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1 Letter to the editor from Kirk et al.: “The Impact of Gender-Affirming Hormone Therapy
2 on Physical Performance”.

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10 The recent article by Cheung et al.[1] provided a review of studies examining the effects of gender-
11 affirming hormone therapy (GAHT) on physical performance, with a focus on the inclusion of
12 transgender people in competitive sports.

13 The authors state throughout that differences between sexes are mitigated when absolute measures are
14 ‘corrected’ by stature (termed height by the authors) or mass. The use of ‘corrected’ is questionable, as
15 this suggests absolute data are ‘incorrect’. When data are expressed relative to morphology they are
16 ‘adjusted’ not ‘corrected’. Even accepting this terminology, much of the argument is based on
17 adjustment of absolute measures by stature, rather than the standard mass, without justification.
18 Nonetheless, there is no attempt to address performance advantages provided by greater stature that
19 overwhelmingly occurs in males[2,3]. Importantly, when GAHT is applied prior to puberty, males still
20 reach their expected stature[4]. Thus, taking the author’s argument to its logical conclusion: if sex
21 categories were to be removed (assuming relative measures based on stature are equal between the two
22 sexes), stature categories would be required instead to ensure competition was still fair.

23 Differences in absolute measures[5] are reported but largely ignored by the authors. Whilst transwomen
24 (TW) and females were found to have similar relative $\dot{V}O_2$ peak and strength after 14 years, this likely

25 only occurred due to TW being ~16kg heavier and ~13cm taller than females due to their male
26 morphology. Relative measures of strength will always ‘favour’ the smaller person (who in this context
27 will typically be female) due to the non-linear relationship between muscle mass and force[6]. Indeed,
28 for two hypothetical athletes of 95kg and 65kg who have equal relative strength, the heavier person will
29 always outperform the lighter person in a test of force. Even when matched by mass, males outperform
30 females in strength events[7], therefore disparities in morphology between TW and females renders any
31 extrapolation of relative measures to a real-world context null. As such, absolute measures should
32 always be considered alongside relative measures, as TW retain significant advantages over females in
33 absolute strength (16%), $\dot{V}O_{2peak}$ (22%), and $\dot{V}O_2$ at the anaerobic threshold (18%), and O_2pulse
34 (17%)[5]. Omitting any discussion of these results was a questionable choice given the importance of
35 these variables in understanding differences between performance standards[8].

36 The conclusions do not reflect the contents of the paper by focusing entirely on two studies from the
37 same observational population without controls, whilst ignoring the Alvares et al.[5] data in both the
38 body of the conclusion and the abstract. Additionally, the conclusion states “*Reasonable
39 accommodations for the inclusion of trans people are sport specific and could be based on the range of
40 competitive advantages and abilities that are already accepted in the cisgender population*”. For this to
41 be a relevant conclusion, the authors would need to: state which specific ‘advantages’ they are referring
42 to; provide evidence that these ‘advantages’ explain performance differences within sex and
43 performance standards; demonstrate that these ‘advantages’ are equal to or greater than the inherent
44 male performance advantages outlined by the authors themselves. As none of these details are provided,
45 this paragraph is an unfounded opinion.

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