

A SURVEY ON CURRENT PRACTICES, NEEDS, RESPONSIBILITIES AND PREFERENCES FOR KNOWLEDGE DISSEMINATION IN THE FIELD OF INJURY AND ILLNESS PREVENTION AMONG COMPETITIVE SNOW SPORTS STAKEHOLDERS

Journal: Sports Medicine Open

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Supplementary file 1

FIS Needs Assessments Questionnaire

FIS Needs Assessments Questionnaire

Please complete the survey below.

Thank you!

FIS-AHU survey on the needs of snow sport stakeholders regarding the dissemination of knowledge on injury and illness prevention

The International Ski and Snowboard Federation's (FIS) Athlete Health Unit (AHU) has made it a priority to disseminate information on effective injury and illness prevention. In this regard, with this survey we aim to understand which information and methods are needed to help snow sports stakeholders to effectively protect the health of their athletes.

As a knowledgeable stakeholder in one of the FIS disciplines, we value your opinion. You are fully aware of the intricate problems related to injury and illness prevention in your discipline, and your knowledge helps us to chart the proper course for successful injury and illness prevention. This short survey is your chance to help formulating the requirements for possible contemporary FIS AHU knowledge dissemination/education initiatives.

The survey will take about 15 to 20 minutes to complete. There are no right or wrong answers to the questions. We are just interested in your knowledge, experience, and viewpoints.

Your response is collected anonymously, and only the project team members will have access to the survey data. Any resulting reports will only include summarized data.

We thank you for your participation on behalf of the project team and the FIS AHU.

PART 1 - This first section of the questionnaire gathers context information on your background and expertise

1a) Which role do you primarily assign yourself?
Multiple options can be answered.

- ☐ Athlete
- ☐ Coach
- ☐ Team staff
- ☐ Equipment supplier representative / industry
- ☐ FIS representative

Please specify your role (e.g., medical doctor, physiotherapist, S&C coach, psychologist/mental coach, nutritionist, ski technician, etc.):

Please specify your role (e.g., service man, engineer, R&D, management etc):

Please specify your position (e.g., race director, committee member, etc):

1b) How do you identify yourself?

- ☐ Female
- ☐ Male
- ☐ Non-binary
- ☐ I prefer not to say
- ☐ I prefer to self-describe

1c) Which gender do your athletes identify with?

- ☐ Female
☐ Male
☐ Both female and male
☐ Non-binary
☐ I prefer not to say
☐ I prefer to self-describe

2) How many years have you been involved in this role?
 [Type: Full numbers from 0-80]

3-i) In which FIS snow sport discipline(s) do you compete? Multiple options can be answered.

- ☐ Alpine Skiing
☐ Freestyle Skiing
☐ Snowboarding
☐ Cross-Country Skiing
☐ Ski Jumping
☐ Nordic Combined

3-ii) In which FIS snow sport discipline(s) do you work? Multiple options can be answered.

- ☐ Alpine Skiing
☐ Freestyle Skiing
☐ Snowboarding
☐ Cross-Country Skiing
☐ Ski Jumping
☐ Nordic Combined

Please specify. Multiple options can be answered.

- ☐ Slalom
☐ Giant Slalom
☐ Super-G
☐ Downhill
☐ Alpine Combined

Please specify. Multiple options can be answered.

- ☐ Aerials
☐ Moguls
☐ Ski Cross
☐ Ski Halfpipe
☐ Ski Slopestyle

Please specify. Multiple options can be answered.

- ☐ Snowboard Alpine
☐ Snowboard Cross
☐ Snowboard Halfpipe
☐ Snowboard Slopestyle
☐ Big Air

Please specify. Multiple options can be answered.

- ☐ Sprint
☐ Distance

4-i) In which competition format(s) of snow sport do you compete? Multiple options can be answered.

- ☐ Youth competitions
☐ FIS competitions
☐ Continent Cups (e.g., European, North-American, South America, Asian, Australia/New Zealand)
☐ World Cup
☐ Master competitions
☐ Mass sport events
☐ Snow Sports events not governed by FIS (e.g. X-Games)

4-ii) In which competition format(s) of snow sport do you work? Multiple options can be answered.

- ☐ Youth competitions
- ☐ FIS competitions
- ☐ Continent Cups (e.g., European, North-American, South America, Asian, Australia/New Zealand)
- ☐ World Cup
- ☐ Master competitions
- ☐ Mass sport events
- ☐ Snow Sports events not governed by FIS (e.g. X-Games)

5-i) At which training/performance level(s) of snow sport do you compete? Multiple options can be answered.

- ☐ trained/developmental
- ☐ highly trained/National level
- ☐ elite/international level
- ☐ world class
- ☐ other

Please specify.

5-ii) At which training/performance level(s) of snow sport do you primarily work? Multiple options can be answered.

- ☐ trained/developmental
- ☐ highly trained/National level
- ☐ elite/international level
- ☐ world class
- ☐ other

Please specify.

6) How many years have you been involved in snow sports in total? [Type: Full numbers from 1-70]

7) What is your age?

- ☐ 10-14 years
- ☐ 15-19 years
- ☐ 20-29 years
- ☐ 30-39 years
- ☐ 40-49 years
- ☐ 50-59 years
- ☐ 60-69 years
- ☐ 70-79 years
- ☐ 80-89 years
- ☐ 90-99 years

8-i) For which nation do you compete?

[e.g., "Andorra", "Netherlands", "Brasil", etc.]

8-ii) For which nation or organisation do you work?

[e.g., "Andorra", "Netherlands", "Brasil", etc.; if you work for an international institution (e.g. "IOC", "FIS"), a company (e.g. "equipment supplier") or as an "independent" expert, please state this with as specific a description as possible.]

PART 2 - In this section, we are interested in your perceptions and perspectives on injury and illness prevention and your current practices.

9a) Do you believe injury and illness prevention are important in snow sports?

☐ I don't know ☐ Not at all ☐ Slightly ☐ Somewhat ☐ Fairly ☐ Very ☐ Completely

9b) Could you briefly give reasoning for your answer?

10a) What kind of injuries are frequent targets of your prevention efforts? Multiple options can be answered.

- ☐ Head Injuries & Concussions
- ☐ Shoulder, Upper Arm & Elbow Injuries
- ☐ Forearm, Wrist & Hand Injuries
- ☐ Thoracic Injuries
- ☐ Abdominal Injuries
- ☐ Spinal Injuries
- ☐ Pelvic Injuries
- ☐ Hip & Groin Injuries
- ☐ Thigh Injuries
- ☐ Knee Injuries
- ☐ Lower Leg & Tibia/Shin Injuries
- ☐ Ankle, Foot & Toe Injuries
- ☐ Other injuries
- ☐ None

Can you briefly explain your answer?

10b) What kind of illnesses are frequent targets of your prevention efforts? Multiple options can be answered.

- ☐ Cardiovascular illnesses (i.e., health problems related to the heart or blood vessels)
- ☐ Endocrinological illnesses (i.e., health problems related to hormonal dysfunction)
- ☐ Respiratory illnesses (i.e., health problems affecting the respiratory system)
- ☐ Thermoregulatory illnesses (i.e., health problems in which abnormal changes in body temperature occur)
- ☐ Other illnesses
- ☐ None

Can you briefly explain your answer?

11a) What kind of athlete-related prevention areas are frequent targets of your prevention efforts? Multiple options can be answered.

- ☐ Physical Aspects
- ☐ Mental Aspects
- ☐ Skill/Technical/Tactical Aspects
- ☐ Load Management
- ☐ Education / Awareness
- ☐ Other/s

Can you briefly explain your answer?

11b) What kind of equipment-related prevention areas are frequent targets of your prevention efforts? Multiple options can be answered.

- ☐ Ski / Board (including preparation)
- ☐ Binding
- ☐ Boot
- ☐ Protectors / Helmets
- ☐ Gear / Clothing
- ☐ Other/s

Can you briefly explain your answer?

11c) What kind of course-related prevention areas are frequent targets of your prevention efforts? Multiple options can be answered.

- ☐ Course Design
- ☐ Jump Design
- ☐ Safety Nets
- ☐ Jury Decisions
- ☐ Other/s

Can you briefly explain your answer?

11d) What kind of snow/environment-related prevention areas are frequent targets of your prevention efforts? Multiple options can be answered.

- ☐ Snow Surface
- ☐ Visibility
- ☐ Temperature
- ☐ Wind
- ☐ Other/s

Can you briefly explain your answer?

11e) What kind of other prevention areas are frequent targets of your prevention efforts? Please specify. If there is no other area, please write "none".

12) How often do you use injury and illness prevention strategies?

- ☐ >5-6 days/week (everyday)
- ☐ 5-6 days/week
- ☐ 3-4 days/week
- ☐ 1-2 days/week
- ☐ 1-2 days/month
- ☐ < 1 day/month
- ☐ Never

13) Where do you perform snow sport-related injury and illness prevention strategies?

14) Why do you follow your snow sport-related injury and illness prevention strategies or practices?

15) How confident are you that your prevention efforts are effective?

- ☐ I don't know ☐ Not at all ☐ Slightly ☐ Somewhat ☐ Fairly ☐ Very ☐ Completely

16) In your opinion, who is responsible for applying/implementing snow sport-related injury and illness prevention measures? Multiple options can be answered.

- ☐ Athlete
☐ Coach
☐ Team staff (medical or technical)
☐ Ski racing supplier representative / industry
☐ Regional/National Skiing and Snowboard Associations
☐ FIS
☐ Others

Please specify (e.g., medical doctor, physiotherapist, S&C coach, psychologist/mental coach, nutritionist, ski technician, etc.):

Please specify (e.g., service man, research and development, etc):

Please specify (e.g., staff for competitions, committee member, etc):

Please specify

17) In your opinion, who is responsible for defining/developing snow sport-related injury and illness prevention measures? Multiple options can be answered.

- ☐ Athlete
☐ Coach
☐ Team staff (medical or technical)
☐ Ski racing supplier representative / industry
☐ Regional/National Skiing and Snowboard Associations
☐ FIS
☐ Others

Please specify (e.g., medical doctor, physiotherapist, S&C coach, psychologist/mental coach, nutritionist, ski technician, etc.):

Please specify (e.g., service man, research and development, etc):

Please specify (e.g., staff for competitions, committee member, etc):

Please specify

18) In your opinion, who is responsible for promoting/disseminating snow sport-related injury and illness prevention measures? Multiple options can be answered.

- ☐ Athlete
☐ Coach
☐ Team staff (medical or technical)
☐ Ski racing supplier representative / industry
☐ Regional/National Skiing and Snowboard Associations
☐ FIS
☐ Others

Please specify (e.g., medical doctor, physiotherapist, S&C coach, psychologist/mental coach, nutritionist, ski technician, etc.):

Please specify (e.g., service man, research and development, etc):

Please specify (e.g., staff for competitions, committee member, etc):

Please specify

PART 3 - In this last section we ask about your needs, preferences, and expectations concerning the delivery of information on injury and illness prevention

19) Do you think you have enough information about snow sport-related injury and illness prevention?

☐ I don't know ☐ Not at all ☐ Slightly ☐ Somewhat ☐ Fairly ☐ Very ☐ Completely

20) Do you feel like you need more information or knowledge in any of the above areas to strengthen your preventative efforts?

☐ Yes
☐ No

Could you briefly explain your answer (e.g., I would like to know more about the topic of ...)?

21a) In order to better safeguard health in snow sports, what injuries and corresponding prevention measures/management strategies would you like to learn more about? Multiple options can be answered.

- ☐ Head Injuries & Concussions
- ☐ Shoulder, Upper Arm & Elbow Injuries
- ☐ Forearm, Wrist & Hand Injuries
- ☐ Thoracic Injuries
- ☐ Abdominal Injuries
- ☐ Spinal Injuries
- ☐ Pelvic Injuries
- ☐ Hip & Groin Injuries
- ☐ Thigh Injuries
- ☐ Knee Injuries
- ☐ Lower Leg & Tibia/Shin Injuries
- ☐ Ankle, Foot & Toe Injuries
- ☐ Other injuries
- ☐ None

Please specify

21b) In order to better safeguard health in snow sports, what illnesses and corresponding prevention measures/management strategies would you like to learn more about? Multiple options can be answered.

- ☐ Cardiovascular illnesses (i.e., health problems related to the heart or blood vessels)
- ☐ Endocrinological illnesses (i.e., health problems related to hormonal dysfunction)
- ☐ Respiratory illnesses (i.e., health problems affecting the respiratory system)
- ☐ Thermoregulatory illnesses (i.e., health problems in which abnormal changes in body temperature occur)
- ☐ Other illnesses
- ☐ None

Please specify

22) Which areas of prevention do you feel like you need more knowledge on to keep yourself or your athletes healthy? Multiple options can be answered.

22a) Athlete-related

- ☐ Physical Aspects
- ☐ Mental Aspects
- ☐ Skill / Technical / Tactical Aspects
- ☐ Load Management
- ☐ Education / Awareness
- ☐ Social Aspects
- ☐ Other/s
- ☐ None

Please specify

22b) Equipment-related

- ☐ Ski / Board (including preparation)
- ☐ Binding
- ☐ Boot
- ☐ Protectors / Helmets
- ☐ Gear / Clothing
- ☐ Other/s
- ☐ None

Please specify

22c) Course-related

- ☐ Course Design
- ☐ Jump Design
- ☐ Security Nets
- ☐ Jury Decisions
- ☐ Other/s
- ☐ None

Please specify

22d) Snow / environment-related

- ☐ Snow Surface
- ☐ Visibility
- ☐ Temperature
- ☐ Wind
- ☐ Other/s
- ☐ None

Please specify

22e) Others (please specify)

23a) Do you feel like you need more information on how to optimize the recording of illness and injury cases?

☐ I don't know ☐ Not at all ☐ Slightly ☐ Somewhat ☐ Fairly ☐ Very ☐ Completely

23b) Could you briefly explain your answer?

24a) Do you feel like you need more information on how to optimize warm up, activate, and cool down?

☐ I don't know ☐ Not at all ☐ Slightly ☐ Somewhat ☐ Fairly ☐ Very ☐ Completely

24b) Could you briefly explain your answer?

25a) Do you feel like you need more information on how to optimize training?

☐ I don't know ☐ Not at all ☐ Slightly ☐ Somewhat ☐ Fairly ☐ Very ☐ Completely

25b) Could you briefly explain your answer?

26a) Do you feel like you need more information on how to optimize testing / screening?

☐ I don't know ☐ Not at all ☐ Slightly ☐ Somewhat ☐ Fairly ☐ Very ☐ Completely

26b) Could you briefly explain your answer?

27a) Do you feel like you need more information on how to optimize the return-to-sport process?

☐ I don't know ☐ Not at all ☐ Slightly ☐ Somewhat ☐ Fairly ☐ Very ☐ Completely

27b) Could you briefly explain your answer?

28) Through which way(s) would you prefer to obtain information on snow sport-related injury and illness prevention? Multiple options can be answered.

- ☐ Book (print)
- ☐ e-Book (digital)
- ☐ Magazine (print)
- ☐ e-Magazine (digital)
- ☐ Newsletter (print)
- ☐ Newsletter (e-mail)
- ☐ Podcasts (audio)
- ☐ Podcasts (video)
- ☐ Seminars (presence)
- ☐ Webinars (digital)
- ☐ Weblog
- ☐ Website
- ☐ Social media
- ☐ Delivery by testimonials (personal)
- ☐ Delivery by testimonials (digital)
- ☐ Other/s

Social media: Please specify the sources

Others: Please specify the sources

PART 4- Additional personal comments

29) May we contact you in case we need further information?

☐ Yes
☐ No

If yes, please provide your contact information

30) Do you want to add any additional comments? If yes, please specify here.

Supplementary file 2

Consensus-Based Checklist for Reporting Of Survey Studies (CROSS)

Developed from: Sharma A, Minh Duc NT, Luu Lam Thang T, Nam NH, Ng SJ, Abbas KS, et al. A consensus-based checklist for reporting of survey studies (CROSS). *J Gen Intern Med.* 2021;36(10):3179–87.

Section/topic	Item	Item description	Reported on page #
Title and abstract			
Title and abstract	1a	State the word “survey” along with a commonly used term in title or abstract to introduce the study’s design.	Title and abstract
	1b	Provide an informative summary in the abstract, covering background, objectives, methods, findings/results, interpretation/discussion, and conclusions.	Abstract
Introduction			
Background	2	Provide a background about the rationale of study, what has been previously done, and why this survey is needed.	Background section
Purpose/aim	3	Identify specific purposes, aims, goals, or objectives of the study.	Background section
Methods			
Study design	4	Specify the study design in the methods section with a commonly used term (e.g., cross-sectional or longitudinal).	Study design and setting section
	5a	Describe the questionnaire (e.g., number of sections, number of questions, number and names of instruments used).	Survey development and design section

Data collection methods	5b	Describe all questionnaire instruments that were used in the survey to measure particular concepts. Report target population, reported validity and reliability information, scoring/classification procedure, and reference links (if any).	Target population, Data collection sections.
	5c	Provide information on pretesting of the questionnaire, if performed (in the article or in an online supplement). Report the method of pretesting, number of times questionnaire was pre-tested, number and demographics of participants used for pretesting, and the level of similarity of demographics between pre-testing participants and sample population.	Survey development and design section
	5d	Questionnaire if possible, should be fully provided (in the article, or as appendices or as an online supplement).	Supplementary file 1
Sample characteristics	6a	Describe the study population (i.e., background, locations, eligibility criteria for participant inclusion in survey, exclusion criteria).	Target population section, Table 1
	6b	Describe the sampling techniques used (e.g., single stage or multistage sampling, simple random sampling, stratified sampling, cluster sampling, convenience sampling). Specify the locations of sample participants whenever clustered sampling was applied.	Study design and setting section
	6c	Provide information on sample size, along with details of sample size calculation.	Results section, Table 1
	6d	Describe how representative the sample is of the study population (or target population if possible), particularly for population-based surveys.	Target population section, Strengths and limitations
Survey administration	7a	Provide information on modes of questionnaire administration, including the type and number of contacts, the location where the survey was conducted (e.g., outpatient room or by use of online tools, such as SurveyMonkey).	Data collection
	7b	Provide information of survey's time frame, such as periods of recruitment, exposure, and follow-up days.	Data collection

	7c	Provide information on the entry process: -->For non-web-based surveys, provide approaches to minimize human error in data entry. -->For web-based surveys, provide approaches to prevent “multiple participation” of participants.	Not reported/applicable
Study preparation	8	Describe any preparation process before conducting the survey (e.g., interviewers’ training process, advertising the survey).	Not reported/applicable
Ethical considerations	9a	Provide information on ethical approval for the survey if obtained, including informed consent, institutional review board [IRB] approval, Helsinki declaration, and good clinical practice [GCP] declaration (as appropriate).	Study design and setting section
	9b	Provide information about survey anonymity and confidentiality and describe what mechanisms were used to protect unauthorized access.	Data collection
Statistical analysis	10a	Describe statistical methods and analytical approach. Report the statistical software that was used for data analysis.	Data analysis
	10b	Report any modification of variables used in the analysis, along with reference (if available).	Not reported/applicable
	10c	Report details about how missing data was handled. Include rate of missing items, missing data mechanism (i.e., missing completely at random [MCAR], missing at random [MAR] or missing not at random [MNAR]) and methods used to deal with missing data (e.g., multiple imputation).	Data analysis
	10d	State how non-response error was addressed.	Data analysis
	10e	For longitudinal surveys, state how loss to follow-up was addressed.	Not reported/applicable
	10f	Indicate whether any methods such as weighting of items or propensity scores have been used to adjust for non-representativeness of the sample.	Not reported/applicable
	10g	Describe any sensitivity analysis conducted.	Not reported/applicable

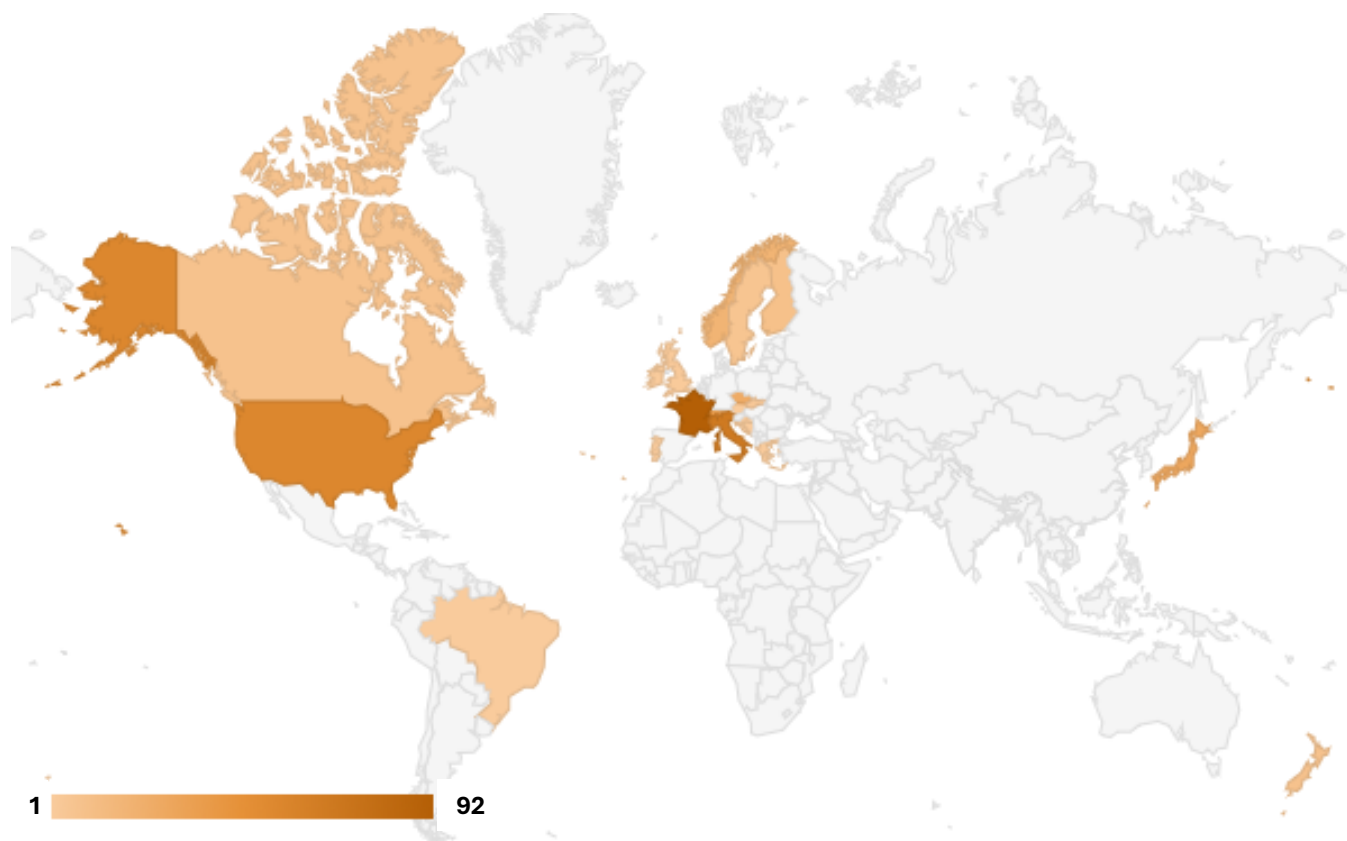
Results			
Respondent characteristics	11a	Report numbers of individuals at each stage of the study. Consider using a flow diagram, if possible.	Table 1
	11b	Provide reasons for non-participation at each stage, if possible.	Not reported/applicable
	11c	Report response rate, present the definition of response rate or the formula used to calculate response rate.	Table 1
	11d	Provide information to define how unique visitors are determined. Report number of unique visitors along with relevant proportions (e.g., view proportion, participation proportion, completion proportion).	Results, Table 1
Descriptive results	12	Provide characteristics of study participants, as well as information on potential confounders and assessed outcomes.	Results, Table 1
Main findings	13a	Give unadjusted estimates and, if applicable, confounder-adjusted estimates along with 95% confidence intervals and p-values.	Not reported/applicable
	13b	For multivariable analysis, provide information on the model building process, model fit statistics, and model assumptions (as appropriate).	Not reported/applicable
	13c	Provide details about any sensitivity analysis performed. If there are considerable amount of missing data, report sensitivity analyses comparing the results of complete cases with that of the imputed dataset (if possible).	Not reported/applicable
Discussion			
Limitations	14	Discuss the limitations of the study, considering sources of potential biases and imprecisions, such as non-representativeness of sample, study design, important uncontrolled confounders.	Strengths and limitations
Interpretations	15	Give a cautious overall interpretation of results, based on potential biases and imprecisions and	Practical recommendations, Key points

		suggest areas for future research.	
Generalizability	16	Discuss the external validity of the results.	Strengths and limitations
Other sections			
Role of funding source	17	State whether any funding organization has had any roles in the survey's design, implementation, and analysis.	Declarations section
Conflict of interest	18	Declare any potential conflict of interest.	Declarations section
Acknowledgements	19	Provide names of organizations/persons that are acknowledged along with their contribution to the research.	Declarations section

Supplementary file 3

Figure 1 Distribution of the 436 stakeholders surveyed

A total of 23 countries were included, with an increase in colour density indicating an increased number of participants.



Supplementary file 4

Table 1 Participants characteristics.

Stakeholder role	n (%)	Gender (n [%])				Age (median [Q3-Q1])				Number of years of experience in snow sports (mean [SD])	
		Female	Male	Non-binary	I prefer not to say	Total	Female	Male	Non-binary	I prefer not to say	Total
Athlete	261 (56.4)	129 (49.4)	129 (49.4)	2 (0.8)	1 (0.4)	2 (3-2)	2 (3-2)	2 (3-2)	2.5 (2.5-2)	4 (4-4)	14.6 (8.1)
Coach	116 (25.1)	19 (16.4)	97 (83.6)	0 (0.0)	0 (0.0)	5 (6-4)	5 (6-4)	5 (6-4)	0 (0)	0 (0)	31.1 (14.0)
Team staff	68 (14.7)	21 (30.9)	47 (69.1)	0 (0.0)	0 (0.0)	5 (6-4)	5 (6-4)	5 (6-4)	0 (0)	0 (0)	22.7 (14.3)
Industry - SRS	5 (1.1)	0 (0.0)	5 (100.0)	0 (0.0)	0 (0.0)	5 (6-5)	0 (0)	5 (6-5)	0 (0)	0 (0)	33.0 (8.4)
FIS representative	13 (2.8)	4 (30.8)	8 (61.5)	1 (7.7)	0 (0.0)	6 (6.5-4)	5 (6-2.5)	6 (7-5.25)	4 (4-4)	0 (0)	32.5 (12.3)
Total	463 (100.0)	168 (38.5)	264 (60.6)	3 (0.7)	1 (0.2)	3 (5-2)	3 (4-2)	4 (5-2)	3 (3.5-2.5)	4 (4-4)	20.1 (13.0)

Participants could answer the same question multiple times according to their characteristics.

Age categories: (1) 10-14 y; (2) 15-19 y; (3) 20-29 y; (4) 30-39 y; (5) 40-49 y; (6) 50-59 y; (7) 60-69 y; (8) 70-79 y; and (9) 80-89 y.

Table 1 *continued.*

Number of years of experience in snow sports (mean [SD])				Snow sport (n [%])									
Female	Male	Non- binary	I prefer not to say	Alpine Skiing						Freestyle Skiing			
				Total	Slalom	Giant Slalom	Super-G	Downhill	Alpine Combined	Total	Aerials	Moguls	Ski Cross
14.0 (5.4)	15.1 (10.0)	11.0 (4.2)	30.0 (0.0)	100 (48.8)	91 (48.7)	91 (47.9)	80 (47.1)	48 (39.0)	41 (43.2)	41 (44.1)	3 (27.3)	16 (45.7)	7 (26.9)
34.2 (14.0)	30.5 (14.0)	0.0 (0.0)	0.0 (0.0)	62 (30.2)	56 (29.9)	58 (30.5)	53 (31.2)	42 (34.1)	29 (30.5)	25 (26.9)	3 (27.3)	10 (28.6)	6 (23.1)
25.0 (15.4)	21.6 (13.8)	0.0 (0.0)	0.0 (0.0)	30 (14.6)	28 (15.0)	29 (15.3)	24 (14.1)	21 (17.1)	15 (15.8)	20 (21.5)	5 (45.5)	8 (22.9)	7 (26.9)
0.0 (0.0)	33.0 (8.4)	0.0 (0.0)	0.0 (0.0)	5 (2.4)	5 (2.7)	5 (2.6)	5 (2.9)	5 (4.1)	5 (5.3)	3 (3.2)	0 (0.0)	0 (0.0)	3 (11.5)
21.3 (7.5)	38.5 (11.0)	30.0 (0.0)	0.0 (0.0)	8 (3.9)	7 (3.7)	7 (3.7)	8 (4.7)	7 (5.7)	5 (5.3)	4 (4.3)	0 (0.0)	1 (2.9)	3 (11.5)
17.3 (10.5)	21.9 (14.1)	17.3 (11.4)	30.0 (0.0)	205 (44.0)	187 (24.4)	190 (24.8)	170 (22.2)	123 (16.1)	95 (12.4)	93 (20.0)	11 (8.2)	35 (26.1)	26 (19.4)

Table 1 *continued.*

Competition level (n [%])													Competition level (n [%])
Freestyle Skiing		Snowboarding						Cross-Country Skiing			Ski Jumping	Nordic Combined	Youth competitions
Ski Halfpipe	Ski Slopestyle	Total	Alpine	Cross	Halfpipe	Slopestyle	Big Air	Total	Sprint	Distance			
2 (13.3)	18 (38.3)	27 (37.5)	5 (21.7)	13 (44.8)	3 (16.7)	8 (28.6)	8 (26.7)	50 (58.8)	42 (57.5)	48 (57.8)	36 (69.2)	10 (32.3)	88 (42.9)
6 (40.0)	13 (27.7)	18 (25.0)	8 (34.8)	6 (20.7)	7 (38.9)	9 (32.1)	9 (30.0)	13 (15.3)	11 (15.1)	13 (15.7)	6 (11.5)	10 (32.3)	74 (36.1)
7 (46.7)	14 (29.8)	21 (29.0)	6 (26.1)	7 (24.1)	8 (44.4)	10 (35.7)	12 (40.0)	18 (21.2)	16 (21.9)	18 (21.7)	9 (17.3)	11 (35.5)	33 (16.1)
0 (0.0)	1 (2.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.2)	1 (1.4)	1 (1.2)	0 (0.0)	0 (0.0)	3 (1.5)
0 (0.0)	1 (2.1)	6 (8.3)	4 (17.4)	3 (10.3)	0 (0.0)	1 (3.6)	1 (3.3)	3 (3.5)	3 (4.1)	3 (3.6)	1 (1.9)	0 (0.0)	7 (3.4)
15 (11.2)	47 (35.1)	72 (15.5)	23 (18.0)	29 (22.7)	18 (14.1)	28 (21.9)	30 (23.4)	85 (18.2)	73 (46.8)	83 (53.2)	11 (8.2)	35 (26.1)	205 (20.0)

Table 1 *continued.*

Competition level (n [%])						
Youth competitions	FIS competitions	Continent Cups	World Cup	Master competitions	Mass events	Snow sports not governed by FIS
88 (42.9)	188 (57.2)	94 (47.7)	90 (45.5)	10 (38.5)	6 (30.0)	16 (30.2)
74 (36.1)	79 (24.2)	62 (31.5)	49 (24.7)	10 (38.5)	5 (25.0)	19 (35.8)
33 (16.1)	44 (13.5)	29 (14.7)	48 (24.2)	5 (19.2)	7 (35.0)	16 (30.2)
3 (1.5)	4 (1.2)	5 (2.5)	5 (2.5)	0 (0.0)	0 (0.0)	1 (1.9)
7 (3.4)	12 (3.7)	7 (3.6)	6 (3.0)	1 (3.8)	2 (10.0)	1 (1.9)
205 (20.0)	327 (31.9)	197 (19.2)	198 (19.3)	26 (2.5)	20 (1.9)	53 (5.2)

Supplementary file 5

Table 1 Current practices on injuries.

	Total		Snow sports											
			Alpine Skiing		Freestyle Skiing		Snowboarding		Cross-Country Skiing		Ski Jumping		Nordic Combined	
	n	%	(n=205)		(n=93)		(n=72)		(n=85)		(n=52)		(n=31)	
			n	%	n	%	n	%	n	%	n	%	n	%
Injury frequent targets														
Head Injuries & Concussions	229	52.5%	124	60.5%	61	65.6%	52	72.2%	19	22.4%	13	25.0%	9	29.0%
Shoulder, Upper Arm & Elbow Injuries	163	37.4%	53	25.9%	37	39.8%	39	54.2%	41	48.2%	9	17.3%	11	35.5%
Forearm, Wrist & Hand Injuries	85	19.5%	39	19.0%	11	11.8%	19	26.4%	17	20.0%	4	7.7%	3	9.7%
Thoracic Injuries	40	9.2%	23	11.2%	7	7.5%	8	11.1%	7	8.2%	3	5.8%	4	12.9%
Abdominal Injuries	27	6.2%	15	7.3%	1	1.1%	5	6.9%	7	8.2%	2	3.8%	3	9.7%
Spinal Injuries	162	37.2%	84	41.0%	37	39.8%	31	43.1%	23	27.1%	10	19.2%	7	22.6%
Pelvic Injuries	44	10.1%	24	11.7%	8	8.6%	10	13.9%	8	9.4%	5	9.6%	3	9.7%
Hip & Groin Injuries	107	24.5%	46	22.4%	19	20.4%	22	30.6%	19	22.4%	15	28.8%	8	25.8%
Thigh Injuries	55	12.6%	27	13.2%	6	6.5%	7	9.7%	10	11.8%	7	13.5%	5	16.1%

Knee Injuries	361	82.8%	175	85.4%	76	81.7%	52	72.2%	40	47.1%	47	90.4%	26	83.9%
Lower Leg & Tibia/Shin Injuries	152	34.9%	86	42.0%	30	32.3%	21	29.2%	25	29.4%	15	28.8%	8	25.8%
Ankle, Foot & Toe Injuries	180	41.3%	67	32.7%	24	25.8%	31	43.1%	40	47.1%	31	59.6%	15	48.4%
Other injuries	21	4.8%	9	4.4%	0	0.0%	2	2.8%	7	8.2%	2	3.8%	1	3.2%
None	14	3.2%	4	2.0%	1	1.1%	1	1.4%	5	5.9%	3	5.8%	1	3.2%

Table 1 *continued.*

	Stakeholder roles										Competition levels			
	Athletes (n=261)		Coaches (n=116)		Team staff (n=68)		Industry - SRS (n=5)		FIS representatives (n=13)		Youth competitions (n=205)		FIS competitions (n=327)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Injury frequent targets														
Head Injuries & Concussions	121	46.4%	74	63.8%	36	52.9%	5	100.0%	7	53.8%	95	46.3%	159	48.6%
Shoulder, Upper Arm & Elbow Injuries	98	37.5%	47	40.5%	25	36.8%	1	20.0%	4	30.8%	66	32.2%	121	37.0%
Forearm, Wrist & Hand Injuries	54	20.7%	21	18.1%	11	16.2%	0	0.0%	4	30.8%	35	17.1%	62	19.0%
Thoracic Injuries	19	7.3%	16	13.8%	10	14.7%	0	0.0%	1	7.7%	15	7.3%	27	8.3%
Abdominal Injuries	15	5.7%	11	9.5%	5	7.4%	0	0.0%	1	7.7%	12	5.9%	18	5.5%
Spinal Injuries	83	31.8%	54	46.6%	31	45.6%	3	60.0%	4	30.8%	68	33.2%	120	36.7%
Pelvic Injuries	21	8.0%	14	12.1%	12	17.6%	0	0.0%	3	23.1%	16	7.8%	29	8.9%
Hip & Groin Injuries	62	23.8%	30	25.9%	20	29.4%	1	20.0%	2	15.4%	44	21.5%	77	23.5%
Thigh Injuries	34	13.0%	15	12.9%	8	11.8%	1	20.0%	1	7.7%	30	14.6%	35	10.7%
Knee Injuries	208	79.7%	107	92.2%	55	80.9%	5	100.0%	8	61.5%	153	74.6%	252	77.1%
Lower Leg & Tibia/Shin Injuries	85	32.6%	41	35.3%	31	45.6%	3	60.0%	4	30.8%	65	31.7%	105	32.1%

Ankle, Foot & Toe Injuries	111	42.5%	46	39.7%	28	41.2%	2	40.0%	4	30.8%	83	40.5%	128	39.1%
Other injuries	10	3.8%	5	4.3%	6	8.8%	0	0.0%	1	7.7%	14	6.8%	17	5.2%
None	10	3.8%	1	0.9%	2	2.9%	0	0.0%	1	7.7%	5	2.4%	8	2.4%

Table 1 *continued.*

	Competition levels									
	Continent Cups (n=197)		World Cup (n=198)		Master competitions (n=26)		Mass events (n=20)		Snow sports not governed by FIS (n=53)	
	n	%	n	%	n	%	n	%	n	%
Injury frequent targets										
Head Injuries & Concussions	98	49.7%	108	54.5%	17	65.4%	6	30.0%	32	60.4%
Shoulder, Upper Arm & Elbow Injuries	81	41.1%	80	40.4%	10	38.5%	11	55.0%	26	49.1%
Forearm, Wrist & Hand Injuries	41	20.8%	30	15.2%	8	30.8%	5	25.0%	11	20.8%
Thoracic Injuries	18	9.1%	21	10.6%	3	11.5%	3	15.0%	9	17.0%
Abdominal Injuries	12	6.1%	10	5.1%	3	11.5%	1	5.0%	5	9.4%
Spinal Injuries	77	39.1%	78	39.4%	9	34.6%	8	40.0%	17	32.1%
Pelvic Injuries	20	10.2%	21	10.6%	5	19.2%	3	15.0%	7	13.2%
Hip & Groin Injuries	47	23.9%	51	25.8%	7	26.9%	8	40.0%	14	26.4%
Thigh Injuries	21	10.7%	22	11.1%	3	11.5%	2	10.0%	5	9.4%
Knee Injuries	156	79.2%	153	77.3%	19	73.1%	12	60.0%	39	73.6%
Lower Leg & Tibia/Shin Injuries	67	34.0%	60	30.3%	9	34.6%	4	20.0%	18	34.0%

Ankle, Foot & Toe Injuries	76	38.6%	72	36.4%	10	38.5%	7	35.0%	21	39.6%
Other injuries	8	4.1%	9	4.5%	2	7.7%	2	10.0%	3	5.7%
None	3	1.5%	8	4.0%	0	0.0%	1	5.0%	1	1.9%

Table 2 Current practices on illnesses.

	Total		Snow sports											
			Alpine Skiing (n=205)		Freestyle Skiing (n=93)		Snowboarding (n=72)		Cross-Country Skiing (n=85)		Ski Jumping (n=52)		Nordic Combined (n=31)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Illness frequent targets														
Cardiovascular illnesses	98	22.5%	49	23.9%	16	17.2%	14	19.4%	23	27.1%	3	5.8%	7	22.6%
Endocrinological illnesses	47	10.8%	18	8.8%	3	3.2%	7	9.7%	16	18.8%	9	17.3%	8	25.8%
Respiratory illnesses	172	39.4%	67	32.7%	33	35.5%	23	31.9%	51	60.0%	14	26.9%	17	54.8%
Thermoregulatory illnesses	65	14.9%	25	12.2%	9	9.7%	10	13.9%	11	12.9%	13	25.0%	3	9.7%
Other illnesses	54	12.4%	23	11.2%	14	15.1%	9	12.5%	9	10.6%	9	17.3%	6	19.4%
None	165	37.8%	79	38.5%	31	33.3%	24	33.3%	12	14.1%	21	40.4%	9	29.0%

Table 2 *continued.*

	Stakeholder roles										Competition levels			
	Athletes (n=261)		Coaches (n=116)		Team staff (n=68)		Industry - SRS (n=5)		FIS representatives (n=13)		Youth competitions (n=205)		FIS competitions (n=327)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Illness frequent targets														
Cardiovascular illnesses	63	24.1%	23	19.8%	13	19.1%	3	60.0%	5	38.5%	35	17.1%	69	21.1%
Endocrinological illnesses	28	10.7%	11	9.5%	10	14.7%	0	0.0%	3	23.1%	20	9.8%	39	11.9%
Respiratory illnesses	96	36.8%	47	40.5%	32	47.1%	2	40.0%	7	53.8%	71	34.6%	125	38.2%
Thermoregulatory illnesses	45	17.2%	11	9.5%	8	11.8%	2	40.0%	1	7.7%	30	14.6%	47	14.4%
Other illnesses	26	10.0%	17	14.7%	9	13.2%	1	20.0%	2	15.4%	21	10.2%	41	12.5%
None	102	39.1%	47	40.5%	23	33.8%	1	20.0%	2	15.4%	69	33.7%	109	33.3%

Table 2 *continued.*

	Competition levels									
	Continent Cups (n=197)		World Cup (n=198)		Master competitions (n=26)		Mass events (n=20)		Snow sports not governed by FIS (n=53)	
	n	%	n	%	n	%	n	%	n	%
Illness frequent targets										
Cardiovascular illnesses	44	22.3%	49	24.7%	6	23.1%	6	30.0%	9	17.0%
Endocrinological illnesses	21	10.7%	23	11.6%	0	0.0%	2	10.0%	4	7.5%
Respiratory illnesses	73	37.1%	85	42.9%	10	38.5%	10	50.0%	23	43.4%
Thermoregulatory illnesses	25	12.7%	28	14.1%	3	11.5%	2	10.0%	10	18.9%
Other illnesses	27	13.7%	21	10.6%	7	26.9%	2	10.0%	7	13.2%
None	66	33.5%	66	33.3%	6	23.1%	3	15.0%	11	20.8%

Supplementary file 6

Table 1.A Frequent targeted areas: overall, athlete- and equipment-related areas.

	Total		Snow sports											
			Alpine Skiing (n=205)		Freestyle Skiing (n=93)		Snowboarding (n=72)		Cross-Country Skiing (n=85)		Ski Jumping (n=52)		Nordic Combined (n=31)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Frequent targeted areas														
A. Athlete-related areas	1402	30.7%	655	29.5%	276	29.9%	211	31.0%	225	36.4%	157	31.2%	114	34.9%
Physical aspects	386	88.5%	177	86.3%	76	81.7%	60	83.3%	65	76.5%	37	71.2%	28	90.3%
Mental aspects	307	70.4%	133	64.9%	64	68.8%	44	61.1%	48	56.5%	38	73.1%	26	83.9%
Skill/technical/tactical aspects	283	64.9%	128	62.4%	54	58.1%	41	56.9%	40	47.1%	40	76.9%	19	61.3%
Load management	196	45.0%	101	49.3%	36	38.7%	28	38.9%	31	36.5%	19	36.5%	18	58.1%
Education/awareness	222	50.9%	109	53.2%	43	46.2%	37	51.4%	39	45.9%	22	42.3%	21	67.7%
Others	8	1.8%	7	3.4%	3	3.2%	1	1.4%	2	2.4%	1	1.9%	2	6.5%

B. Equipment-related areas	1240	27.1%	636	28.7%	245	26.6%	161	23.7%	139	22.5%	147	29.2%	83	25.4%
Ski/board (including preparation)	283	64.9%	144	70.2%	55	59.1%	34	47.2%	38	44.7%	26	50.0%	17	54.8%
Binding	224	51.4%	119	58.0%	49	52.7%	22	30.6%	13	15.3%	36	69.2%	19	61.3%
Boot	204	46.8%	104	50.7%	40	43.0%	24	33.3%	24	28.2%	27	51.9%	14	45.2%
Protectors/helmet	312	71.6%	154	75.1%	69	74.2%	53	73.6%	27	31.8%	34	65.4%	17	54.8%
Gear/clothing	195	44.7%	109	53.2%	31	33.3%	24	33.3%	27	31.8%	20	38.5%	13	41.9%
Others	22	5.0%	6	2.9%	1	1.1%	4	5.6%	10	11.8%	4	7.7%	3	9.7%

Table 1.A *continued.*

	Stakeholder roles										Competition levels			
	Athletes (n=261)		Coaches (n=116)		Team staff (n=68)		Industry - SRS (n=5)		FIS representatives (n=13)		Youth competitions (n=205)		FIS competitions (n=327)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Frequent targeted areas														
A. Athlete-related areas	764	29.3%	447	32.2%	244	34.5%	12	24.5%	37	26.1%	606	30.9%	986	31.0%
Physical aspects	223	85.4%	108	93.1%	63	92.6%	5	100.0%	10	76.9%	160	78.0%	264	80.7%
Mental aspects	182	69.7%	91	78.4%	45	66.2%	2	40.0%	7	53.8%	126	61.5%	215	65.7%
Skill/technical/tactical aspects	165	63.2%	91	78.4%	40	58.8%	1	20.0%	8	61.5%	125	61.0%	199	60.9%
Load management	91	34.9%	72	62.1%	39	57.4%	2	40.0%	5	38.5%	87	42.4%	139	42.5%
Education/awareness	100	38.3%	84	72.4%	53	77.9%	1	20.0%	7	53.8%	105	51.2%	163	49.8%
Others	3	1.1%	1	0.9%	4	5.9%	1	20.0%	0	0.0%	3	1.5%	6	1.8%

B. Equipment-related areas	733	28.1%	361	26.0%	168	23.7%	19	38.8%	38	26.8%	535	27.3%	856	26.9%
Ski/board (including preparation)	170	65.1%	83	71.6%	36	52.9%	5	100.0%	8	61.5%	122	59.5%	200	61.2%
Binding	120	46.0%	77	66.4%	35	51.5%	5	100.0%	8	61.5%	99	48.3%	152	46.5%
Boot	116	44.4%	59	50.9%	33	48.5%	4	80.0%	8	61.5%	92	44.9%	138	42.2%
Protectors/helmet	195	74.7%	82	70.7%	34	50.0%	4	80.0%	9	69.2%	130	63.4%	210	64.2%
Gear/clothing	121	46.4%	59	50.9%	20	29.4%	1	20.0%	5	38.5%	82	40.0%	142	43.4%
Others	11	4.2%	1	0.9%	10	14.7%	0	0.0%	0	0.0%	10	4.9%	14	4.3%

Table 1.A *continued.*

	Competition levels									
	Continent Cups (n=197)		World Cup (n=198)		Master competitions (n=26)		Mass events (n=20)		Snow sports not governed by FIS (n=53)	
	n	%	n	%	n	%	n	%	n	%
Frequent targeted areas										
A. Athlete-related areas	631	31.3%	617	30.7%	73	27.5%	54	31.0%	157	32.2%
Physical aspects	166	84.3%	172	86.9%	20	76.9%	13	65.0%	39	73.6%
Mental aspects	139	70.6%	137	69.2%	15	57.7%	14	70.0%	34	64.2%
Skill/technical/tactical aspects	131	66.5%	114	57.6%	17	65.4%	11	55.0%	28	52.8%
Load management	91	46.2%	97	49.0%	6	23.1%	5	25.0%	24	45.3%
Education/awareness	102	51.8%	93	47.0%	14	53.8%	11	55.0%	30	56.6%
Others	2	1.0%	4	2.0%	1	3.8%	0	0.0%	2	3.8%

B. Equipment-related areas	526	26.1%	524	26.1%	77	29.1%	42	24.1%	120	24.6%
Ski/board (including preparation)	121	61.4%	111	56.1%	15	57.7%	9	45.0%	22	41.5%
Binding	95	48.2%	102	51.5%	18	69.2%	7	35.0%	24	45.3%
Boot	85	43.1%	83	41.9%	14	53.8%	8	40.0%	22	41.5%
Protectors/helmet	138	70.1%	132	66.7%	17	65.4%	10	50.0%	32	60.4%
Gear/clothing	84	42.6%	84	42.4%	12	46.2%	7	35.0%	16	30.2%
Others	3	1.5%	12	6.1%	1	3.8%	1	5.0%	4	7.5%

Table 1.B Frequent targeted areas: course- and snow/environment-related areas.

	Total		Snow sports											
			Alpine Skiing (n=205)		Freestyle Skiing (n=93)		Snowboarding (n=72)		Cross-Country Skiing (n=85)		Ski Jumping (n=52)		Nordic Combined (n=31)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
C. Course-related areas	895	19.6%	452	20.4%	200	21.7%	141	20.7%	107	17.3%	87	17.3%	57	17.4%
Course design	282	64.7%	144	70.2%	57	61.3%	50	69.4%	52	61.2%	13	25.0%	8	25.8%
Jump design	186	42.7%	68	33.2%	61	65.6%	33	45.8%	3	3.5%	31	59.6%	17	54.8%
Safety nets	217	49.8%	140	68.3%	39	41.9%	30	41.7%	21	24.7%	12	23.1%	8	25.8%
Jury decisions	175	40.1%	88	42.9%	34	36.6%	23	31.9%	19	22.4%	31	59.6%	19	61.3%
Others	35	8.0%	12	5.9%	9	9.7%	5	6.9%	12	14.1%	0	0.0%	5	16.1%
D. Snow- and environment-related areas	1037	22.7%	476	21.5%	201	21.8%	167	24.6%	147	23.8%	113	22.4%	73	22.3%
Snow surface	328	75.2%	172	83.9%	53	57.0%	48	66.7%	41	48.2%	35	67.3%	22	71.0%
Visibility	306	70.2%	158	77.1%	71	76.3%	52	72.2%	28	32.9%	21	40.4%	15	48.4%
Temperature	152	34.9%	61	29.8%	22	23.7%	23	31.9%	48	56.5%	11	21.2%	8	25.8%
Wind	233	53.4%	79	38.5%	53	57.0%	40	55.6%	25	29.4%	45	86.5%	25	80.6%
Others	18	4.1%	6	2.9%	2	2.2%	4	5.6%	5	5.9%	1	1.9%	3	9.7%

Table 1.B *continued.*

	Stakeholder roles										Competition levels			
	Athletes (n=261)		Coaches (n=116)		Team staff (n=68)		Industry - SRS (n=5)		FIS representatives (n=13)		Youth competitions (n=205)		FIS competitions (n=327)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
C. Course-related areas	496	19.0%	282	20.3%	144	20.3%	10	20.4%	33	23.2%	373	19.1%	619	19.5%
Course design	157	60.2%	94	81.0%	44	64.7%	3	60.0%	8	61.5%	120	58.5%	195	59.6%
Jump design	100	38.3%	68	58.6%	26	38.2%	2	40.0%	6	46.2%	76	37.1%	129	39.4%
Safety nets	126	48.3%	61	52.6%	32	47.1%	2	40.0%	9	69.2%	87	42.4%	145	44.3%
Jury decisions	95	36.4%	52	44.8%	32	47.1%	2	40.0%	9	69.2%	75	36.6%	125	38.2%
Others	18	6.9%	7	6.0%	10	14.7%	1	20.0%	1	7.7%	15	7.3%	25	7.6%
D. Snow- and environment-related areas	612	23.5%	299	21.5%	152	21.5%	8	16.3%	34	23.9%	444	22.7%	721	22.7%
Snow surface	187	71.6%	99	85.3%	46	67.6%	5	100.0%	12	92.3%	145	70.7%	226	69.1%
Visibility	184	70.5%	85	73.3%	44	64.7%	2	40.0%	11	84.6%	125	61.0%	212	64.8%
Temperature	85	32.6%	51	44.0%	24	35.3%	0	0.0%	5	38.5%	73	35.6%	110	33.6%
Wind	146	55.9%	61	52.6%	34	50.0%	1	20.0%	5	38.5%	95	46.3%	161	49.2%
Others	10	3.8%	3	2.6%	4	5.9%	0	0.0%	1	7.7%	6	2.9%	12	3.7%

Table 1.B *continued.*

	Competition levels									
	Continent Cups (n=197)		World Cup (n=198)		Master competitions (n=26)		Mass events (n=20)		Snow sports not governed by FIS (n=53)	
	n	%	n	%	n	%	n	%	n	%
C. Course-related areas	409	20.3%	416	20.7%	54	20.4%	36	20.7%	97	19.9%
Course design	124	62.9%	129	65.2%	20	76.9%	12	60.0%	31	58.5%
Jump design	99	50.3%	98	49.5%	10	38.5%	7	35.0%	23	43.4%
Safety nets	96	48.7%	95	48.0%	14	53.8%	5	25.0%	18	34.0%
Jury decisions	82	41.6%	78	39.4%	7	26.9%	11	55.0%	18	34.0%
Others	8	4.1%	16	8.1%	3	11.5%	1	5.0%	7	13.2%
D. Snow- and environment-related areas	452	22.4%	454	22.6%	61	23.0%	42	24.1%	114	23.4%
Snow surface	140	71.1%	140	70.7%	19	73.1%	9	45.0%	32	60.4%
Visibility	136	69.0%	134	67.7%	18	69.2%	12	60.0%	33	62.3%
Temperature	60	30.5%	59	29.8%	10	38.5%	9	45.0%	16	30.2%
Wind	110	55.8%	113	57.1%	11	42.3%	11	55.0%	30	56.6%
Others	6	3.0%	8	4.0%	3	11.5%	1	5.0%	3	5.7%

Supplementary file 7

Table 1 Beliefs and frequency of prevention strategies.

	Total		Snow sports													
			Alpine Skiing (n=205)		Freestyle Skiing (n=93)		Snowboarding (n=72)		Cross-Country Skiing (n=85)		Ski Jumping (n=52)		Nordic Combined (n=31)			
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Beliefs in snow sports prevention																
I don't know	11	2.5%	7	3.7%	0	0.0%	1	1.5%	1	1.3%	1	2.0%	1	3.2%		
Not at all	7	1.6%	1	0.5%	1	1.2%	3	4.6%	1	1.3%	1	2.0%	0	0.0%		
Slightly	6	1.4%	0	0.0%	2	2.4%	0	0.0%	1	1.3%	3	5.9%	1	3.2%		
Somewhat	10	2.3%	7	3.7%	0	0.0%	0	0.0%	3	3.9%	0	0.0%	1	3.2%		
Fairly	21	4.8%	9	4.8%	4	4.9%	3	4.6%	3	3.9%	1	2.0%	2	6.5%		
Very	108	24.8%	40	21.3%	24	29.3%	9	13.8%	21	27.3%	15	29.4%	9	29.0%		
Completely	272	62.5%	124	66.0%	51	62.2%	49	75.4%	47	61.0%	30	58.8%	17	54.8%		

Table 1 *continued.*

Frequency of performing prevention														
>5-6 days/week	156	36.2%	81	43.5%	24	29.6%	23	36.5%	21	27.3%	7	13.7%	12	38.7%
5-6 days/week	44	10.2%	21	11.3%	13	16.0%	6	9.5%	4	5.2%	4	7.8%	1	3.2%
3-4 days/week	85	19.7%	38	20.4%	14	17.3%	18	28.6%	14	18.2%	16	31.4%	4	12.9%
1-2 days/week	79	18.3%	27	14.5%	19	23.5%	8	12.7%	21	27.3%	9	17.6%	8	25.8%
1-2 days/month	28	6.5%	12	6.5%	4	4.9%	3	4.8%	6	7.8%	2	3.9%	3	9.7%
< 1 day/month	17	3.9%	2	1.1%	5	6.2%	1	1.6%	5	6.5%	4	7.8%	2	6.5%
Never	22	5.1%	5	2.7%	2	2.5%	4	6.3%	6	7.8%	9	17.6%	1	3.2%

Table 1 *continued.*

	Stakeholder roles										Competition levels			
	Athletes (n=261)		Coaches (n=116)		Team staff (n=68)		Industry - SRS (n=5)		FIS representatives (n=13)		Youth competitions (n=205)		FIS competitions (n=327)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Beliefs in snow sports prevention														
I don't know	11	4.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3	1.6%	9	3.0%
Not at all	6	2.3%	1	0.9%	0	0.0%	0	0.0%	0	0.0%	2	1.1%	3	1.0%
Slightly	5	1.9%	0	0.0%	1	1.5%	0	0.0%	0	0.0%	1	0.5%	3	1.0%
Somewhat	5	1.9%	4	3.4%	1	1.5%	0	0.0%	0	0.0%	4	2.2%	7	2.3%
Fairly	15	5.8%	2	1.7%	3	4.4%	1	20.0%	0	0.0%	8	4.3%	13	4.3%
Very	59	22.7%	33	28.4%	14	20.6%	3	60.0%	5	38.5%	50	27.2%	73	23.9%
Completely	159	61.2%	76	65.5%	49	72.1%	1	20.0%	8	61.5%	116	63.0%	197	64.6%

Table 1 *continued.*

Frequency of performing prevention														
>5-6 days/week	83	32.0%	57	49.6%	25	37.9%	1	20.0%	3	25.0%	57	31.1%	106	35.2%
5-6 days/week	28	10.8%	10	8.7%	6	9.1%	0	0.0%	1	8.3%	21	11.5%	32	10.6%
3-4 days/week	52	20.1%	22	19.1%	13	19.7%	1	20.0%	3	25.0%	38	20.8%	63	20.9%
1-2 days/week	52	20.1%	15	13.0%	13	19.7%	1	20.0%	2	16.7%	34	18.6%	52	17.3%
1-2 days/month	17	6.6%	6	5.2%	3	4.5%	0	0.0%	3	25.0%	14	7.7%	20	6.6%
< 1 day/month	10	3.9%	5	4.3%	2	3.0%	1	20.0%	0	0.0%	10	5.5%	12	4.0%
Never	17	6.6%	0	0.0%	4	6.1%	1	20.0%	0	0.0%	9	4.9%	16	5.3%

Table 1 *continued.*

	Competition levels									
	Continent Cups (n=197)		World Cup (n=198)		Master competitions (n=26)		Mass events (n=20)		Snow sports not governed by FIS (n=53)	
	n	%	n	%	n	%	n	%	n	%
Beliefs in snow sports prevention										
I don't know	1	0.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Not at all	3	1.6%	5	2.7%	0	0.0%	0	0.0%	0	0.0%
Slightly	0	0.0%	4	2.2%	0	0.0%	1	6.3%	0	0.0%
Somewhat	2	1.1%	4	2.2%	0	0.0%	0	0.0%	1	2.2%
Fairly	7	3.8%	12	6.5%	1	4.5%	1	6.3%	3	6.7%
Very	51	27.9%	39	21.0%	3	13.6%	4	25.0%	14	31.1%
Completely	119	65.0%	122	65.6%	18	81.8%	10	62.5%	27	60.0%

Table 1 *continued.*

Frequency of performing prevention										
>5-6 days/week	63	34.6%	74	40.0%	12	54.5%	4	25.0%	14	31.1%
5-6 days/week	21	11.5%	19	10.3%	2	9.1%	1	6.3%	7	15.6%
3-4 days/week	41	22.5%	36	19.5%	3	13.6%	4	25.0%	12	26.7%
1-2 days/week	35	19.2%	33	17.8%	2	9.1%	3	18.8%	7	15.6%
1-2 days/month	8	4.4%	11	5.9%	2	9.1%	1	6.3%	1	2.2%
< 1 day/month	6	3.3%	7	3.8%	0	0.0%	2	12.5%	3	6.7%
Never	8	4.4%	5	2.7%	1	4.5%	1	6.3%	1	2.2%

Supplementary file 8

Table 1 Perspectives regarding having enough information or needing more information or knowledge on injury and illness prevention.

	Total		Snow sports											
			Alpine Skiing (n=205)		Freestyle Skiing (n=93)		Snowboarding (n=72)		Cross-Country Skiing (n=85)		Ski Jumping (n=52)		Nordic Combined (n=31)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Having enough information														
I don't know	19	4.6%	8	4.4%	2	2.5%	1	1.6%	1	1.3%	4	7.84%	4	12.9%
Not at all	51	12.4%	19	10.6%	13	16.0%	12	19.7%	10	13.0%	6	11.76%	5	16.1%
Slightly	54	13.1%	23	12.8%	8	9.9%	2	3.3%	12	15.6%	7	13.73%	5	16.1%
Somewhat	86	20.9%	41	22.8%	16	19.8%	15	24.6%	15	19.5%	14	27.45%	6	19.4%
Fairly	97	23.6%	49	27.2%	19	23.5%	11	18.0%	15	19.5%	10	19.61%	4	12.9%
Very	82	20.0%	32	17.8%	18	22.2%	15	24.6%	21	27.3%	8	15.69%	6	19.4%
Completely	22	5.4%	8	4.4%	5	6.2%	5	8.2%	3	3.9%	2	3.92%	1	3.2%
Feeling of needing more information or knowledge														
Yes	323	76.5%	147	81.2%	61	75.3%	44	72.1%	57	74.0%	41	80.4%	22	71.0%
No	99	23.5%	34	18.8%	20	24.7%	17	27.9%	20	26.0%	10	19.6%	9	29.0%

Table 1 *continued.*

	Stakeholder roles										Competition levels			
	Athletes (n=261)		Coaches (n=116)		Team staff (n=68)		Industry - SRS (n=5)		FIS representatives (n=13)		Youth competitions (n=205)		FIS competitions (n=327)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Having enough information														
I don't know	16	6.3%	2	1.8%	1	1.6%	0	0.0%	0	0.0%	8	4.4%	13	4.4%
Not at all	28	10.9%	14	12.7%	10	16.1%	0	0.0%	3	23.1%	27	14.9%	34	11.5%
Slightly	33	12.9%	13	11.8%	5	8.1%	1	20.0%	2	15.4%	23	12.7%	39	13.2%
Somewhat	62	24.2%	24	21.8%	13	21.0%	1	20.0%	2	15.4%	33	18.2%	64	21.7%
Fairly	61	23.8%	27	24.5%	8	12.9%	3	60.0%	1	7.7%	39	21.5%	69	23.4%
Very	40	15.6%	27	24.5%	23	37.1%	0	0.0%	4	30.8%	42	23.2%	59	20.0%
Completely	16	6.3%	3	2.7%	2	3.2%	0	0.0%	1	7.7%	9	5.0%	17	5.8%
Feeling of needing more information or knowledge														
Yes	187	72.8%	94	85.5%	47	75.8%	5	100.0%	9	69.2%	141	77.9%	231	78.0%
No	70	27.2%	16	14.5%	15	24.2%	0	0.0%	4	30.8%	40	22.1%	65	22.0%

Table 1 *continued.*

	Competition levels									
	Continent Cups (n=197)		World Cup (n=198)		Master competitions (n=26)		Mass events (n=20)		Snow sports not governed by FIS (n=53)	
	n	%	n	%	n	%	n	%	n	%
Having enough information										
I don't know	7	4.0%	3	1.7%	0	0.0%	0	0.0%	3	7.1%
Not at all	18	10.2%	24	13.4%	4	19.0%	4	25.0%	7	16.7%
Slightly	20	11.3%	26	14.5%	1	4.8%	1	6.3%	7	16.7%
Somewhat	43	24.3%	43	24.0%	6	28.6%	4	25.0%	5	11.9%
Fairly	52	29.4%	38	21.2%	5	23.8%	2	12.5%	9	21.4%
Very	28	15.8%	35	19.6%	5	23.8%	4	25.0%	10	23.8%
Completely	9	5.1%	10	5.6%	0	0.0%	1	6.3%	1	2.4%
Feeling of needing more information or knowledge										
Yes	132	74.6%	138	77.1%	16	76.2%	11	68.8%	33	78.6%
No	45	25.4%	41	22.9%	5	23.8%	5	31.3%	9	21.4%

Supplementary file 9

Table 1 Needs for more information on injuries.

	Total		Snow sports											
			Alpine Skiing		Freestyle Skiing		Snowboarding		Cross-Country Skiing		Ski Jumping		Nordic Combined	
	n	%	(n=205)		(n=93)		(n=72)		(n=85)		(n=52)		(n=31)	
			n	%	n	%	n	%	n	%	n	%	n	%
Injury frequent targets														
Head Injuries & Concussions	250	57.3%	129	62.9%	61	65.6%	43	59.7%	29	34.1%	18	34.6%	14	45.2%
Shoulder, Upper Arm & Elbow Injuries	115	26.4%	37	18.0%	26	28.0%	25	34.7%	35	41.2%	9	17.3%	12	38.7%
Forearm, Wrist & Hand Injuries	60	13.8%	25	12.2%	10	10.8%	10	13.9%	15	17.6%	4	7.7%	5	16.1%
Thoracic Injuries	58	13.3%	27	13.2%	11	11.8%	12	16.7%	11	12.9%	5	9.6%	6	19.4%
Abdominal Injuries	60	13.8%	27	13.2%	10	10.8%	10	13.9%	14	16.5%	3	5.8%	4	12.9%
Spinal Injuries	163	37.4%	80	39.0%	34	36.6%	31	43.1%	20	23.5%	13	25.0%	11	35.5%
Pelvic Injuries	63	14.4%	28	13.7%	12	12.9%	14	19.4%	11	12.9%	8	15.4%	4	12.9%
Hip & Groin Injuries	96	22.0%	39	19.0%	16	17.2%	17	23.6%	17	20.0%	12	23.1%	9	29.0%
Thigh Injuries	58	13.3%	26	12.7%	11	11.8%	10	13.9%	10	11.8%	5	9.6%	5	16.1%
Knee Injuries	281	64.4%	132	64.4%	50	53.8%	29	40.3%	35	41.2%	47	90.4%	26	83.9%

Lower Leg & Tibia/Shin Injuries	129	29.6%	66	32.2%	22	23.7%	14	19.4%	24	28.2%	19	36.5%	10	32.3%
Ankle, Foot & Toe Injuries	144	33.0%	52	25.4%	26	28.0%	22	30.6%	28	32.9%	27	51.9%	13	41.9%
Other injuries	26	6.0%	15	7.3%	5	5.4%	5	6.9%	6	7.1%	0	0.0%	1	3.2%
None	37	8.5%	12	5.9%	9	9.7%	8	11.1%	11	12.9%	2	3.8%	2	6.5%

Table 1 *continued.*

	Stakeholder roles										Competition levels			
	Athletes (n=261)		Coaches (n=116)		Team staff (n=68)		Industry - SRS (n=5)		FIS representatives (n=13)		Youth competitions (n=205)		FIS competitions (n=327)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Injury frequent targets														
Head Injuries & Concussions	140	53.6%	71	61.2%	39	57.4%	4	80.0%	9	69.2%	102	49.8%	169	51.7%
Shoulder, Upper Arm & Elbow Injuries	66	25.3%	35	30.2%	21	30.9%	1	20.0%	2	15.4%	51	24.9%	88	26.9%
Forearm, Wrist & Hand Injuries	39	14.9%	12	10.3%	9	13.2%	0	0.0%	3	23.1%	27	13.2%	47	14.4%
Thoracic Injuries	37	14.2%	16	13.8%	8	11.8%	0	0.0%	2	15.4%	26	12.7%	44	13.5%
Abdominal Injuries	40	15.3%	16	13.8%	6	8.8%	0	0.0%	2	15.4%	30	14.6%	45	13.8%
Spinal Injuries	91	34.9%	49	42.2%	30	44.1%	2	40.0%	5	38.5%	77	37.6%	121	37.0%
Pelvic Injuries	33	12.6%	20	17.2%	12	17.6%	0	0.0%	3	23.1%	31	15.1%	48	14.7%
Hip & Groin Injuries	56	21.5%	28	24.1%	16	23.5%	0	0.0%	3	23.1%	46	22.4%	69	21.1%
Thigh Injuries	39	14.9%	14	12.1%	6	8.8%	0	0.0%	2	15.4%	29	14.1%	43	13.1%
Knee Injuries	172	65.9%	76	65.5%	38	55.9%	5	100.0%	8	61.5%	127	62.0%	204	62.4%
Lower Leg & Tibia/Shin Injuries	72	27.6%	40	34.5%	21	30.9%	2	40.0%	4	30.8%	59	28.8%	93	28.4%

Ankle, Foot & Toe Injuries	90	34.5%	33	28.4%	23	33.8%	2	40.0%	3	23.1%	69	33.7%	98	30.0%
Other injuries	15	5.7%	9	7.8%	2	2.9%	0	0.0%	1	7.7%	15	7.3%	22	6.7%
None	21	8.0%	6	5.2%	8	11.8%	0	0.0%	2	15.4%	14	6.8%	22	6.7%

Table 1 *continued.*

	Competition levels									
	Continent Cups (n=197)		World Cup (n=198)		Master competitions (n=26)		Mass events (n=20)		Snow sports not governed by FIS (n=53)	
	n	%	n	%	n	%	n	%	n	%
Injury frequent targets										
Head Injuries & Concussions	104	52.8%	118	59.6%	14	53.8%	7	35.0%	25	47.2%
Shoulder, Upper Arm & Elbow Injuries	53	26.9%	58	29.3%	7	26.9%	8	40.0%	19	35.8%
Forearm, Wrist & Hand Injuries	23	11.7%	24	12.1%	5	19.2%	4	20.0%	9	17.0%
Thoracic Injuries	26	13.2%	29	14.6%	3	11.5%	2	10.0%	7	13.2%
Abdominal Injuries	25	12.7%	20	10.1%	3	11.5%	1	5.0%	5	9.4%
Spinal Injuries	72	36.5%	72	36.4%	9	34.6%	5	25.0%	13	24.5%
Pelvic Injuries	26	13.2%	26	13.1%	6	23.1%	2	10.0%	10	18.9%
Hip & Groin Injuries	42	21.3%	44	22.2%	5	19.2%	2	10.0%	9	17.0%
Thigh Injuries	19	9.6%	25	12.6%	3	11.5%	1	5.0%	5	9.4%
Knee Injuries	111	56.3%	110	55.6%	15	57.7%	9	45.0%	25	47.2%
Lower Leg & Tibia/Shin Injuries	51	25.9%	48	24.2%	6	23.1%	3	15.0%	13	24.5%

Ankle, Foot & Toe Injuries	54	27.4%	59	29.8%	10	38.5%	5	25.0%	16	30.2%
Other injuries	16	8.1%	12	6.1%	3	11.5%	1	5.0%	5	9.4%
None	14	7.1%	17	8.6%	3	11.5%	2	10.0%	3	5.7%

Table 2 Needs for more information on illnesses.

	Total		Snow sports											
			Alpine Skiing (n=205)		Freestyle Skiing (n=93)		Snowboarding (n=72)		Cross-Country Skiing (n=85)		Ski Jumping (n=52)		Nordic Combined (n=31)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Illness frequent targets														
Cardiovascular illnesses	145	33.3%	66	32.2%	25	26.9%	20	27.8%	37	43.5%	9	17.3%	11	35.5%
Endocrinological illnesses	138	31.7%	61	29.8%	22	23.7%	21	29.2%	33	38.8%	19	36.5%	8	25.8%
Respiratory illnesses	188	43.1%	81	39.5%	36	38.7%	24	33.3%	48	56.5%	11	21.2%	17	54.8%
Thermoregulatory illnesses	134	30.7%	57	27.8%	22	23.7%	22	30.6%	25	29.4%	15	28.8%	9	29.0%
Other illnesses	36	8.3%	18	8.8%	5	5.4%	6	8.3%	5	5.9%	8	15.4%	5	16.1%
None	108	24.8%	47	22.9%	27	29.0%	20	27.8%	9	10.6%	10	19.2%	4	12.9%

Table 2 *continued.*

	Stakeholder roles										Competition levels			
	Athletes (n=261)		Coaches (n=116)		Team staff (n=68)		Industry - SRS (n=5)		FIS representatives (n=13)		Youth competitions (n=205)		FIS competitions (n=327)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Illness frequent targets														
Cardiovascular illnesses	99	37.9%	35	30.2%	18	26.5%	2	40.0%	4	30.8%	66	32.2%	97	29.7%
Endocrinological illnesses	84	32.2%	34	29.3%	24	35.3%	1	20.0%	4	30.8%	60	29.3%	103	31.5%
Respiratory illnesses	114	43.7%	48	41.4%	30	44.1%	2	40.0%	6	46.2%	79	38.5%	132	40.4%
Thermoregulatory illnesses	87	33.3%	31	26.7%	19	27.9%	1	20.0%	4	30.8%	49	23.9%	89	27.2%
Other illnesses	15	5.7%	15	12.9%	6	8.8%	1	20.0%	2	15.4%	21	10.2%	33	10.1%
None	66	25.3%	31	26.7%	10	14.7%	1	20.0%	4	30.8%	47	22.9%	73	22.3%

Table 2 *continued.*

	Competition levels									
	Continent Cups (n=197)		World Cup (n=198)		Master competitions (n=26)		Mass events (n=20)		Snow sports not governed by FIS (n=53)	
	n	%	n	%	n	%	n	%	n	%
Illness frequent targets										
Cardiovascular illnesses	67	34.0%	68	34.3%	10	38.5%	7	35.0%	15	28.3%
Endocrinological illnesses	60	30.5%	59	29.8%	5	19.2%	6	30.0%	14	26.4%
Respiratory illnesses	81	41.1%	81	40.9%	11	42.3%	10	50.0%	18	34.0%
Thermoregulatory illnesses	52	26.4%	55	27.8%	8	30.8%	8	40.0%	15	28.3%
Other illnesses	19	9.6%	12	6.1%	2	7.7%	1	5.0%	6	11.3%
None	43	21.8%	48	24.2%	2	7.7%	2	10.0%	12	22.6%

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Table 1.A Needs for more information on targeted prevention areas: overall, athlete- and equipment-related areas.

	Total		Snow sports											
			Alpine Skiing (n=205)		Freestyle Skiing (n=93)		Snowboarding (n=72)		Cross-Country Skiing (n=85)		Ski Jumping (n=52)		Nordic Combined (n=31)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Frequent targeted areas														
A. Athlete-related areas	1206	32.0%	556	31.4%	233	32.2%	178	32.7%	214	35.3%	149	31.6%	92	30.8%
Physical aspects	280	64.2%	125	61.0%	54	58.1%	38	52.8%	55	64.7%	31	59.6%	22	71.0%
Mental aspects	299	68.6%	127	62.0%	61	65.6%	45	62.5%	52	61.2%	40	76.9%	22	71.0%
Skill/technical/tactical aspects	176	40.4%	80	39.0%	32	34.4%	24	33.3%	25	29.4%	34	65.4%	12	38.7%
Load management	158	36.2%	85	41.5%	27	29.0%	22	30.6%	29	34.1%	14	26.9%	15	48.4%
Education/awareness	148	33.9%	76	37.1%	29	31.2%	25	34.7%	21	24.7%	15	28.8%	10	32.3%
Social aspects	114	26.1%	51	24.9%	22	23.7%	17	23.6%	25	29.4%	13	25.0%	10	32.3%
Others	5	1.1%	4	2.0%	1	1.1%	2	2.8%	1	1.2%	1	1.9%	1	3.2%
None	26	6.0%	8	3.9%	7	7.5%	5	6.9%	6	7.1%	1	1.9%	0	0.0%

B. Equipment-related areas	938	24.9%	462	26.1%	163	22.5%	119	21.9%	124	20.4%	136	28.8%	81	27.1%
Ski/board (including preparation)	208	47.7%	99	48.3%	31	33.3%	20	27.8%	36	42.4%	32	61.5%	20	64.5%
Binding	172	39.4%	91	44.4%	24	25.8%	18	25.0%	10	11.8%	37	71.2%	22	71.0%
Boot	153	35.1%	77	37.6%	23	24.7%	15	20.8%	19	22.4%	28	53.8%	13	41.9%
Protectors/helmet	185	42.4%	102	49.8%	40	43.0%	32	44.4%	11	12.9%	16	30.8%	11	35.5%
Gear/clothing	121	27.8%	60	29.3%	25	26.9%	16	22.2%	19	22.4%	17	32.7%	12	38.7%
Others	9	2.1%	6	2.9%	4	4.3%	3	4.2%	1	1.2%	1	1.9%	0	0.0%
None	90	20.6%	27	13.2%	16	17.2%	15	20.8%	28	32.9%	5	9.6%	3	9.7%

Table 1.A *continued.*

	Stakeholder roles										Competition levels			
	Athletes (n=261)		Coaches (n=116)		Team staff (n=68)		Industry - SRS (n=5)		FIS representatives (n=13)		Youth competitions (n=205)		FIS competitions (n=327)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Frequent targeted areas														
A. Athlete-related areas	706	31.9%	342	32.5%	195	32.8%	14	26.4%	39	32.8%	555	33.4%	890	33.1%
Physical aspects	170	65.1%	75	64.7%	45	66.2%	5	100.0%	9	69.2%	134	65.4%	205	62.7%
Mental aspects	182	69.7%	78	67.2%	49	72.1%	2	40.0%	9	69.2%	131	63.9%	221	67.6%
Skill/technical/tactical aspects	116	44.4%	39	33.6%	26	38.2%	2	40.0%	3	23.1%	83	40.5%	139	42.5%
Load management	79	30.3%	54	46.6%	29	42.6%	2	40.0%	5	38.5%	72	35.1%	110	33.6%
Education/awareness	73	28.0%	54	46.6%	26	38.2%	2	40.0%	7	53.8%	71	34.6%	111	33.9%
Social aspects	63	24.1%	38	32.8%	18	26.5%	0	0.0%	5	38.5%	55	26.8%	88	26.9%
Others	2	0.8%	1	0.9%	1	1.5%	1	20.0%	0	0.0%	2	1.0%	5	1.5%
None	21	8.0%	3	2.6%	1	1.5%	0	0.0%	1	7.7%	7	3.4%	11	3.4%
B. Equipment-related areas	552	24.9%	256	24.4%	138	23.2%	20	37.7%	28	23.5%	412	24.8%	662	24.6%
Ski/board (including preparation)	126	48.3%	53	45.7%	30	44.1%	5	100.0%	7	53.8%	94	45.9%	156	47.7%

Binding	90	34.5%	55	47.4%	30	44.1%	5	100.0%	5	38.5%	81	39.5%	117	35.8%
Boot	84	32.2%	45	38.8%	27	39.7%	4	80.0%	6	46.2%	71	34.6%	107	32.7%
Protectors/helmet	112	42.9%	50	43.1%	21	30.9%	4	80.0%	4	30.8%	79	38.5%	127	38.8%
Gear/clothing	76	29.1%	33	28.4%	15	22.1%	2	40.0%	2	15.4%	54	26.3%	85	26.0%
Others	4	1.5%	5	4.3%	2	2.9%	0	0.0%	1	7.7%	3	1.5%	7	2.1%
None	60	23.0%	15	12.9%	13	19.1%	0	0.0%	3	23.1%	30	14.6%	63	19.3%

Table 1.A *continued.*

	Competition levels															
	Continent (n=197)		Cups (n=198)		World (n=198)		Cup (n=26)		Master (n=26)		Mass (n=20)		events (n=20)		Snow sports not governed by FIS (n=53)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Frequent targeted areas																
A. Athlete-related areas	524	33.0%	512	31.5%	62	28.4%	52	32.1%	119	32.2%						
Physical aspects	116	58.9%	112	56.6%	13	50.0%	11	55.0%	26	49.1%						
Mental aspects	126	64.0%	125	63.1%	13	50.0%	15	75.0%	28	52.8%						
Skill/technical/tactical aspects	76	38.6%	67	33.8%	10	38.5%	4	20.0%	19	35.8%						
Load management	69	35.0%	78	39.4%	7	26.9%	7	35.0%	18	34.0%						
Education/awareness	71	36.0%	65	32.8%	10	38.5%	4	20.0%	14	26.4%						
Social aspects	52	26.4%	47	23.7%	7	26.9%	10	50.0%	11	20.8%						
Others	3	1.5%	3	1.5%	0	0.0%	0	0.0%	0	0.0%						
None	11	5.6%	15	7.6%	2	7.7%	1	5.0%	3	5.7%						
B. Equipment-related areas	393	24.8%	397	24.5%	55	25.2%	40	24.7%	84	22.7%						
Ski/board (including preparation)	90	45.7%	85	42.9%	11	42.3%	11	55.0%	17	32.1%						
Binding	70	35.5%	76	38.4%	11	42.3%	6	30.0%	13	24.5%						
Boot	64	32.5%	62	31.3%	10	38.5%	7	35.0%	13	24.5%						

Protectors/helmet	75	38.1%	82	41.4%	13	50.0%	6	30.0%	19	35.8%
Gear/clothing	49	24.9%	50	25.3%	6	23.1%	6	30.0%	12	22.6%
Others	4	2.0%	5	2.5%	1	3.8%	0	0.0%	3	5.7%
None	41	20.8%	37	18.7%	3	11.5%	4	20.0%	7	13.2%

Table 1.B Needs for more information on targeted areas: course- and snow/environment-related areas.

	Total		Snow sports											
			Alpine Skiing (n=205)		Freestyle Skiing (n=93)		Snowboarding (n=72)		Cross-Country Skiing (n=85)		Ski Jumping (n=52)		Nordic Combined (n=31)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
C. Course-related areas	775	20.6%	382	21.5%	165	22.8%	120	22.1%	116	19.1%	81	17.2%	58	19.4%
Course design	231	53.0%	123	60.0%	45	48.4%	38	52.8%	39	45.9%	16	30.8%	12	38.7%
Jump design	154	35.3%	61	29.8%	45	48.4%	28	38.9%	7	8.2%	28	53.8%	17	54.8%
Safety nets	126	28.9%	81	39.5%	26	28.0%	20	27.8%	14	16.5%	8	15.4%	9	29.0%
Jury decisions	160	36.7%	83	40.5%	32	34.4%	18	25.0%	29	34.1%	18	34.6%	11	35.5%
Others	4	0.9%	3	1.5%	0	0.0%	0	0.0%	1	1.2%	0	0.0%	1	3.2%
None	100	22.9%	31	15.1%	17	18.3%	16	22.2%	26	30.6%	11	21.2%	8	25.8%
D. Snow- and environment-related areas	846	22.5%	373	21.0%	163	22.5%	127	23.3%	153	25.2%	106	22.5%	68	22.7%
Snow surface	258	59.2%	127	62.0%	41	44.1%	35	48.6%	43	50.6%	33	63.5%	21	67.7%
Visibility	179	41.1%	95	46.3%	40	43.0%	28	38.9%	20	23.5%	17	32.7%	11	35.5%
Temperature	138	31.7%	57	27.8%	21	22.6%	20	27.8%	42	49.4%	14	26.9%	10	32.3%
Wind	170	39.0%	52	25.4%	36	38.7%	26	36.1%	30	35.3%	37	71.2%	22	71.0%
Others	10	2.3%	6	2.9%	3	3.2%	1	1.4%	1	1.2%	1	1.9%	1	3.2%

None	91	20.9%	36	17.6%	22	23.7%	17	23.6%	17	20.0%	4	7.7%	3	9.7%
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Table 1.B *continued.*

	Stakeholder roles										Competition levels			
	Athletes (n=261)		Coaches (n=116)		Team staff (n=68)		Industry - SRS (n=5)		FIS representatives (n=13)		Youth competitions (n=205)		FIS competitions (n=327)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
C. Course-related areas	455	20.6%	226	21.5%	116	19.5%	10	18.9%	25	21.0%	330	19.9%	551	20.5%
Course design	134	51.3%	73	62.9%	33	48.5%	5	100.0%	7	53.8%	103	50.2%	160	48.9%
Jump design	85	32.6%	50	43.1%	24	35.3%	2	40.0%	3	23.1%	62	30.2%	112	34.3%
Safety nets	68	26.1%	41	35.3%	20	29.4%	1	20.0%	7	53.8%	48	23.4%	86	26.3%
Jury decisions	100	38.3%	45	38.8%	22	32.4%	2	40.0%	5	38.5%	74	36.1%	118	36.1%
Others	1	0.4%	2	1.7%	1	1.5%	0	0.0%	0	0.0%	1	0.5%	4	1.2%
None	67	25.7%	15	12.9%	16	23.5%	0	0.0%	3	23.1%	42	20.5%	71	21.7%
D. Snow- and environment-related areas	500	22.6%	227	21.6%	145	24.4%	9	17.0%	27	22.7%	365	22.0%	589	21.9%
Snow surface	145	55.6%	75	64.7%	45	66.2%	5	100.0%	8	61.5%	117	57.1%	178	54.4%
Visibility	110	42.1%	44	37.9%	31	45.6%	2	40.0%	6	46.2%	71	34.6%	126	38.5%
Temperature	78	29.9%	38	32.8%	29	42.6%	2	40.0%	5	38.5%	67	32.7%	98	30.0%
Wind	104	39.8%	43	37.1%	31	45.6%	0	0.0%	4	30.8%	72	35.1%	114	34.9%
Others	4	1.5%	4	3.4%	2	2.9%	0	0.0%	0	0.0%	4	2.0%	9	2.8%

None	59	22.6%	23	19.8%	7	10.3%	0	0.0%	4	30.8%	34	16.6%	64	19.6%
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Table 1.B *continued.*

	Competition levels									
	Continent Cups (n=197)		World Cup (n=198)		Master competitions (n=26)		Mass events (n=20)		Snow sports not governed by FIS (n=53)	
	n	%	n	%	n	%	n	%	n	%
C. Course-related areas	323	20.4%	341	21.0%	49	22.5%	32	19.8%	77	20.8%
Course design	91	46.2%	99	50.0%	17	65.4%	9	45.0%	23	43.4%
Jump design	71	36.0%	74	37.4%	9	34.6%	7	35.0%	15	28.3%
Safety nets	46	23.4%	58	29.3%	10	38.5%	4	20.0%	11	20.8%
Jury decisions	71	36.0%	65	32.8%	10	38.5%	9	45.0%	14	26.4%
Others	1	0.5%	2	1.0%	1	3.8%	0	0.0%	1	1.9%
None	43	21.8%	43	21.7%	2	7.7%	3	15.0%	13	24.5%
D. Snow- and environment-related areas	347	21.9%	373	23.0%	52	23.9%	38	23.5%	90	24.3%
Snow surface	107	54.3%	110	55.6%	13	50.0%	12	60.0%	24	45.3%
Visibility	73	37.1%	82	41.4%	14	53.8%	8	40.0%	18	34.0%
Temperature	53	26.9%	55	27.8%	9	34.6%	6	30.0%	14	26.4%
Wind	67	34.0%	84	42.4%	11	42.3%	9	45.0%	23	43.4%
Others	4	2.0%	5	2.5%	1	3.8%	1	5.0%	2	3.8%
None	43	21.8%	37	18.7%	4	15.4%	2	10.0%	9	17.0%

Supplementary file 11

Table 1.A Needs for more information on specific preventative intervention areas: injury and illness registration methods and warm-up, activation and cool-down strategies.

	Total		Snow sports											
			Alpine Skiing (n=205)		Freestyle Skiing (n=93)		Snowboarding (n=72)		Cross-Country Skiing (n=85)		Ski Jumping (n=52)		Nordic Combined (n=31)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
A. Injury and illness registration methods														
I don't know	82	19.9%	29	16.5%	22	27.5%	14	24.1%	8	10.4%	8	16.0%	4	13.3%
Not at all	71	17.2%	24	13.6%	16	20.0%	10	17.2%	17	22.1%	4	8.0%	5	16.7%
Slightly	42	10.2%	13	7.4%	6	7.5%	7	12.1%	11	14.3%	10	20.0%	6	20.0%
Somewhat	61	14.8%	34	19.3%	9	11.3%	6	10.3%	12	15.6%	4	8.0%	2	6.7%
Fairly	67	16.2%	32	18.2%	11	13.8%	10	17.2%	11	14.3%	14	28.0%	5	16.7%
Very	59	14.3%	28	15.9%	11	13.8%	5	8.6%	10	13.0%	8	16.0%	8	26.7%
Completely	31	7.5%	16	9.1%	5	6.3%	6	10.3%	8	10.4%	2	4.0%	0	0.0%
B. Warm-up, activation and cool-down strategies														
I don't know	23	5.6%	9	5.1%	5	6.3%	2	3.4%	2	2.6%	2	4.0%	3	10.0%
Not at all	95	23.1%	32	18.3%	22	27.5%	21	36.2%	16	20.8%	8	16.0%	8	26.7%
Slightly	63	15.3%	34	19.4%	13	16.3%	10	17.2%	14	18.2%	10	20.0%	7	23.3%
Somewhat	75	18.2%	31	17.7%	16	20.0%	13	22.4%	13	16.9%	7	14.0%	3	10.0%

Fairly	79	19.2%	36	20.6%	11	13.8%	5	8.6%	15	19.5%	10	20.0%	4	13.3%
Very	33	8.0%	12	6.9%	7	8.8%	1	1.7%	7	9.1%	6	12.0%	5	16.7%
Completely	44	10.7%	21	12.0%	6	7.5%	6	10.3%	10	13.0%	7	14.0%	0	0.0%

Table 1.A *continued.*

	Stakeholder roles										Competition levels			
	Athletes (n=261)		Coaches (n=116)		Team staff (n=68)		Industry - SRS (n=5)		FIS representatives (n=13)		Youth competitions (n=205)		FIS competitions (n=327)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
A. Injury and illness registration methods														
I don't know	62	24.7%	14	12.8%	8	13.3%	1	20.0%	2	15.4%	32	17.9%	57	19.5%
Not at all	40	15.9%	20	18.3%	11	18.3%	0	0.0%	2	15.4%	30	16.8%	45	15.4%
Slightly	25	10.0%	14	12.8%	7	11.7%	0	0.0%	1	7.7%	16	8.9%	32	10.9%
Somewhat	34	13.5%	20	18.3%	7	11.7%	1	20.0%	0	0.0%	30	16.8%	45	15.4%
Fairly	37	14.7%	19	17.4%	11	18.3%	2	40.0%	2	15.4%	26	14.5%	50	17.1%
Very	34	13.5%	13	11.9%	12	20.0%	1	20.0%	4	30.8%	25	14.0%	42	14.3%
Completely	19	7.6%	9	8.3%	4	6.7%	0	0.0%	2	15.4%	20	11.2%	22	7.5%
B. Warm-up, activation and cool-down strategies														
I don't know	19	7.5%	2	1.9%	1	1.6%	1	20.0%	0	0.0%	8	4.5%	15	5.2%
Not at all	58	22.9%	23	21.9%	14	23.0%	0	0.0%	4	30.8%	29	16.4%	61	21.0%
Slightly	31	12.3%	19	18.1%	14	23.0%	1	20.0%	5	38.5%	24	13.6%	48	16.6%
Somewhat	45	17.8%	21	20.0%	12	19.7%	0	0.0%	1	7.7%	38	21.5%	56	19.3%
Fairly	50	19.8%	19	18.1%	12	19.7%	1	20.0%	1	7.7%	37	20.9%	55	19.0%
Very	21	8.3%	9	8.6%	2	3.3%	2	40.0%	0	0.0%	20	11.3%	22	7.6%
Completely	29	11.5%	12	11.4%	6	9.8%	0	0.0%	2	15.4%	21	11.9%	33	11.4%

Table 1.A *continued.*

	Competition levels									
	Continent Cups (n=197)		World Cup (n=198)		Master competitions (n=26)		Mass events (n=20)		Snow sports not governed by FIS (n=53)	
	n	%	n	%	n	%	n	%	n	%
A. Injury and illness registration methods										
I don't know	35	20.0%	32	18.3%	3	15.0%	1	6.3%	6	14.6%
Not at all	26	14.9%	33	18.9%	6	30.0%	2	12.5%	7	17.1%
Slightly	23	13.1%	19	10.9%	2	10.0%	3	18.8%	6	14.6%
Somewhat	29	16.6%	21	12.0%	3	15.0%	1	6.3%	7	17.1%
Fairly	31	17.7%	30	17.1%	0	0.0%	4	25.0%	5	12.2%
Very	24	13.7%	29	16.6%	2	10.0%	4	25.0%	6	14.6%
Completely	7	4.0%	11	6.3%	4	20.0%	1	6.3%	4	9.8%
B. Warm-up, activation and cool-down strategies										
I don't know	6	3.4%	8	4.6%	0	0.0%	0	0.0%	2	4.9%
Not at all	42	24.1%	44	25.1%	3	15.0%	5	31.3%	9	22.0%
Slightly	35	20.1%	30	17.1%	3	15.0%	4	25.0%	5	12.2%
Somewhat	35	20.1%	35	20.0%	5	25.0%	2	12.5%	11	26.8%
Fairly	30	17.2%	32	18.3%	4	20.0%	1	6.3%	2	4.9%
Very	12	6.9%	13	7.4%	0	0.0%	1	6.3%	6	14.6%
Completely	14	8.0%	13	7.4%	5	25.0%	3	18.8%	6	14.6%

Table 1.B Needs for more information on specific intervention areas: training methods and testing practices.

	Total		Snow sports											
			Alpine Skiing (n=205)		Freestyle Skiing (n=93)		Snowboarding (n=72)		Cross-Country Skiing (n=85)		Ski Jumping (n=52)		Nordic Combined (n=31)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
C. Training methods														
I don't know	33	8.0%	16	9.1%	3	3.8%	3	5.2%	6	7.8%	1	2.0%	4	13.8%
Not at all	67	16.3%	21	11.9%	19	23.8%	11	19.0%	14	18.2%	6	12.0%	7	24.1%
Slightly	45	10.9%	21	11.9%	12	15.0%	7	12.1%	9	11.7%	6	12.0%	4	13.8%
Somewhat	87	21.1%	42	23.9%	15	18.8%	13	22.4%	12	15.6%	12	24.0%	1	3.4%
Fairly	73	17.7%	35	19.9%	15	18.8%	7	12.1%	11	14.3%	9	18.0%	5	17.2%
Very	57	13.8%	22	12.5%	9	11.3%	9	15.5%	11	14.3%	8	16.0%	7	24.1%
Completely	50	12.1%	19	10.8%	7	8.8%	8	13.8%	14	18.2%	8	16.0%	1	3.4%
D. Testing practices														
I don't know	71	17.3%	31	17.8%	14	17.5%	9	15.5%	9	11.7%	8	16.0%	3	10.3%
Not at all	82	20.0%	24	13.8%	23	28.8%	13	22.4%	19	24.7%	7	14.0%	6	20.7%
Slightly	42	10.2%	22	12.6%	8	10.0%	7	12.1%	14	18.2%	4	8.0%	4	13.8%
Somewhat	67	16.3%	31	17.8%	12	15.0%	10	17.2%	10	13.0%	8	16.0%	3	10.3%
Fairly	67	16.3%	34	19.5%	9	11.3%	3	5.2%	7	9.1%	15	30.0%	5	17.2%
Very	47	11.5%	17	9.8%	8	10.0%	10	17.2%	8	10.4%	5	10.0%	8	27.6%
Completely	34	8.3%	15	8.6%	6	7.5%	6	10.3%	10	13.0%	3	6.0%	0	0.0%

Table 1.B *continued.*

	Stakeholder roles										Competition levels			
	Athletes (n=261)		Coaches (n=116)		Team staff (n=68)		Industry - SRS (n=5)		FIS representatives (n=13)		Youth competitions (n=205)		FIS competitions (n=327)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
C. Training methods														
I don't know	30	11.9%	0	0.0%	2	3.3%	1	20.0%	0	0.0%	14	7.8%	23	7.9%
Not at all	40	15.9%	16	15.1%	12	19.7%	1	20.0%	4	30.8%	24	13.4%	40	13.7%
Slightly	22	8.7%	15	14.2%	8	13.1%	1	20.0%	2	15.4%	17	9.5%	31	10.7%
Somewhat	50	19.8%	28	26.4%	13	21.3%	0	0.0%	2	15.4%	38	21.2%	62	21.3%
Fairly	43	17.1%	23	21.7%	9	14.8%	0	0.0%	1	7.7%	38	21.2%	54	18.6%
Very	34	13.5%	14	13.2%	10	16.4%	2	40.0%	2	15.4%	30	16.8%	43	14.8%
Completely	33	13.1%	10	9.4%	7	11.5%	0	0.0%	2	15.4%	18	10.1%	38	13.1%
D. Testing practices														
I don't know	55	21.9%	10	9.6%	3	5.0%	2	40.0%	1	7.7%	30	16.9%	55	19.0%
Not at all	60	23.9%	12	11.5%	12	20.0%	0	0.0%	3	23.1%	30	16.9%	58	20.1%
Slightly	22	8.8%	16	15.4%	8	13.3%	0	0.0%	1	7.7%	17	9.6%	28	9.7%
Somewhat	36	14.3%	23	22.1%	9	15.0%	0	0.0%	3	23.1%	25	14.1%	40	13.8%
Fairly	34	13.5%	23	22.1%	11	18.3%	2	40.0%	0	0.0%	34	19.2%	48	16.6%
Very	25	10.0%	10	9.6%	11	18.3%	1	20.0%	3	23.1%	23	13.0%	33	11.4%
Completely	19	7.6%	10	9.6%	6	10.0%	0	0.0%	2	15.4%	18	10.2%	27	9.3%

Table 1.B *continued.*

	Competition levels									
	Continent (n=197)		World Cup (n=198)		Master competitions (n=26)		Mass events (n=20)		Snow sports not governed by FIS (n=53)	
	n	%	n	%	n	%	n	%	n	%
C. Training methods										
I don't know	9	5.2%	10	5.7%	0	0.0%	1	6.3%	1	2.4%
Not at all	30	17.3%	36	20.6%	1	5.0%	2	12.5%	8	19.5%
Slightly	22	12.7%	25	14.3%	2	10.0%	5	31.3%	5	12.2%
Somewhat	40	23.1%	32	18.3%	4	20.0%	2	12.5%	8	19.5%
Fairly	32	18.5%	29	16.6%	4	20.0%	2	12.5%	7	17.1%
Very	26	15.0%	25	14.3%	4	20.0%	2	12.5%	8	19.5%
Completely	14	8.1%	18	10.3%	5	25.0%	2	12.5%	4	9.8%
D. Testing practices										
I don't know	25	14.5%	22	12.6%	5	25.0%	0	0.0%	5	12.2%
Not at all	35	20.2%	41	23.4%	4	20.0%	4	25.0%	10	24.4%
Slightly	19	11.0%	20	11.4%	2	10.0%	2	12.5%	6	14.6%
Somewhat	34	19.7%	32	18.3%	4	20.0%	1	6.3%	7	17.1%
Fairly	26	15.0%	25	14.3%	2	10.0%	4	25.0%	3	7.3%
Very	23	13.3%	23	13.1%	1	5.0%	3	18.8%	5	12.2%
Completely	11	6.4%	12	6.9%	2	10.0%	2	12.5%	5	12.2%

Table 1.C Needs for more information on specific intervention areas: the return-to-sport process.

	Total		Snow sports											
			Alpine Skiing (n=205)		Freestyle Skiing (n=93)		Snowboarding (n=72)		Cross-Country Skiing (n=85)		Ski Jumping (n=52)		Nordic Combined (n=31)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
E. Return-to-sport process														
I don't know	41	10.0%	13	7.4%	9	11.3%	5	8.6%	7	9.2%	4	8.0%	3	10.3%
Not at all	60	14.6%	22	12.6%	18	22.5%	8	13.8%	14	18.4%	4	8.0%	2	6.9%
Slightly	47	11.5%	19	10.9%	9	11.3%	7	12.1%	16	21.1%	8	16.0%	5	17.2%
Somewhat	71	17.3%	34	19.4%	13	16.3%	11	19.0%	9	11.8%	8	16.0%	6	20.7%
Fairly	61	14.9%	21	12.0%	12	15.0%	8	13.8%	10	13.2%	11	22.0%	8	27.6%
Very	76	18.5%	37	21.1%	12	15.0%	7	12.1%	12	15.8%	10	20.0%	5	17.2%
Completely	54	13.2%	29	16.6%	7	8.8%	12	20.7%	8	10.5%	5	10.0%	0	0.0%

Table 1.C *continued.*

	Stakeholder roles										Competition levels			
	Athletes (n=261)		Coaches (n=116)		Team staff (n=68)		Industry - SRS (n=5)		FIS representatives (n=13)		Youth competitions (n=205)		FIS competitions (n=327)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
E. Return-to-sport process														
I don't know	37	14.8%	3	2.9%	1	1.7%	1	20.0%	0	0.0%	11	6.2%	28	9.7%
Not at all	37	14.8%	15	14.3%	10	16.7%	0	0.0%	4	30.8%	24	13.5%	35	12.1%
Slightly	27	10.8%	9	8.6%	11	18.3%	1	20.0%	1	7.7%	21	11.8%	30	10.3%
Somewhat	44	17.6%	20	19.0%	8	13.3%	1	20.0%	0	0.0%	30	16.9%	49	16.9%
Fairly	31	12.4%	20	19.0%	13	21.7%	0	0.0%	2	15.4%	21	11.8%	46	15.9%
Very	40	16.0%	24	22.9%	9	15.0%	2	40.0%	4	30.8%	45	25.3%	60	20.7%
Completely	34	13.6%	14	13.3%	8	13.3%	0	0.0%	2	15.4%	26	14.6%	42	14.5%

Table 1.C *continued.*

	Competition levels									
	Continent Cups (n=197)		World Cup (n=198)		Master competitions (n=26)		Mass events (n=20)		Snow sports not governed by FIS (n=53)	
	n	%	n	%	n	%	n	%	n	%
E. Return-to-sport process										
I don't know	17	9.8%	18	10.3%	1	5.0%	0	0.0%	2	4.9%
Not at all	26	15.0%	33	19.0%	2	10.0%	0	0.0%	7	17.1%
Slightly	19	11.0%	23	13.2%	2	10.0%	6	37.5%	4	9.8%
Somewhat	33	19.1%	29	16.7%	6	30.0%	2	12.5%	7	17.1%
Fairly	27	15.6%	30	17.2%	0	0.0%	1	6.3%	6	14.6%
Very	32	18.5%	27	15.5%	3	15.0%	6	37.5%	9	22.0%
Completely	19	11.0%	14	8.0%	6	30.0%	1	6.3%	6	14.6%

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Table 1.A Responsibilities across prevention stages: development and dissemination.

	Total		Snow sports											
			Alpine Skiing (n=205)		Freestyle Skiing (n=93)		Snowboarding (n=72)		Cross-Country Skiing (n=85)		Ski Jumping (n=52)		Nordic Combined (n=31)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
A. Development														
Athlete	182	41.7%	69	33.7%	35	37.6%	22	30.6%	28	32.9%	31	59.6%	12	38.7%
Coach	273	62.6%	119	58.0%	54	58.1%	35	48.6%	40	47.1%	38	73.1%	17	54.8%
Team staff	249	57.1%	119	58.0%	56	60.2%	42	58.3%	46	54.1%	14	26.9%	19	61.3%
SRS/industry	96	22.0%	57	27.8%	19	20.4%	11	15.3%	12	14.1%	5	9.6%	7	22.6%
Regional/NSSA	185	42.4%	100	48.8%	32	34.4%	32	44.4%	32	37.6%	13	25.0%	11	35.5%
FIS	231	53.0%	116	56.6%	47	50.5%	34	47.2%	31	36.5%	21	40.4%	18	58.1%
Others	11	2.5%	6	2.9%	3	3.2%	2	2.8%	1	1.2%	0	0.0%	1	3.2%
B. Dissemination														
Athlete	155	35.6%	59	28.8%	25	26.9%	25	34.7%	28	32.9%	29	55.8%	12	38.7%
Coach	286	65.6%	121	59.0%	59	63.4%	51	70.8%	46	54.1%	37	71.2%	23	74.2%
Team staff	211	48.4%	102	49.8%	47	50.5%	39	54.2%	32	37.6%	17	32.7%	13	41.9%
SRS/industry	102	23.4%	60	29.3%	15	16.1%	18	25.0%	12	14.1%	7	13.5%	6	19.4%

Regional/NSSA	241	55.3%	118	57.6%	43	46.2%	39	54.2%	41	48.2%	21	40.4%	20	64.5%
FIS	248	56.9%	125	61.0%	49	52.7%	32	44.4%	42	49.4%	21	40.4%	19	61.3%
Others	15	3.4%	10	4.9%	3	3.2%	4	5.6%	2	2.4%	0	0.0%	0	0.0%

Table 1.A *continued.*

	Stakeholder roles										Competition levels			
	Athletes (n=261)		Coaches (n=116)		Team staff (n=68)		Industry - SRS (n=5)		FIS representatives (n=13)		Youth competitions (n=205)		FIS competitions (n=327)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
A. Development														
Athlete	128	49.0%	40	34.5%	19	27.9%	1	20.0%	6	46.2%	74	36.1%	131	40.1%
Coach	167	64.0%	76	65.5%	34	50.0%	2	40.0%	12	92.3%	118	57.6%	198	60.6%
Team staff	137	52.5%	75	64.7%	46	67.6%	2	40.0%	9	69.2%	105	51.2%	175	53.5%
SRS/industry	49	18.8%	33	28.4%	17	25.0%	2	40.0%	3	23.1%	32	15.6%	62	19.0%
Regional/NSSA	89	34.1%	70	60.3%	35	51.5%	0	0.0%	6	46.2%	89	43.4%	131	40.1%
FIS	125	47.9%	76	65.5%	34	50.0%	5	100.0%	6	46.2%	94	45.9%	166	50.8%
Others	5	1.9%	4	3.4%	3	4.4%	0	0.0%	0	0.0%	9	4.4%	5	1.5%
B. Dissemination														
Athlete	103	39.5%	34	29.3%	23	33.8%	0	0.0%	5	38.5%	71	34.6%	112	34.3%
Coach	171	65.5%	78	67.2%	44	64.7%	2	40.0%	9	69.2%	131	63.9%	206	63.0%
Team staff	113	43.3%	63	54.3%	41	60.3%	1	20.0%	7	53.8%	86	42.0%	145	44.3%
SRS/industry	50	19.2%	37	31.9%	20	29.4%	0	0.0%	1	7.7%	43	21.0%	66	20.2%
Regional/NSSA	126	48.3%	79	68.1%	45	66.2%	1	20.0%	9	69.2%	113	55.1%	172	52.6%
FIS	134	51.3%	77	66.4%	40	58.8%	5	100.0%	6	46.2%	99	48.3%	177	54.1%
Others	3	1.1%	7	6.0%	6	8.8%	0	0.0%	0	0.0%	12	5.9%	7	2.1%

Table 1.A *continued.*

	Competition levels									
	Continent (n=197)		World (n=198)		Master (n=26)		Mass (n=20)		Snow sports not governed by FIS (n=53)	
	n	%	n	%	n	%	n	%	n	%
A. Development										
Athlete	72	36.5%	78	39.4%	10	38.5%	10	50.0%	21	39.6%
Coach	118	59.9%	110	55.6%	14	53.8%	12	60.0%	26	49.1%
Team staff	115	58.4%	124	62.6%	12	46.2%	7	35.0%	29	54.7%
SRS/industry	45	22.8%	50	25.3%	8	30.8%	2	10.0%	12	22.6%
Regional/NSSA	82	41.6%	74	37.4%	14	53.8%	9	45.0%	26	49.1%
FIS	113	57.4%	114	57.6%	13	50.0%	6	30.0%	22	41.5%
Others	3	1.5%	4	2.0%	2	7.7%	0	0.0%	3	5.7%
B. Dissemination										
Athlete	62	31.5%	71	35.9%	3	11.5%	6	30.0%	22	41.5%
Coach	119	60.4%	116	58.6%	15	57.7%	12	60.0%	31	58.5%
Team staff	94	47.7%	98	49.5%	11	42.3%	8	40.0%	26	49.1%
SRS/industry	42	21.3%	45	22.7%	7	26.9%	3	15.0%	14	26.4%
Regional/NSSA	109	55.3%	99	50.0%	16	61.5%	14	70.0%	29	54.7%
FIS	117	59.4%	122	61.6%	12	46.2%	8	40.0%	26	49.1%
Others	3	1.5%	5	2.5%	2	7.7%	0	0.0%	4	7.5%

Table 1.B Responsibilities across prevention stages: implementation.

	Total		Snow sports											
			Alpine Skiing		Freestyle Skiing		Snowboarding		Cross-Country Skiing		Ski Jumping		Nordic Combined	
	n	%	(n=205)	(n=93)	(n=72)	(n=85)	(n=52)	(n=31)						
			n	%	n	%	n	%	n	%	n	%		
C. Implementation														
Athlete	337	77.3%	145	70.7%	60	64.5%	52	72.2%	53	62.4%	45	86.5%	25	80.6%
Coach	356	81.7%	158	77.1%	70	75.3%	54	75.0%	62	72.9%	40	76.9%	27	87.1%
Team staff	271	62.2%	127	62.0%	57	61.3%	45	62.5%	50	58.8%	19	36.5%	22	71.0%
SRS/industry	120	27.5%	65	31.7%	22	23.7%	19	26.4%	19	22.4%	12	23.1%	13	41.9%
Regional/NSSA	165	37.8%	77	37.6%	36	38.7%	31	43.1%	27	31.8%	17	32.7%	20	64.5%
FIS	210	48.2%	102	49.8%	43	46.2%	36	50.0%	26	30.6%	23	44.2%	22	71.0%
Others	18	4.1%	13	6.3%	2	2.2%	3	4.2%	3	3.5%	2	3.8%	2	6.5%

Table 1.B *continued.*

	Stakeholder roles										Competition levels			
	Athletes (n=261)		Coaches (n=116)		Team staff (n=68)		Industry - SRS (n=5)		FIS representatives (n=13)		Youth competitions (n=205)		FIS competitions (n=327)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
C. Implementation														
Athlete	214	82.0%	88	75.9%	45	66.2%	2	40.0%	9	69.2%	144	70.2%	232	70.9%
Coach	203	77.8%	109	94.0%	54	79.4%	2	40.0%	11	84.6%	158	77.1%	252	77.1%
Team staff	146	55.9%	83	71.6%	51	75.0%	3	60.0%	9	69.2%	113	55.1%	189	57.8%
SRS/industry	53	20.3%	47	40.5%	26	38.2%	3	60.0%	2	15.4%	48	23.4%	81	24.8%
Regional/NSSA	74	28.4%	64	55.2%	36	52.9%	1	20.0%	7	53.8%	77	37.6%	119	36.4%
FIS	104	39.8%	75	64.7%	37	54.4%	4	80.0%	5	38.5%	85	41.5%	147	45.0%
Others	8	3.1%	6	5.2%	5	7.4%	0	0.0%	1	7.7%	10	4.9%	8	2.4%

Table 1.B *continued.*

	Competition levels									
	Continent Cups (n=197)		World Cup (n=198)		Master competitions (n=26)		Mass events (n=20)		Snow sports not governed by FIS (n=53)	
	n	%	n	%	n	%	n	%	n	%
C. Implementation										
Athlete	131	66.5%	138	69.7%	17	65.4%	11	55.0%	36	67.9%
Coach	155	78.7%	146	73.7%	15	57.7%	14	70.0%	41	77.4%
Team staff	128	65.0%	137	69.2%	14	53.8%	11	55.0%	32	60.4%
SRS/industry	56	28.4%	69	34.8%	9	34.6%	6	30.0%	17	32.1%
Regional/NSSA	82	41.6%	82	41.4%	10	38.5%	10	50.0%	23	43.4%
FIS	107	54.3%	116	58.6%	10	38.5%	8	40.0%	26	49.1%
Others	4	2.0%	5	2.5%	4	15.4%	0	0.0%	1	1.9%

Supplementary file 13

Table 1 Knowledge dissemination preferences.

Communication tool	Total		Snow sport											
			Alpine Skiing (n=205)		Freestyle Skiing (n=93)		Snowboarding (n=72)		Cross-Country Skiing (n=85)		Ski Jumping (n=52)		Nordic Combined (n=31)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Book	88	20.2%	44	21.5%	14	15.1%	14	19.4%	16	18.8%	9	17.3%	7	22.6%
e-Book	132	30.3%	66	32.2%	25	26.9%	21	29.2%	23	27.1%	12	23.1%	9	29.0%
Magazine print	57	13.1%	34	16.6%	11	11.8%	5	6.9%	10	11.8%	2	3.8%	4	12.9%
Magazine digital	77	17.7%	41	20.0%	16	17.2%	8	11.1%	12	14.1%	11	21.2%	4	12.9%
Newsletter print	35	8.0%	21	10.2%	9	9.7%	5	6.9%	5	5.9%	2	3.8%	3	9.7%
Newsletter e-mail	137	31.4%	72	35.1%	23	24.7%	22	30.6%	29	34.1%	12	23.1%	9	29.0%
Podcasts audio	151	34.6%	73	35.6%	34	36.6%	22	30.6%	27	31.8%	11	21.2%	10	32.3%
Podcasts video	140	32.1%	74	36.1%	33	35.5%	20	27.8%	21	24.7%	10	19.2%	6	19.4%
Seminars	119	27.3%	61	29.8%	19	20.4%	18	25.0%	21	24.7%	17	32.7%	11	35.5%
Webinars	128	29.4%	67	32.7%	25	26.9%	23	31.9%	27	31.8%	18	34.6%	11	35.5%
Weblog	19	4.4%	7	3.4%	5	5.4%	6	8.3%	4	4.7%	4	7.7%	4	12.9%
Website	154	35.3%	77	37.6%	22	23.7%	18	25.0%	31	36.5%	23	44.2%	11	35.5%
Social media	125	28.7%	49	23.9%	26	28.0%	17	23.6%	28	32.9%	14	26.9%	4	12.9%
Testimonials personal	64	14.7%	33	16.1%	10	10.8%	10	13.9%	16	18.8%	8	15.4%	5	16.1%

Testimonials digital	49	11.2%	34	16.6%	11	11.8%	7	9.7%	10	11.8%	2	3.8%	1	3.2%
Other/s	10	2.3%	3	1.5%	5	5.4%	3	4.2%	1	1.2%	1	1.9%	0	0.0%

Table 1 *continued.*

Communication tool	Stakeholder roles										Competition levels			
	Athletes (n=261)		Coaches (n=116)		Team staff (n=68)		Industry - SRS (n=5)		FIS representatives (n=13)		Youth competitions (n=205)		FIS competitions (n=327)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Book	48	18.4%	26	22.4%	19	27.9%	2	40.0%	3	23.1%	36	17.6%	61	18.7%
e-Book	74	28.4%	39	33.6%	23	33.8%	2	40.0%	8	61.5%	54	26.3%	93	28.4%
Magazine print	39	14.9%	12	10.3%	7	10.3%	0	0.0%	3	23.1%	24	11.7%	40	12.2%
Magazine digital	50	19.2%	15	12.9%	10	14.7%	2	40.0%	7	53.8%	29	14.1%	58	17.7%
Newsletter print	20	7.7%	10	8.6%	4	5.9%	1	20.0%	3	23.1%	13	6.3%	26	8.0%
Newsletter e-mail	73	28.0%	39	33.6%	22	32.4%	3	60.0%	7	53.8%	71	34.6%	107	32.7%
Podcasts audio	98	37.5%	37	31.9%	18	26.5%	1	20.0%	5	38.5%	62	30.2%	108	33.0%
Podcasts video	80	30.7%	43	37.1%	16	23.5%	3	60.0%	4	30.8%	64	31.2%	104	31.8%
Seminars	51	19.5%	47	40.5%	27	39.7%	0	0.0%	7	53.8%	55	26.8%	92	28.1%
Webinars	47	18.0%	52	44.8%	37	54.4%	1	20.0%	6	46.2%	65	31.7%	94	28.7%
Weblog	11	4.2%	4	3.4%	4	5.9%	0	0.0%	1	7.7%	7	3.4%	14	4.3%
Website	101	38.7%	35	30.2%	22	32.4%	3	60.0%	3	23.1%	65	31.7%	119	36.4%
Social media	104	39.8%	13	11.2%	9	13.2%	0	0.0%	3	23.1%	55	26.8%	99	30.3%
Testimonials personal	41	15.7%	14	12.1%	12	17.6%	0	0.0%	2	15.4%	27	13.2%	49	15.0%
Testimonials digital	31	11.9%	12	10.3%	8	11.8%	1	20.0%	2	15.4%	22	10.7%	38	11.6%
Other/s	4	1.5%	4	3.4%	3	4.4%	0	0.0%	0	0.0%	4	2.0%	5	1.5%

Table 1 *continued.*

Communication tool	Competition levels									
	Continent Cups (n=197)		World Cup (n=198)		Master competitions (n=26)		Mass events (n=20)		Snow sports not governed by FIS (n=53)	
	n	%	n	%	n	%	n	%	n	%
Book	38	19.3%	38	19.2%	4	15.4%	4	20.0%	10	18.9%
e-Book	56	28.4%	60	30.3%	7	26.9%	6	30.0%	15	28.3%
Magazine print	20	10.2%	19	9.6%	6	23.1%	2	10.0%	4	7.5%
Magazine digital	34	17.3%	27	13.6%	5	19.2%	4	20.0%	6	11.3%
Newsletter print	15	7.6%	13	6.6%	5	19.2%	1	5.0%	6	11.3%
Newsletter e-mail	66	33.5%	48	24.2%	12	46.2%	8	40.0%	19	35.8%
Podcasts audio	74	37.6%	62	31.3%	7	26.9%	7	35.0%	14	26.4%
Podcasts video	68	34.5%	54	27.3%	8	30.8%	4	20.0%	12	22.6%
Seminars	55	27.9%	55	27.8%	7	26.9%	8	40.0%	13	24.5%
Webinars	65	33.0%	63	31.8%	9	34.6%	9	45.0%	20	37.7%
Weblog	9	4.6%	7	3.5%	2	7.7%	2	10.0%	3	5.7%
Website	67	34.0%	59	29.8%	12	46.2%	7	35.0%	10	18.9%
Social media	57	28.9%	36	18.2%	2	7.7%	4	20.0%	7	13.2%
Testimonials personal	26	13.2%	29	14.6%	3	11.5%	1	5.0%	9	17.0%
Testimonials digital	24	12.2%	23	11.6%	3	11.5%	1	5.0%	8	15.1%
Other/s	4	2.0%	7	3.5%	1	3.8%	0	0.0%	3	5.7%