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Thermal Strain During Endurance Running Events

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It is widely accepted that the human capacity to perform prolonged exercise is impaired in warm environments. **PURPOSE:** The aim of this study was to investigate the potential impact of thermal strain during endurance running events in male athletes. **METHODS:** Data from six running events were obtained from publicly available online sources. Weather data [air temperature, dew point, wind speed, cloud coverage, and Wet-Bulb Globe Temperature (WBGT)] corresponding to the time of each race (marathon, 50km race-walk, 20km race-walk, 10,000m, 5,000m and 3,000m-steeplechase) were obtained from the free-available online database. Data of body mass and height were collected for the top five international men athletes of each event and Body Mass Index and Body Surface Area were calculated. Thereafter, the clothing insulation was calculated by finding the sum from a list of clothing, and the metabolic rate was calculated using previous methodology of regression equation between running velocity and oxygen uptake. In turn, computer-based simulations using the FAME Lab Predicted Heat Strain software were conducted to calculate the heat strain of elite runners performing in the most frequent cool and warm weather conditions. **RESULTS:** Simulated data showed that athletes running in warm conditions (ranged between 20°C and 27°C), experience on average 0.87 ± 0.26 °C higher core temperature, 2.29 ± 1.02 °C higher skin temperature, and 24.67 ± 3.33 higher bpm predicted heart rate compared to the same athletes running in cooler environmental conditions (ranged between 5°C and 16°C). **CONCLUSION:** Concluding, male athletes may experience a greater heat strain with potential impacts on performance and health running in warmer conditions. Athletes and coaches must be educated about these risks and prepare for the heat by employing heat mitigation strategies where possible.