

Keep our Para athletes healthy

- Injury and illness surveillance of elite athletes, the Norwegian Olympic team experience

Kathrin Steffen

Senior researcher

Oslo Sports Trauma Research Center | Norwegian School of Sport Sciences

Norwegian Olympic Training Center (Olympiatoppen) | Oslo | Norway

Keep our Para athletes healthy

- International health surveillance/monitoring and research programs
 - Paralympics Games
 - Longitudinal health monitoring in German and Swedish elite para sport
- Norwegian Olympic team experience



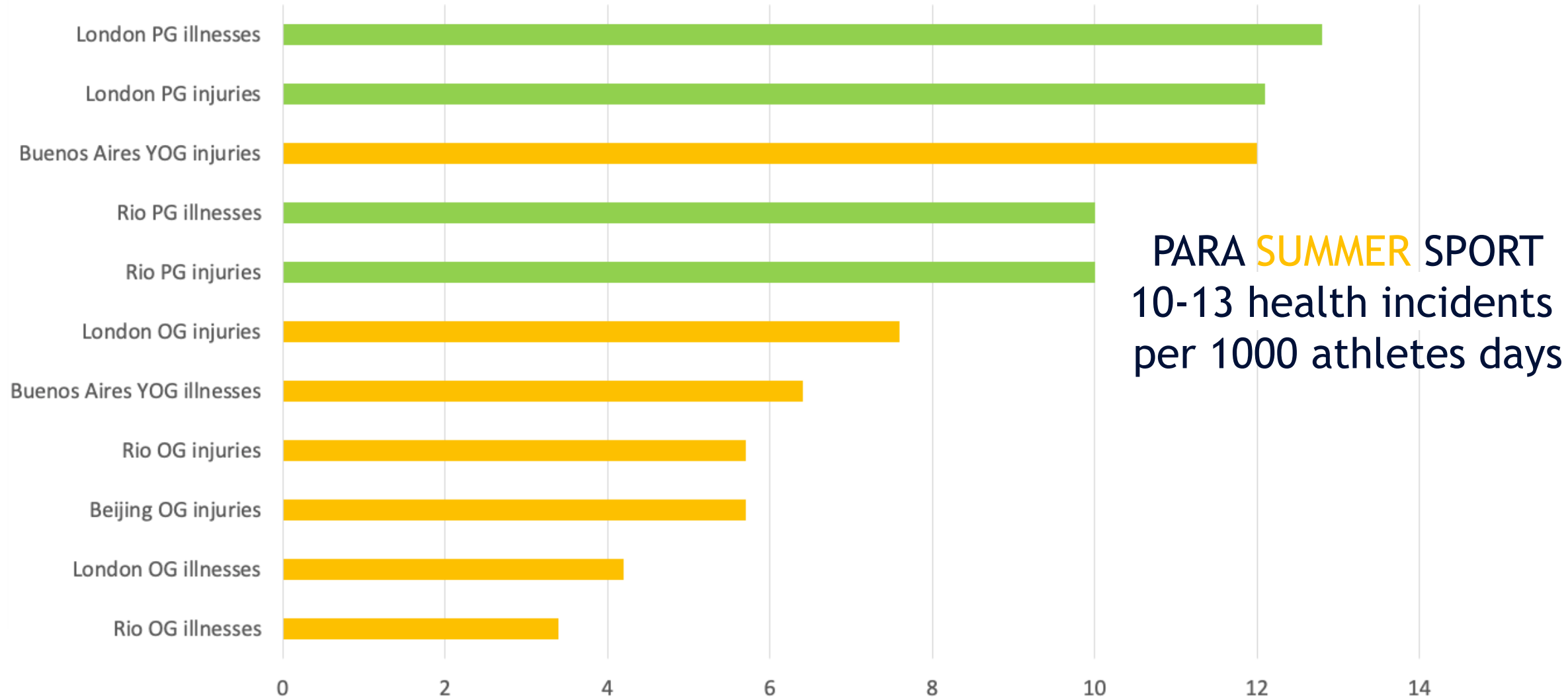
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SUMMER - Comparison Paralympics vs Olympics

Summer Games - Incidence per 1000 athlete days





telenor

Alpine Ski
FONDAZIONE TERZO PILASTRO
ITALIA E MIO TERRANO

79

tesler

LISK
SPORT EQUIPMENT
MADE IN ITALY

High incidence of injury at the Sochi 2014 Winter Paralympic Games: a prospective cohort study of 6564 athlete days

W Derman,^{1,2,3} M P Schwellnus,^{2,3,4} E Jordaan,⁵ P Runciman,¹ P Van de Vliet,⁶ C Blauwet,⁷ N Webborn,⁸ S Willick,⁹ J Stomphorst¹⁰

ABSTRACT

Objective To describe the epidemiology of injuries at the Sochi 2014 Winter Paralympic Games.

Methods A total of 547 athletes from 45 countries were monitored daily for 12 days during the Sochi 2014 Winter Paralympic Games (6564 athlete days). Daily

from the able-bodied sport to accommodate for the athletes' impairment type, resulting in specific rule and regulation changes within the sports.⁴ The sport of snowboarding was introduced for the first time at the Sochi Games and has been adapted from the able-bodied version of the sport where a group of four athletes proceed down the course at



Patterns of illness at the Sochi 2014 Winter Paralympic Games: a prospective cohort study of 6564 athlete days

W Derman,^{1,2,3} M P Schwellnus,^{2,3,4} E Jordaan,⁵ P Runciman,¹ P Van de Vliet,⁶ C Blauwet,⁷ N Webborn,⁸ S Willick,⁹ J Stomphorst¹⁰

ABSTRACT

Objective To describe the epidemiology of illness at the Sochi 2014 Winter Paralympic Games.

Methods A total of 547 athletes from 45 countries were monitored daily for 12 days over the Sochi 2014 Winter Paralympic Games (6564 athlete days). Illness data were obtained daily from teams without their own medical support (13 teams, 37 athletes) and teams with

as proportion of athletes with an illness was higher compared to data from studies conducted in similar able-bodied athlete populations.⁷⁻⁹ This study concluded that a population of athletes with impairment might be at higher risk of developing illness by nature of their underlying impairment.^{10,11}

The International Paralympic Committee (IPC) adopted a Medical Code in 2011 which

High incidence of injuries at the Pyeongchang 2018 Paralympic Winter Games: a prospective cohort study of 6804 athlete days

Wayne Derman,^{1,2} Phoebe Runciman,^{1,2} Esme Jordaan,^{3,4} Martin Schwellnus,^{5,6} Cheri Blauwet,⁷ Nick Webborn,⁸ Jan Lexell,⁹ Peter van de Vliet,¹⁰ James Kissick,¹¹ Jaap Stomphorst,¹² Young-Hee Lee,¹³ Keun-Suh Kim¹⁴

ABSTRACT

Objective To describe the epidemiology of sports injury at the Pyeongchang 2018 Paralympic Winter Games.

Methods 567 athletes from 49 countries were monitored daily for 12 days over the Pyeongchang 2018 Paralympic Winter Games (6804 athlete days). Injury data were obtained daily from teams with their own medical support (41 teams and 557 athletes) and teams without their own medical support (8 teams and 10

athlete days. The overall IR of the 12-day Sochi 2014 Paralympic Winter Games was 26.5 injuries per 1000 athlete days (95% CI 22.7 to 30.8).⁴ The combined sports of para alpine skiing and para snowboard (a sub sport of the Sochi Games) had the highest IR of 41.1 [95% CI 33.3 to 48.9] injuries per 1000 athlete days, with all other sports having an IR of 20.0 to 30.0 injuries per 1000 athlete days.



Incidence rate and burden of illness at the Pyeongchang 2018 Paralympic Winter Games: a prospective cohort study of 6804 athlete days

Wayne Derman,^{1,2} Phoebe Runciman,^{1,2} Esme Jordaan,^{3,4} Martin Schwellnus,^{2,5} Cheri Blauwet,⁶ Nick Webborn,⁷ Jan Lexell,⁸ Peter van de Vliet,⁹ James Kissick,¹⁰ Jaap Stomphorst,¹¹ Young-Hee Lee,¹² Keun-Suh Kim¹³

ABSTRACT

Objective To describe the incidence rate (IR) and illness burden (IB) at the Pyeongchang 2018 Paralympic Winter Games.

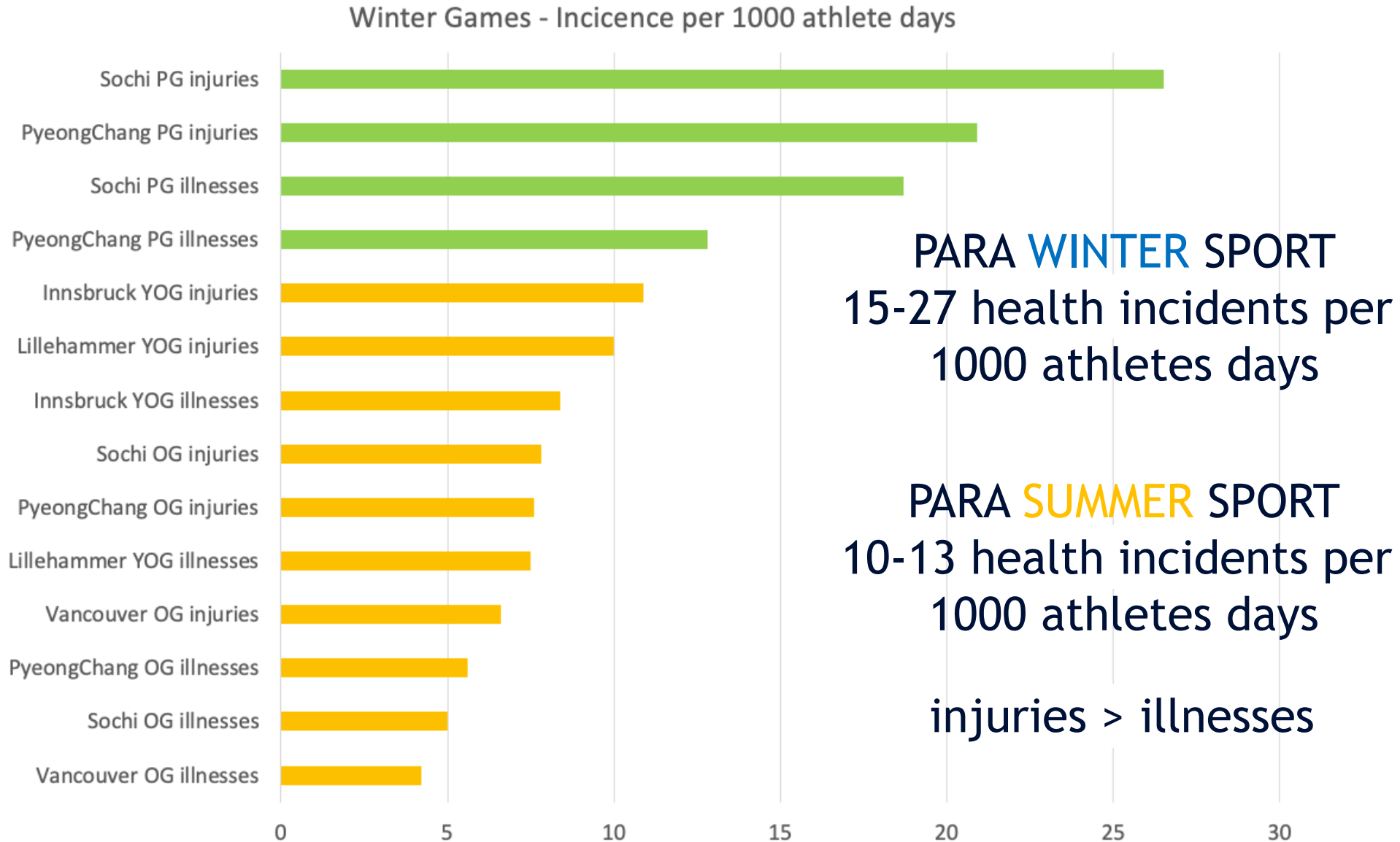
Methods A total of 567 athletes from 49 countries were monitored for 12 days over the Pyeongchang 2018 Games (6804 athlete days). Illness data were obtained daily from teams with (41 teams, 557 athletes) and teams without (8 teams, 10 athletes) their own medical support, through electronic data capturing systems.

Results There were 87 illnesses reported, with an

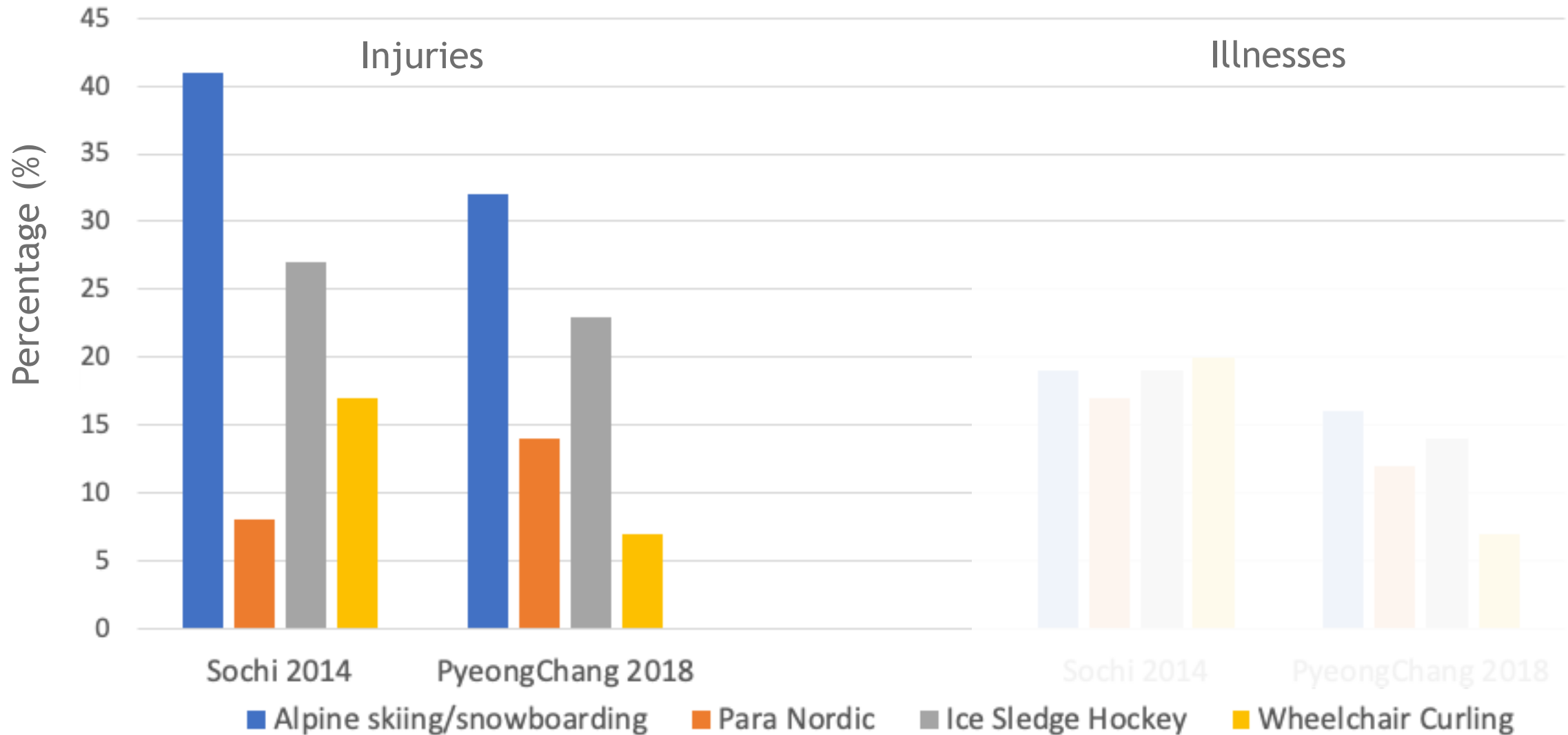
What are the findings?

- This was the first study to document both the incidence rate and burden of illness per 1000 athlete days at a Winter Paralympic Games.
- The sport with the highest incidence rate of illness was Para snowboard, and illnesses were most commonly reported in the skin and subcutaneous system in this sport.
- Illnesses were most common in the respiratory system, skin and subcutaneous system, and eye.

WINTER - Comparison Paralympics vs Olympics

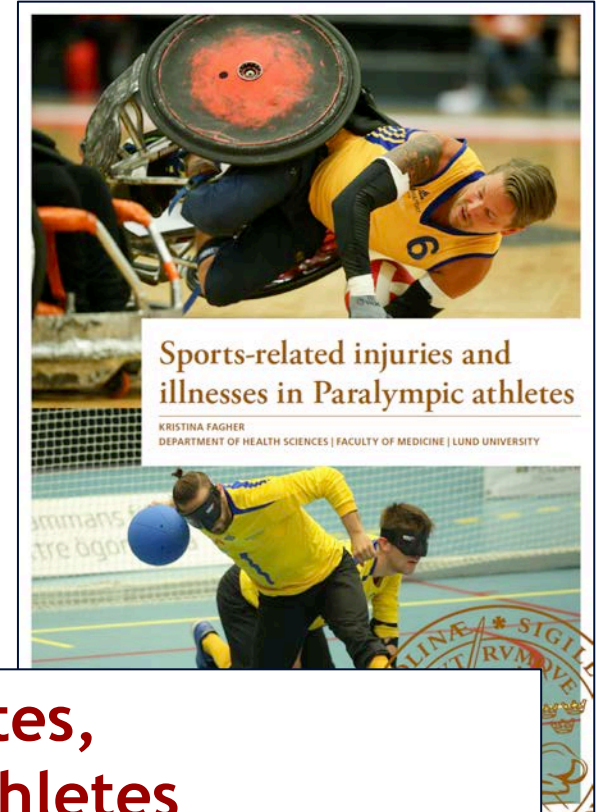


Sochi 2014 versus PyeongChang 2018



2 longitudinal para sport data sets

**52 weeks, 107 athletes,
where of 20 winter sport athletes (4 sports)**



Injuries and illnesses in Swedish Paralympians - a prospective study of incidence and risk factors



**29 weeks, 58 athletes,
all summer sport athletes**

Kristina Fagher¹  | Örjan Dahlström^{2,3}  | Je
Toomas Timpka²  | Jan Lexell¹ 

**Injury and illness surveillance in elite Paralympians - urgent need for suitable
illness prevention strategies in para athletes**

Hardly any longitudinal data on winter sport athletes !

²Department of Medical and Health Sciences, Athletics Research Center, Linköping University, Linköping, Sweden

³Department of Behavioural Sciences and

this study was to describe the injuries and illnesses among Swedish Paralympians

Methods: Swedish Paralympians

Anja Hirschmüller^{1,2}, Katharina Fassbender¹, Johanna Kubosch¹, Reiner Leonhart³,

Kathrin Steffen⁴

Challenges providing medical support to an Olympic & Paralympic team

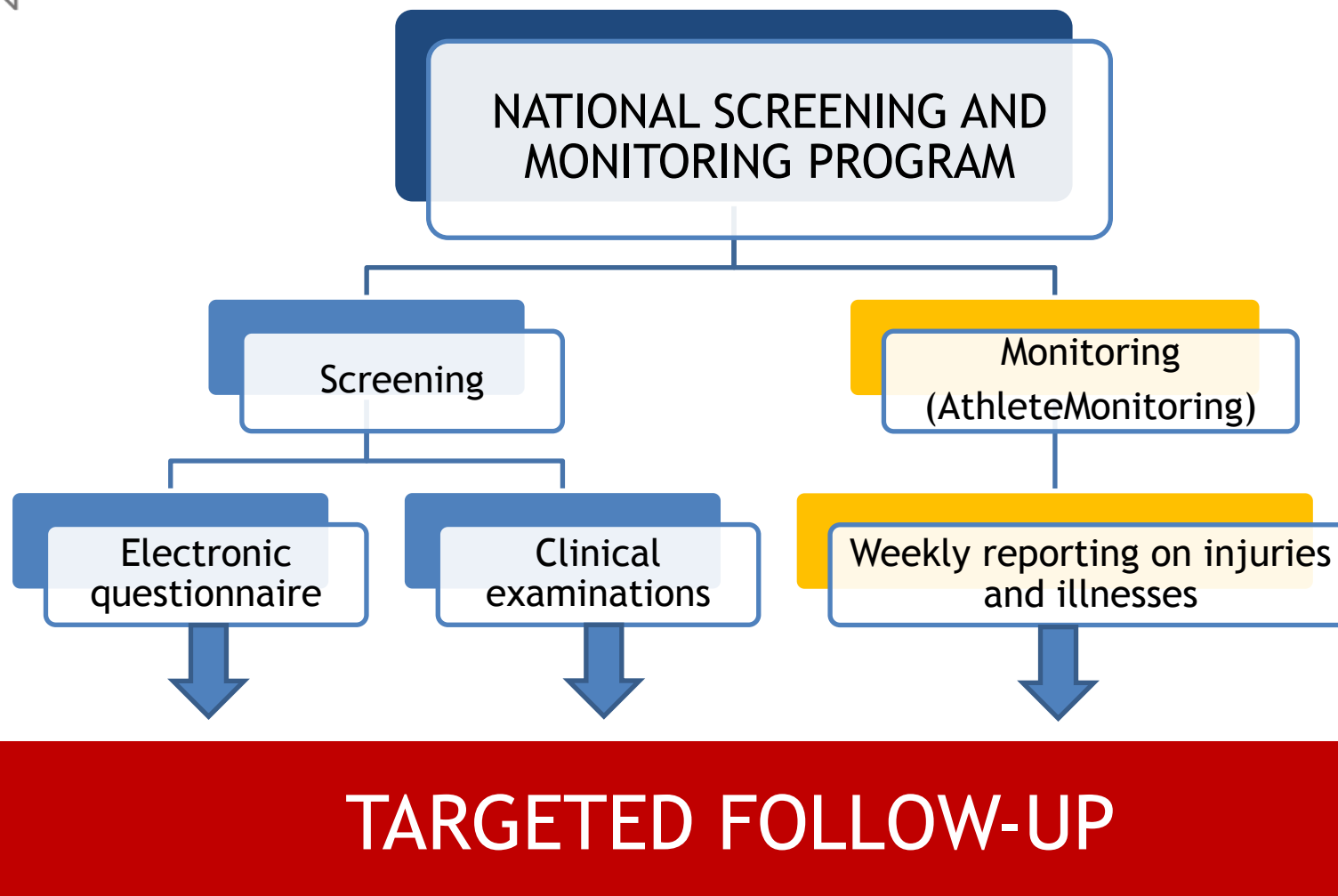
- High-quality prospective injury and illness data relies on close and consistent contact between athletes and their medical staff
- Athletes live all over the world & travel constantly
- Few sports have year-round medical coverage (huge problem in para sport)
- Athletes relate to multiple medical providers
 - Olympic Training Centre
 - National team
 - Professional team/club
 - Local support network

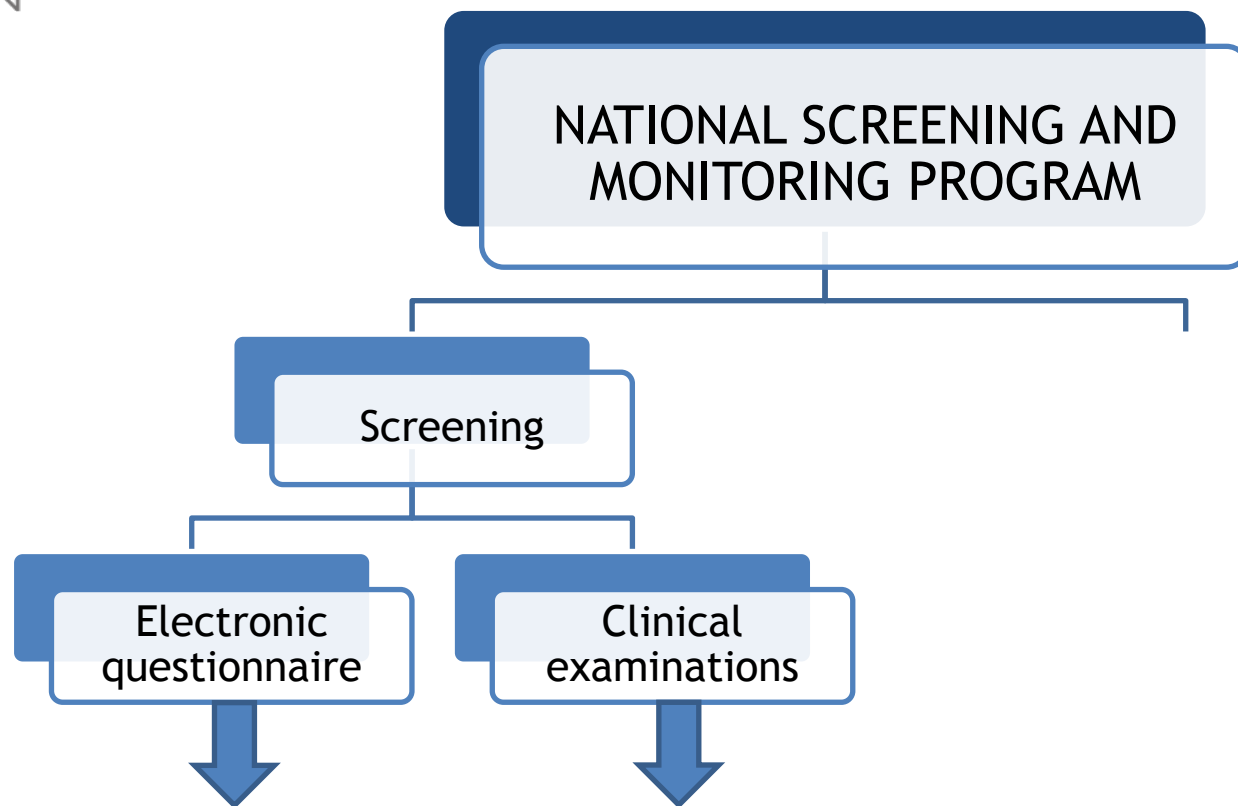
Keep our Para athletes healthy

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 - Longitudinal health monitoring in German and Swedish elite para sport
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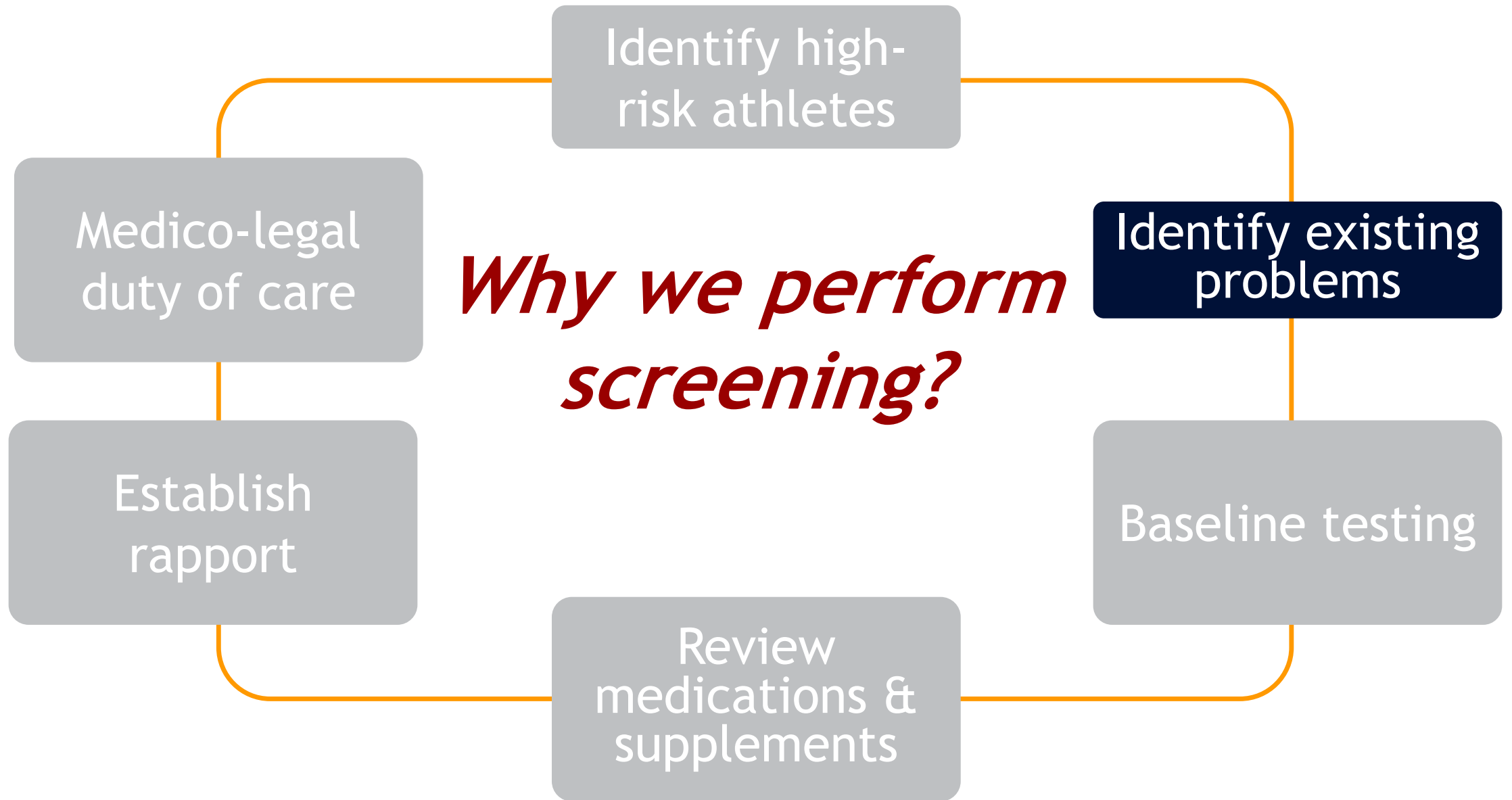








TARGETED FOLLOW-UP

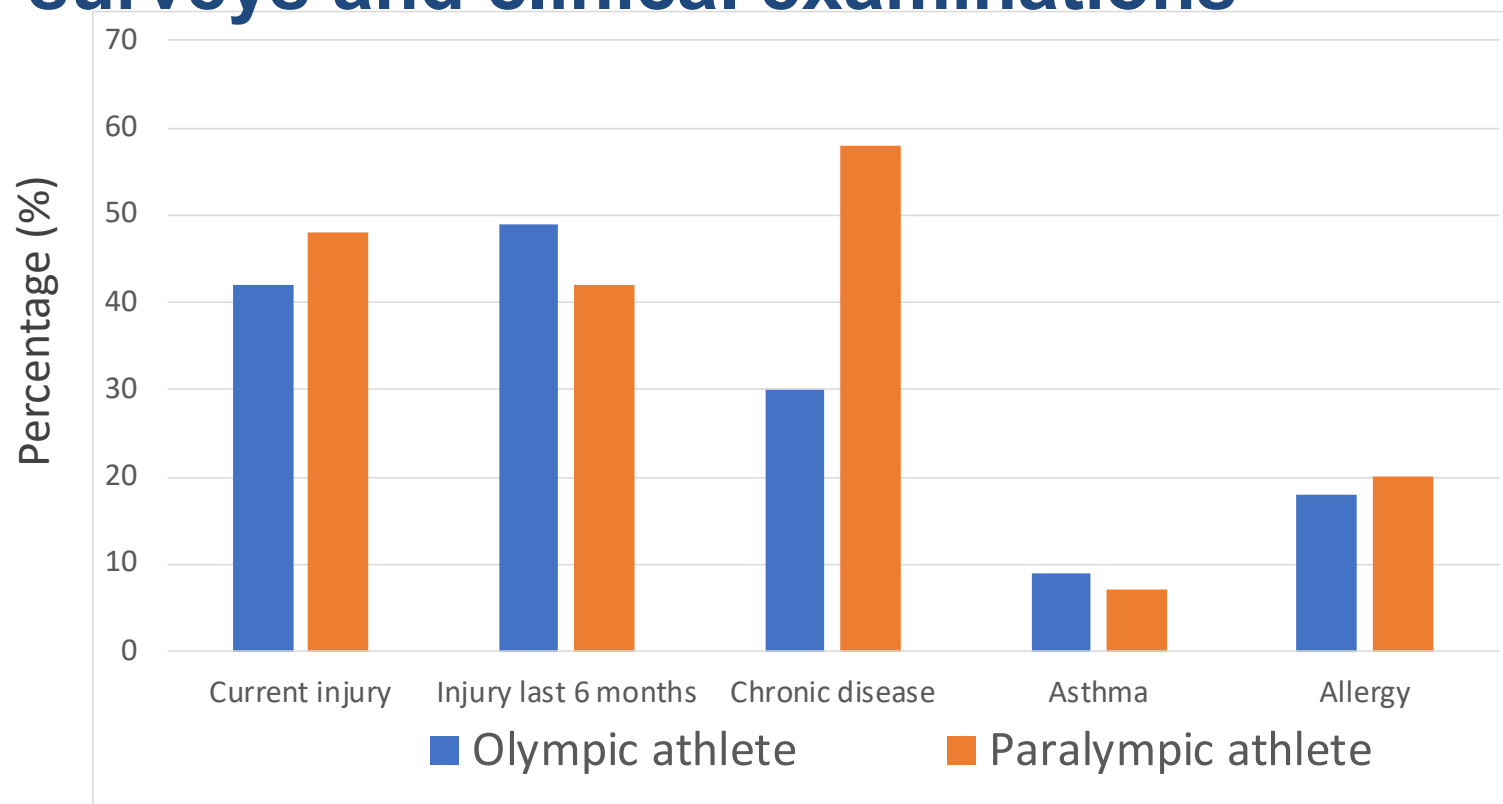


NORGE



OLYMPIATOPPEN

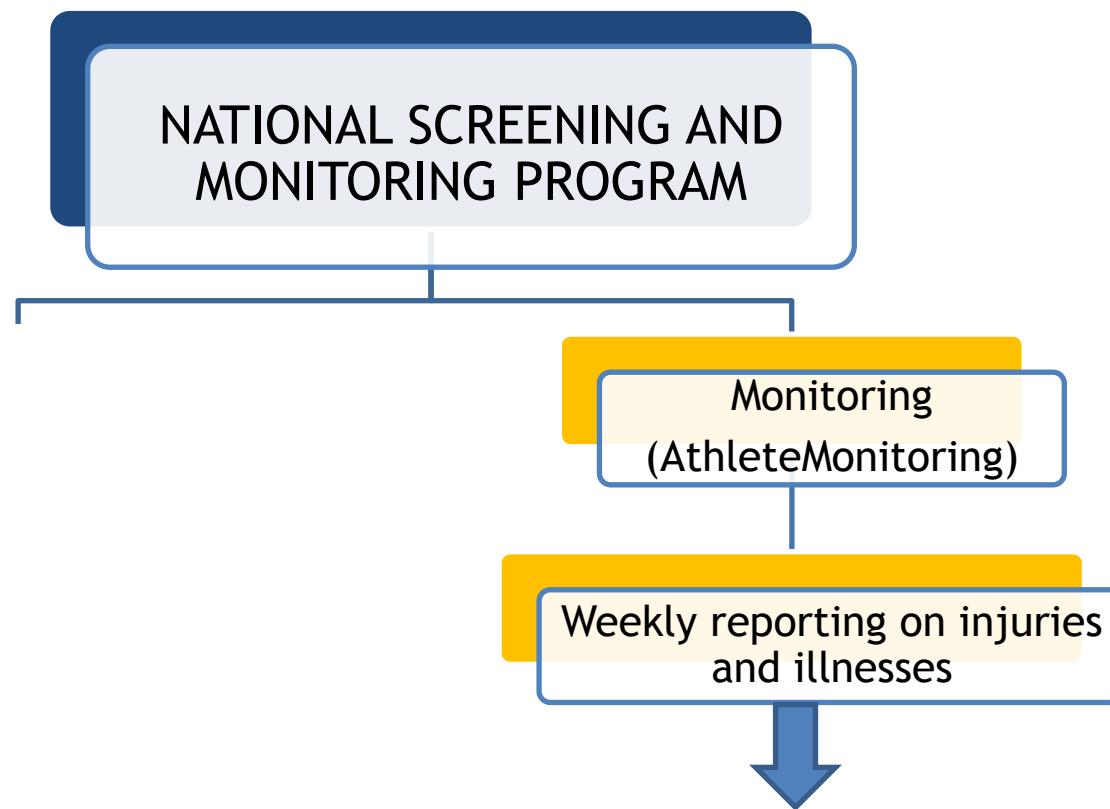
Previous findings – based on health surveys and clinical examinations



Common health problems in hockey team



- Urinary track infections
- Upper respiratory tract infections
- Asthma
- Digestive/gastrointestinal problems
- Skin infections caused by equipment/orthotics/prothesis
- Overuse injuries
- Co-morbidities



Health monitoring

Two complementary clinical benefits

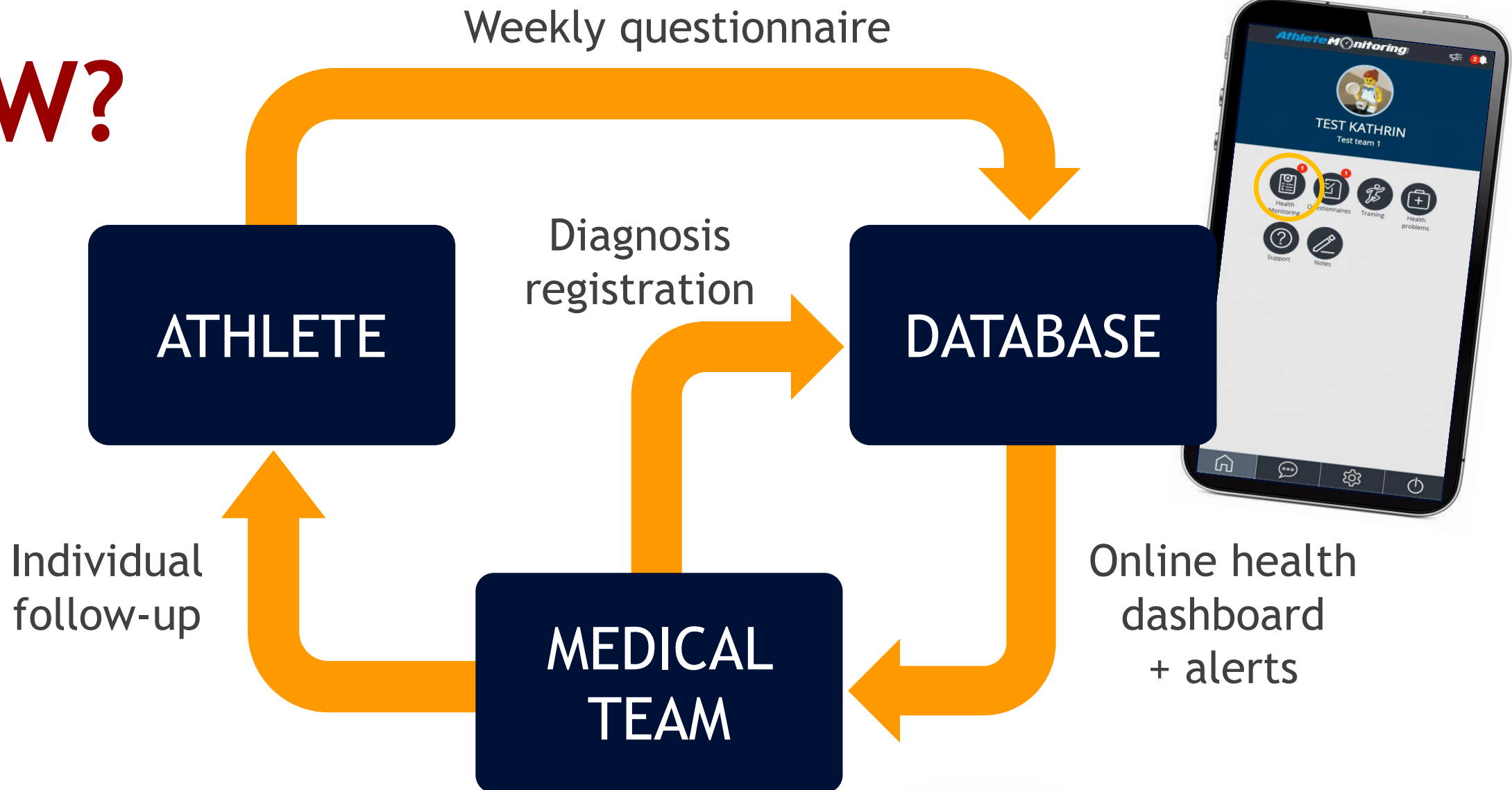
Individual level

- Facilitate consistent communication between athletes and medical staff
- Early identification of new problems
- Continuous monitoring of known problems

"Big-picture" risk evaluation

- Identify injury and illness patterns
 - What types of injuries and illnesses?
 - Which athletes are affected?
 - What times of the year?
- Identify prevention priorities
- Assess effect of interventions

HOW?



Original article

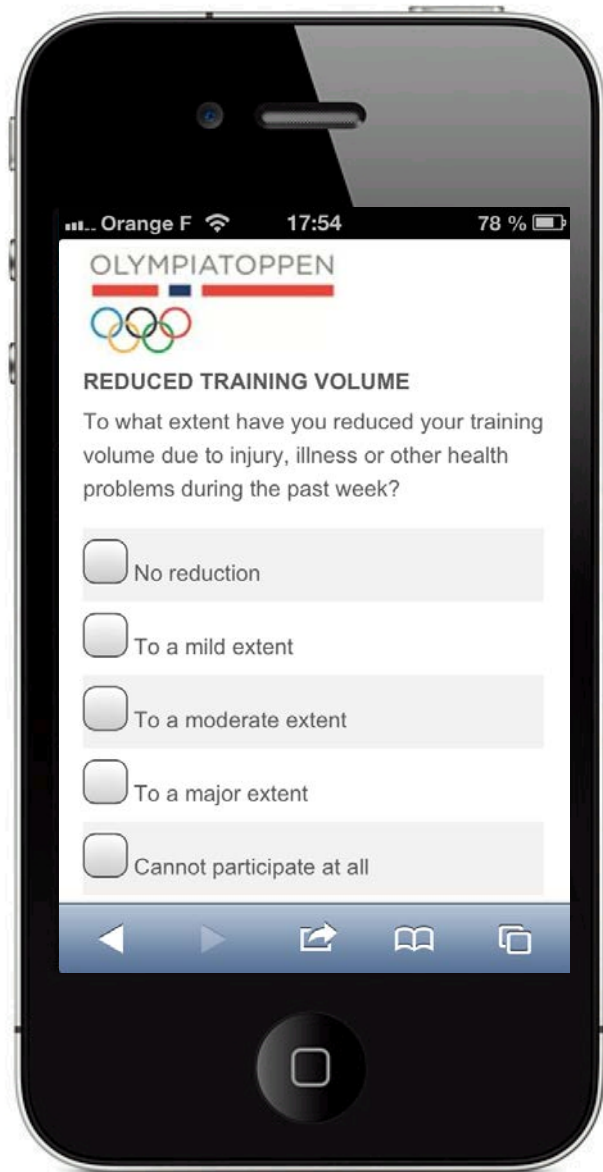
The Oslo Sports Trauma Research Center questionnaire on health problems: a new approach to prospective monitoring of illness and injury in elite athletes

Benjamin Clarsen,¹ Ola Rønsen,² Grethe Myklebust,¹ Tonje Wåle Florenes,¹ Roald Bahr¹

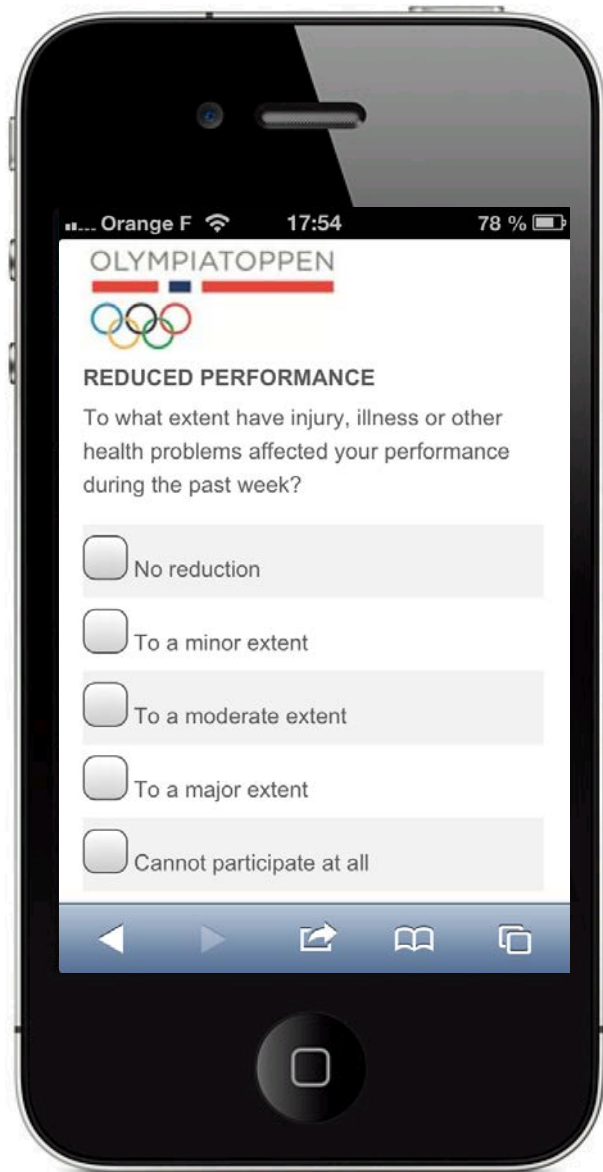


Have you had any **difficulties participating in normal training or competition** due to injury, illness or other health problems during the past week?



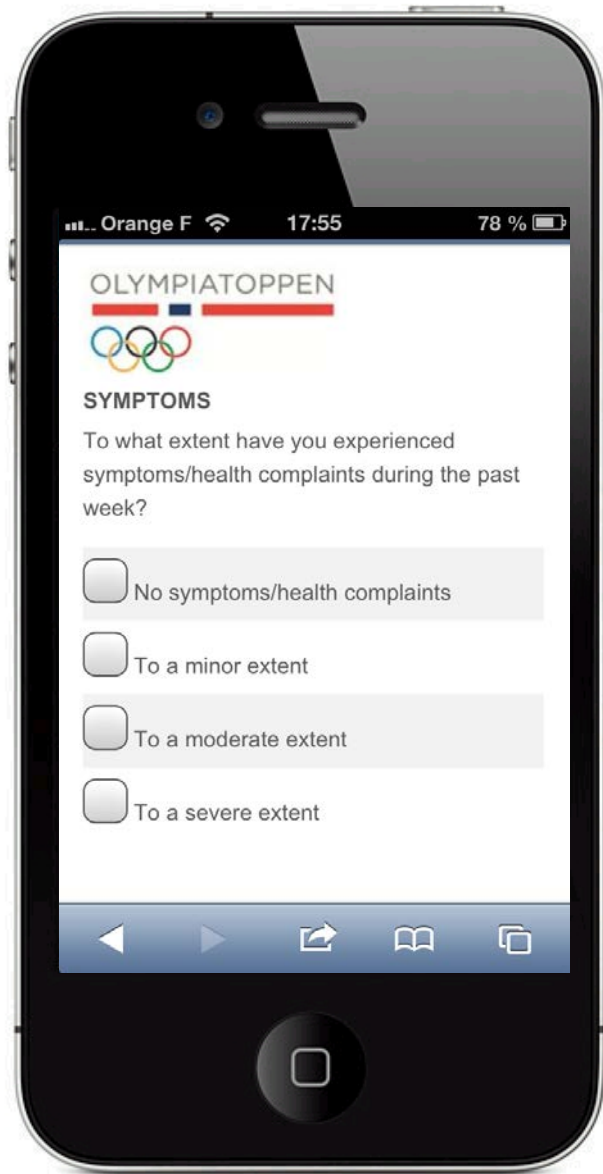


To what extent have you **reduced your training volume** due to injury, illness or other health problems during the past week?



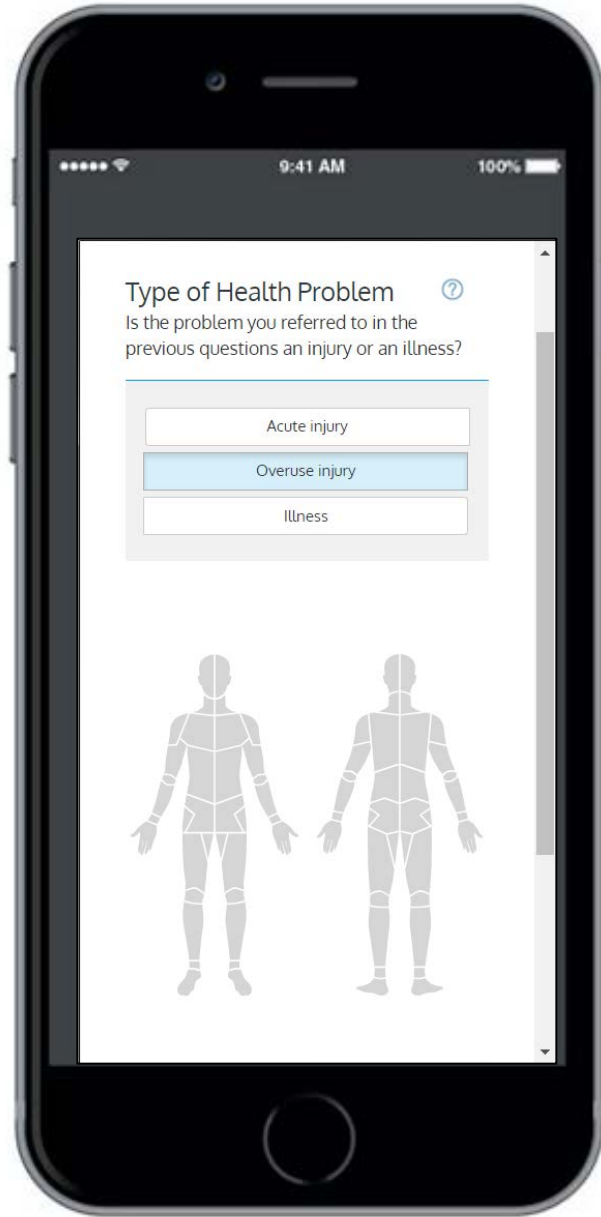
To what extent have injury, illness or other health problems affected your **performance** during the past week





To what extent have you experienced **symptoms**/health complaints during the past week?





- Injury or illness?
- Region/symptoms?
- New?
- Time loss?
- Who knows about it?
- New medication?
- Any comments?

Results from 90 para + 499 Olympic athletes

48% of para and 29% of Olympic athletes with multiple Games preparations



Cross-country skiing

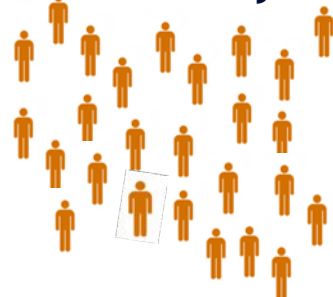
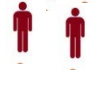
Snowboard

Curling

Luge

Golf

Ishockey



Triathlon

Gymnastics

Handball Men

Athletics

Sailing

Shooting



Weight lifting

Swimming

NORGE

Taekwondo



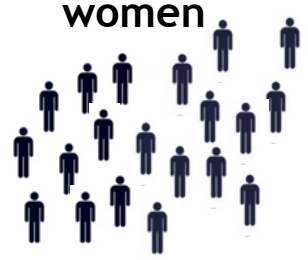
Nordic Combined

Handball women

Freeski

Cycling

Paralympics

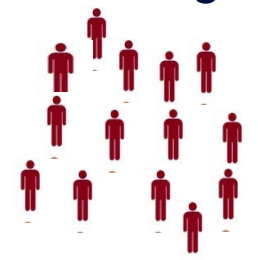
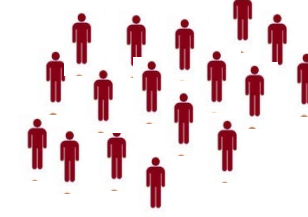


Biathlon

Skating

Boxing

Beach Volleyball



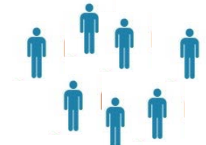
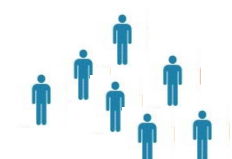
Rowing

Canoeing

Wrestling

Ski jumping

Figure Skating



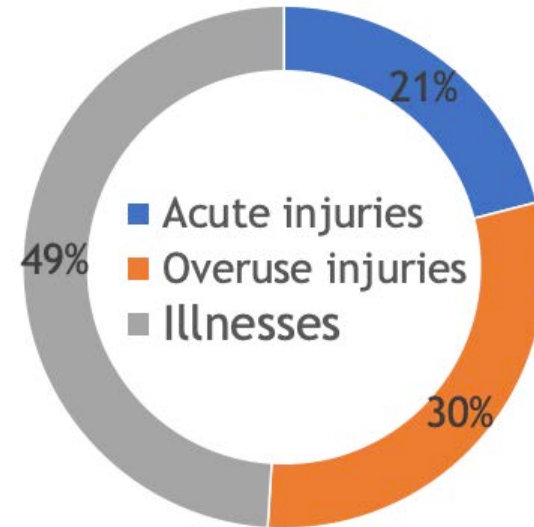
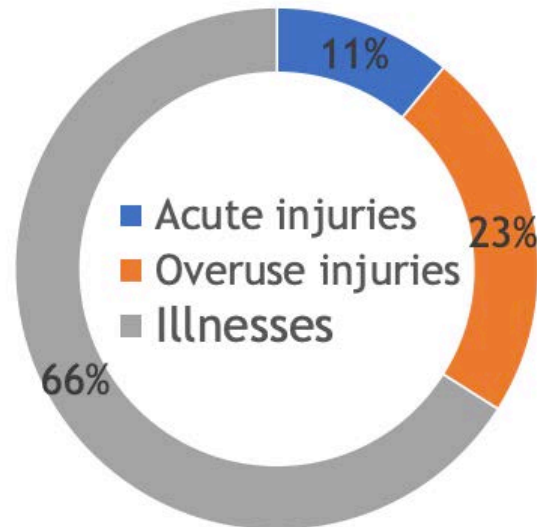
- ENDURANCE**
- Langrenn/ skiskyting
 - Roing
 - Sykling
 - Svømming

- TECHNICAL**
- Alpint
 - Bordtennis
 - Bueskyting
 - Boccia
 - Friidrett
 - Ridning
 - Seiling
 - Skyting
 - Snowboard

- TEAM**
- Curling
 - Kjelke-hockey

35.272 weekly athlete responses

4.088 injuries and illnesses diagnosed and treated



How often do our athletes get sick or injured?

How many of our athletes are sick or injured at any given time?

What are the biggest health problems affecting our team?

How often do our athletes get sick or injured?

How many of our athletes are sick or injured at any given time?

What are the biggest health problems affecting our team?

On average, each of our athletes report ...

5 health problems a year
95% CI: 5.1 to 5.7


7

1 95% CI 0.6 - 1.1	Acute injuries	1 95% CI 1.0 - 1.2
2 95% CI 1.6 - 2.7	Overuse injuries	1.6 95% CI 1.5 - 1.8
4 95% CI 3.4 - 4.8	Illness	2.4 95% CI 2.2 - 2.6


5

How often do our athletes get sick or injured?

How many of our athletes are sick or injured at any given time?


What are the biggest health problems affecting our team?

At any given time

35% of our athletes have health problems
95% CI: 32 to 37%


38%

5% 95% CI 5 - 6	Acute injuries	10% 95% CI 9 - 10
16% 95% CI 15 - 17	Overuse injuries	15% 95% CI 14 - 15
19% 95% CI 18 - 20	Illness	10% 95% CI 9 - 10


32%

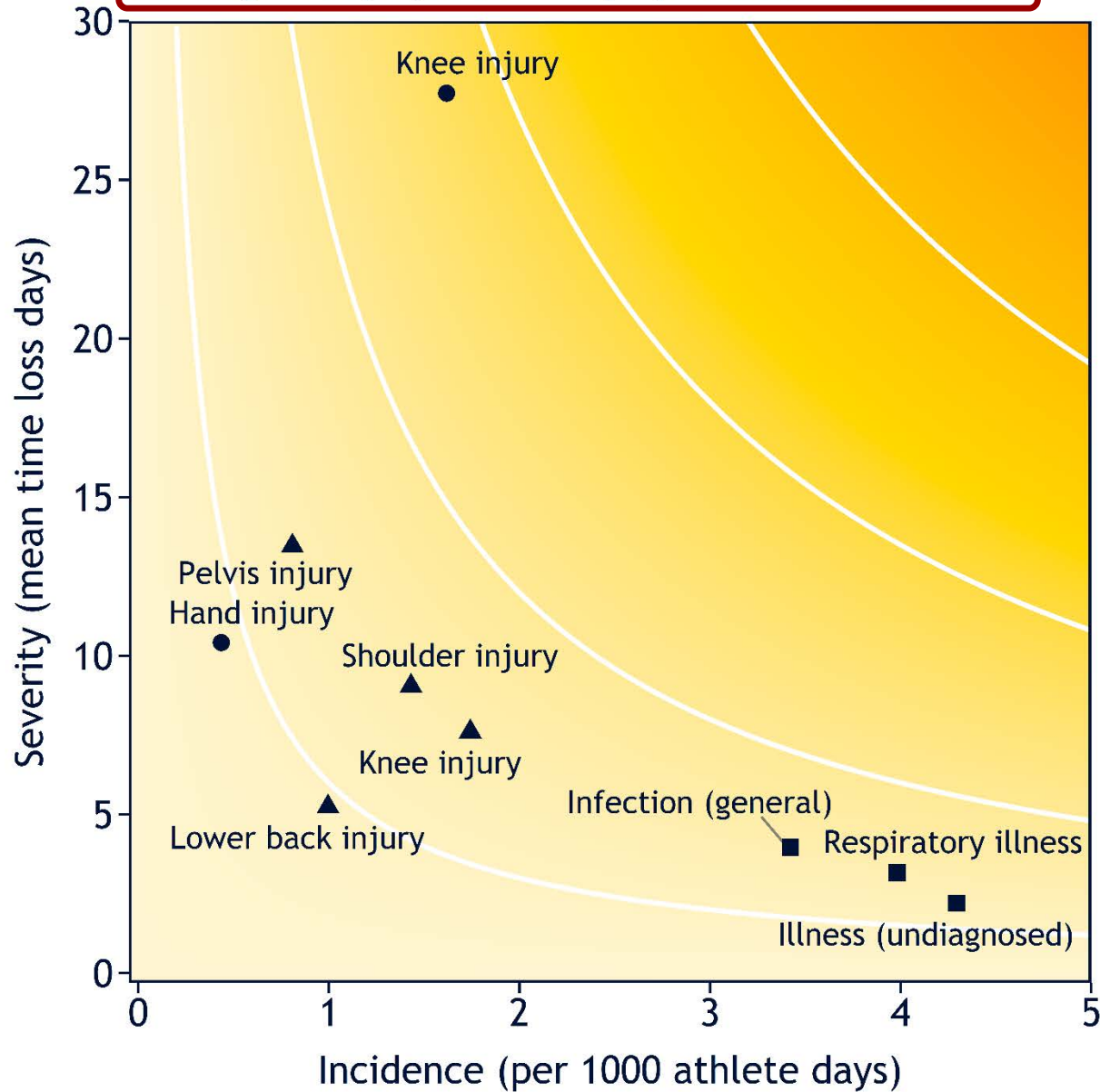
How often do our athletes get sick or injured?

How many of our athletes are sick or injured at any given time?

What are the biggest health problems affecting our team?

Injury and illness risk matrix

Norwegian Olympic & Paralympic Team 2018-2019



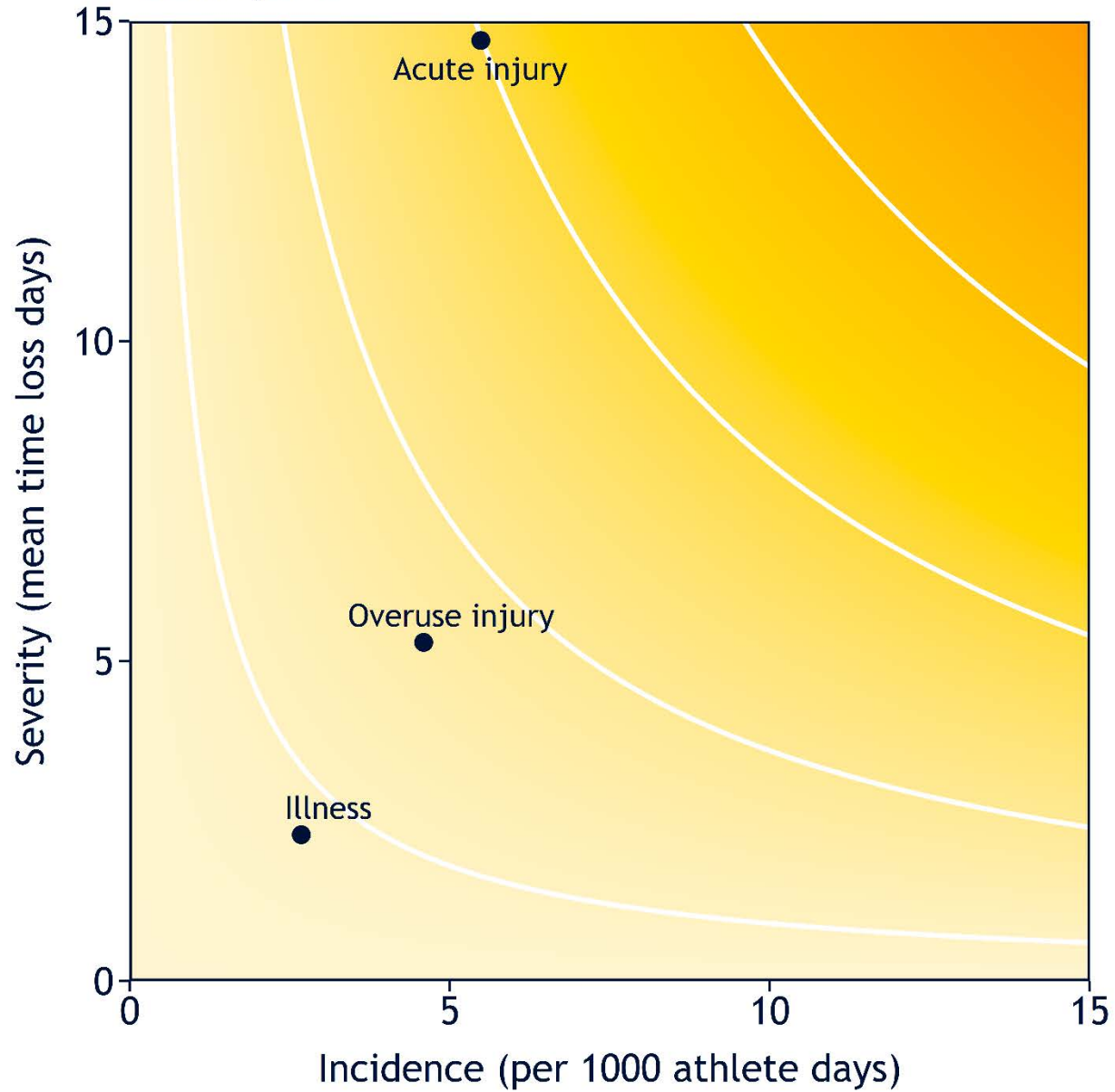
RISK MATRIX

- the darker the colour, the higher the burden

- Acute injury
- ▲ Overuse injury
- Illness

Injury and illness risk matrix

Team sports

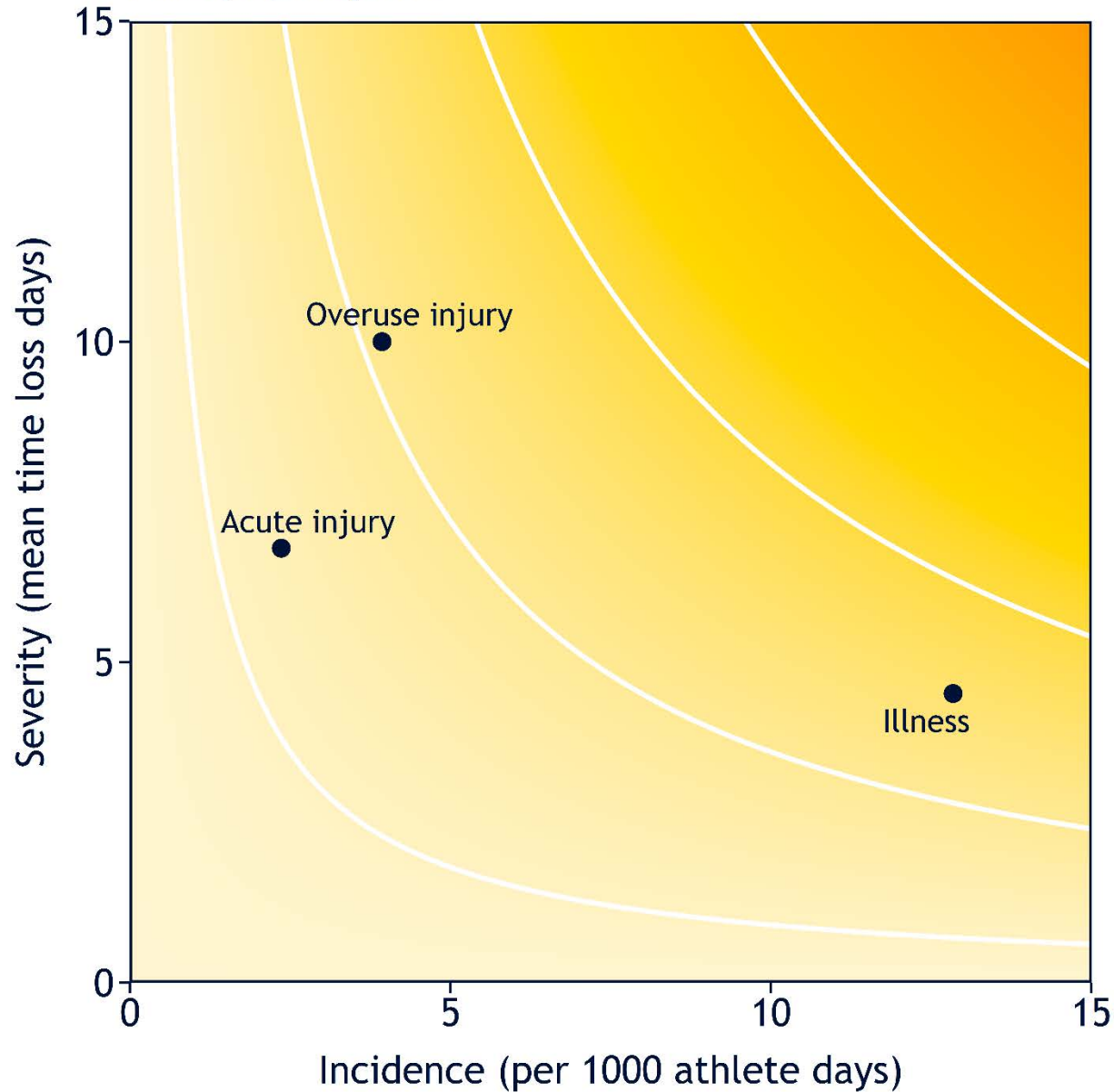


TEAM SPORTS

Beach volleyball (4)
Handball (56)

Injury and illness risk matrix

Paralympic sports



PARA SPORTS

- Athletics (3)
- Badminton (1)
- Equestrian (5)
- Rowing (1)
- Shooting (5)
- Swimming (5)
- Table tennis (4)

What do these figures mean for athletes/coaches?

What do these figures mean for athletes/coaches?

26

days lost due to a health problem - each year

95% CI: 24 to 28



29 days lost

3 days 95% CI 2 - 5	Acute injuries	9 days 95% CI 7 - 11
10 days 95% CI 5 - 15	Overuse injuries	7 days 95% CI 5 - 8
16 days 95% CI 13 - 20	Illness	8 days 95% CI 4 - 12



24 days lost

Key messages

- Para winter sport is associated with higher injury & illness risk compared to summer sport
 - Illnesses are more common in para than in Olympic athletes
 - Para athletes might be more vulnerable to certain illness by nature of their underlying co-morbidities
- For long-term success of ongoing health monitoring, athletes, medical staff and coaches should see direct benefits (e.g. fewer health incidents, short duration of complaints, and more effective training days throughout the year)
- Good monitoring data inform risk management at both an individual and a group level

The Oslo Sports Trauma Research Center

has been established at the Norwegian School of Sport Sciences through generous grants from the Royal Norwegian Ministry of Culture, the South-Eastern Norway Regional Health Authority, the International Olympic Committee, the Norwegian Olympic Committee & Confederation of Sport, and Norsk Tipping AS



INTERNATIONAL
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