-and-gender-identity>.
- 29 See Jennifer C. Braceras & Kelsey Bolar, *Biden Administration's New Title IX Guidance Solidifies Threat To Girls' Sports*, INDEPENDENT WOMEN'S FORUM (June 17, 2021), <https://www.iwf.org/2021/06/17/biden-administrations-new-title-ix-guidance-solidifies-threat-to-girls-sports/> (explaining the impact of the new policy).
- 30 Equality Act, H.R. 5, 117th Cong. (as introduced in the House, Feb. 18, 2021).
- 31 See Inez F. Stepman, *The Equality Act Makes Women Unequal*, WALL STREET JOURNAL (Feb. 23, 2021) (explaining that the Equality Act would jeopardize myriad sex-specific programs, including women's prisons, domestic violence shelters, STEM education programs, and more).
- 32 See Doriane Coleman, Martina Navratilova, & Sanya Richards-Ross, *Pass The Equality Act, But Don't Abandon Title IX*, WASH. POST (Apr. 29, 2019) (hereinafter *Don't Abandon Title IX*).
- 33 See e.g., *Clark v. Arizona Interscholastic Ass'n* ("Clark I") 695 F.2d 1126 (9th Cir. 1982), cert. denied, 464 U.S. 818 (1983) and *Clark v. Arizona Interscholastic Ass'n*, 886 F.2d 1191 (9th Cir. 1989) ("Clark II") (rejecting claims of discrimination by a male high school student who was not allowed to compete for a place on the women's volleyball team where the school offered no men's team.)
- 34 See *Attorney Gen. v. Mass. Interscholastic Athletic Ass'n*, 378 Mass. 342 (1979) (relying on Mass. Const. art. I; Mass. Const. art. CVI in holding that the Massachusetts ERA prohibits the state athletic association from adopting a rule that "No boy may play on a girls team").
- 35 Tom Fargo, *Coalition Takes Field Hockey Concerns To The State House*, BOSTON HERALD (Jan. 23, 2020) (explaining the objection of various parents to boys playing on high school women's field hockey teams).
- 36 See Tommy Cassell, *Boys Just Want To Have Fun: Three Boys From Wayland High Teamed Up To Play Field Hockey This Fall*, MILFORD DAILY NEWS (Nov. 9, 2019); Buddy Thomas, *Playing Boys Puts Bullseye On Somerset Berkley Field Hockey*, SOUTHCOAST TODAY (Oct. 10, 2018); see also Shira Springer, *MIAA Must Draw A Line On Boys Playing Girls' Field Hockey*, BOSTON GLOBE (Nov. 27, 2015) (objecting to the Massachusetts policy).
- 37 *Bostock v. Clayton County*, 590 U.S. ___, 140 S. Ct. 1731, 1742 (2020).
- 38 The fact that the team is set up to be a single-sex team would, likely, provide no defense under a Title IX, which lacks any sort of Bona Fide Occupational Qualification (BFOQ) exemption for sex discrimination.
- 39 See Jennifer C. Braceras, *On Day One, Biden Eliminates Single Sex Sports*, INDEPENDENT WOMEN'S FORUM (Jan. 21, 2021), <https://www.iwf.org/2021/01/21/biden-eliminates-single-sex-sports/>.
- 40 *Id.*
- 41 See Nancy Leong, *Against Women's Sports*, 95 WASH. U. L. REV. 1249 (2018) (arguing that dividing athletes by sex should not be our default position); EILEEN MCDONAGH & LAURA PAPPANO, *PLAYING WITH THE BOYS: WHY SEPARATE IS NOT EQUAL IN SPORTS* (2008).
- 42 See Nancy Leong & Emily Bartlett, *Sex Segregation in Sport As A Public Health Issue*, 40 CARDOZO L. REV. 1813, 1816 (2019); ADRIENNE MILNER & JOMILLS BRADDOCK, *SEX SEGREGATION IN SPORTS: WHY SEPARATE IS NOT EQUAL* (2016).
- 43 Elizabeth Sharrow, *Five States Ban Transgender Girls From Girls' School Sports. But Segregating Sports By Sex Hurts All Girls*, WASH. POST (Apr. 16, 2021) (arguing that single-sex teams reinforce gender stereotypes and claiming that Title IX's endorsement of single-sex teams was intended to be "temporary"); see also Robin Ryle, *The Case of Transgender Athletes. Why Sports Aren't Fair and That's OK*, NEWSWEEK (Feb. 12, 2021) (arguing that "sports remain one of the last strongholds for the cult of gender differences" and suggesting that sex is not a meaningful category when it comes to competitive sport).

- 44 The 14th Amendment's Equal Protection Clause already prohibits discrimination against similarly-situated individuals. If we layer the Equal Rights Amendment on top of the existing Equal Protection mandate, courts are likely to interpret the new amendment as going further than current law and requiring that the government treat males and females not just equally, but the same. See Kim Forde-Mazrui, ***Why the Equal Rights Amendment Would Endanger Women's Equality: Lessons from Colorblind Constitutionalism***, 16 DUKE J. CONST. LAW & PUB. POL'Y 1, 22 (2021) (hereinafter *The ERA Would Endanger Women's Equality*) (explaining that courts would likely interpret the ERA as requiring the strictest of scrutiny for all sex-specific government policies and arguing, from a progressive standpoint, that this is bad for women); see also Inez Stepman, *Equal Rights Amendment Will Replace Equality With Enforced Sameness*, THE HILL (Jan. 17, 2020), <https://thehill.com/opinion/civil-rights/478765-equal-rights-amendment-will-replace-equality-with-enforced-sameness> (explaining, from a conservative perspective, the dangers of treating men and women the same in all circumstances).
- 45 See *The ERA Would Endanger Women's Equality*, supra n. 44 at 38 (explaining that the ERA would likely eliminate single-sex activities such as separate men's and women's sports).
- 46 See Jennifer C. Braceras, ***On The Anniversary Of Title IX, Are Women's Sports In Jeopardy?***, THE HILL (June 23, 2020).
- 47 Grimm v. Gloucester Cnty. Sch. Bd., 972 F.3d 586, 616 (4th Cir. 2020), *as amended* (Aug. 28, 2020), *reh'g en banc denied*, 976 F.3d 399 (4th Cir. 2020), *cert. denied*, No. 20-1163, 2021 U.S. LEXIS 3441 (U.S., June 28, 2021); Adams v. Sch. Bd. of St. Johns Cnty., 968 F.3d 1286, 1305 (11th Cir. 2020), *vacated*, No. 18-13592, 2021 U.S. App. LEXIS 20777, (11th Cir. Fla., July 14, 2021).
- 48 Protect Women's Sports Act of 2020, H.R. 8932, 116th Cong. (2019-2020).
- 49 *Id.*; see also Jennifer C. Braceras, *One Progressive's Attempt To Save Women's Sports*, INDEPENDENT WOMEN'S FORUM (Dec. 15, 2020), <https://www.iwf.org/2020/12/15/protect-womens-sports/> (describing the legislation and its objectives).
- 50 **Fairness in Women's Sports Act**, H.B. 500, 65th Leg., 2020 Second Reg. Sess. (Idaho 2020) ("Athletic teams or sports designated for females, women, or girls shall not be open to students of the male sex. If disputed, a student may establish sex by presenting a signed physician's statement that shall indicate the student's sex based solely on: (a) The student's internal and external reproductive anatomy; (b) The student's normal endogenously produced levels of testosterone; and (c) An analysis of the student's genetic makeup.") The Idaho law applies to any sport or athletic team sponsored by a public school or college as well as any school that is a member of the Idaho high school activities association or any college that is a member of the national collegiate athletic association (NCAA), national association of intercollegiate athletics (NAIA), or national junior college athletic association (NJCAA). *Id.*
- 51 See Bianca Quilantan, ***This Isn't The Olympics': GOP Transgender Laws Head To Court***, POLITICO (July 3, 2021); Gillian R. Brassil, ***How Some States Are Moving to Restrict Transgender Women in Sports***, N.Y. TIMES (June 22, 2021) (as of June, 2021, at least 25 states have introduced bills banning male-bodied athletes from competing in women's sports).
- 52 See e.g., Hecox v. Little, 479 F. Supp. 3d 930 (D. Idaho 2020) (blocking enforcement of Idaho's law prohibiting natal males from participating in girls' sports), *remanded by* Hecox v. Little, No. 20-35815, 2021 U.S. App. LEXIS 18903 (9th Cir., June 24, 2021); BPJ v. W.Va. State Bd. of Educ., No. 2:21-cv-00316 (D. W.Va., July 21, 2021) (temporarily enjoining West Virginia's law barring natal males from participating in girls' sports); D.N. v. DeSantis, No. 21-cv-61344 (S.D. Fla., June 29, 2021)(complaint filed); see also Quilantan, supra n. 51 (describing the lawsuits challenging state prohibitions on male-bodied athletes in female sport).
- 53 Tennessee v. Cardona, No. 3:21-cv-00308, (E.D. Tenn., Aug. 30, 2021)(complaint filed).
- 54 Were that the case, we would expect to see the male-female athletic gap continuing to narrow over time. In fact, over the last forty years, the gap has remained steady, despite increased opportunities and funding for women's sports. See CAROLE HOOVEN, T: THE STORY OF TESTOSTERONE: THE HORMONE THAT DOMINATES AND DIVIDES US at 107 (2021); Emma N. Hilton & Tommy R. Lundberg, ***Transgender Women in the Female Category of Sport: Perspectives on testosterone Suppression and Performance Advantage***, 51 SPORTS MED. 199, 201 (2021); Valérie Thibault, et al., ***Women and Men in Sport Performance: The Gender Gap Has Not Evolved Since 1983***, 9 J. SPORTS SCI. MED. 214 (2010).

- 55 *Don't Abandon Title IX*, *supra* n. 32 (“[t]he sex differential isn’t the result of boys and men having a male gender identity, more resources, better training or superior discipline. It’s because they have androgenized bodies”).
- 56 See Doriane Lambelet Coleman, *Sex in Sport*, 80 LAW & CONTEMP. PROBS. 63, 90 (2017) (hereinafter *Sex in Sport*) (most females have a matching XX pair of chromosomes and most males have an unmatched XY pair, and this genetic standard is the case in all but a few births per thousand); *Sex Begins in the Womb* in EXPLORING THE BIOLOGICAL CONTRIBUTIONS TO HUMAN HEALTH: DOES SEX MATTER? (2001) (in utero, developmental processes differentially organize tissues for later activation in the male or female; sex determination and differentiation occur in a series of sequential processes governed by genetic and environmental factors); Emma Hilton, Reviewing The Science Supporting The IOC Decision To Let Male-born Transgender Athletes Into Female Competition at #WPUKFairPlay meeting in London (July 10, 2019) (hereinafter Hilton Speech) (transcript available at https://fairplayforwomen.com/emma_hilton/) (“at 7 weeks gestation . . . genetic makeup drives sex differentiation into male or female forms, and the dimorphic characteristics associated with sex begin to develop.”).
- 57 Stefan Pfaffenberger et al., *Size Matters! Impact of Age, Sex, Height, and Weight on the Normal Heart Size*, 6 CIRCULATION: CARDIOVASCULAR IMAGING 1073 (2013); see also Albert Oberman et al., *Heart Size of Adults in a Natural Population- Tecumseh, Michigan Variation by Sex, Age, Height, and Weight*, 35 CIRCULATION 724, 729 (1967) (neither body size nor clinical status fully compensate for the discrepancies in heart size between the sexes).
- 58 College of Arts & Sciences Forum, *Running: Why Are Men Faster than Women?*, Ohio State University (Mar. 10, 2015) (hereinafter Ohio State Forum), <https://www.ohio-forum.com/2015/03/running-why-are-men-faster-than-women/>.
- 59 Michelle A. Carey et al., *It's All About Sex: Male-female Differences In Lung Development And Disease*, 18 TRENDS ENDOCRINOL. METAB. 308 (2007); see also Antonella LoMauro & Andrea Aliverti, *Sex Differences In Respiratory Function*, 14 BREATHE 131 (2018) (sex differences in lung growth and development start in the prenatal period).
- 60 Ohio State Forum, *supra* n. 58.
- 61 William G. Murphy, *The Sex Difference In Haemoglobin Levels In Adults - Mechanisms, Causes, And Consequences*, 28 BLOOD REVIEWS 41 (2013).
- 62 Ohio State Forum, *supra* n. 58.
- 63 Hilton & Lundberg, *supra* n. 54, at 201-202 (citing Russell R. Pate and Andrea Kriska, *Physiological Basis of the Sex Difference in Cardiorespiratory Endurance*, 1 SPORTS MED. 87 (1984)); Ohio State Forum, *supra* n. 58 (noting that the “difference in VO₂max can be explained by the fact that men tend to have a higher concentration of hemoglobin for transporting oxygen in the blood, larger hearts for pumping oxygen rich blood to the working muscles, and larger lungs for oxygenating the blood”); Hanjabam Barun Sharma and Jyotsna Kailashiya, *Gender Difference in Aerobic Capacity and the Contribution by Body Composition and Haemoglobin Concentration: A Study in Young Indian National Hockey Players*, 10 J. CLIN. AND DIAGN. RES. CC09 (2016) (males had greater aerobic capacity than females with similar training & competition level).
- 64 Max Roser et al., *Human Height*, OUR WORLD IN DATA (May 2019), <https://ourworldindata.org/human-height#:~:text=Where%20are%20men%20much%20taller,3%25%20to%20over%2012%25>.
- 65 Jerry W. Nieves et al., *Males Have Larger Skeletal Size and Bone Mass Than Females, Despite Comparable Body Size*, 20 J. OF BONE AND MINERAL RES. 529 (2005); see also Hilton & Lundberg, *supra* n. 54, at 201-202.
- 66 Nieves, *supra* n. 65 at 529.
- 67 *Id.*
- 68 Andrew Langford, *Sex Differences, Gender, and Competitive Sport*, QUILLETTE (Apr. 5, 2019), https://quillette.com/2019/04/05/sex-differences-gender-and-competitive-sport/#_ftnref10. In addition, male bodies have a lower incidence of stress and osteoporotic fractures than females. Nieves et al., *supra* n. 65 at 529. And females lose bone mass faster and earlier than men as they age. Khaled A. Alswat, *Gender Disparities in Osteoporosis*, 9 J. CLIN. MED. RES. 382 (2017).

- 69 Ian Janssen et al., *Skeletal Muscle Mass And Distribution In 468 Men And Women Aged 18–88 Yr*, 89 J. APPLIED PHYSIOL. 81 (2000); see also Hilton & Lundberg, *supra* n. 54, at 204 (in both athletes and non-athletes, sex differences in size and strength are more pronounced in upper body).
- 70 Ohio State Forum, *supra* n. 58; see also Langford, *supra* n. 68 (in skeletal muscle, males have a higher proportion of type II fibres, which are able to contract quicker and produce more force than their counterparts).
- 71 Dong Hoon Lee et al., *Development And Validation Of Anthropometric Prediction Equations For Lean Body Mass, Fat Mass And Percent Fat In Adults Using The National Health And Nutrition Examination Survey (Nhanes) 1999-2006*, 118 BR. J. NUTR. 858 (2017) (on average, men had 11% less body fat than women and men had higher variation in lean body mass, whereas women had higher variation in fat mass); Kalypso Karastergiou et al., *Sex Differences In Human Adipose Tissues - The Biology Of Pear Shape*, 3 BIOLOGY OF SEX DIFFERENCES 13 (2012) (women have higher percent body fat and deposit it in a different pattern than men with relatively more adipose tissue in the hips and thighs).
- 72 Andrea E. J. Miller et al., *Gender Differences In Strength And Muscle Fiber Characteristics*, 66 EUR. J. APPL. PHYSIOL. 254, 261 (1993).
- 73 Hilton & Lundberg, *supra* n. 54, at 204.
- 74 Marnee McKay & Joshua Burns, *When it Comes To Sport, Boys 'Play Like a Girl'*, THE CONVERSATION (Aug. 3, 2017), <http://theconversation.com/when-it-comes-to-sport-boys-play-like-agirl-80328>.
- 75 Carlos C. Marta et al., *Physical Fitness Differences Between Prepubescent Boys And Girls*, 26 J. STRENGTH & CONDITIONING RESEARCH 1756 (2012).
- 76 Hilton & Lundberg, *supra* n. 54, at 203 (citing J.R. Thomas and K.E. French, *Gender Differences Across Age In Motor Performance: A Meta-analysis*, 98 PSYCHOL. BULLETIN 260 (1985)); see also Tamar Haspel, *Throw Like A Girl? With Some Practice, You Can Do Better*, WASH. POST (Sept. 10, 2012), https://www.washingtonpost.com/national/health-science/throw-like-a-girl-with-some-practice-you-can-do-better/2012/09/10/9ffc8bc8-dc09-11e1-9974-5c975ae4810f_story.html (noting that, beginning at 4 years of age, the overhand male-female throwing gap is three times that of any other motor task; studies of overhand ball throwing across cultures have found that prepubescent girls throw 51 to 69 percent of the distance that boys do, at 51 to 78 percent of the velocity).
- 77 Hilton & Lundberg, *supra* n. 54, at 201 (citing Mark J. Catley & Grant R. Tomkinson, *Normative Health-related Fitness Values For Children: Analysis Of 85347 Test Results On 9–17-year-old Australians Since 1985*, 47 BR. J. SPORTS MED. 98 (2013) (study of 85,000 Australian children found that 9-year-old boys could run faster, jump higher, and complete more push-ups than 9-year-old girls); Konstantinos D. Tambalis, Demosthenes D. Panagiotakos, Glykeria Psarra et al., *Physical Fitness Normative Values For 6–18-year-old Greek Boys And Girls, Using The Empirical Distribution And The Lambda, Mu, And Sigma Statistical Method*, 16 EUR. J. SPORT SCI. 736 (2016) (male athletic advantage found in running and jumping in a study of Greek 6-year-olds); S. Eiberg, H. Hasselstrom, V. Grønfeldt et al., *Maximum Oxygen Uptake And Objectively Measured Physical Activity In Danish Children 6–7 Years Of Age: The Copenhagen School Child Intervention Study*, 39 BR. J. SPORTS MED. 725 (2005) (study of 6- and 7-year-old Danish children found boys had a higher absolute and relative aerobic capacity than girls).
- 78 David J Handelsman et al., *Circulating Testosterone as the Hormonal Basis of Sex Differences in Athletic Performance*, 39 ENDOCRINE REV., 803 (2018) (from puberty onward, males have a 15- to 20-fold greater circulating testosterone than children or women at any age).
- 79 *When is Puberty too Early?*, DUKE HEALTH (updated July 7, 2020), <https://www.dukehealth.org/blog/when-puberty-too-early> (most boys begin puberty between the ages of 9 and 14); see also *Men's Health Issues: Biology Of The Male Reproductive System / Puberty In Boys*, MERCK MANUAL CONSUMER VERSION, <https://www.merckmanuals.com/home/men-s-health-issues/biology-of-the-male-reproductive-system/puberty-in-boys> ("In boys, puberty usually occurs between the ages of 10 and 14 years. However, it is not unusual for puberty to begin as early as age 9 or to continue until age 16").

- 80 See e.g., HOOVEN, *supra* n. 54 at 105 (noting that, by age 15, nearly every boy throws better than even the best girls); see also McKay & Burns, *supra* n. 74 (significant male-female athletic differences emerge around age 12).
- 81 See WORLD RUGBY TRANSGENDER GUIDELINE (Oct. 9, 2020) (hereinafter RUGBY REPORT), <https://www.world.rugby/the-game/player-welfare/guidelines/transgender/women>.
- 82 Stéphane François Bermon, *Androgens And Athletic Performance Of Elite Female Athletes*, 24 CURRENT OPINION 246, 249 (2017).
- 83 Langford, *supra* n. 68; see also John J. McMahon et al., *Sex Differences in Countermovement Jump Phase Characteristics*, 5 SPORTS 8 (2017) (finding that men jumped 24% higher than women in line with the range of 25%–27% reported in similar studies).
- 84 Langford, *supra* n. 68; see also Jerry R. Thomas & Katherine T. Thomas, *Development of Gender Diff in Phys Activity*, 40 QUEST 219 (2012) (17 year old boys can throw further than 90% of adult females); Neil V. Watson, *Sex differences in throwing: Monkeys having a fling*, 5 TRENDS IN COGNITIVE SCI., 98-99 (2001) (finding that males were much better than females at throwing accuracy and rather than a learned characteristic, the data indicate that there is an innate component to the sexual differentiation).
- 85 Hilton & Lundberg, *supra* n. 54, at 204.
- 86 Langford, *supra* n. 68 (citing Isaiah T. McFarland et al., *Relationship of Two Vertical Jumping Tests to Sprint and Change of Direction Speed among Male and Female Collegiate Soccer Players*, 4 SPORTS 11 (2016)).
- 87 Hilton & Lundberg, *supra* n. 54, at 203-204 (even after adjustment for mass, male olympic weightlifters are 30% stronger than female weightlifters, and even females who are 60% heavier than males do not overcome strength deficits); see also D. Leyk et al., *Hand-grip Strength Of Young Men, Women And Highly Trained Female Athletes*, 99 EUR. J. APPL. PHYSIOL. 415 (2007) (males have significantly greater grip strength, a measure commonly used to indicate overall strength; even strength training by women will rarely make them stronger than the majority of untrained or not specifically trained men).
- 88 Langford, *supra* n. 68.
- 89 Paul Gabrielsen, *Why Males Pack a Powerful Punch*, @TheU (Feb. 5 2020), <https://attheu.utah.edu/facultystaff/carrier-punch/> (citing Jeremy S. Morris et al., *Sexual Dimorphism in Human Arm Power and Force*, 223 J. EXPER. BIOLOGY at 4 (2020)).
- 90 James R. Morrow Jr. & W.W. Hosler, *Strength Comparisons In Untrained Men And Trained Women Athletes*, 13 MED. SCI. SPORTS EXERC. 194 (1981) (finding that untrained men were significantly stronger than trained female athletes).
- 91 Robert H. Shmerling, *The Gender Gap In Sports Injuries*, HARVARD HEALTH BLOG, June 22, 2020, <https://www.health.harvard.edu/blog/the-gender-gap-in-sports-injuries-201512038708> (citing Cindy Y. Lin et al., *Sex Differences in Common Sports Injuries*, 10 J. INJURY, FUNCTION, & REHAB. 1073 (2018)).
- 92 Hilton & Lundberg, *supra* n. 54, at 201-204.
- 93 Doriane Lambelet Coleman & Wickliffe Shreve, *Comparing Athletic Performances of the Best Elite Women to the Boys and Men*, DUKE CENTER FOR SPORTS LAW & POL'Y, Summer 2017, <https://law.duke.edu/sports/sex-sport/comparative-athletic-performance/>.
- 94 Ohio State Forum, *supra* n. 58.
- 95 Gary Klein, *Allyson Felix Breaks Record For Most U.S. Olympic Track Medals, Surpassing Carl Lewis*, L.A. TIMES (Aug. 7. 2021); Ben Church and Hannah Ritchie, *Allyson Felix Becomes Most Decorated Us Track And Field Athlete In Olympics History*, CNN (Aug. 7, 2021), <https://www.google.com/amp/s/amp.cnn.com/cnn/2021/08/07/sport/allyson-felix-tokyo-2020-olympics-spt-intl/index.html>.
- 96 *Allyson Felix*, WORLD ATHLETICS, <https://worldathletics.org/athletes/united-states/allyson-felix-14309983>.
- 97 *Usain Bolt*, WORLD ATHLETICS, <https://worldathletics.org/athletes/jamaica/usain-bolt-14201847>.
- 98 *Wayde Van Niekerk*, WORLD ATHLETICS, <https://worldathletics.org/athletes/south-africa/wayde-van-niekerk-14417677>.

- 99 *Biography: Florence Joyner* (May 6, 2021), <https://www.biography.com/athlete/florence-joyner>.
- 100 *Women's World Records*, TRACK & FIELD NEWS, <https://trackandfieldnews.com/records/womens-world-records/>.
- 101 *100 Metres Men*, WORLD ATHLETICS, <https://www.worldathletics.org/records/all-time-toplists/sprints/100-metres/outdoor/men/senior?regionType=world&timing=electronic&windReading=regular&page=1&bestResultsOnly=true&firstDay=1899-12-31&lastDay=2021-06-29>.
- 102 *200 Metres Men*, WORLD ATHLETICS, <https://www.worldathletics.org/records/all-time-toplists/sprints/200-metres/outdoor/men/senior>.
- 103 Cindu Yu & Talya Minsberg, *A Look At All Of The World Records That Were Broken At The Tokyo Olympics*, N.Y. TIMES (Aug. 8, 2021).
- 104 *Cycling BMX Racing - Women's Final Results*, Olympics.com, <https://olympics.com/tokyo-2020/olympic-games/en/results/cycling-bmx-racing/results-women-fnl-000100-.htm>.
- 105 *Cycling BMX Racing - Men's Final Results*, Olympics.com, <https://olympics.com/tokyo-2020/olympic-games/en/results/cycling-bmx-racing/results-men-fnl-000100-.htm>
- 106 April Siese, *17-year-old Lydia Jacoby Becomes First U.S. Female Swimmer To Win Gold At Tokyo Olympics*, CBSNews.com (July 26, 2021), <https://www.cbsnews.com/news/lydia-jacoby-olympics-breast-stroke/>.
- 107 David Fucillo, *2021 Olympic Swimming Results: Adam Peaty Wins 100m Breaststroke*, Draftkings Nation (July 25, 2021), <https://dknation.draftkings.com/2021/7/25/22593631/olympics-2021-swimming-results-mens-100m-breaststroke-adam-peaty-nicolo-martinenghi-arno-kamminga>.
- 108 *Sex in Sport*, *supra* n. 56 (internal citations and quotations omitted).
- 109 *The Man Who Beat Venus and Serena Back-to-Back*, TennisNow.com (Nov. 2017), [https://www.tennisnow.com/Blogs/NET-POSTS/November-2017-\(1\)/The-Man-Who-Beat-Venus-and-Serena-Back-to-Back.aspx](https://www.tennisnow.com/Blogs/NET-POSTS/November-2017-(1)/The-Man-Who-Beat-Venus-and-Serena-Back-to-Back.aspx); see also Alan Dawson, *People Are Asking Who Would Win In A Match Between Roger Federer And Serena Williams — And The Winner Is Clear*, BUSINESS INSIDER (May 23, 2018), <https://www.businessinsider.com/roger-federer-vs-serena-williams-who-would-win-2018-3> (even at her best, Serena Williams could not have beaten Roger Federer).
- 110 *18th FINA World Championships 2019*, FINA, <https://www.fina.org/competitions/95/18th-fina-world-championships-2019/results?disciplines=SW&event=4f352b04-b2cf-415f-a8bd-11df1c659125>.
- 111 Spencer Penland, *James Plage Wins Men's 1500, Ranking #9 All-Time for 15-16 Boys*, Swimswam (Aug. 6, 2019), <https://swimswam.com/james-plage-wins-mens-1500-ranking-9-all-time-for-15-16-boys/>.
- 112 *2019 Speedo Junior National Championships*, <https://www.usaswimming.org/docs/default-source/eventdocuments/meet-results/2019-summer-juniors/speedo-junior-nationals-completw-results.pdf>.
- 113 *Matthew Boling, Track & Field Bio*, ATHLETIC.NET, <https://www.athletic.net/TrackAndField/Athlete.aspx?AID+16283783>.
- 114 *100 Metres Men*, WORLD ATHLETICS, <https://www.worldathletics.org/records/all-time-toplists/sprints/100-metres/outdoor/men/senior?regionType=world&timing=electronic&windReading=regular&page=60&bestResultsOnly=true&firstDay=1900-01-01&lastDay=2020-12-14> (accessed August 12, 2021).
- 115 Coleman and Shreve, *supra* n. 93.
- 116 *Id.*
- 117 *Id.*
- 118 *U.S. Olympic Women's Hockey Team Preparing for Sochi Games by Playing High School Boys Teams in New England (Video)*, NESN (Jan. 12, 2014), <https://nesn.com/2014/01/u-s-womens-olympic-hockey-team-preparing-for-sochi-games-by-playing-boys-high-school-teams-in-new-england/>.
- 119 Roger Gonzalez, *FFC Dallas Under-15 Boys Squad Beat The U.S. Women's National Team in a Scrimmage*, CBS SPORTS (Apr. 4, 2017), <https://www.cbssports.com/soccer/news/a-dallas-fc-under-15-boys-squad-beat-the-u-s-womens-national-team-in-a-scrimmage/>.

- 120 Hilton & Lundberg, *supra* n. 54, at 204.
- 121 RUGBY REPORT, *supra* n. 81.
- 122 *High School - Men's 200 Meters Rankings*, ATHLETIC.NET, <https://www.athletic.net/TrackAndField/Division/Event.aspx?DivID=97967&Event=2>; *High School - Women's 200 Meters Rankings*, ATHLETIC.NET, <https://www.athletic.net/TrackAndField/Division/Top.aspx?DivID=97967&gender=f>.
- 123 2019 Speedo Junior National Championships - 8/6/2019 to 8/10/2019 Results, <https://www.usaswimming.org/docs/default-source/eventsdocuments/meet-results/2019-summer-juniors/speedo-junior-nationals-completw-results.pdf>.
- 124 Hilton & Lundberg, *supra* n. 54, at 204 (male performance advantages are similar in magnitude in athletes and untrained people.).
- 125 See SCHOOLS IN TRANSITION, *supra* n. 21; Pell, *supra* n. 20.
- 126 See IOC Consensus, *supra* n. 24, at 2.
- 127 Under IOC rules, testosterone levels must be below ten nanomoles per liter for at least 12 months prior to the competition. See *supra*, pt. II(A)(i). In 2019, the International Association of Athletics Federation (IAAF) lowered the maximum level of testosterone to five nanomoles per liter for athletes who wish to compete in eight particular women's events at international athletics competitions. See *Executive Summary*, TRIBUNAL ARBITRAL DU SPORT COURT OF ARBITRATION FOR SPORT (Apr., 2019), https://www.tas-cas.org/fileadmin/user_upload/CAS_Executive_Summary__5794_.pdf; see also Press Release, World Athletics, IAAF Publishes Briefing Notes and Q & A on Female Eligibility Regulations (May 2019), <https://www.worldathletics.org/news/press-release/questions-answers-iaaf-female-eligibility-reg> and Farrell, *supra* n. 25 (explaining the policy). The IAAF rule applies only to intersex women who suffer from a disorder of sexual development ("DSD"), a rare condition that results in them having genitalia that are not typically male or female. See Gina Kolata, *Track and Field Tries to Understand New Rules for Intersex Athletes*, N.Y. TIMES (May 8, 2019).
- 128 RUGBY REPORT, *supra* n. 81, at 13-14.
- 129 Langford, *supra* n. 68.
- 130 *Id.*
- 131 Blair R. Hamilton et al., *Integrating Transwomen and Female Athletes with Differences of Sex Development (DSD) into Elite Competition: The FIMS 2021 Consensus Statement*, 51 SPORTS MED. 1401 (2021) ("different populations of muscle cells may express different phenotypes of androgen sensitivity, raising the possibility that the muscle response to training may be different between men and women at the same testosterone concentrations.")
- 132 Hilton & Lundberg, *supra* n. 54, at 205; see also HOOVEN, *supra* n. 54 at 121 (certain effects of testosterone, such as "lengthening, enlarging, and strengthening are, for the most part, permanent").
- 133 Hilton & Lundberg, *supra* n. 54, at 205.
- 134 *Id.*
- 135 *Id.* (citing Louis J.G. Gooren and Mathjis C.M. Bunck, *Transsexuals And Competitive Sports*, 151 EUR. J. ENDOCRINOL. 425 (2004)); see also RUGBY REPORT, *supra* n. 81 (muscle mass reduced by at most 5%-10% after a year of hormone therapy.).
- 136 Hilton & Lundberg, *supra* n. 54 at 205.
- 137 *Id.* at 203.
- 138 *Id.* at 205-207.
- 139 *Id.* at 205-208; Anna Wiik et al., *Muscle Strength, Size, and Composition Following 12 Months of Gender-affirming Treatment in Transgender Individuals*, 105 J. CLINICAL ENDOCRINOLOGY & METABOLISM 805 (2020) (finding that after a year of testosterone suppression, muscle volume in thighs and quadriceps decreased modestly, but general strength levels remained the same); see also Joanna Harper et al., *How Does Hormone Transition In Transgender Women Change Body Composition, Muscle Strength And Haemoglobin? Systematic Review With A Focus On The Implications For Sport Participation*, 55 BR. J. SPORTS MED. 865 (2020) (transgender athletes who were born male may retain strength advantages over biological females "even after 3 years of hormone therapy").

- 140 Hilton & Lundberg, *supra* n. 54, at 210 (noting that most of the studies concerning the effect of testosterone suppression were conducted on non-athletically trained individuals and that “muscle memory” in males who trained prior to hormone therapy may assist those people in building and maintaining muscle as they retrain. As a result, while testosterone is crucial for developing muscle mass, particularly during puberty, maintenance of that muscle mass seems to depend less on current testosterone levels).
- 141 *Id.*, at 208.
- 142 *Id.*, at 208-209; see also Harper, *supra* n. 139 (reporting that hemoglobin levels decrease to those seen in biological women after just months of hormone therapy.).
- 143 Timothy A Roberts, Joshua Smalley & Dale Ahrendt, ***Effect Of Gender Affirming Hormones On Athletic Performance In Transwomen And Transmen: Implications For Sporting Organisations And Legislators***, 55 Br. J. Sports Med. 577 (2021) (with hormone therapy transgenderwomen [natal males] lost any athletic advantage in ability to perform push-ups and sit ups; however, they maintained a 9% faster mean run speed after the one year period of testosterone suppression that is recommended by World Athletics for inclusion in women’s events.)
- 144 See Complaint tbl. 6, ***Soule v. Connecticut Assoc. Of Schools***, filed Feb. 12, 2020 (D. Conn) (hereinafter Soule Comp.).
- 145 Of course, as Professor Coleman of Duke Law School has noted, there is really no point quibbling over the size of the performance gap if that gap, “however large or small[,] . . .always determines females’ capacity for the win and their overall win share.” See *Sex in Sport*, *supra* n. 56, at 108.
- 146 David Epstein, ***Testosterone and the Transgender Athlete***, WALL ST. J. (Mar. 15, 2019) (quoting Joanna Harper).
- 147 Richards v. U.S. Tennis Assn., 93 Misc.2d 713 (N.Y. App. Div. 1977) (holding that under the New York Human Rights Law, Executive Law, § 290 et seq., U.S. Tennis could not use the “Barr Body Test” as the sole criterion for determining eligibility to play in the women’s division of the US Open, “where as here, the circumstances warrant consideration of other factors.”)
- 148 *Cross-Court Winner*, SLATE (Oct. 12 2012), <https://slate.com/culture/2012/10/jewish-jocks-and-renee-richards-the-life-of-the-transsexual-tennis-legend.html>.
- 149 In boys, puberty usually occurs between the ages of 10 and 14 years but can begin as early as age 9 and continue until age 16. *Men’s Health Issues: Biology Of The Male Reproductive System / Puberty In Boys*, MERCK MANUAL CONSUMER VERSION (last modified Mar. 2021), <https://www.merckmanuals.com/home/men-s-health-issues/biology-of-the-male-reproductive-system/puberty-in-boys>.
- 150 HOOVEN, *supra* n. 54 at 116.
- 151 Hilton Speech, *supra* n. 56.
- 152 See Hecox, *supra* n. 53.
- 153 Soule Comp. at 12, ¶ 29.
- 154 ADF client testimony submitted to the U.S. Senate Judiciary Committee regarding the Equality Act (Mar. 17, 2021), <https://adfmedialegalfiles.blob.core.windows.net/files/EqualityActTestimonySJC.pdf>.
- 155 Chelsea Mitchell, ***I Was The Fastest Girl In Connecticut. But Transgender Athletes Made It An Unfair Fight***, USA TODAY, May 22, 2021.
- 156 *Fight for Fairness*, *supra* n. 1
- 157 Montana Grizzlies, *2017 Men’s Cross Country Roster, Jonathan Eastwood* (accessed July 28, 2021), <https://gogrizz.com/sports/mens-cross-country/roster/jonathan-eastwood/4479>.
- 158 Telephone Interview by Kelsey Bolar with Haley Tanne (June 21, 2021)(transcription available).
- 159 Madeleine Kearns, *Rachel McKinnon Is a Cheat and a Bully*, NAT’L REV. (Oct. 29, 2019), <https://www.nationalreview.com/2019/10/rachel-mckinnon-is-a-cheat-and-a-bully/>.
- 160 Dr. Veronica Ivy, <http://veronicaivy.com/> (accessed Aug. 11, 2021).
- 161 *F35-39 - Sprint - Final - Start List*, UCI, (accessed Aug. 11, 2021) <http://www.cyclingmasters.com/site/results/444-f35-39-sprint-final-start-list-2019>.
- 162 *Paving The Way For Transgender Cyclists: The Story Of Jillian Bearden*, CYCLING TIPS (Dec. 6, 2016), <https://cyclingtips.com/2016/12/paving-the-way-for-transgender-cyclists-the-story-of-jillian-bearden/>

163 *Id.*

164 Bill Chapell, *Trans Athlete Laurel Hubbard Has Made Olympic History Competing In Individual Event*, NPR (Aug. 2, 2021), <https://www.npr.org/sections/tokyo-olympics-live-updates/2021/08/02/1023724506/trans-weightlifter-laurel-hubbard-tokyo-olympics>.

165 Robert Hart, *Laurel Hubbard Crashes Out Of Weightlifting As Quinn Makes Soccer Final — Here Are The First Openly Transgender And Nonbinary Olympians (Photos)*, FORBES (Aug. 2, 2021), <https://www.forbes.com/sites/roberthart/2021/08/02/laurel-hubbard-crashes-out-of-weightlifting-as-quinn-makes-soccer-final---here-are-the-first-openly-transgender-and-nonbinary-olympians-photos/?sh=485d73245efa>.

166 N.Z. Sen. Claire Chandler, *Laurel Hubbard And Single-sex Sporting Competitions For Women* (Aug. 4, 2021), <https://senatorchandler.com.au/laurel-hubbard-and-single-sex-sporting-competitions-for-women/>.

167 Alex Raskin & Charlie Walker, *Ex-new Zealand Olympic Weightlifter Weighs In On Transgender Athletes After Laurel Hubbard Qualified For Tokyo Games Warning It Will 'knock Women Out Of Sport'*, THE DAILY SIGNAL (June 23, 2021), <https://www.dailymail.co.uk/news/article-9718233/Ex-New-Zealand-Olympic-weightlifter-weighs-transgender-athletes-Laurel-Hubbard.html>.

168 Telephone interview by Kelsey Bolar with Destiny Labuanan (July 11, 2021).

169 Stepman, *supra* note 31.

170 *Fight for Fairness*, *supra* n. 1.

171 RUGBY REPORT, *supra* n. 81, at 2; see also *Rugby Says Transgender Women Should Not Play For Elite Teams*, THE ASSOCIATED PRESS (Oct. 9, 2020), <https://apnews.com/article/rugby-archive-2650df82f07c43bf17234382e817db90> (reporting on World Rugby's policy).

172 See Ryle, *supra* note 43.

173 See *supra* pt. II(C).



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