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Conference Abstract

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Do Women and Men Fail Differently? DNF Risk Prediction in Self-Routed Ultracycling (TCRNo10–No11)

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Abstract

We analyse whether women and men differ in Do-Not-Finish (DNF) risk in self-routed ultracycling using Transcontinental Race (TCR) No10–No11 replay tracking. Men rode faster when moving (~10%) but DNF survival curves showed minimal separation by sex. Stopping strategies did not differ. In post-48 h landmark Cox models, early stopped time (within 48h) strongly predicted later DNF while higher moving speed was protective; sex had no effect. Route-aware distance analysis supported these conclusions. Early pacing and stop management (regardless the sex) dominate DNF risk.

Keywords

ultracycling; survival analysis; Cox PH; landmark model; route-aware distance; women-in-cycling

1 Introduction

In ultracycling reaching the final checkpoint is a victory, no matter which is the final position, but outcomes depend not only on speed but also on decisions under sleep deprivation and logistical constraints. The Transcontinental Race (TCR) [1] exhibits high attrition, motivating a survival-analysis view of "time/distance to scratch". Here we test whether women and men differ in Do-Not-Finish (DNF) risk, early behaviour strategies (first 48 h) and if these predict later DNF.

2 Material and Methods

Data source and cohort. Public geographical position and time replay data from Follow My Challenge were used for TCRNo10 (2024) and TCRNo11 (2025) [2,3], restricted to solo riders. Rider metadata (sex, DNF) were taken from the same source.

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Route-aware distance and speed computation. Straight-line (Haversine) distances were avoided because error depends on sampling resolution, which varies from minutes to hours. Road-network distance between consecutive points was estimated via OpenRouteService API (v2) [4] hosted in velodata.ai; segment distance divided by time gap gave route-aware velocity. Riders with segment velocities >90 km/h were removed (n=8).

Stops and 48 h features. Points with velocity <2 km/h were classified as stopped and merged into stop bouts. In 0–48 h we computed total stopped time and (exploratory) decomposed it into micro (<30 min) and macro (≥30 min) stop time.

Survival analysis. Kaplan–Meier curves (women vs men) were compared via log-rank tests on both time and distance scales [5]. Cox PH models [5] were stratified by edition (baseline hazard allowed to differ by year). A post-48 h landmark design was used: only riders active at 48 h entered the risk set, with covariates measured in 0–48 h. We report HR, 95% CI, and p-values. Analysis was done with python library lifelines [6].

3 Results

We analysed solo riders from TCRNo10 and TCRNo11 (TCRNo10: 21 women, 206 men; TCRNo11: 60 women, 281 men). Although men rode around 10% (2 km/h) faster than women (95% CI 1.49-2.46; $p=1.7\times10^{-15}$), DNF rates were similar by sex and did not show a consistent direction across editions (No10: 42.9% women vs 47.6% men; No11: 48.3% women vs 44.5% men). Stopped time in the first 48h overlapped by sex (medians ≈11–12 h) with no adjusted sex difference (OLS: Δ(M–F)=–0.05 h; p=0.925). Micro- and macro-stop distributions did not differ by sex.

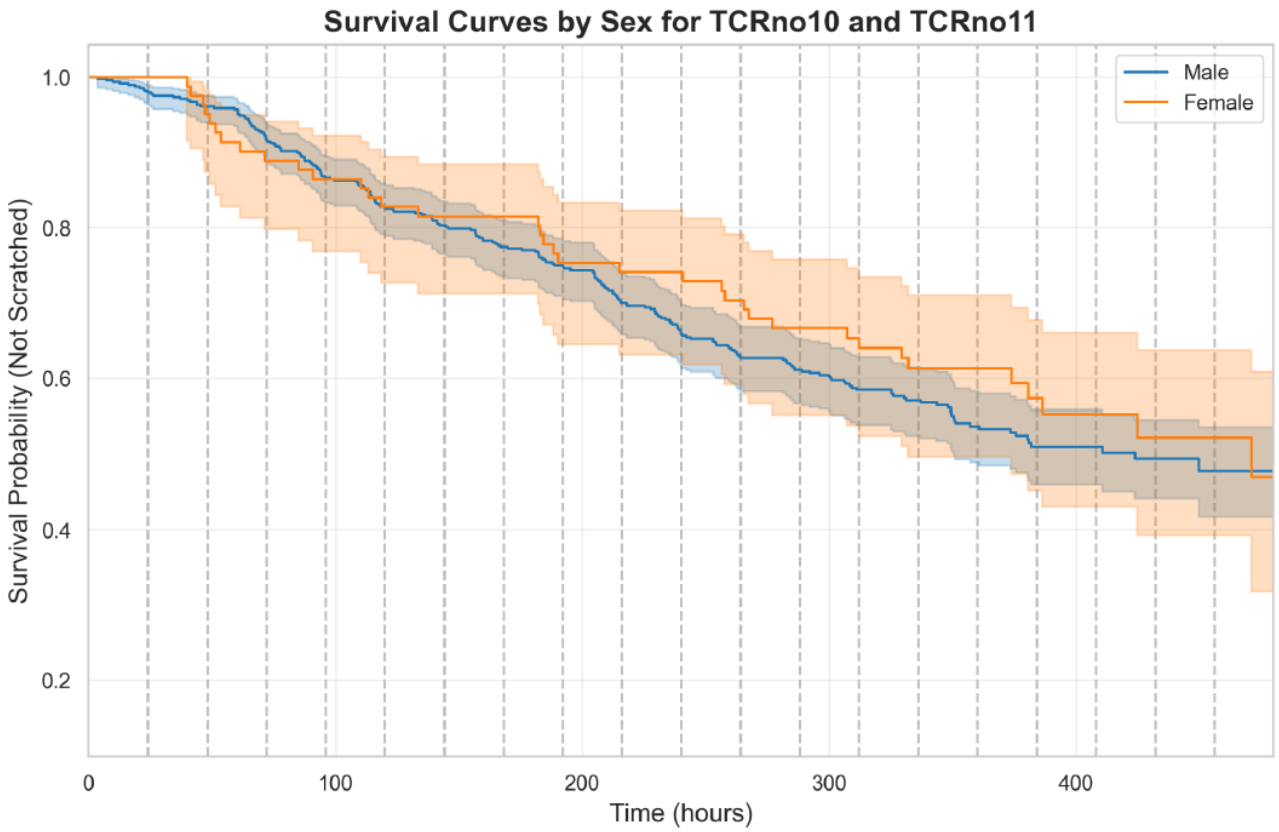


Figure 1. Kaplan-Meier curves. The higher the better. Color shade shows 95% CI.

Although later scratch time for women was observed in the K–M curves (Figure 1), no evidence was detected (time log-rank χ^2=0.266, p=0.606; distance χ^2=0.034, p=0.853). Cox models stratified by edition confirmed no detectable sex effect for time (HRmale=1.05, 95% CI 0.75–1.50; p=0.75) and distance (HRmale=0.97, 95% CI 0.69–1.37; p=0.858).

In landmark Cox models, early stopped time strongly predicted later DNF (HR=1.13 per hour, 95% CI 1.10–1.16; $p=3.24\times10^{-18}$) while sex did not. Adding moving speed showed both contributed independently: higher speed was protective (HR=0.913 per km/h; p=0.004) and stopped time remained predictive (HR=1.10 per hour; $p=4.31\times10^{-9}$). Results were unchanged when using reconstructed road-network distance. Macro-stop time was consistently associated with higher hazard; micro-stop time became non-significant once moving speed was included, suggesting it reflects pace rather than an independent mechanism.

4 Discussion

We have evidence that men ride faster, and we observed that women tend to scratch later than men in TCRNo10 and TCRNo11; however, we found no statistical evidence that sex affects DNF hazard. Stopping strategies did not differ by sex. What mattered was early behaviour: higher moving speed and lower stopped time in the first 48 h independently predicted completion. Early in the race, riders optimize stops; those unable to minimise stopped time or sustain pace were more prone to scratch, irrespective of sex.

5 Practical Applications

Completion depends on minimising stops in the first 48 h, not on sex. Athletes should train this capacity in shorter ultracycling events such as Pedalma, Badlands, or Transpyrenees.

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Conflicts of Interest: The authors declare no conflict of interest.

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