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Is the prescription of “appropriate” running shoes an evidence-based preventive measure for running-related injury?

Laurent Malisoux

Luxembourg Institute of Health

Department of Precision Health

Shoe prescription for injury prevention



Minimalist shoes

Body Mass and Weekly Training Distance Influence the Pain and Injuries Experienced by Runners Using Minimalist Shoes

A Randomized Controlled Trial

Joel T. Fuller,^{*,†} BSc, Dominic Thewlis,[†] PhD, Jonathan D. Buckley,[†] PhD, Nicholas A.T. Brown,[‡] PhD, Joseph Hamill,[§] PhD, and Margarita D. Tsiros,[†] PhD

- ✓ Randomised Control Trial (26 weeks)
- ✓ 61 trained, habitual rearfoot runners
- ✓ **Conventional** versus **minimalist** shoes
- ✓ **Outcome: musculoskeletal problem (medical visit, medication, or reduced weekly training)**

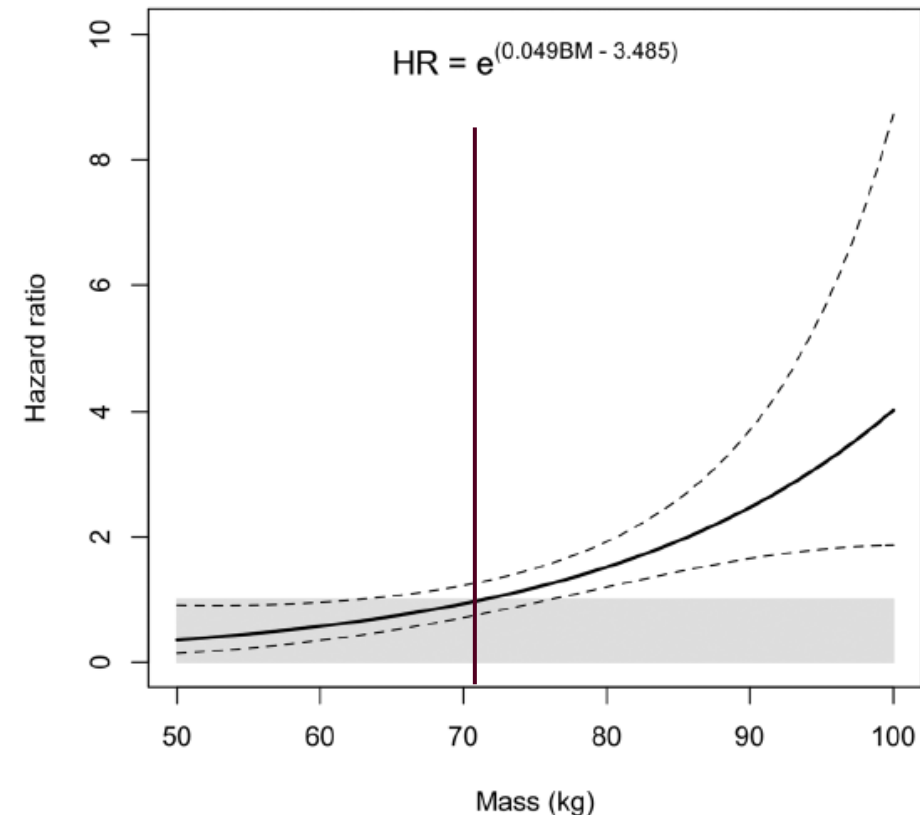
→ 27 injuries

Shoe type

HR: 1.64 [0.63-4.27] $p = 0.31$

Body mass

HR: 0.93 [0.86-0.99] $p = 0.04$



Motion Control Shoes

Injury risk in runners using standard or motion control shoes: a randomised controlled trial with participant and assessor blinding

Laurent Malisoux,¹ Nicolas Chambon,² Nicolas Delattre,² Nils Gueguen,²
Axel Urhausen,^{1,3} Daniel Theisen¹

Motion Control System

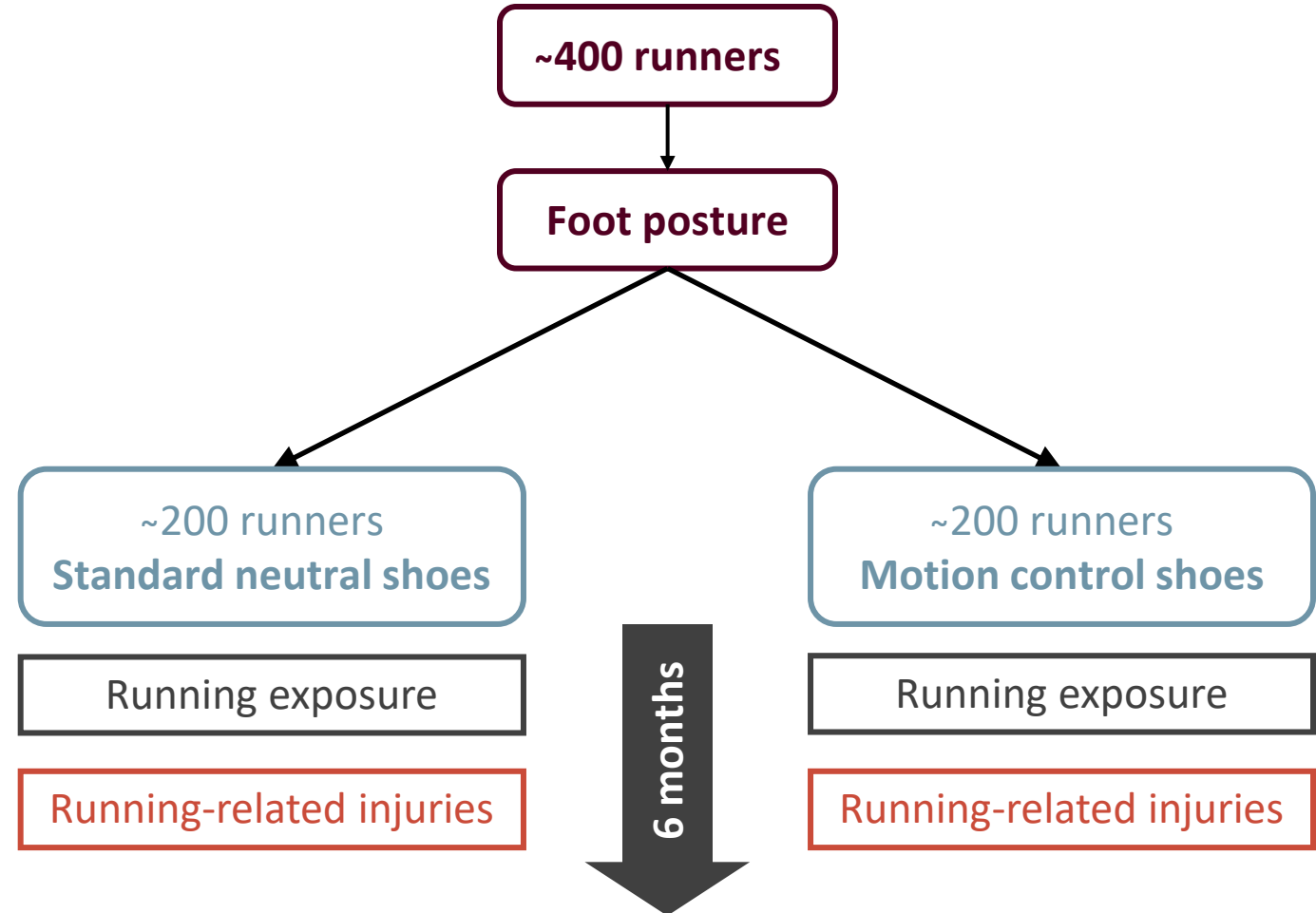


Medial arch support

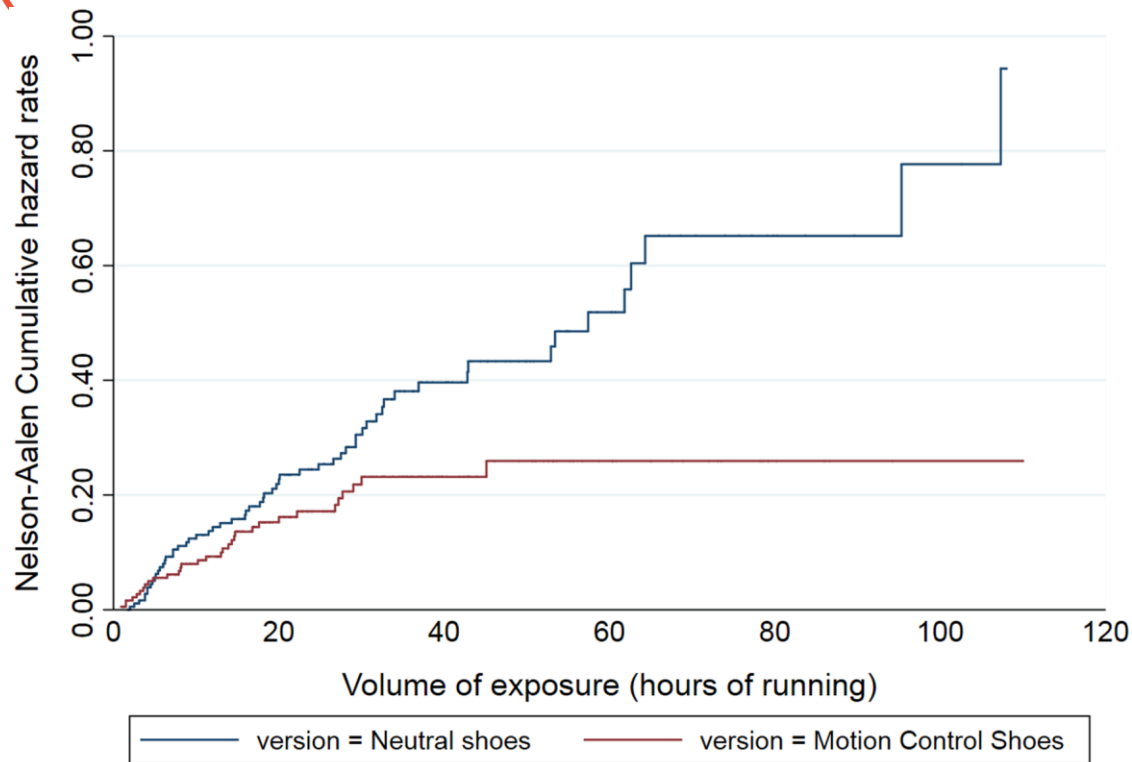


Dual-density midsole

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Motion Control Shoes (MCS)



Total sample

MCS - HR [95% CI] = 0.55 [0.23; 0.98]

Motion Control Shoes vs. Neutral shoes

- ✓ 372 regular leisure-time runners
- ✓ 93 injured runners (25%)



Runners with Pronated feet (n=94)

MCS - HR = 0.34 [0.13; 0.84]



Runners with Supinated feet (n=60)

MCS - HR = 0.59 [0.20; 1.73]



Runners with Neutral feet (n=218)

MCS - HR = 0.78 [0.44; 1.37]

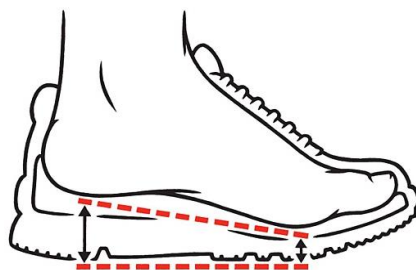


Shoe drop in cushioned shoes

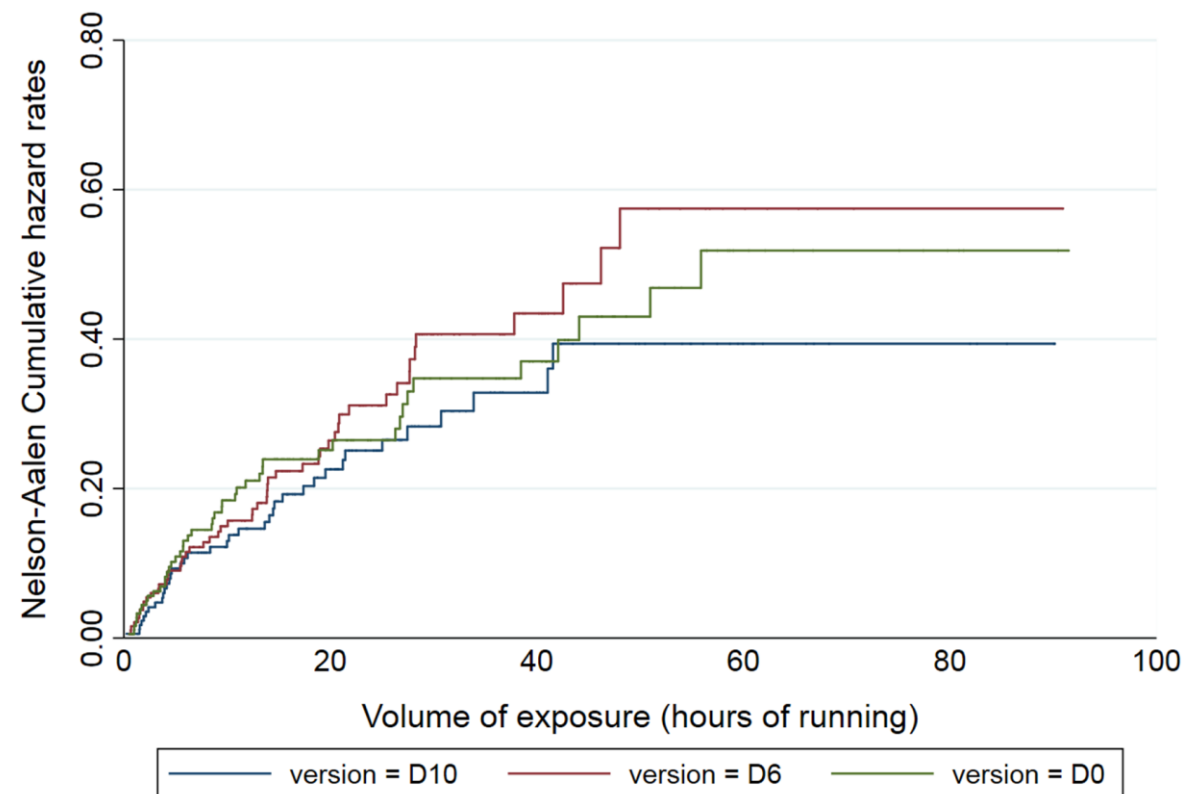
Influence of the Heel-to-Toe Drop of Standard Cushioned Running Shoes on Injury Risk in Leisure-Time Runners

Shoe drop: 10 mm (ref), 6 mm and 0 mm

- ✓ 553 leisure-time runners
- ✓ 136 injured runners (~25%)



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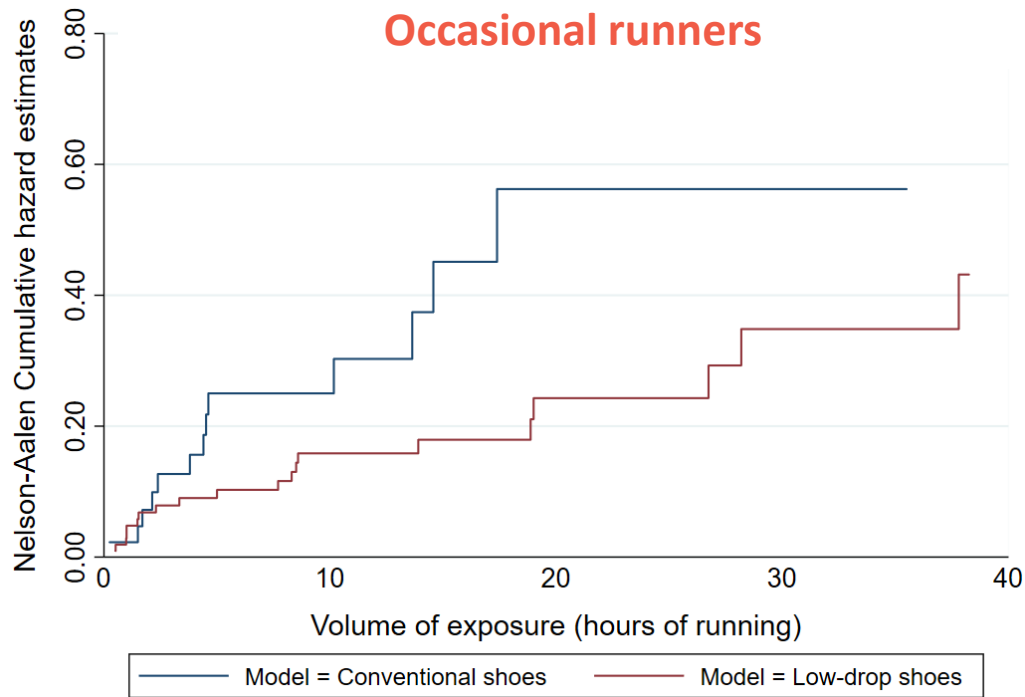


Total sample

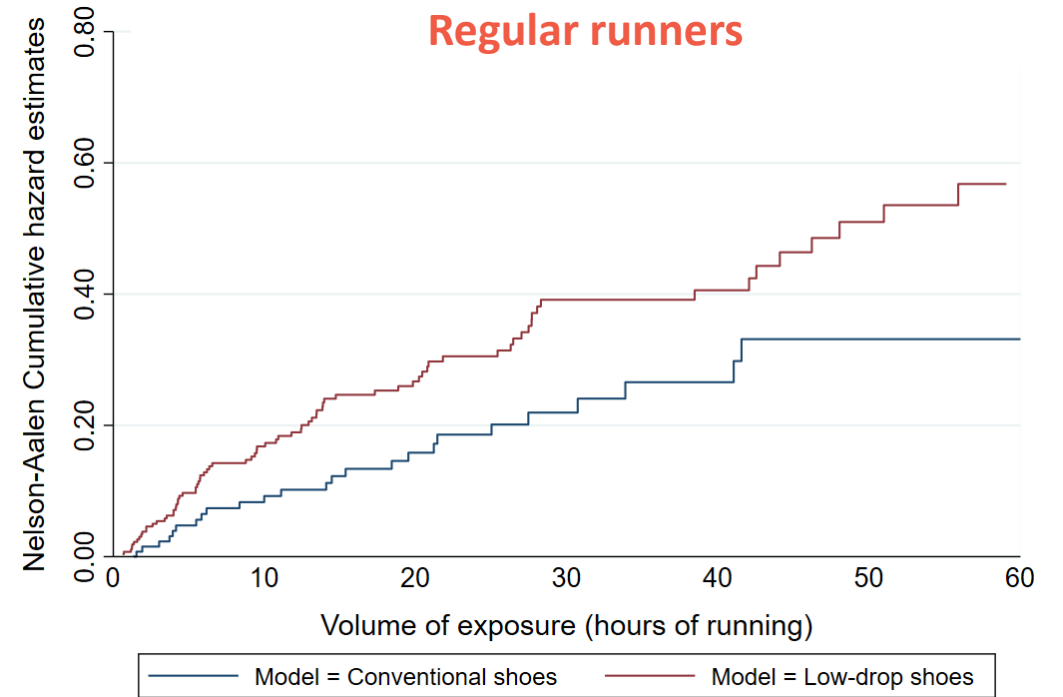
Drop 6 mm - HR [95% CI] = 1.30 [0.86; 1.98]

Drop 0 mm - HR [95% CI] = 1.17 [0.76; 1.80]

Shoe drop in cushioned shoes



HR (ref=Drop 10 mm) = 0.48 [0.23; 0.98]



HR (ref=Drop 10 mm) = 1.67 [1.07; 2.62]



Shoe cushioning

BMJ Open

Shoe cushioning, body mass and running biomechanics as risk factors for running injury: a study protocol for a randomised controlled trial

Laurent Malisoux,¹ Nicolas Delattre,² Axel Urhausen,^{1,3,4} Daniel Theisen¹

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Shoe cushioning



Body mass



Injury risk

Running technique



Shoe cushioning

Shoe Cushioning Influences the Running Injury Risk According to Body Mass

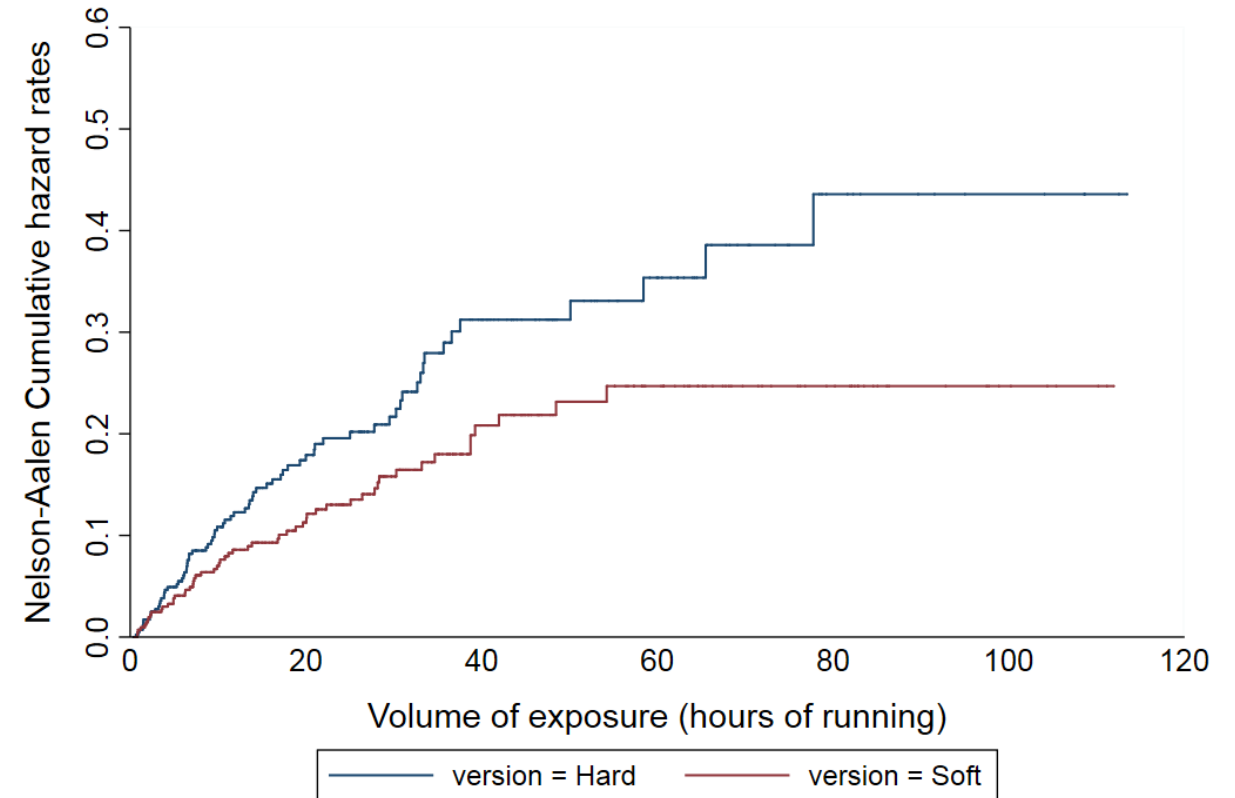
A Randomized Controlled Trial Involving 848 Recreational Runners

Laurent Malisoux,^{*†} PhD, Nicolas Delattre,[‡] PhD, Axel Urhausen,^{†§} Prof., MD, PhD, and Daniel Theisen,^{†||} Prof., PhD

Investigation performed at the Sports Medicine Research Laboratory, Luxembourg Institute of Health, Luxembourg, Grand Duchy of Luxembourg

Soft shoes vs. Hard shoes

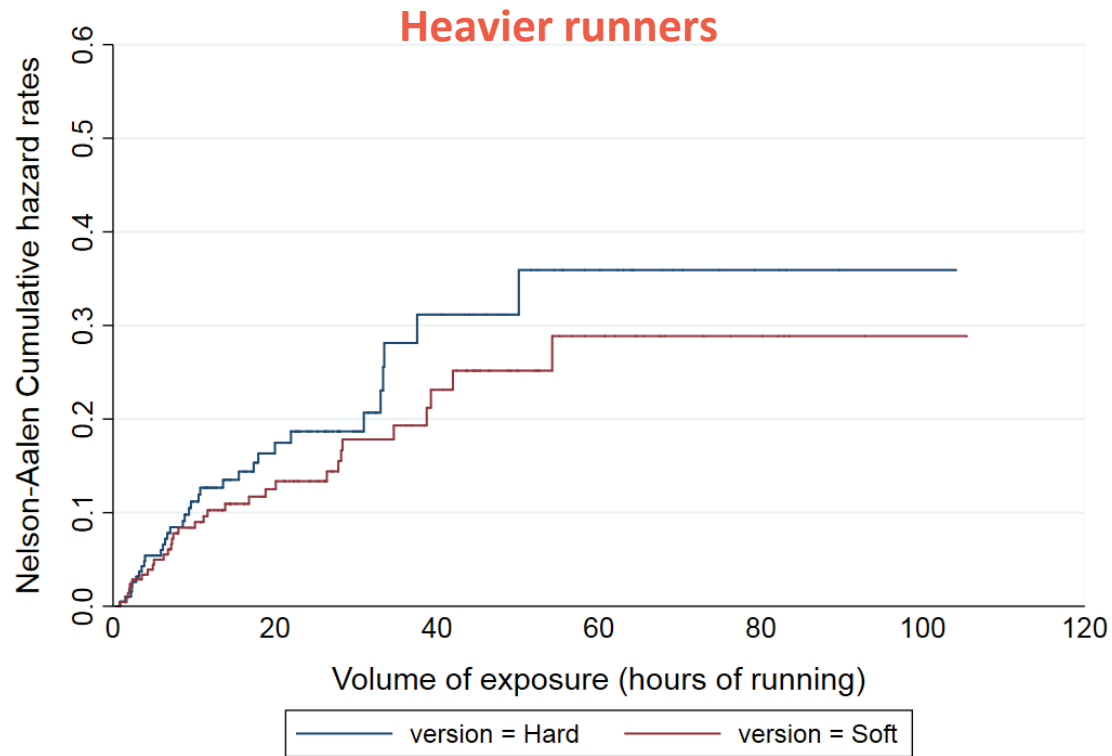
- ✓ 848 recreational runners
- ✓ 128 injuries
- ✓ 247 678 km with the study shoes



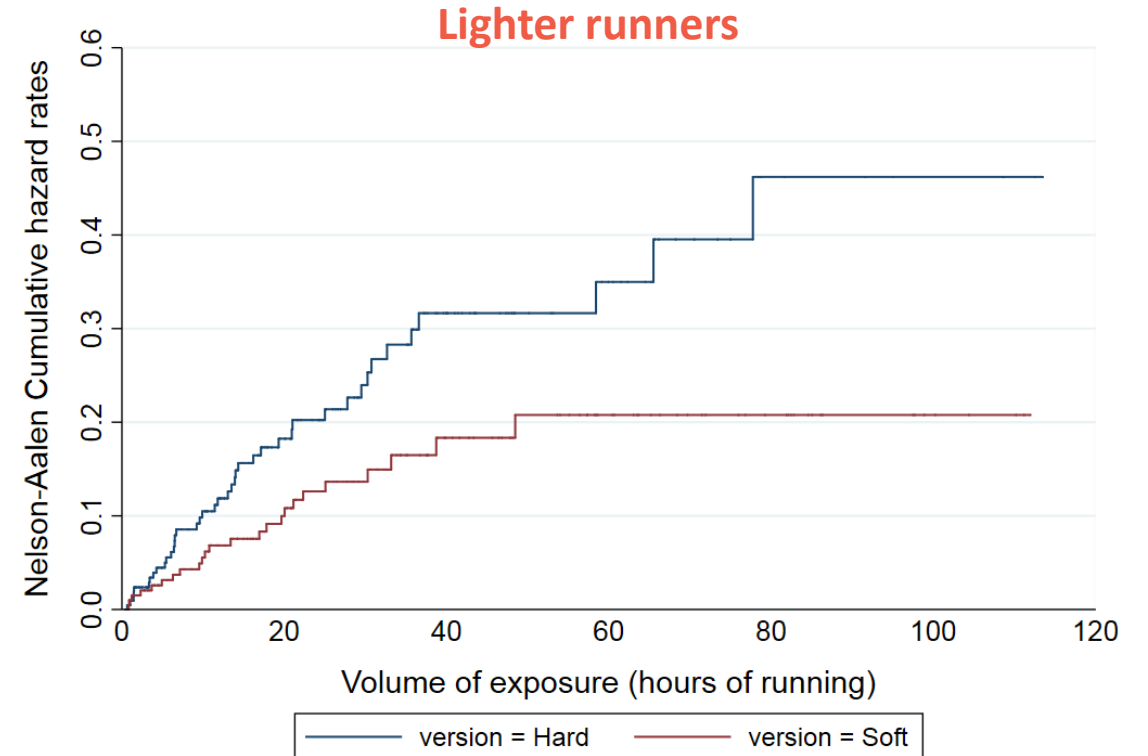
Total sample

Soft shoes - HR [95% CI] = 0.67 [0.47; 0,95]

Shoe cushioning and body mass



Soft shoes - HR = 0.84 [0.51 ; 1.37]



Soft shoes - HR = 0.54 [0.33 ; 0.90]





Shoe prescription ?

= Personalised advice based on the runners' profile

- Lack of high quality RCTs *(Replication, new features...)*
- Underlying mechanisms yet to be uncovered *(Motion control, shoe drop...)*
- Global effect vs. Individual response
- Role of shoe features in the causal pathway





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