

# Snow parks: Safety Analysis and Injury Prevention

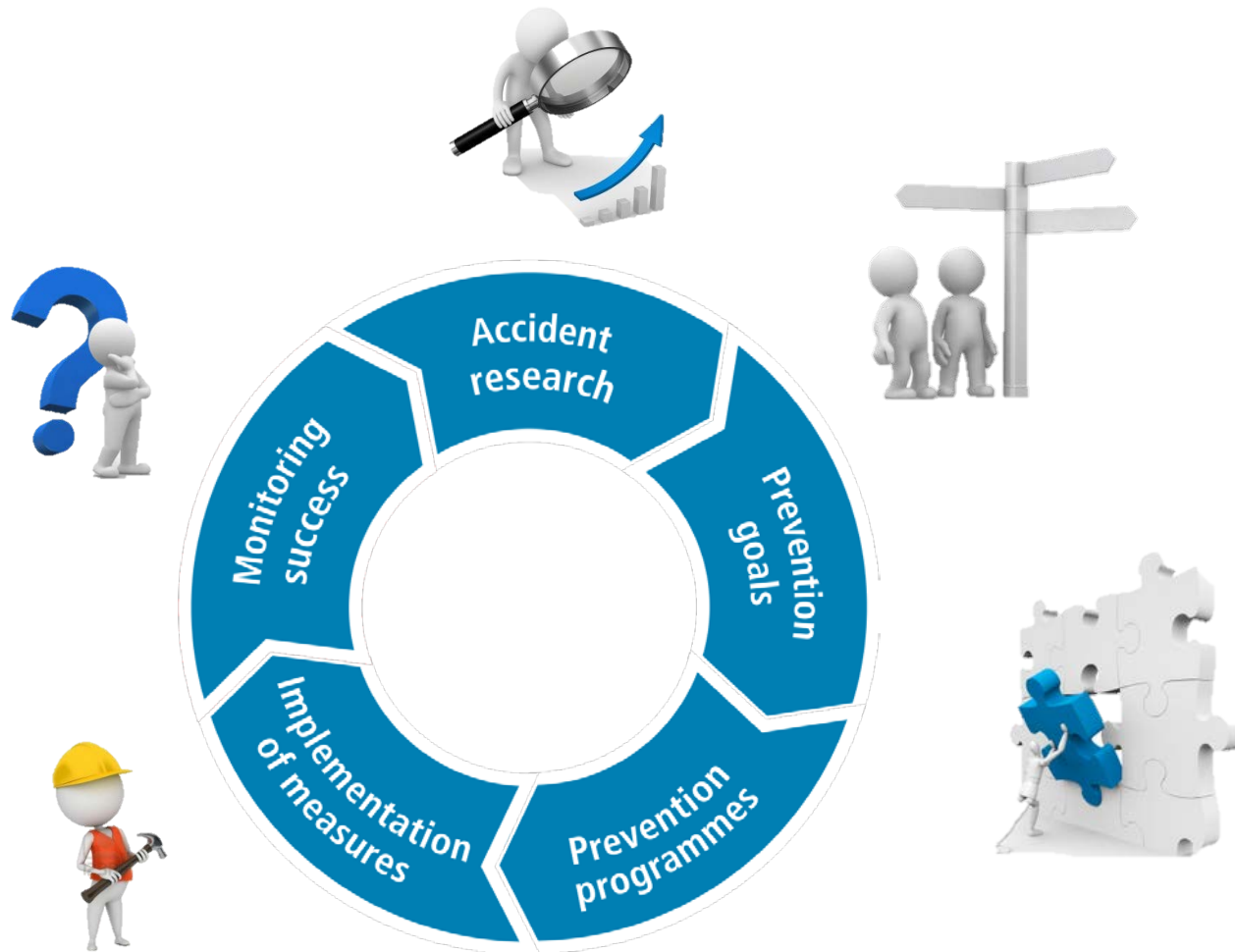
36<sup>th</sup> SITEMSH Congress, 13.03.18. Arosa

Othmar Brügger, MSc, teamleader sports research  
o.bruegger@bfu.ch – [www.bfu.ch](http://www.bfu.ch)

Flavia Bürgi, PhD, Research associate, Research



# Prevention is directed by findings from accident analysis and research



# Accident Research: 3 research questions



Accident research  
comprises 3 part-steps

### Accident analysis



**What happens?**

### Risk analysis



**Why does it happen?**

### Interventions analysis



**How to prevent it?**



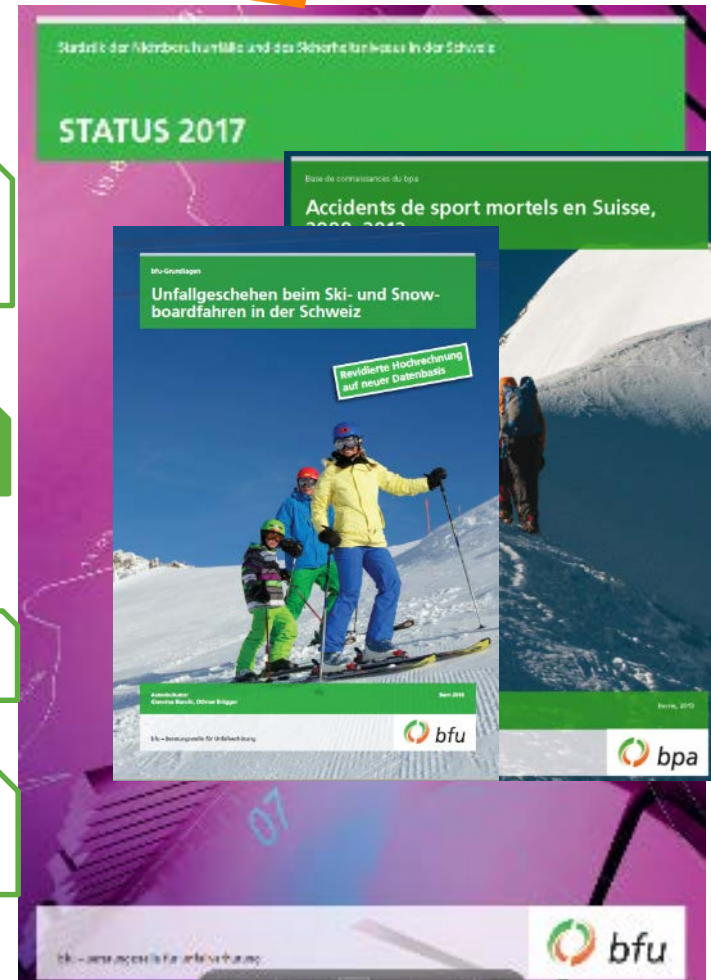
## Data sources

UVG-statistic: Central Office for Statistics in Accident Insurance (SSUV)

Special Household survey; bfu

bfu statistics on fatal sports accidents

bfu statistics on the transportation of persons injured in snowsports



# bfu statistics on the transportation of persons injured in snowsports

- cooperation with cableway companies
- 12'000 injured persons/a



## Unfall erfassen

### Neuen Unfall erfassen

(\* = Pflichtfelder)

Unfalldaten    Personendaten    Verletzungen    Zeugen    Fotos

### Unfalldatum und -zeit

Unfalldatum \*

Unfallzeit \*

### Alarm- und Rettungszeiten

Alarmzeit

Eintreffen Rettungsdienst

Übergabe an medizinischen Dienst

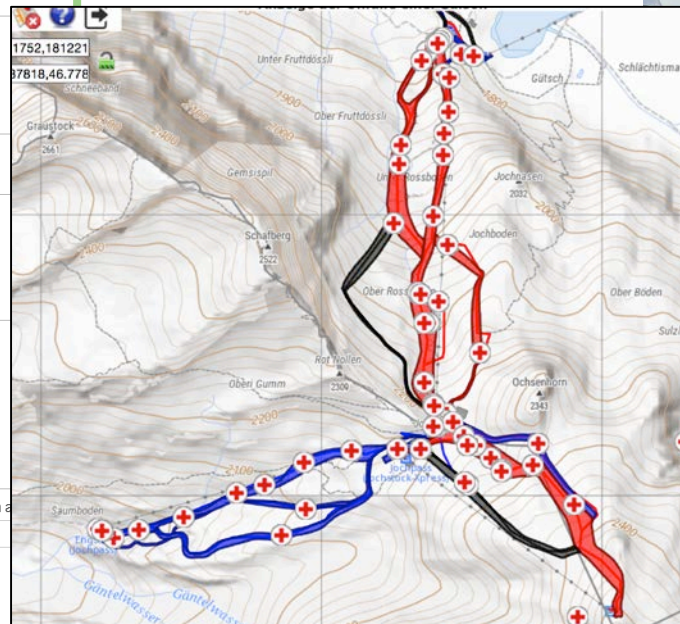
### Unfallort

Bitte geben Sie die Koordinaten im Schweizer Koordinatensystem an

X-Koordinate / Y-Koordinate \*  
(6-stellige Zahl, ohne Sonderzeichen)

[internationale koordinaten](#)

[karte anzeigen](#)



# bfu statistics on the transportation of persons injured


**Seilbahnen Schweiz**  
 Remontées Mécaniques Suisses  
 Funivie Svizzera

maps

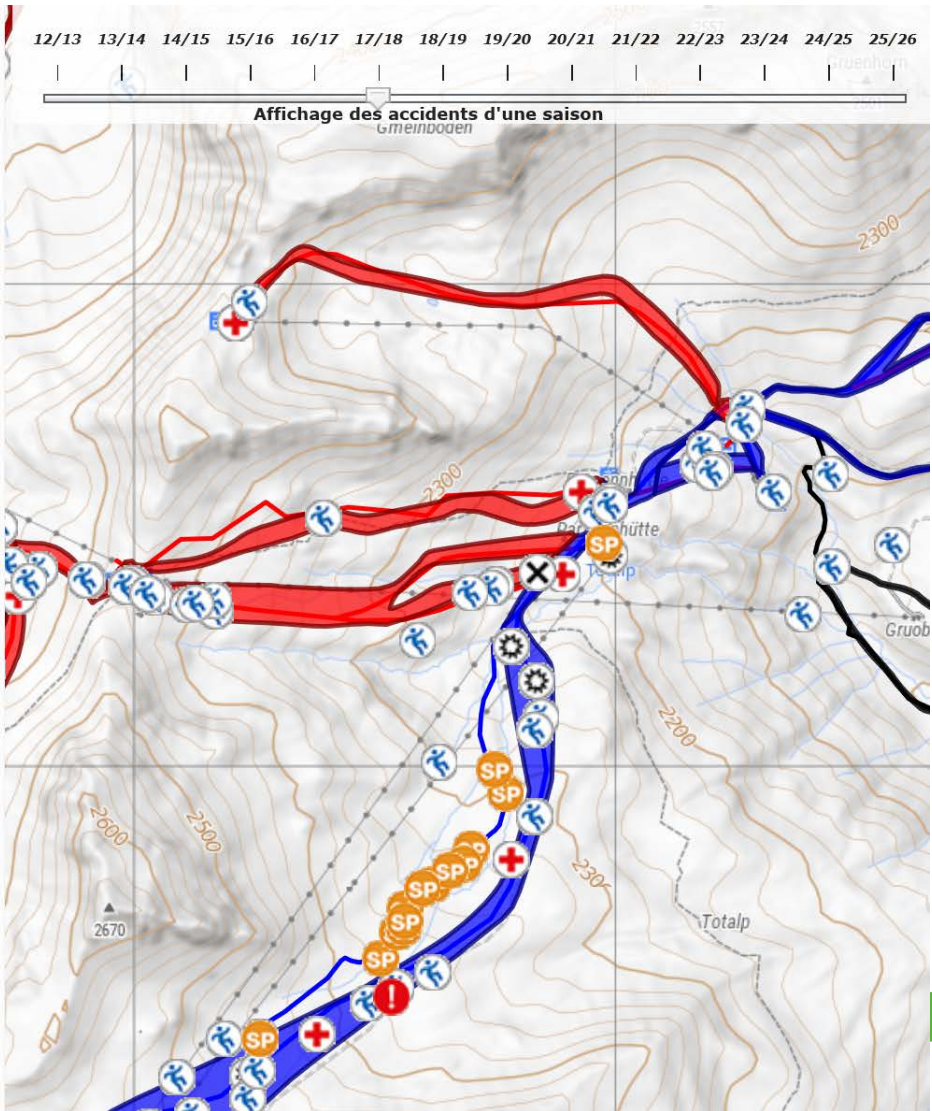
Accidents

- Tous les accidents
- Collisions
- Accidents individuels
- Blessures graves ou ayant entraîné la mort
- Accidents aux croisements
- Accidents dans les snowparks

Infrastructure

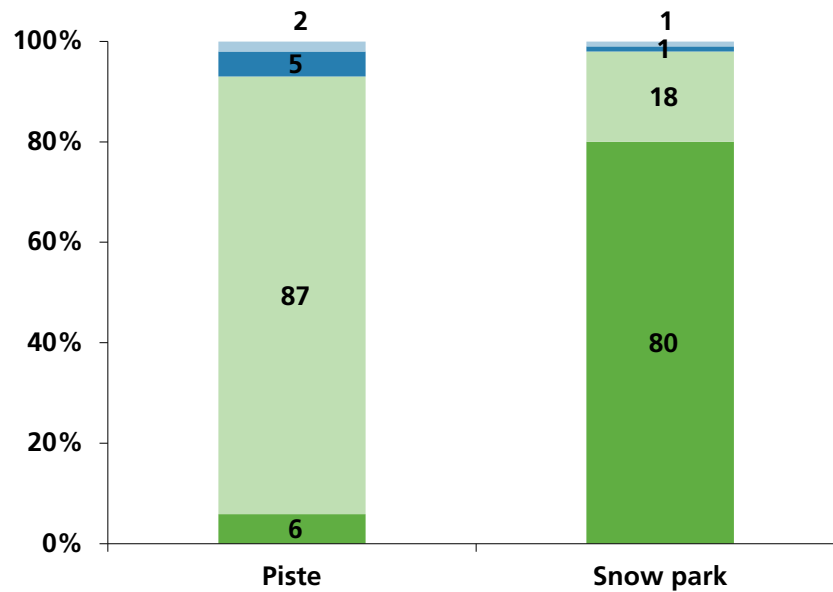
- Pistes de ski (représentation exacte)
- Pistes de ski (simplifiées) **Modifier**
- Remontées mécaniques: Informations
- Remontées mécaniques: Tracés
- Remontées mécaniques: Stations, pylônes
- Pente / [Légende](#)

analyses  
apps



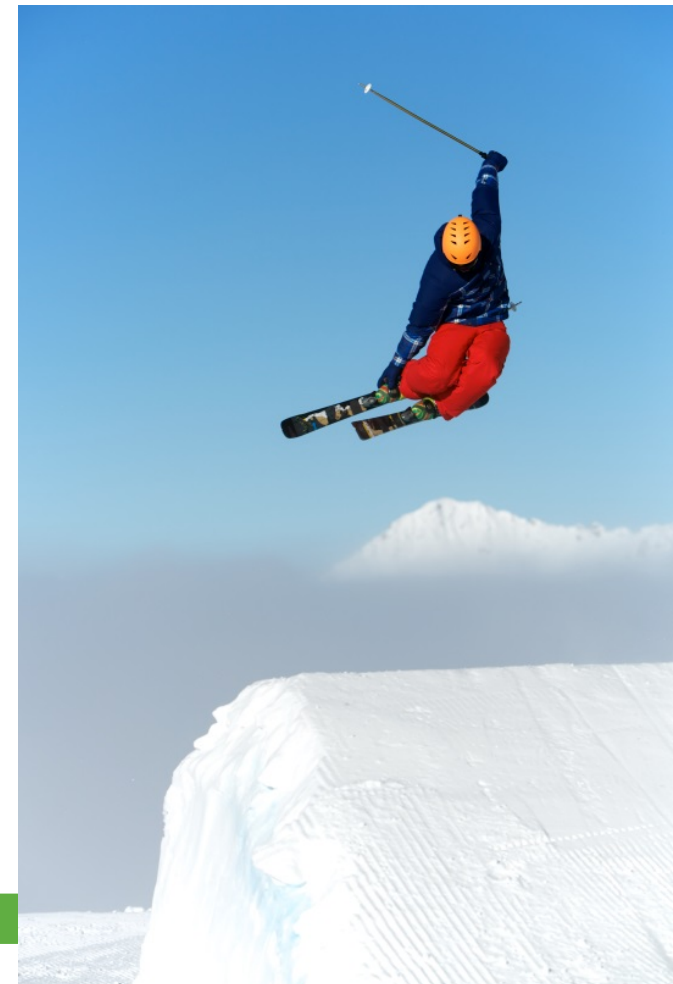
Coordonnées suisses 781336,192066  
 Lon,Lat 9.81679,46.85499

# Persons injured, by accident location and accident circumstance. Age group 10 – 30 y. Ø 2012–2017.

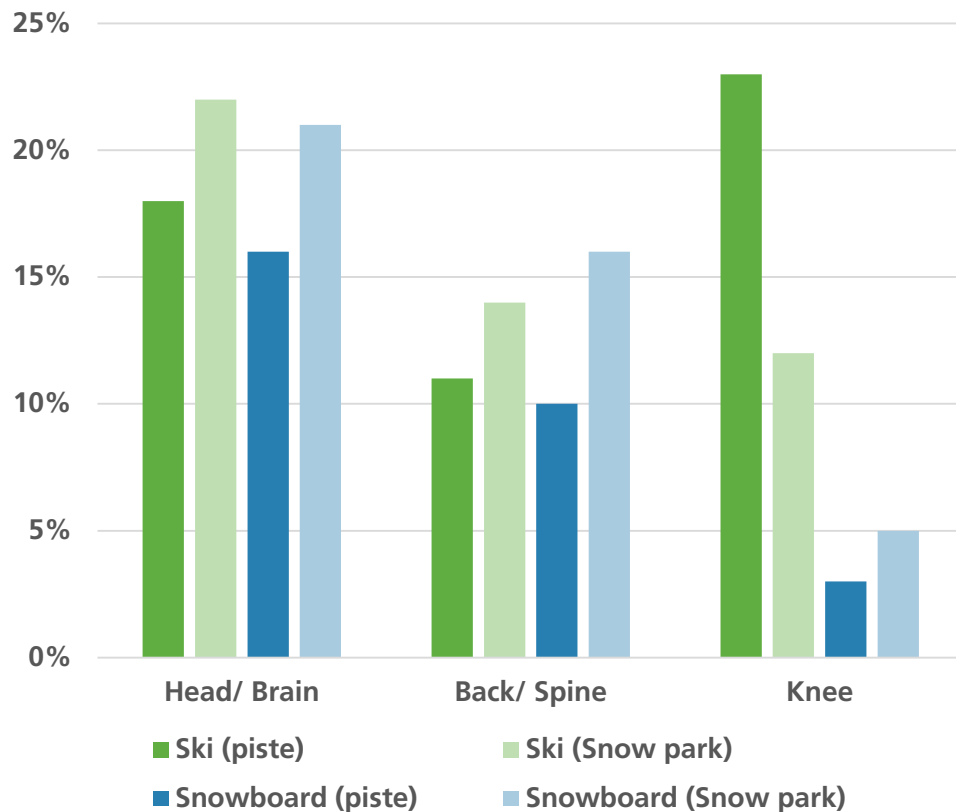


- Collision with object
- Collision with person
- Accident due to own fault without jump
- Accident due to own fault after a jump

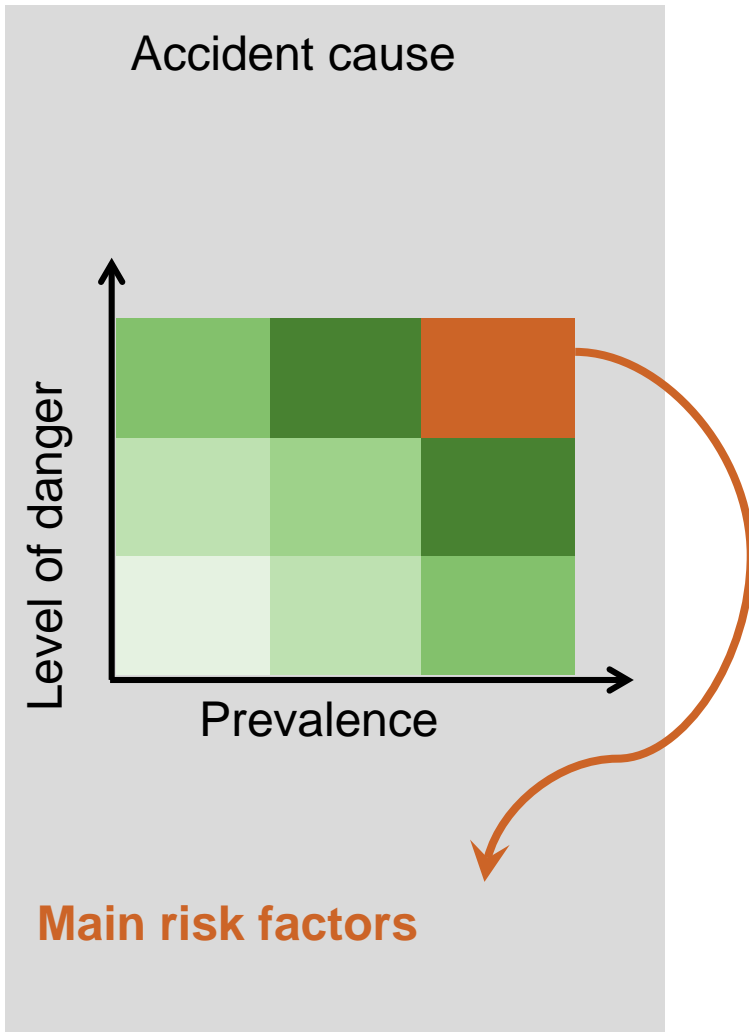
Injured persons recorded:  
skiing 38,774  
snowboarding 8,923



# Injury localisation by type of sport and accident localisation. 10-30y, Ø 2012–2017



Persons recorded:  
 skiing 38,774  
 snowboarding 8,923



## Knowledge management: Evidence?

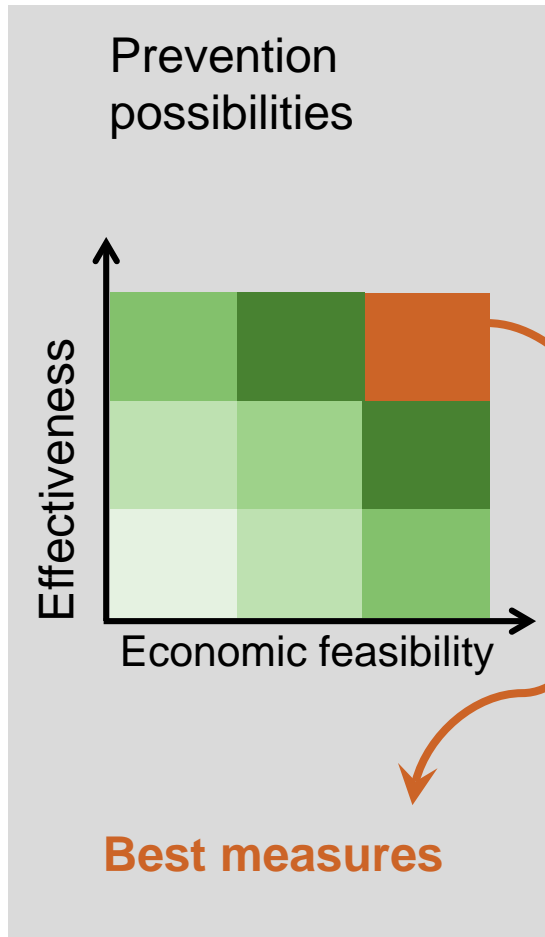
(non representative selection)

- Aegerter, Samuli, CH
- Böhm & Senner, TU München, DE
- Brooks, Rivera et al. USA
- Cartus, (ES)
- Goulet, Hagel, Russel, Meeuwisse et al., CAN
- Hubbard, McNeil, Swedberg et al. Davis, CA (USA)
- LaHard, Worcester PolyTec Inst. (USA)
- Laporte, Binet, et al. Médecins de Montagne (FR)
- McAlpine et al. (NZ)
- Soulé et al. (FR)
- Ruedl et al. Uni Innsbruck (AT)
- Müller et al. Uni Salzburg (AT)
- Scher, Shealy, Stepha et al. WA, CA, NY (USA)

# Injury Control Strategy: Haddon-Matrix

Phase	Agent: human	Vector: energy	Environment
Pre-event	Risk behaviour	Speed	Slope design
	Readiness Skiing skills	Equipment	Visibility
Event	Fall experience Constitution	Helmet-wearing PPE	Collision object
Post-event	Compliance Age	First Aide	Rescue service

# Intervention analysis



## Original article

### National Strategy for Preventing Injuries from Skiing and Snowboarding in Switzerland

Giannina Bianchi<sup>1</sup>, Othmar Brügger<sup>1</sup>

<sup>1</sup> bfu – Swiss Council for Accident Prevention, Research Department, Berne, Switzerland

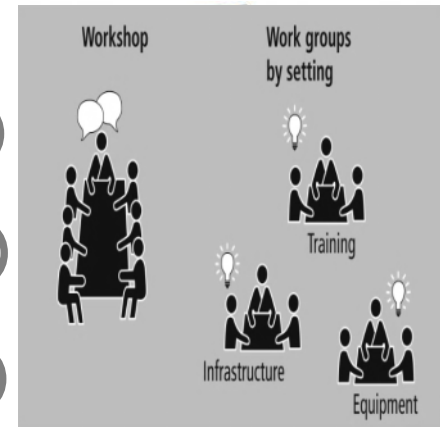
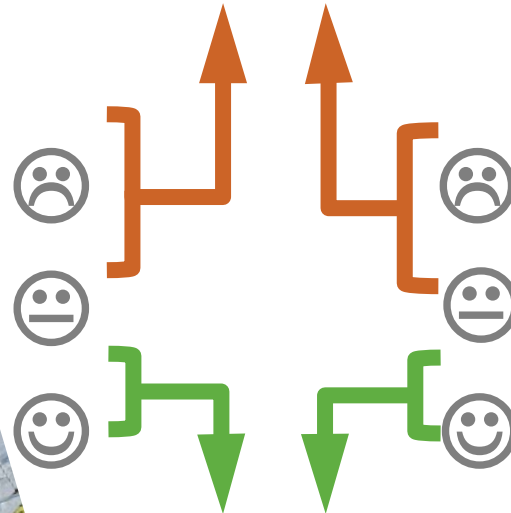
**SWISS**  
**SPORTS &**  
**EXERCISE**  
**MEDICINE**

63 (2), 6-12, 2015

# Prevention programme: evidence into practice

## Workshop with all Stakeholders

A programme contains  
a clearly defined  
package of measures




# Prevention recommendations: five main areas


**Research**



**Accident research**



**Knowledge management**



**Studies in focal topics**

**Training**



**Education at schools**



**Vocational education coaches**

**Advice**



**Skiing area design incl. snow parks**




**bfu safety label**




**Product Safety law**

**Product standardization**


**Communication**



**Skiing and Snowboarding**




**Avantstiches can kill**

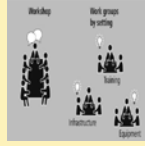


**Evaluation der bfu-Prüfungskampagne im Schneesport**


**Cooperation**



**bfu-Priority programme**



**Member in Commissions**



**International Exchange**

# Design of snow parks

Congress of the International Society for Skiing Safety ISSS, Innsbruck, 2017

bfu-Fachdokumentation 2.081

## Snowparks



Autor: Marc Weiler Bern 2013



## Information panel in the parks

Swiss Commission for the  
Prevention of Accidents on  
Snowsport Runs **SKUS**

Founders:

Swiss Council for Accident  
Prevention bfu

Swiss Snowsports

Swiss Ski Federation

Swiss-Ski

Cableways Switzerland SBS

Association of Public Transport VÖV

# SNOWPARK

**DE**

Denke daran, dass sich die Bedingungen laufend verändern und die FIS-Regeln und SKUS-Richtlinien auch hier gelten.



**erst schauen  
dann springen**



**plane  
deinen Lauf**



**geh es  
langsam an**



**Respekt  
verdient Respekt**



**small**  
Diese Elemente weisen eine geringe Absturzhöhe auf und sind fahrbar (auch für Snowpark-Einsteiger).

**FR**

N'oubliez pas que les conditions changent en permanence, et que les règles de la FIS et les directives de la SKUS sont aussi valables ici.

**regarde avant  
de sauter**

**planifie  
ton passage**

**vas-y  
gentiment**

**le respect  
invite au respect**

**small**  
La hauteur de chute de ces éléments est peu importante et ils peuvent être parcourus en glissant (aussi par les novices dans les snowparks).

**IT**

Ricorda che le condizioni cambiano costantemente e che le regole FIS e le direttive SKUS valgono anche negli snowpark.

**controlla prima  
di saltare**

**pianifica  
la discesa**

**progredisci un  
passo per volta**

**rispetto  
chiede rispetto**

**small**  
Questi elementi hanno un'esigua altezza di caduta e sono utilizzabili (anche dagli iniziati) snowpark).

**EN**

Keep in mind that the conditions are constantly changing, and that the FIS rules and SKUS guidelines also apply here.

**look before  
you leap**

**make  
a plan**

**easy  
style it**

**respect  
gets respect**

**small**  
These elements have a low fall height and are rideable (even for snowpark beginners).

## Start small and work your way up.



# Teach the teachers

## Snow-Safety-Kartenset

Unterrichtskarten für die Sicherheit beim Skifahren und Snowboarden



bfu – Beratungsstelle für Unfallverhütung



## VIII. Verhalten im Snowpark



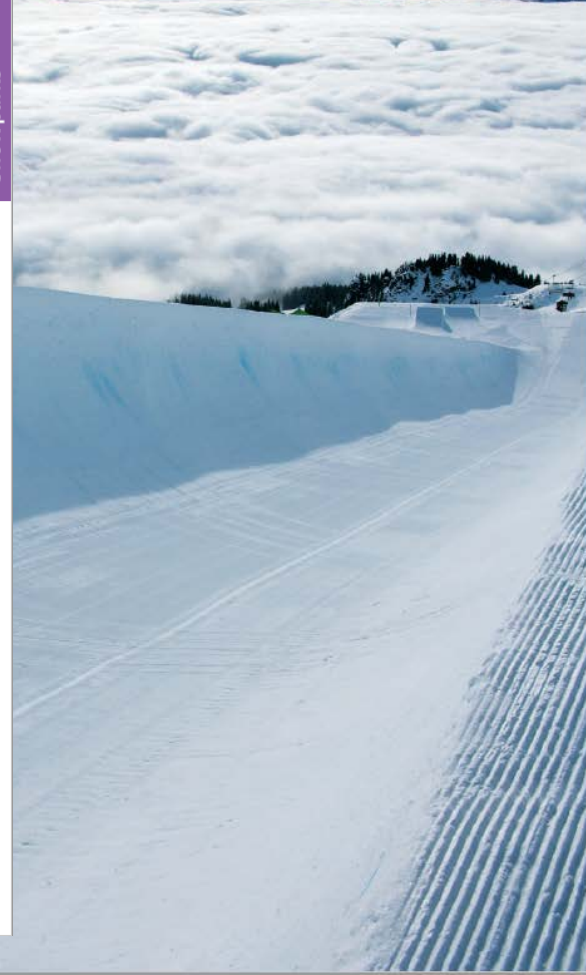
# SNOWPARK

DE	FR	IT	EN
<p><small>Denke daran, dass sich die Bedingungen während verändernden die FIS-Regeln und SICU Richtlinien auch hier gelten.</small></p> <p><b>erst schauen dann springen</b></p> <p><b>plane deinen Lauf</b></p> <p><b>geh es langsam an</b></p> <p><b>Respekt verdient Respekt</b></p> <p><small>small</small> Dovei farverto veitast einu gættu áhrstúðulei naf und þú fætur! (auch für Snowpark freigelegt)</p>	<p><small>N'oublie pas que les conditions changent en permanence, et que les règles de la FIS et les directives de la SICU s'appliquent aussi ici.</small></p> <p><b>regarde avant de sauter</b></p> <p><b>planifie ton passage</b></p> <p><b>vas-y gentiment</b></p> <p><b>le respect invite au respect</b></p> <p><small>small</small> La facilité de chute de ces éléments est plus importante et tu pourrais être parcourus en glissant (aussi par les novices dans un snowpark).</p>	<p><small>Ricorda che le condizioni cambiano costantemente e che le regole FIS e le direttive SICU valgono anche negli snowpark.</small></p> <p><b>controlla prima di saltare</b></p> <p><b>planifica la discesa</b></p> <p><b>progredisci un passo per volta</b></p> <p><b>rispetto chiede rispetto</b></p> <p><small>small</small> Questi elementi hanno un'alta altezza e sono difficili e sono utilizzati anche dagli esperti snowpark!</p>	<p><small>Keep in mind that the conditions are constantly changing and that the FIS rules and SICU guidelines also apply here.</small></p> <p><b>look before you leap</b></p> <p><b>make a plan</b></p> <p><b>easy style it</b></p> <p><b>respect gets respect</b></p> <p><small>small</small> These elements have a low fall height and are difficult even for snowpark beginners.</p>

## Start small and work your way up.

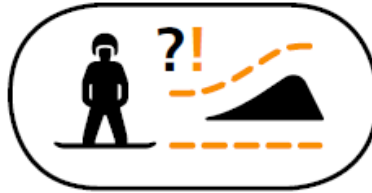
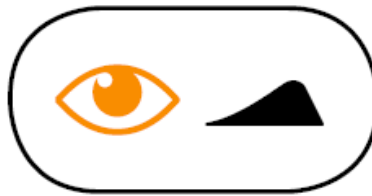


Snowparks



# Skiing and Snowboarding

Fun on the slopes



small

## Conduct in Snow parks



- Markings & Signage
- Helmet, Wrist Protectors, Back protectors
- FIS rules
- Ski binding adjustment

Swiss Competence and  
Coordination Centre for  
Accident Prevention

thanks for your interest

[www.bfu.ch](http://www.bfu.ch)



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**Swiss Council  
for Accident Prevention**

