

Editorial

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Beyond the Olympic and Paralympic Games

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The section, “Beyond the Olympic Games” is dedicated to the world of sport science and sports medicine, with particular focus on the Paris Olympic and Paralympic Games. By delving into diverse hot topics, we aim to provide readers with a flavour of the multifaceted nature of the science and medicine of sports today. This special section touches upon certain critical and sensitive issues impacting athletes’ health and performance, such as doping, gender issues in sport, the intriguing question why athletes from East Africa dominate distance running and finally, equality issues related to the participation in sports events around the world. This section is entirely within the core scope of the journal Translation Exercise Biomedicine (TEB), and is timely given the occurrence of the XXXIII Olympiad. The Paris 2024 Olympics could mark the start of a new era for the Olympic Movement after the challenges over doping and gender issues faced in London 2012, Rio 2016 and Tokyo 2020. Therefore, this dedicated Olympic and Paralympic section is envisaged to provide the reader with a broad but highly relevant overview of some of the most significant threats to the modern Games such as doping, gender and inclusion, while also highlighting cutting-edge research and science opportunities that need to be at the heart of a concerted reaction by the sport science and medicine community.

The paper “Practical Steps to develop a transcriptomic test for blood doping” by Sutehall et al. [1] explores innovative methods to enhance the detection and prevention of blood doping in sports. It focuses on analysing gene expression profiles in blood samples to identify doping practices such as the misuse of recombinant human erythropoietin (rHuEPO) and blood transfusions in the first instance. This pioneering approach offers a more precise method compared to traditional methods, detecting subtle changes in gene expression indicative of doping with limited opportunities for dopers to bypass. The paper outlines the practical steps required to develop reliable transcriptomic tests, emphasising the potential to significantly improve anti-doping

efforts, promote fair play, and protect athletes’ health. Despite challenges like false positives and data complexity, transcriptomic testing represents a promising advancement in maintaining the integrity of competitive sports.

The paper “A Unique Pseudo-Eligibility Analysis of Longitudinal Laboratory Performance Data from a Transgender Female Competitive Cyclist” by Hamilton et al. [2] delves into the complexities surrounding the inclusion of transgender athletes in competitive sports. It emphasises the importance of balancing ethical considerations of inclusivity with the need to maintain competitive fairness. The study examines the longitudinal performance data of a transgender female cyclist, analysing the impact of hormone therapy on athletic performance and eligibility. Through this analysis, the paper sheds light on the challenges and policies being considered to integrate transgender athletes effectively. It also discusses the evolving landscape of sports governance, aiming to ensure that inclusivity initiatives do not compromise the integrity and fairness of competitive sports.

The narrative review paper “Why the Dominance of East Africans in Distance Running? A Narrative Review” by Grivas et al. [3] examines the multifaceted reasons behind the remarkable success of East African athletes in distance running. The review highlights a combination of genetic, environmental, and training-related factors that could contribute to their dominance. Genetics does not seem to be the primary factor responsible for this, or even other running phenomena such as the Jamaican Sprint Factory. The primary factors that appear to explain the East African running phenomenon include advantageous physiological traits such as high aerobic capacity and efficient running economy acquired through prolonged adaptation to the high-altitude environment where many of these athletes live and train. Rigorous and culturally ingrained training methods, often starting from a young age, further bolster their endurance and performance. This comprehensive analysis underscores the interplay of these factors in shaping the unparalleled achievements of East African runners in the global arena of distance running.

Finally, the paper “Gender Equality Policy in Chinese Sport Governing Bodies” by Huang et al. [4], explores the implementation of gender equality policies from the Olympic Movement within Chinese sports governance, specifically

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focusing on elite volleyball. The article examines how these policies are translated into practice, evaluating their successes and identifying ongoing challenges. By analysing the state of gender equality in Chinese sports, the research highlights significant progress in policy adoption and execution. However, it also underscores persistent areas requiring improvement to achieve true gender parity. The findings provide a comprehensive overview of the current landscape of gender equality in Chinese elite volleyball, offering valuable insights for policymakers and sports administrators.

Human performance has long intrigued scientists and sports enthusiasts, driving the quest to understand the limits of athletic achievement. Research, especially over the past five decades has generated a wealth of knowledge about the biological and physiological constraints of human performance and emphasizes the role of genetics, advanced training methods, and technological innovations in pushing these boundaries [5–10]. Expanding “The Limit of Human Performance” beyond Olympic games requires an interdisciplinary approach involving disciplines such as physiology, sports science, psychology, and bioengineering. However, challenges in sports competition persist. Doping detection relies on the development of new technologies. Expertise across these fields is essential for advancing our understanding and enhancing athletic capabilities. This collaborative approach fosters innovative thinking and redefines what is possible in sports and beyond, integrating research, technology, and broad scientific knowledge to achieve new heights in human performance.

Finally, this section on elite performance and Olympics and Paralympics is intended to stimulate much further interest in developing the science of sport in the hope of achieving, in the not too distant future, an Olympic sports

brand free of the main sports integrity issues. Never in the history of the modern Olympic Games has there been a more urgent need for science and medicine to inspire a generation and rebrand the world’s most majestic sporting showcase.

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