



## Concussion knowledge across roles and cultures

Symposium – Advancing Concussion  
Prevention and Recovery: Integrative  
Approaches and Innovative Strategies

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## Concussion prevention: what do we need ?

### Primary prevention:

- Effective equipment
- Evidence-based rules & regulations adaptation
- Injury prevention programmes
- ...

### Secondary prevention:

- Proper detection and management

### Tertiary prevention:

- Long-term monitoring



# Concussion prevention: what do we need ?

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# Concussion guidelines: the Concussion in Sport Group example



- Expert- and evidence-based clinical recommendations
- Based on systematic reviews
- Leads to development of **detection tools** and **management strategies**: SC(O)AT, 6-step return to sport protocol...



## SCAT6<sup>TM</sup>

Sport Concussion Assessment Tool

For Adolescents (13 years +) & Adults



## SCOAT6<sup>TM</sup>

Sport Concussion Office Assessment Tool

For Adults & Adolescents (13 years +)



Jointly organised by:



International  
Olympic  
Committee



# Concussion guidelines: how do they translate locally?



British Journal of  
**Sports Medicine**



Consensus statement

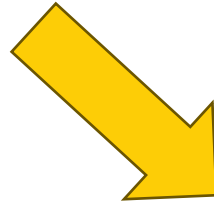
Consensus statement on concussion in sport: the 6th International Conference on Concussion in Sport—Amsterdam, October 2022 FREE



Consensus du Comité International Olympique (CIO)

Commotions cérébrales dans le sport:  
synthèse ReFORM de la déclaration de  
Consensus de la 6<sup>e</sup> Conférence  
internationale

Concussion in sport: ReFORM synthesis of  
the consensus statement from the 6th  
International Conference



# Is knowledge about concussion and guidelines homogeneous?



## Question

*Do injury prevention initiatives, mainly arising from the English-speaking world, translate to the French-speaking world?*

## Hypothesis

Field stakeholders might have differing levels of knowledge thereby impacting their confidence in concussion prevention and management

# ReFORM concussion survey



**Objective:** Assess the current state of **knowledge** and **practice** regarding SRC within a French-speaking consortium

- Online survey (French)
- 5 ReFORM countries (Belgium, Canada, France, Luxembourg, Switzerland)
- 25 – 33 questions
- Demographics, exposure to concussion, knowledge about concussion, management of concussion, existing educational programmes

- Athletes
- Health Care Professionals
- Trainers





# ReFORM concussion survey: demographics



(n=2073) * 1692 finished questionnaires	Healthcare professionals (n=398)	Athletes (n=998)	Trainers (n=677)
<b>Country</b>			
Belgium	42 (10.6%)	162 (16.2%)	<b>219 (32.3%)</b>
Canada	<b>111 (28.0%)</b>	<b>635 (63.6%)</b>	<b>343 (50.7%)</b>
France	<b>125 (31.5%)</b>	73 (7.3%)	36 (5.3%)
Luxembourg	19 (4.8%)	14 (1.4%)	6 (0.9%)
Switzerland	40 (10.1%)	61 (6.1%)	25 (3.7%)
Other	60 (15.1%)	53 (5.3%)	48 (7.1%)
<b>Gender</b>			
Female	125 (35.1%)	484 (50.7%)	143 (22.3%)
Male	<b>228 (64.0%)</b>	468 (49.1%)	<b>496 (77.4%)</b>
Would rather not report	3 (0.8%)	2 (0.2%)	2 (0.3%)
<b>Age</b>			
14-18 y		465 (48.7%)	
19-25 y		316 (33.1%)	
26-30 y		69 (7.2%)	
31-35 y		29 (3.0%)	
> 35 y		75 (7.9%)	

## Main sports

- Football (soccer) – **n=665 (32%)**
- Rugby/Football US – n=210 (10%)
- Martial arts – n=114 (6%)
- Hockey – n=110 (5%)

# ReFORM concussion survey: knowledge assessment



**Self-reported knowledge:** « How would you rate your knowledge of concussion?»; (excellent, very good, good, poor, none)

Comment évaluez-vous vos connaissances sur les commotions cérébrales ?

- ☐ Excellentes
- ☐ Très bonnes
- ☐ Bonnes
- ☐ Peu de connaissances
- ☐ Pas de connaissance

**Knowledge score:** Calculated based on 4 questions on concussion mechanisms, symptoms and immediate management

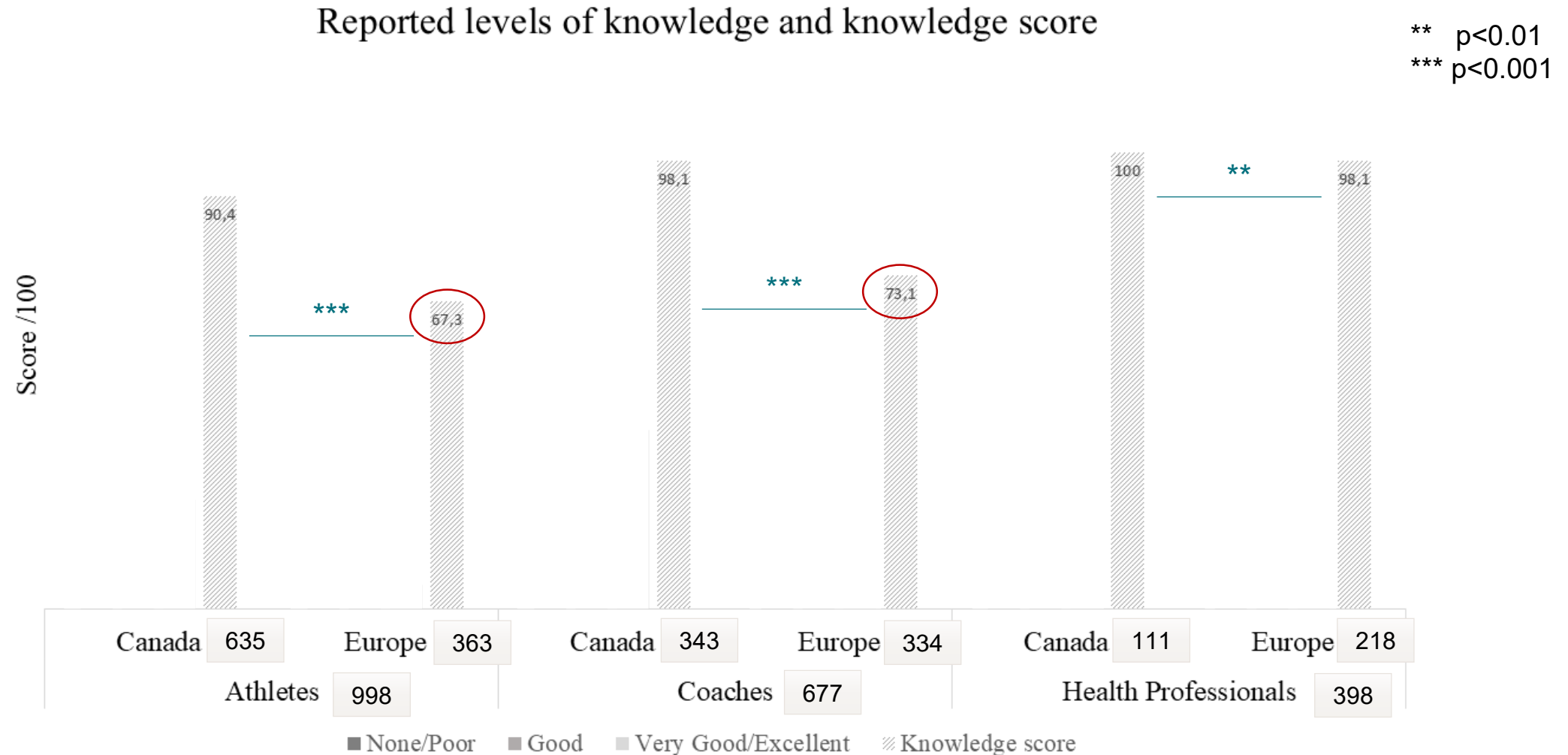
Selon vous, est-ce que toute commotion est associée à une perte de conscience ?

Peut-on avoir une commotion cérébrale sans coup direct à la tête ? (exemple : décélération brutale)

Parmi les symptômes suivants, cochez celui ou ceux qui peut/peuvent indiquer une commotion cérébrale (plusieurs choix possibles)

Considérez-vous qu'un(e) athlète pourrait continuer à faire du sport pendant qu'il/elle a des symptômes de commotion cérébrale ?

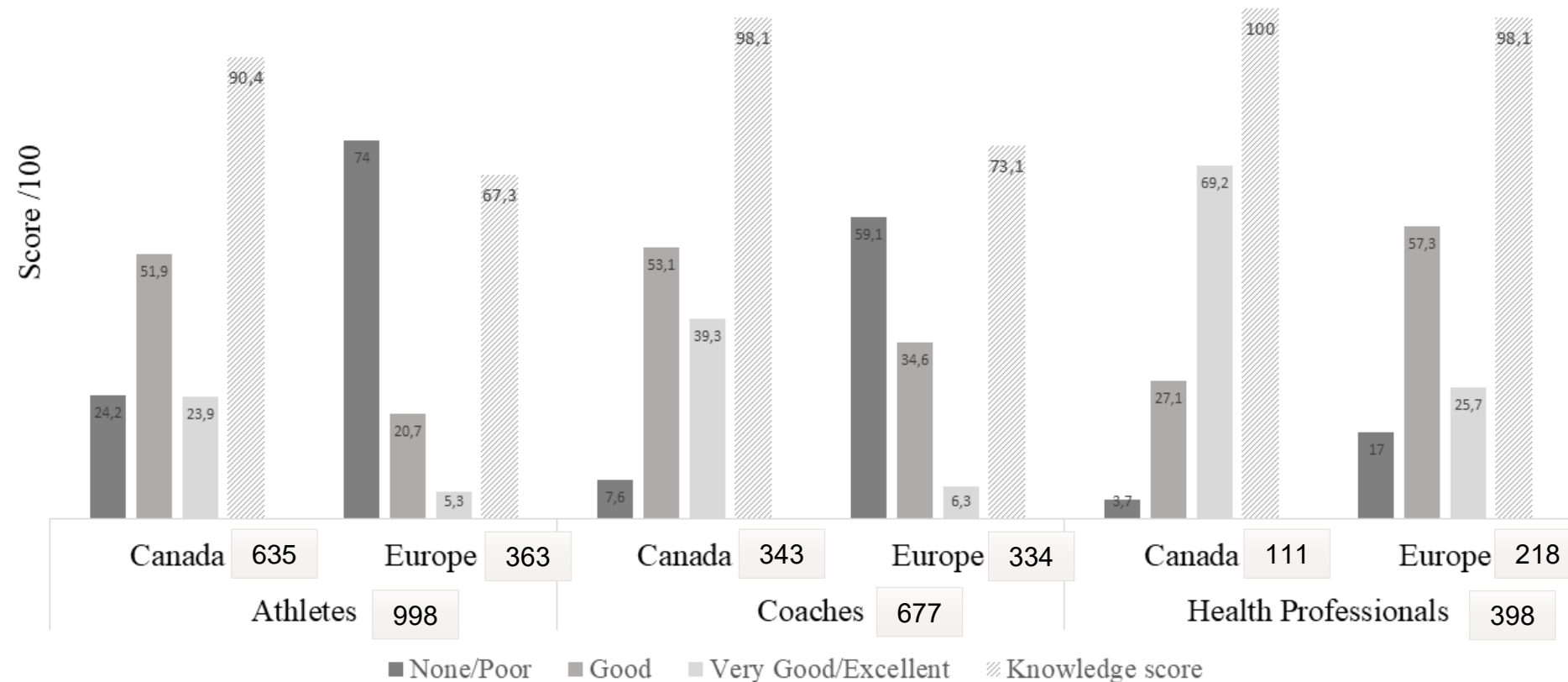
# ReFORM concussion survey: knowledge assessment



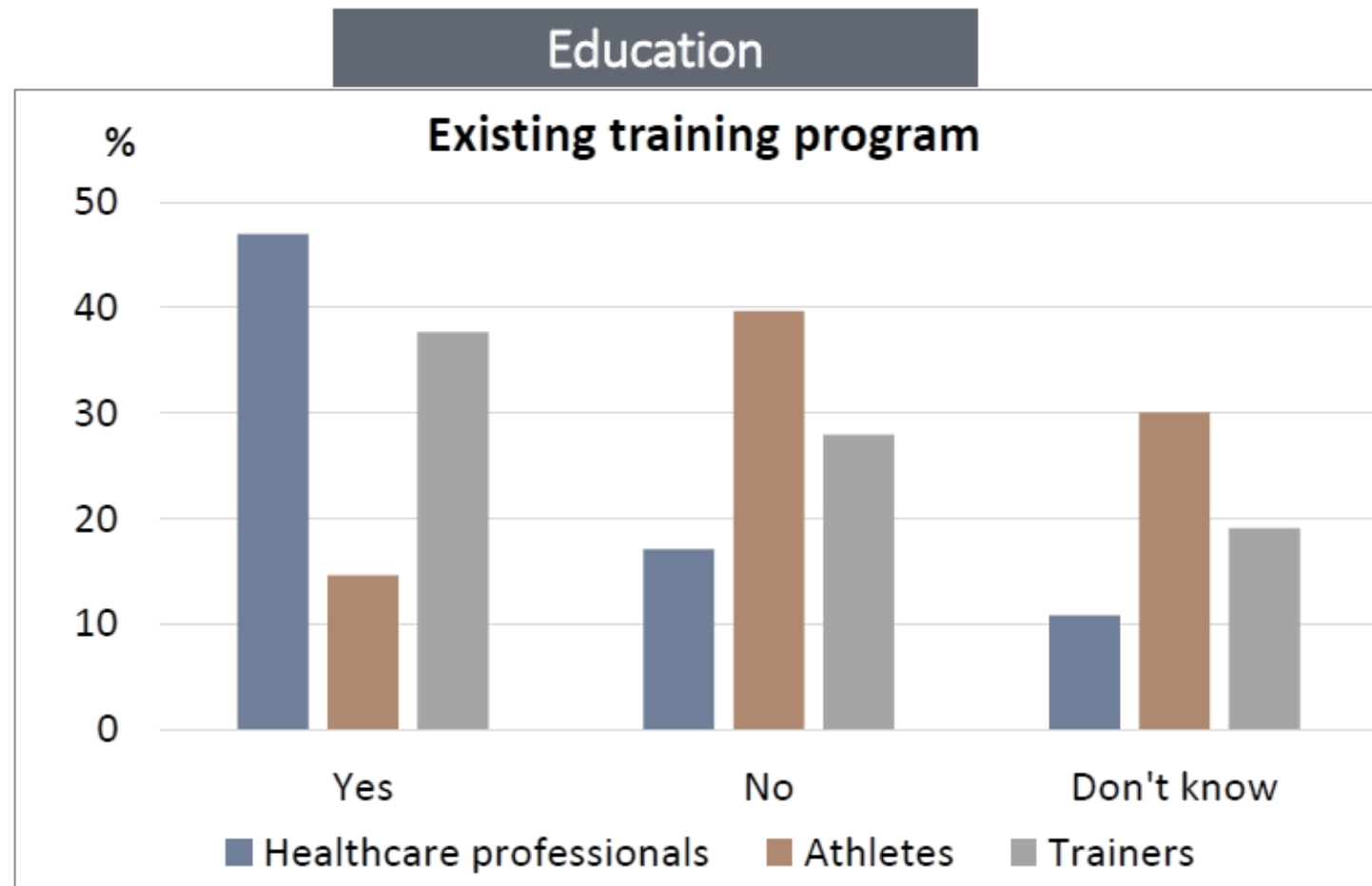
# ReFORM concussion survey: knowledge assessment



Reported levels of knowledge and knowledge score



## ReFORM concussion survey: access to concussion education



# Is knowledge about concussion and guidelines homogeneous?



## Implications

*We are not equal when preventing or facing a concussion*

## Solutions

Provide locally-adapted training & education on SRC to harmonize best practices

+ evaluate their efficacy



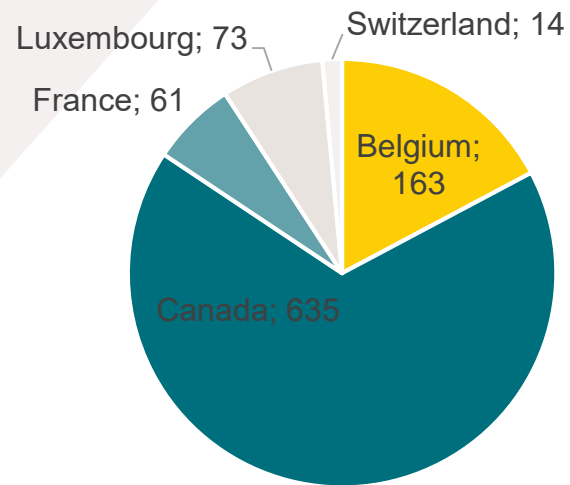
# **The athletes' experience**

Symptom duration & return to sport

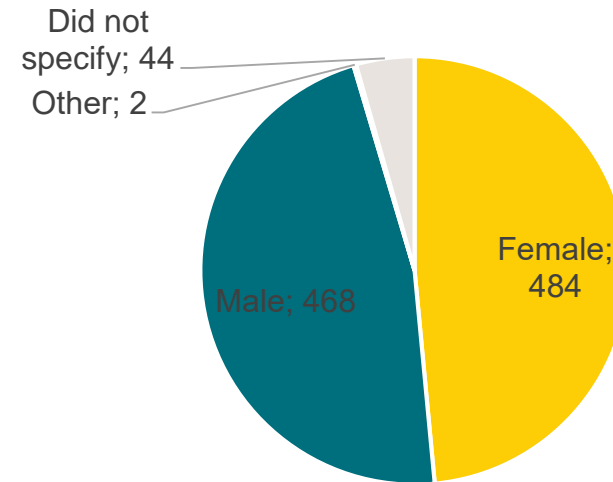
# ReFORM concussion survey: athletes subsample (n=998)



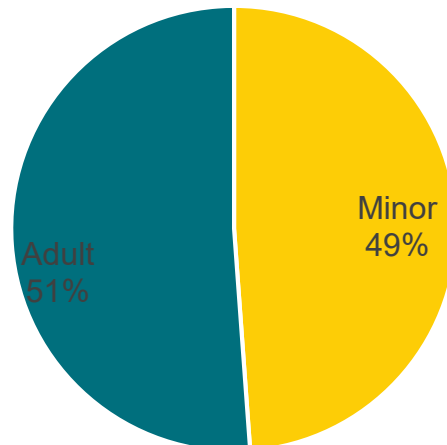
**Country**



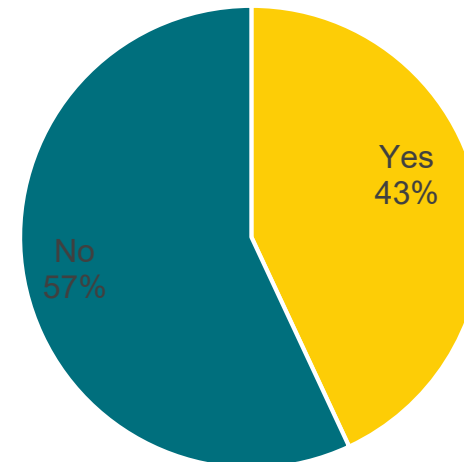
**Gender**



**Age**



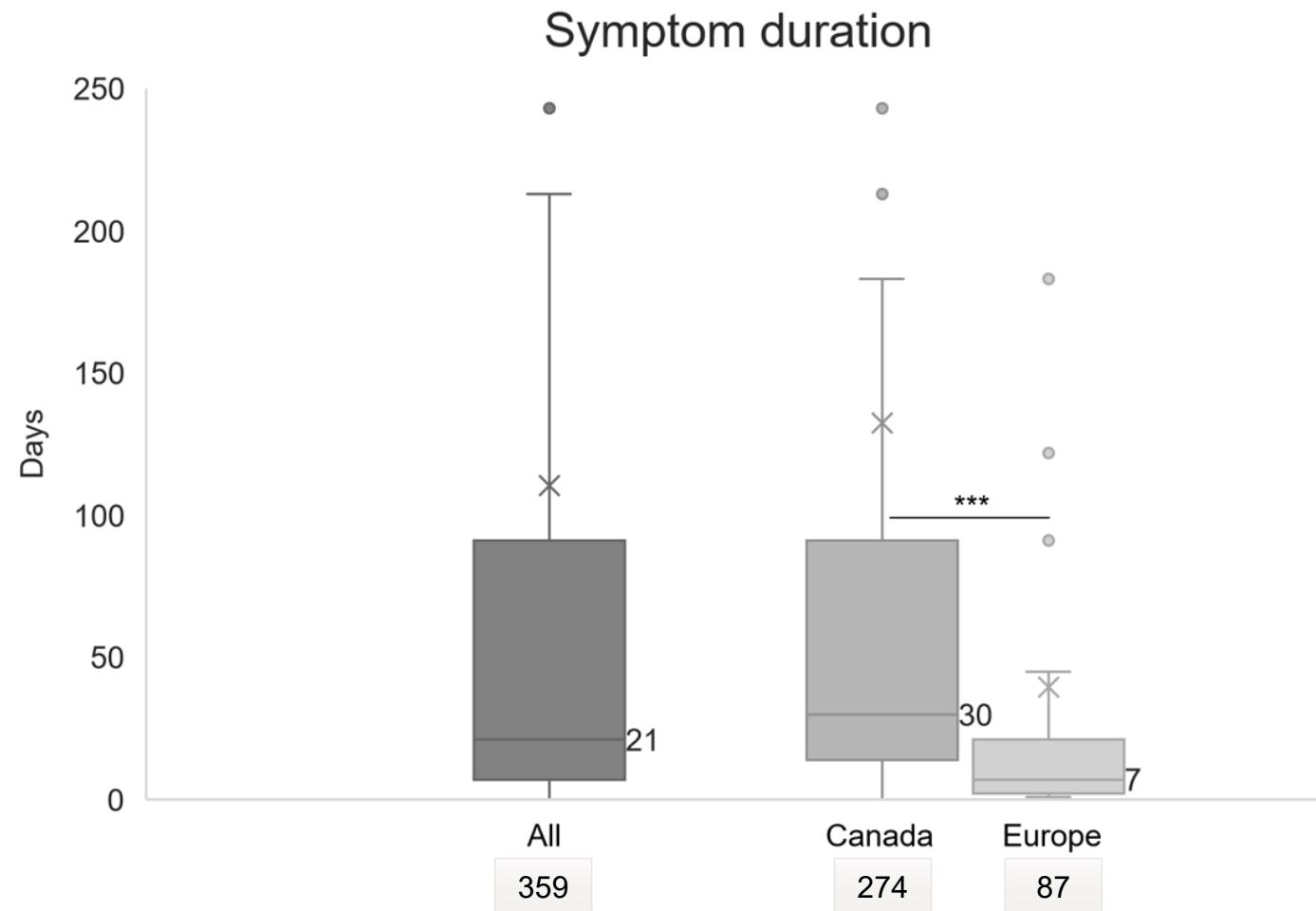
**Concussion history**



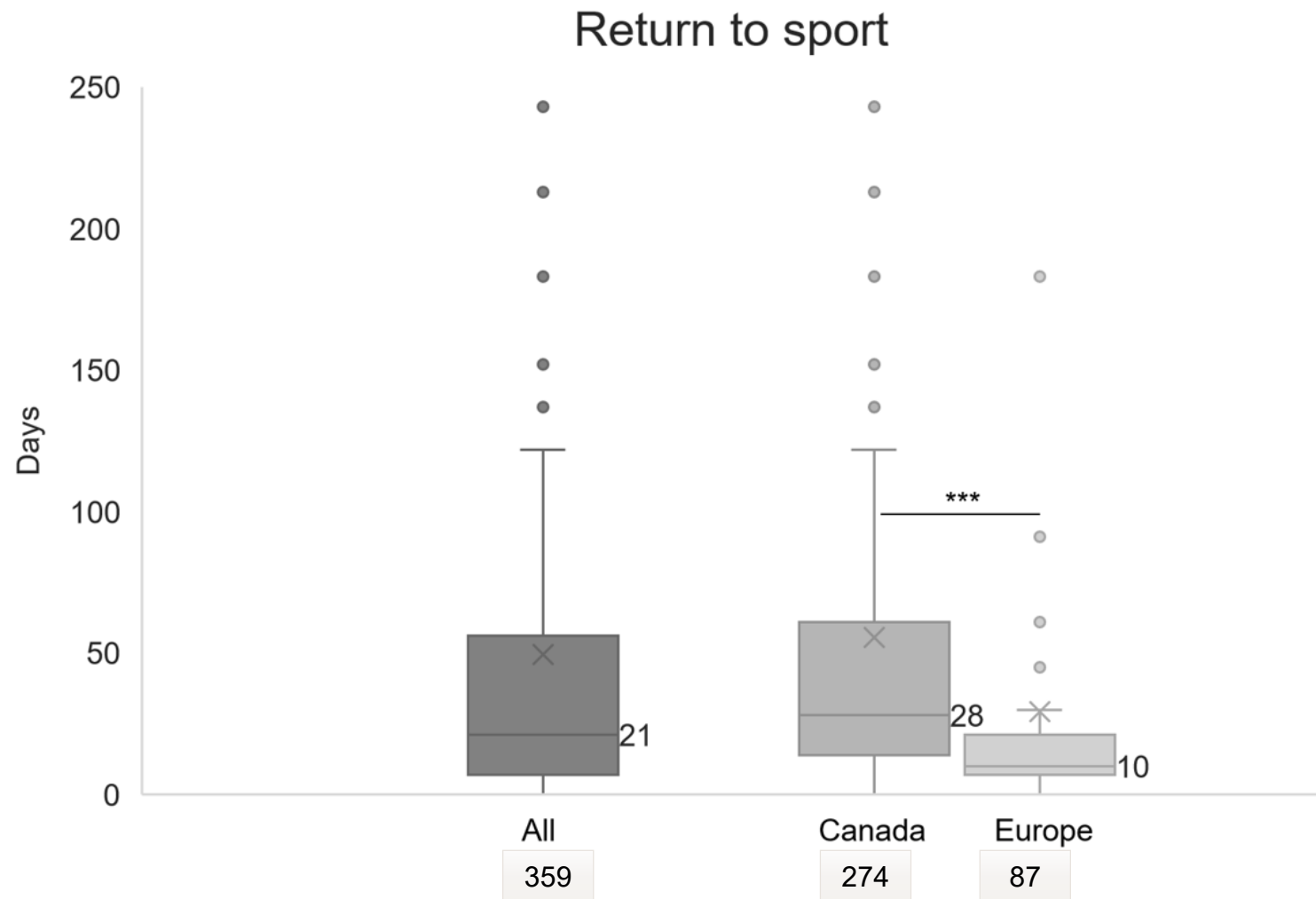
n=429



# Symptom duration



## Return to sport



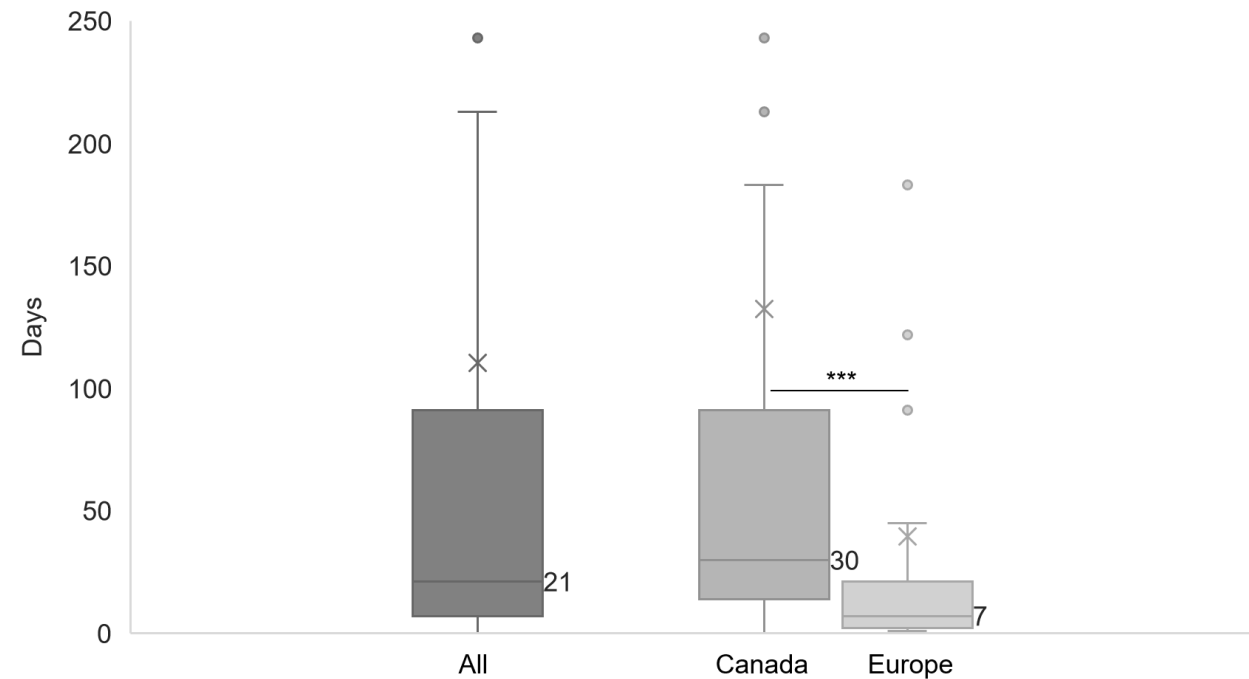
# Return to sport vs. symptoms



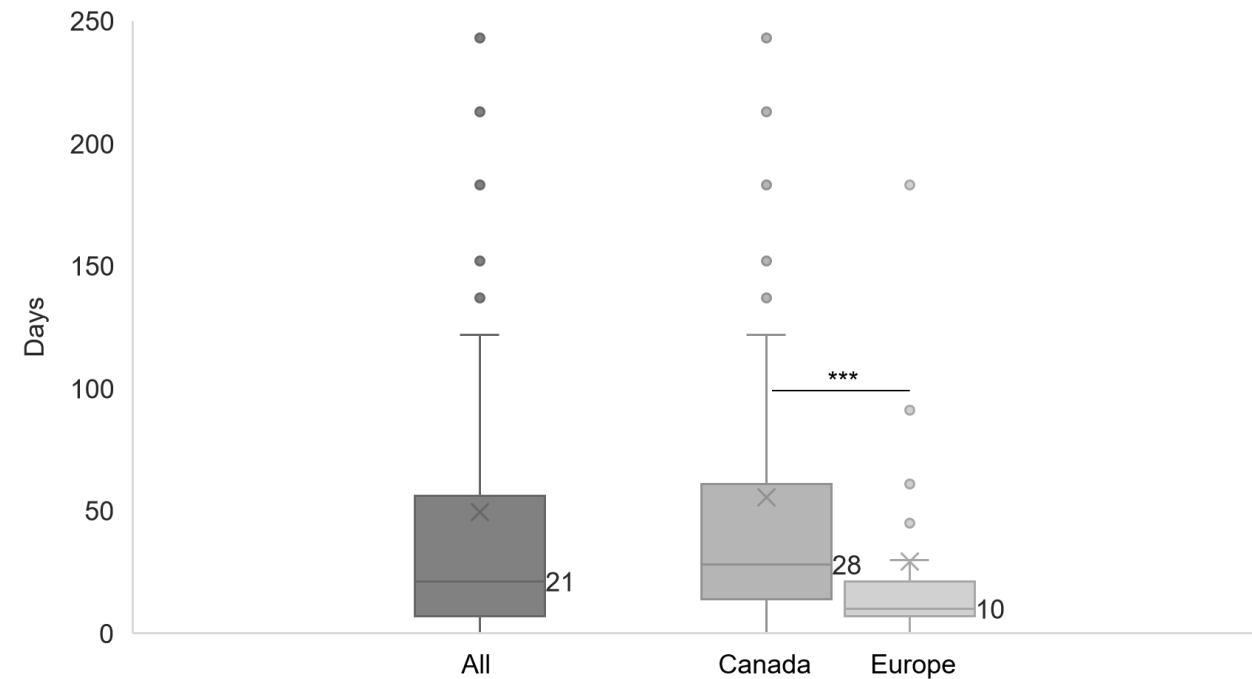
Symptom-free waiting period:

- Canada: -2 days
- Europe: 3 days

Symptom duration



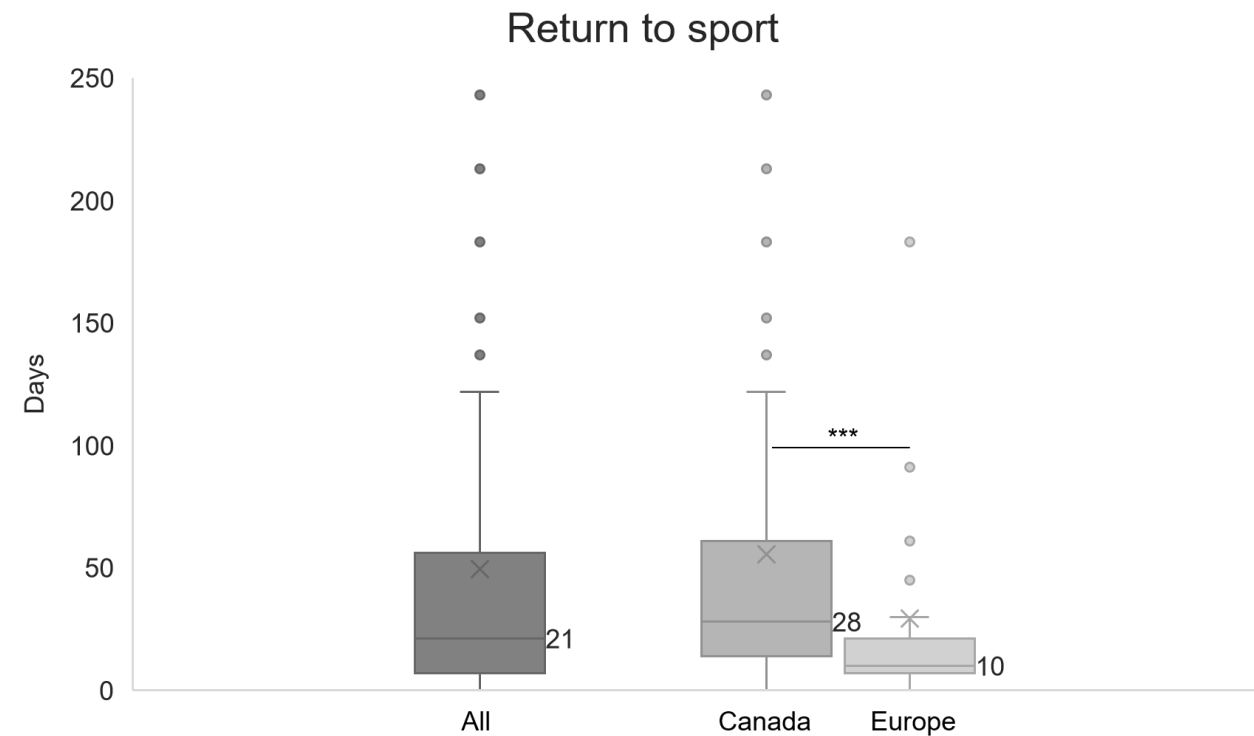
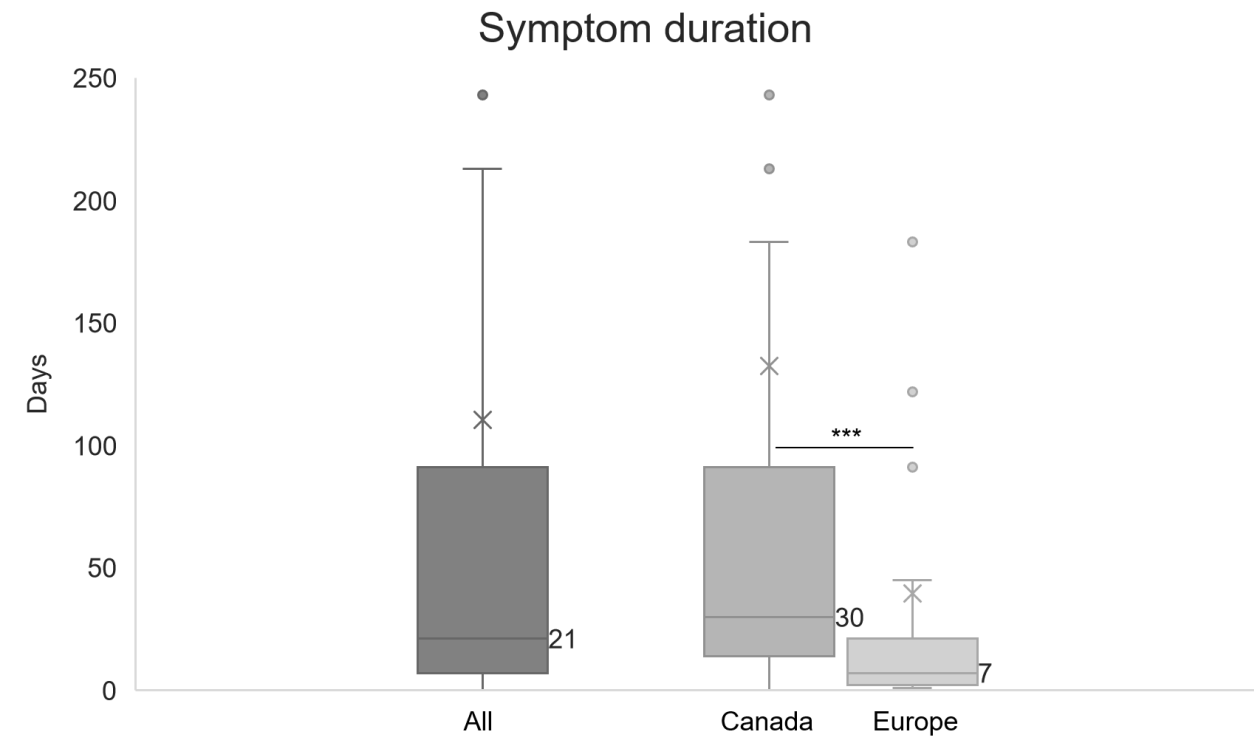
Return to sport



# Return to sport vs. symptoms



Symptom duration vs. symptom recognition?



## Conclusions



Important disparities in SRC knowledge between Canadian and European cultures in the French-speaking community might affect SRC management

SRC recovery patterns differ among French-speaking Canadian and European athletes, which contrasts with the global nature of the international recommendations

## Future paths: education



### Efficacy of education interventions? Knowledge vs. behavior

#### ► Systematic review

25 publications selected / 7,534 articles screened

20/25 articles: assessment of impact on knowledge and behavior

#### Available interventions

- PowerPoint presentations; videos: **knowledge**
- Interactive computer modules: **knowledge and problem awareness**
- Interviews, focus groups, questionnaires: **impact on behavior**



#### Intervention based on expert opinion (CDC, CISG)

- ↑ Knowledge from 2 to 24 weeks
- Return to baseline
- ≈ behavior improvement



#### Interventions based on recommendations from previous research :

- ↑ Knowledge & behaviors (reporting symptoms, reporting concussion, removing an athlete suspected of having a concussion)
- Ø Long-term impact data

# Take home



Improve access to education tools for the French-speaking community

- Online training in French
- Translation of recognized international tools (SCAT, CRT, SCOAT...)

Choose the right tool/objective based on target groups

- Athletes/Coaches: Culture shift for behavior change
- Sports clubs and Federations: Enhancing culture change
- Doctors, healthcare professionals: Better retention for behaviour change

Intervention programs primarily aimed at safety behaviors

- Research projects evaluating the long-term impacts of different programs

# References



Conaghan, C., Daly, E., Pearce, A. J., King, D. A., & Ryan, L. (2021). A systematic review of the effects of educational interventions on knowledge and attitudes towards concussion for people involved in sport—optimising concussion education based on current literature. *Journal of Sports Sciences*, 39(5), 552-567.

Martens, G., Edouard, P., Tscholl, P., Bieuzen, F., Winkler, L., Cabri, J., ... & Seil, R. (2020). Document, create and translate knowledge: the mission of ReFORM, the Francophone IOC Research Centre for Prevention of Injury and Protection of Athlete Health. *British journal of sports medicine*.

Thibaut, A., Kaux, J. F., Martens, G., Urhausen, A., Tscholl, P., Hannouche, D., ... & Leclerc, S. (2022). Way for improvement: Primary survey on concussion knowledge of sports stakeholders in three European countries. *Science & Sports*, 37(2), 94-100.





# Thank you for your attention!

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