

Dear Representatives Manning, Bird, Robinson, and Members of the House Primary and Secondary Education Committee,

My name is Greg Brown, and I am a Professor of Exercise Science at the University of Nebraska at Kearney. My research and teaching focus on Exercise Physiology and Sports Nutrition. I have previously provided expert testimony for the legal cases of Soule v. Connecticut Association of Schools, Hecox v. Little, and before several state legislative bodies regarding bills like House Bill 61 (the Save Women's Sports Act). These are my own opinions and do not represent an official statement from the University of Nebraska.

I have three main points to make in this testimony, and they are: 1) Eons of human experience and thousands of research studies show that there are important biological differences between human males (boys & men) and human females (girls & women), 2) these biological differences confer inherent athletic advantages to boys & men, and 3) the athletic advantages conferred by male biology are not erased by transgender identification and the use of cross sex hormones.

Briefly summarized boys & men are taller, weigh more, have more muscle mass, less fat mass, and are bigger, faster, and stronger than comparably aged and trained girls & women. This information has been well established by human experience and in innumerable research papers, and can be found in pretty much any textbook on the topic of Exercise Physiology or Fitness Testing. Fitness testing in children as young as 6 years old shows that boys perform better than girls of the same age on tests of muscular strength, muscular endurance, and aerobic fitness ^(2, 5, 18, 31, 33, 34). Comparing competitive performance after age 11, boys and men run 10-15% faster than girls & women, jump 15-20% longer and higher, and can lift 30-60% more weight than comparably aged and trained girls and women ^(3, 4, 10, 13, 14, 17, 19-21, 23, 28, 29, 32, 35). To help put this into perspective, based on NCAA Outdoor Championship running performance, the typical time difference between first place and second place is 0.5-0.7%, and the time difference between a gold medal and no medal is less than 2%.

Opponents of House Bill 61 will argue that if biological males take puberty suppressing drugs and cross-sex hormones the athletic advantages conferred by male biology are erased, but that argument is not supported by research. For example, of six separate research studies published since 2015 measuring the effects of male-to-female hormone administration on muscle strength, three showed no decrease in muscle strength after 12 months of hormone use ^(1, 30, 39) while the other three show only a 4-9% reduction in muscle strength ^(27, 36, 40) (keep in mind that men are 30-60% stronger than women). The handgrip strength in these studies showed that the male-to-female transgender subjects were weaker than most comparably aged men but were stronger than 95% of comparably aged women, even after 2 years of male to female hormones. Another study evaluating running performance in male-to-female transgender subjects found that even after 2 years of male-to-female hormone use, the biologically male subjects were still 12% faster than comparably aged women ⁽²⁵⁾. Considering that men typically have 30-40% more muscle mass than women, a number of longitudinal research studies show that male-to-female hormone use only reduces muscle mass by 4-12% over the course of several years ^(1, 6-8, 11, 15, 16, 22, 24, 27, 36-39). Finally, three recent review papers ^(9, 12, 14) and an in-depth evaluation by World Rugby ⁽²⁶⁾ summarized the research on the changes in physiological factors that influence athletic

performance and how these factors are affected by male-to-female hormone use, and all came to the same conclusions that a year or more of testosterone suppression and male-to-female hormone use does not erase the inherent athletic advantages biologically conferred upon males.

In summary, males have undeniable biologically based athletic advantages over females in almost all sports, and even extended use of male-to-female hormones does not erase those advantages. All that House Bill 61 seeks to do is to ensure that female sports teams are preserved for biological females so girls and women can compete on a level playing field.

Thank you for your time and consideration.

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