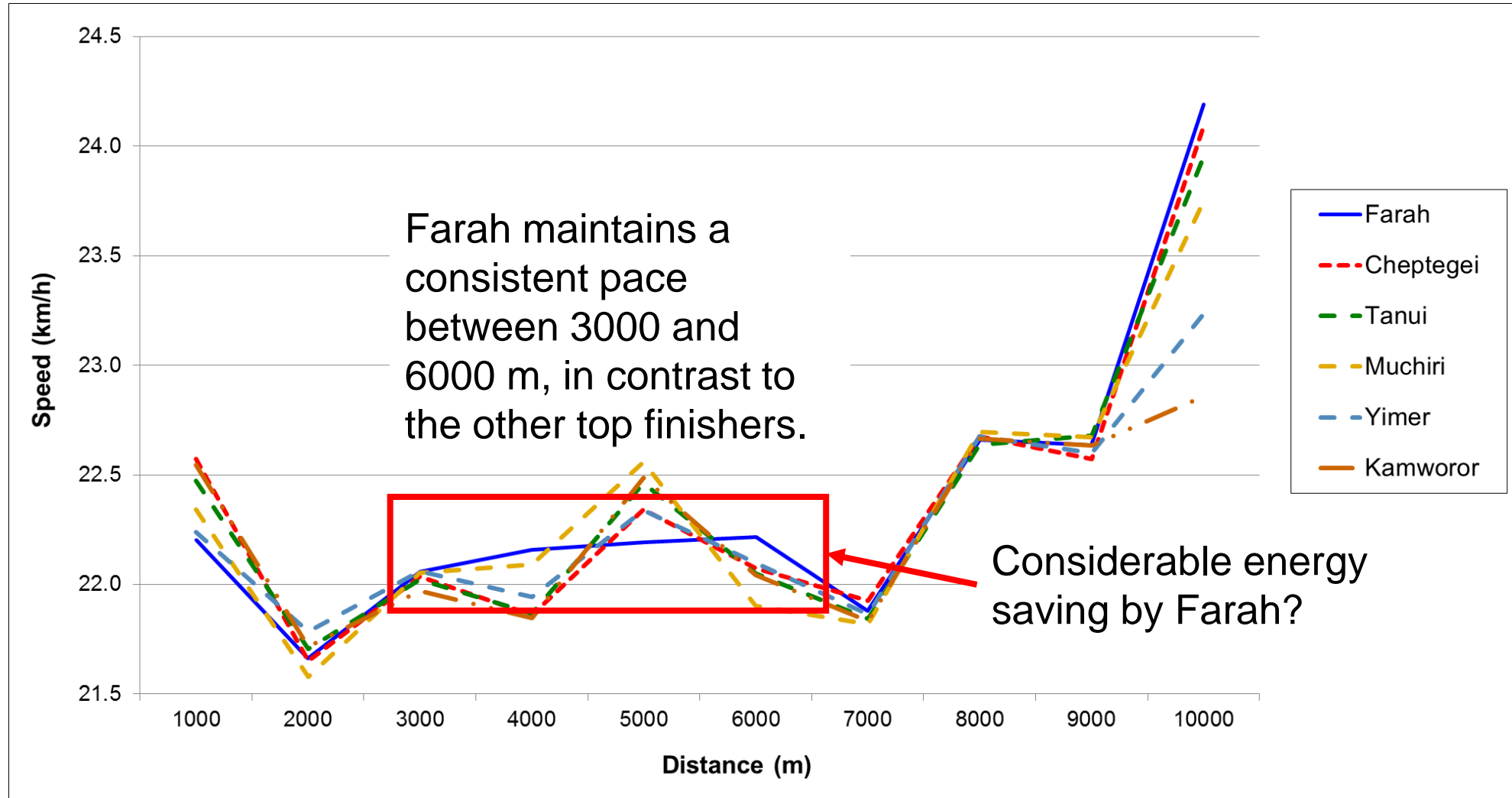# Preliminary Analysis of Men's 10,000 m Final
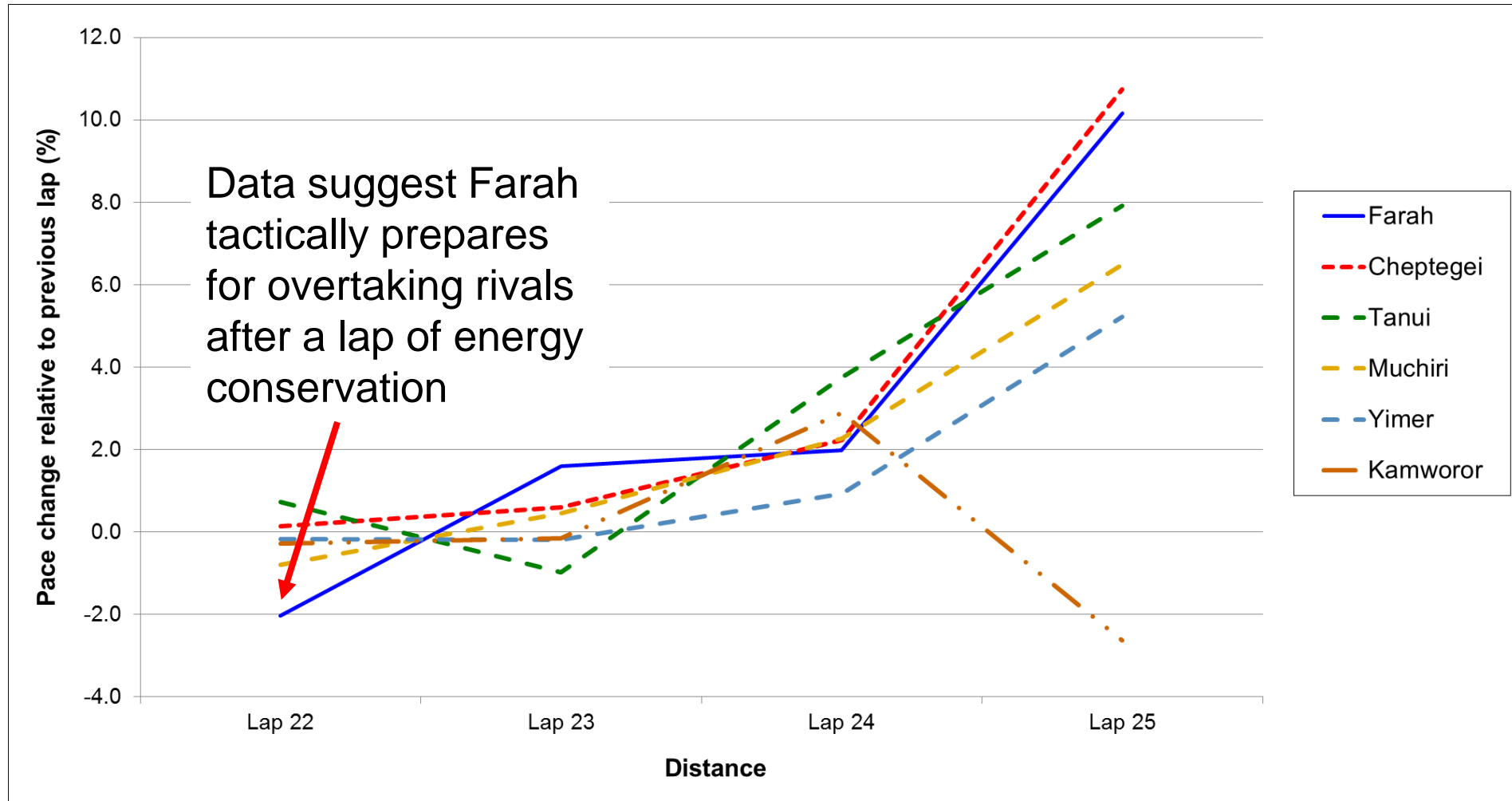
Brief data capture details

- Ten digital video cameras were placed in the stands around the stadium to record data for 3D motion analysis. The cameras recorded at between 50 and 250 frames per second.

- The athletes were recorded on each lap for subsequent biomechanical analysis. For this presentation, athletes were analysed during Laps 5, 10, 15, 20 and 25.

- For the purposes of this flash report, selected variables have been included while a more detailed report is being prepared.
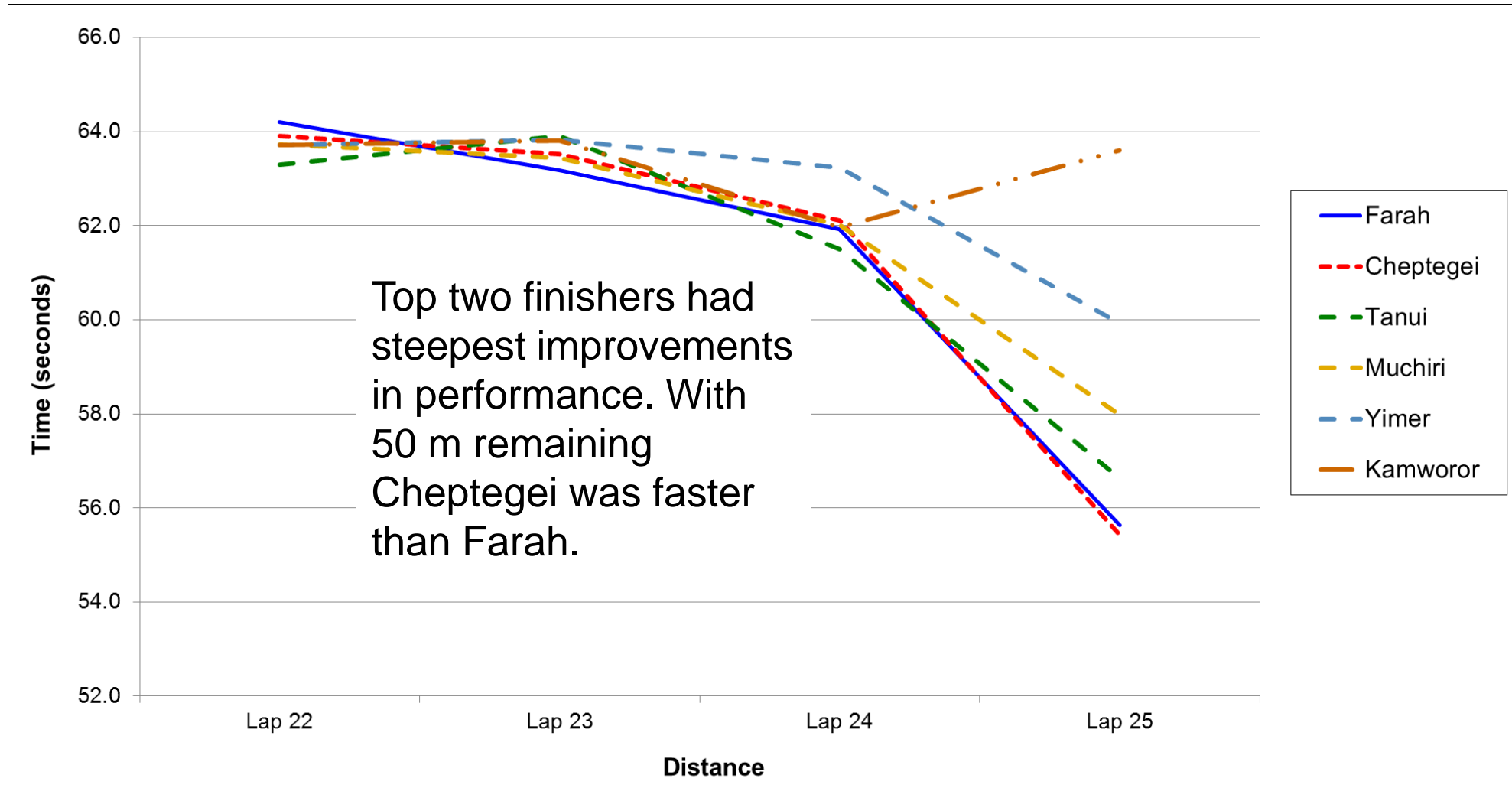
- The split data for each 100 m were provided by SEIKO.
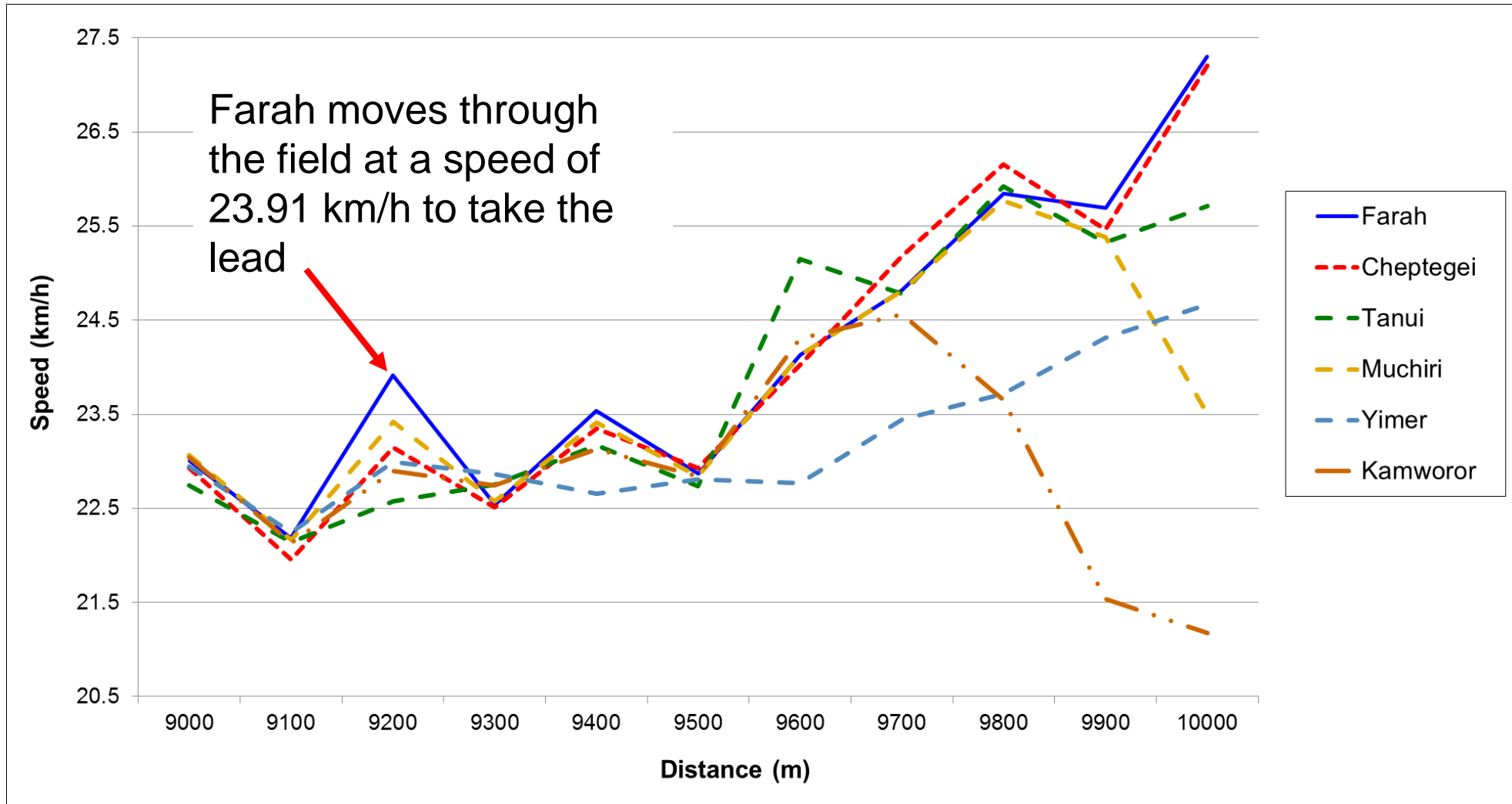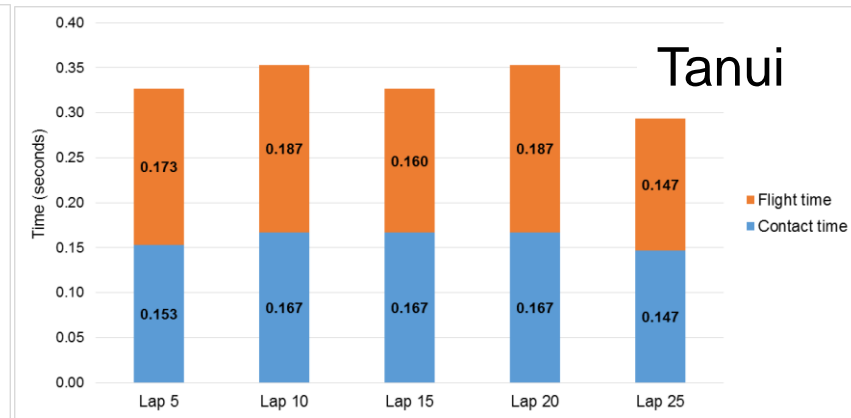
Average pace for each 1000 m
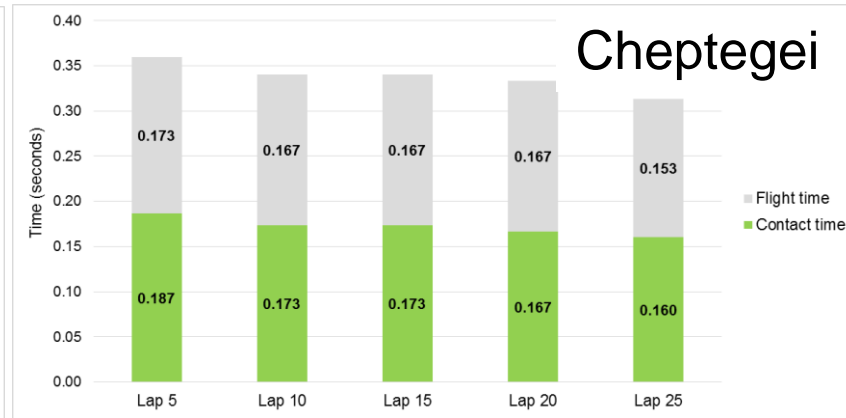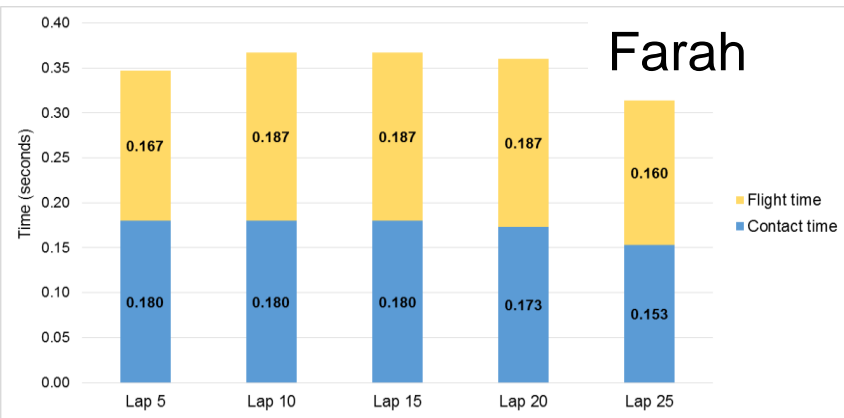
# Changes in pace during the final four laps

Performance during the final four laps

Top two finishers had steepest improvements in performance. With 50 m remaining Cheptegei was faster than Farah.

Changes in pace during the final 1000 m

Farah moves through the field at a speed of 23.91 km/h to take the lead
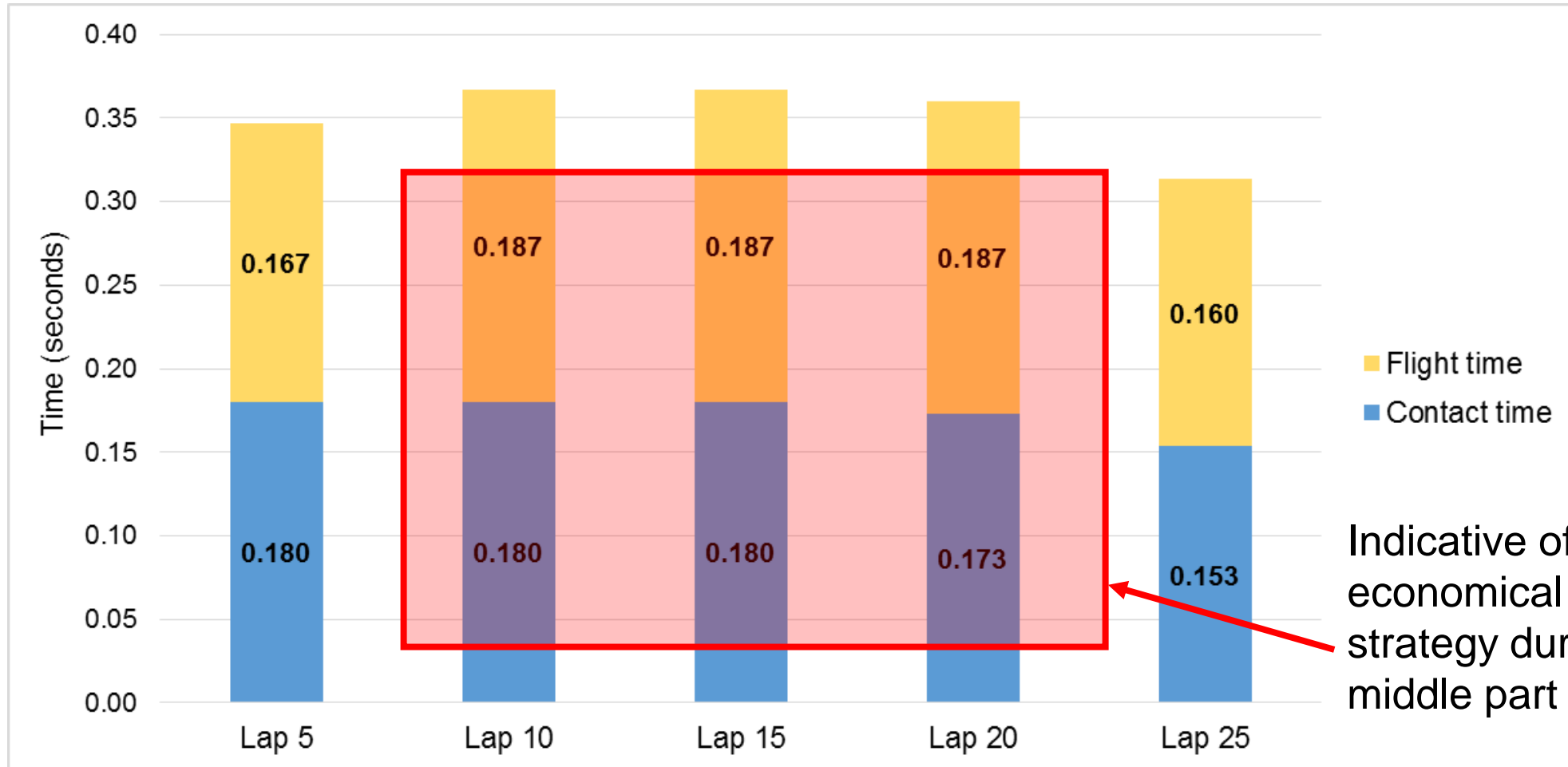
Contact and flight times throughout the race

Farah

Cheptegei

Tanui

Farah's pacing strategy reduces variation in step times before his considerable increase in speed

Muchiri

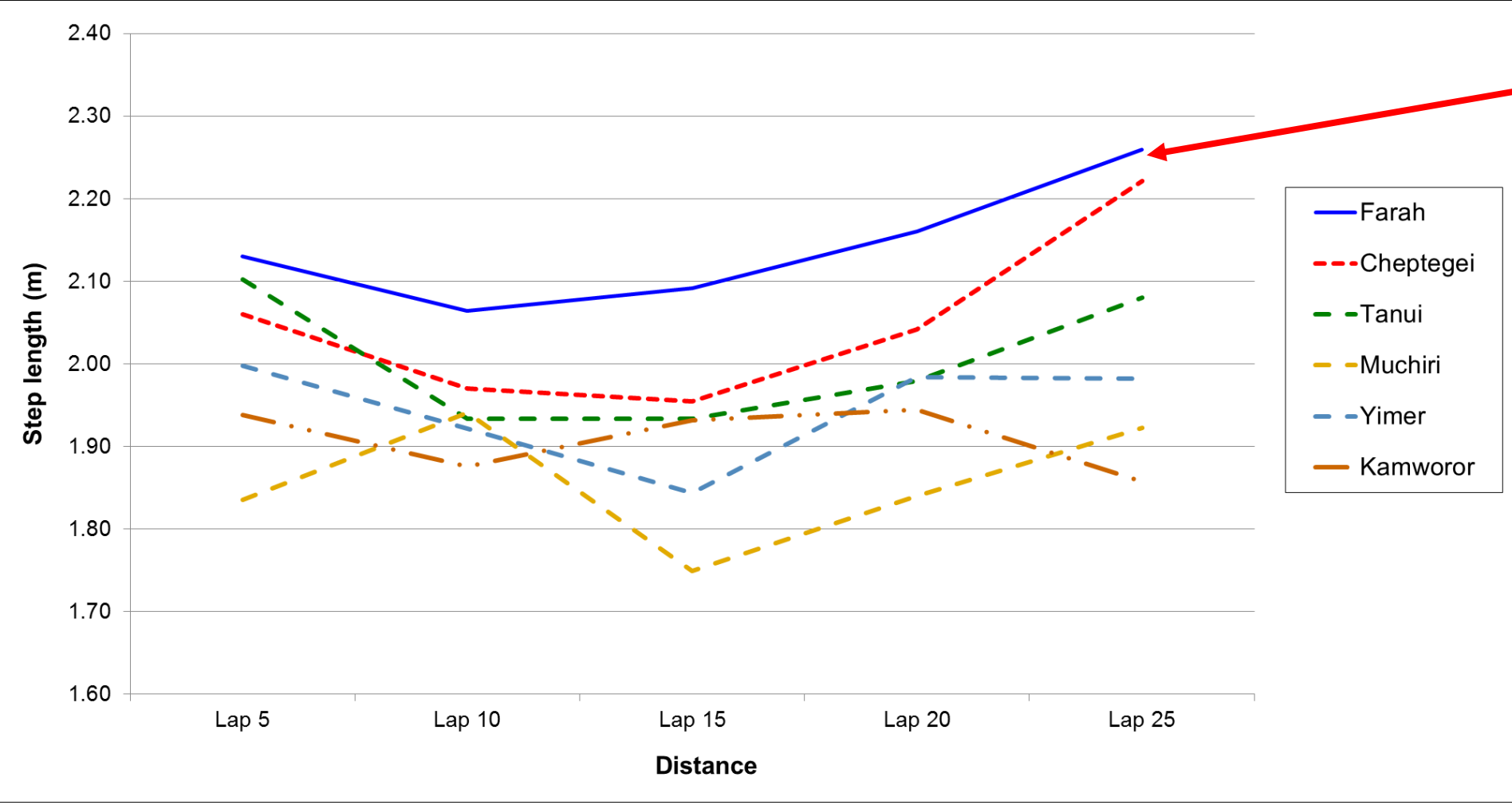Yimer

Kamworor
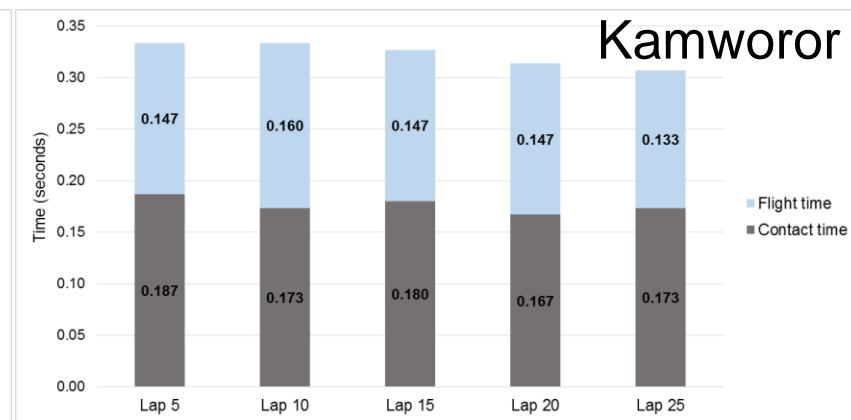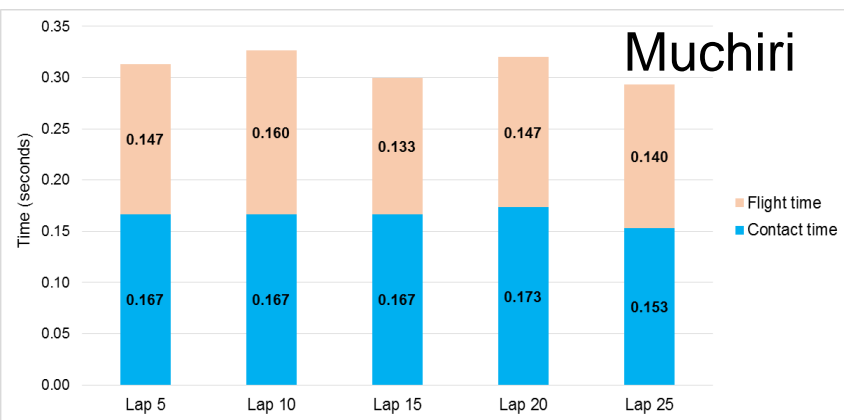
Contact and flight times - Farah

Example of braking:propulsion ratio (Lap 25)
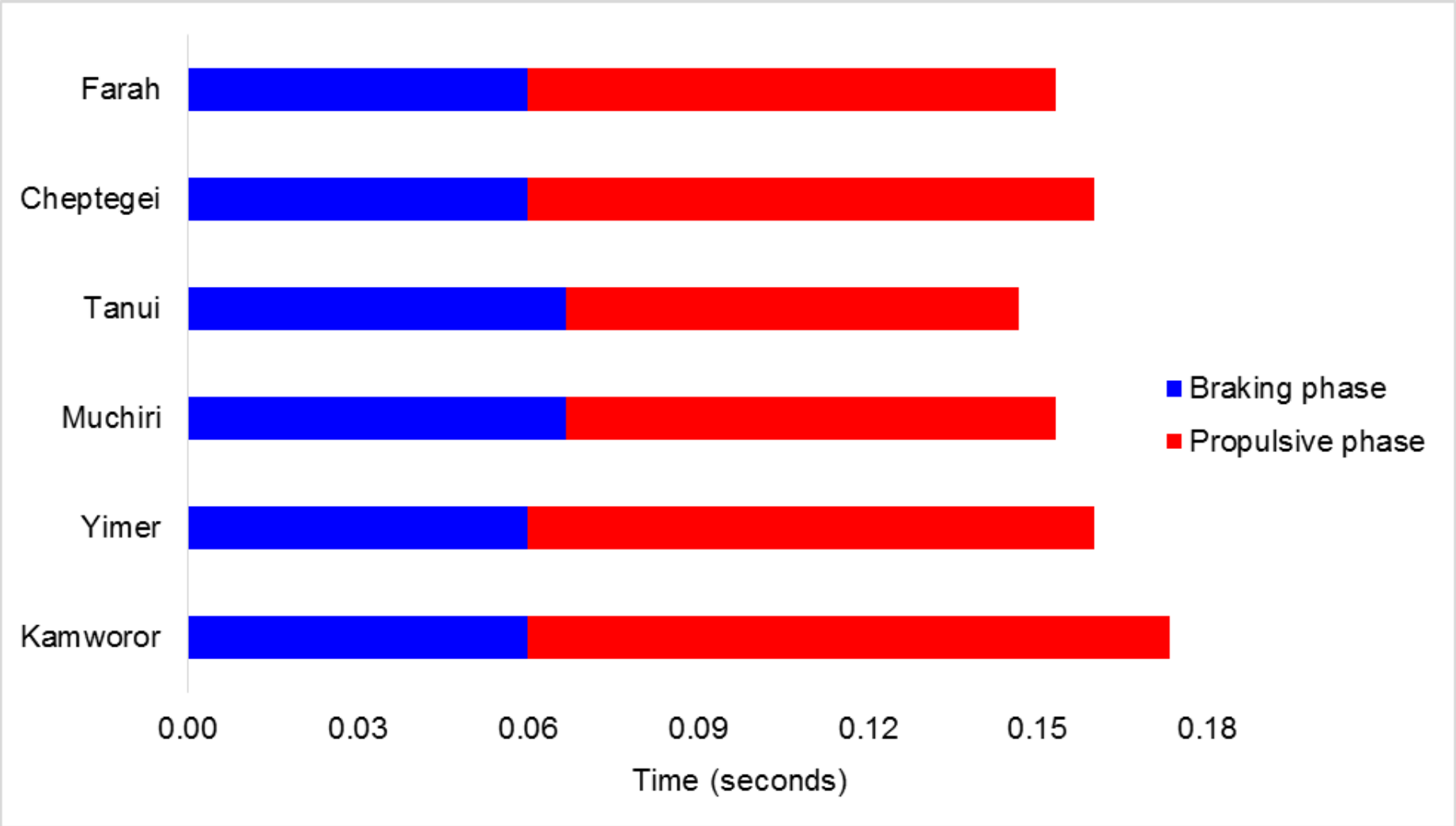
Farah and Cheptegei both had symmetrical values (right and left legs), but the other athletes did not.

Changes in step length during the race

Farah had the longest step length of the top 6 finishers throughout the race.

Step length and speed changes during the race
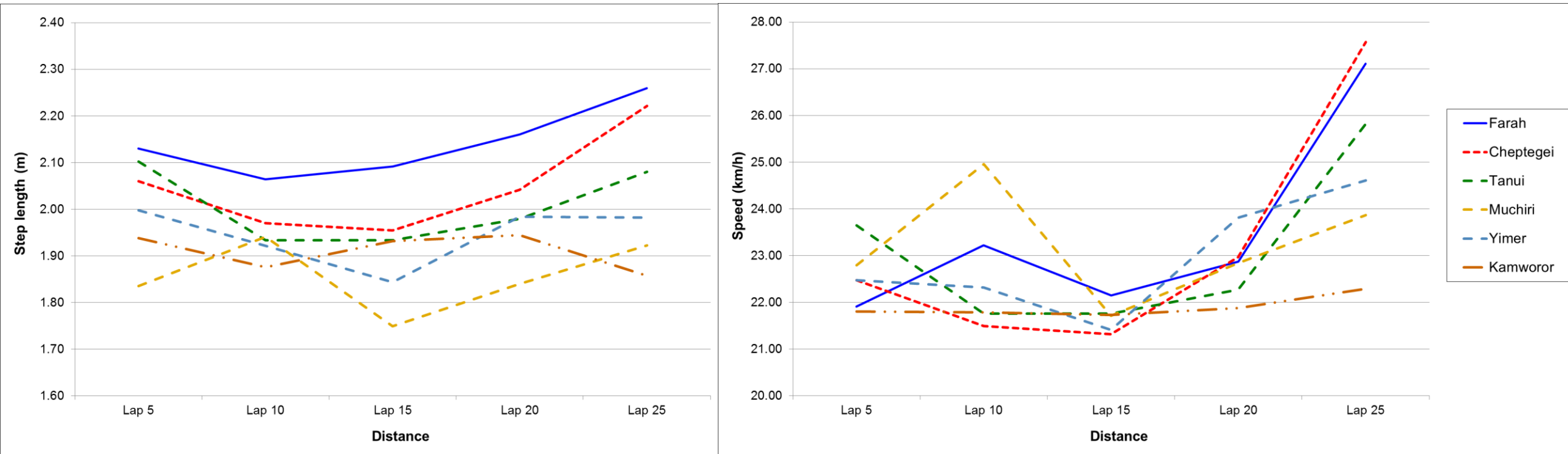
The athletes tended to vary their pace by altering step length. The velocities shown were measured using 3D motion analysis alongside the step length calculations.

Sprint finish analysis at 9950 m

	Speed (km/h)	Step length (m)
• Farah	27.11	2.26
• Cheptegei	27.58	2.22
• Tanui	25.82	2.08
• Muchiri	23.87	1.92
• Yimer	24.61	1.98
• Kamworor	22.30	1.88

Having overtaken Tanui at the start of the home straight, Cheptegai's superior speed at this point was not sufficient to overtake Farah who held on to win by 0.43 seconds. Farah's tactics and experience meant he retained the title through optimising his physical abilities.

Coaching implications

- Despite being an arduous endurance event, the very best athletes exhibited running speeds in excess of 25 km/h in the final 100 m. Based on the data collected, it appears that step length was the determining factor in achieving the medal-winning times. Taking into account that step time reduced in the final stages, it becomes apparent that sufficient impulse was achieved through the production of large forces at a fast rate.

- Traditionally, endurance training has focussed on physiological development; however, concurrent attention to the development of neuromuscular characteristics must be considered in the physical preparation of the elite distance athlete.