

THE NATIONAL INTERSCHOLASTIC CYCLING ASSOCIATION SAFETY REPORT

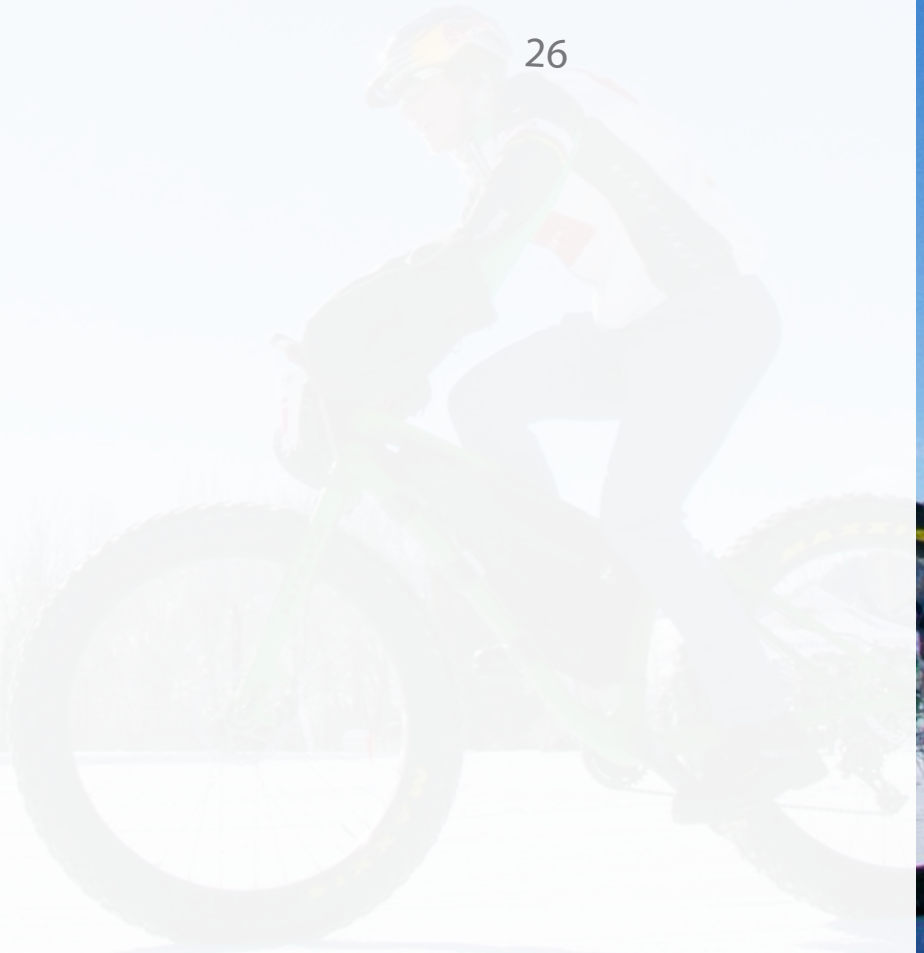
2019

In partnership with the University of Utah Sports Medicine



Table of Contents

Introduction	3
Definitions	4
NICA Safety Report Team	6
Data Section A: 2019 Student-Athlete Injury	8
Data Section B: 2019 Coach Injury Data	19
Limitations	23
Summary and Future Directions	24
Endnotes	26





INTRODUCTION

PREAMBLE:

The National Interscholastic Cycling Association (NICA) is committed to protecting the safety of everyone participating in interscholastic mountain bike programs. To this aim, NICA and its partners at the University of Utah have collaborated to establish the NICA Safety Report. The Safety Report is designed to better understand the types and causes of injuries seen in middle and high school mountain biking, and to pursue data-driven strategies to protect the safety of student-athletes, coaches, officials and fans.

The NICA Safety Report solicits and welcomes input from all stakeholders, including student-athletes, coaches, parents, race staff and others. The NICA Safety Report also partners with sports injury prevention experts from other prestigious institutions, including the Mayo Clinic.

After nearly three years of project development, consultation with leading sports epidemiologists around the world and extensive beta testing, the NICA Safety Report formally started in the 2018 season. Because of the dedication and commitment of many individuals, the first two years of data collection for the NICA Safety Report were very successful. The NICA Safety Report is the largest and most comprehensive mountain biking injury surveillance system in the world. The NICA Safety Report is also the first sports injury surveillance system to track injuries among coaches. With the knowledge gained from this report, NICA is leading the way in efforts to make the sport of mountain biking safer, and to protect the health of the student-athletes and all others involved in this sport.

This document is the 2nd annual official NICA Safety Report. The NICA Safety Report plans on producing publicly available reports on an annual basis. These reports will ultimately include results of injury reduction interventions.

***“...to pursue data-driven strategies
to protect the safety of student-
athletes...”***

Protection of Personal Information:

NICA and its partners take protection of personal information very seriously. All of the information used in the NICA Safety Report is always protected to the greatest degree possible. The NICA Safety Report meets or exceeds all national and local standards for the protection of personal information. All injury incident reports are only visible to NICA national staff, league staff, and NICA's insurance broker. NICA and its partners will never release an individual's personal health information without their formal permission. NICA's partners at the University of Utah never see any information that can personally identify individuals. All data is analyzed in aggregate, making it impossible to identify any individual in the final analysis.

DEFINITIONS

Injury Definition: Injury is defined as any physical event that occurs during a NICA sanctioned team practice, race, coaches training session or camp that results in physical harm to the participant significant enough to:

1) Warrant referral to a medical provider

OR

2) Lose time from training or competition beyond the day of injury

OR

3) Miss school or work

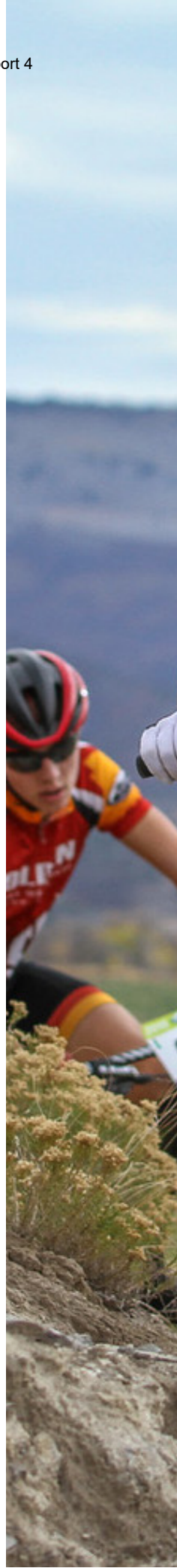
Notes regarding Injury Definition:

- If an injury event does not result in an injury that meets one or more of the above criteria, then the injury event should not be entered into the NICA Safety Report database.
- If a rider is seen in the medical tent in the Pit Zone of a race, but otherwise none of the above 3 parameters are met, the injury event does not warrant inclusion in the injury database.

Injury Event: An injury event is a single event that caused one or more injuries meeting the above injury definition. In the majority of cases, an injury event is due to a crash or collision while riding. In some cases, an injury may be the result of chronic overload to a body part, for example tendinitis in the knee.

Note regarding Injury Event Definition: A single injury event can result in more than one injury. For example, A rider might crash and sustain a hip contusion (i.e. bruise) and a fracture of the clavicle (i.e. broken collarbone).

Designated Reporter: The Designated Reporter is the individual from each team who completes the weekly exposure reports and completes the injury report forms.





Exposure Reporting: The total amount that a student-athlete is exposed to the risk of injury is a very important parameter in sports epidemiology. Exposure can be estimated in many different ways. In order to obtain an estimate of how much student-athletes are exposed to risk, the NICA Safety Report asks the Designated Reporters to provide the following information on a weekly basis:

1) How many NICA-sanctioned races, practices and other activities their team participated in each week

AND

2) How many student-athletes participated in each team race, practice and other activities.

This information provides the total number of student-athlete exposures.

Injury Proportion: The injury proportion is the number of injury events in one year divided by 100 participating riders. The injury proportion is expressed as a percentage.

Injury Incidence: The injury incidence is the number of injury events per student-athlete exposure. In sports epidemiology, injury incidence is often considered more important than injury proportion because it takes into account how much exposure a student-athlete has to risk. Injury incidence can be reported in different ways. Some common examples include:

- the number of student-athlete injuries per 1,000 student-athlete practices and races;
- the number of student-athlete injuries per 1,000 student-athlete practices;
- the number of student-athlete injuries per 1,000 student-athlete races.

Note regarding exposure and injury incidence: During the first two years (2018 and 2019) of the NICA Safety Report, exposure reporting was insufficient (~40%) to calculate injury incidences with confidence. Therefore, injury incidences are not included in this report. NICA is pursuing ongoing efforts to improve reporting of injury incidence.

Student-Athlete: The term student-athlete refers to any youth who has registered and paid for a given season in the NICA Pit Zone with the intent to participate in NICA programs.

Coach: The term coach refers to adults who have registered and paid for a given season in the NICA Pit Zone with the intent to volunteer for NICA programs.

Category: The term category refers to a group of student athletes defined by grade-level, gender and/or ability.

*...strong minds,
bodies, character...*

NICA SAFETY REPORT TEAM



Chris Spencer

Director of Risk Management and Training

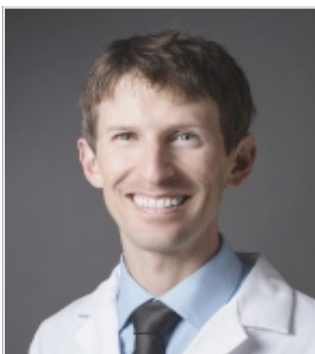
Chris is a proud NorCal League Alumni. Since 2009, he has worked for the NorCal League and then the NICA national office. Chris has had many roles at NICA with his primary contributions being the development and refinement of the risk management and training programs. The focus of his post-high school education has been economics, project management, counseling, program development, and risk management. Chris brings a wide range of experience including work as a bike mechanic, deckhand-engineer on tug boats, aviation and maritime insurance adjuster, comedian, residential advisor, outside salesman, and marketing representative.



Stuart Willick, MD

Professor University of Utah

Stuart Willick, MD is a fellowship trained, board certified sports medicine physician. He has worked with numerous elite sports organizations, including the University of Utah, the United States Ski and Snowboard Association, US Speedskating, the US Bobsled and Skeleton Federation, USA Climbing and the International Olympic and Paralympic Medical Committees. Dr. Willick helps athletes of all ages recover from their sports injuries and stay healthy and active. His research focus is the prevention of injury and illness in sport.



Dan Cushman, MD

Associate Professor University of Utah

Dan Cushman, M.D., is board-certified in both Sports Medicine and Physical Medicine & Rehabilitation, and specializes in the care of musculoskeletal injuries in both athletes & non-athletes, musculoskeletal ultrasound, electrodiagnostics, and endurance sports-specific injuries with a particular interest in runners, cyclists, swimmers, and triathletes. He is Director of Sports Medicine Research at the University of Utah.



Sarah Thomson

Registration Coordinator

Sarah is a Bay Area native, growing up in Menlo Park and attending UC Santa Cruz where she earned a degree in Marine Biology. She has been a competitive fencer for over 15 years and has worked with fencing clubs and leagues for over 10 years. Sarah is excited to join NICA and bring her extensive experience with fencing tournaments and registration to her new role here. In her spare time she likes to read, in particular murder mysteries.



Masaru Teramoto, PhD, MPH
Research Assistant Professor University of Utah



Jerel Wilson
Senior Training Manager



Nargis Solis
Systems Management



Julia Lawrence
Registration & Administration Manager



Luke Garcia
Undergraduate Research Assistant



Andrew Garcia
Undergraduate Research Assistant

“Every youth is empowered to be part of a thriving and engaged cycling community”



DATA SECTION A: 2019 STUDENT-ATHLETE INJURY DATA

2019 student-athletes summary	n	%
Total n of student-athletes Nationwide:	22,752	
Total n of male student-athletes Nationwide:	18,108	79.59%
Total n of female student-athletes Nationwide:	4,644	20.41%
Total number of student-athletes by Division		
Middle school	9,049	
Freshman	4,534	
Sophomore	1,419	
Junior varsity	6,941	
Varsity	807	
n and % of injured student-athletes Nationwide:	605	2.66%
n and % of injured male student-athletes Nationwide:	462	2.55%
n and % of injured female student-athletes Nationwide:	143	3.08%
Number and % of injured student-athletes by Division		
Middle school	223	2.46%
Freshman	128	2.82%
Sophomore	65	4.58%
Junior varsity	148	2.13%
Varsity	35	4.34%

Table A1. 2018 student-athlete summary data. The percentages refer to the number of injury events per 100 student-athletes.

Percent of Injury Events by Race Category

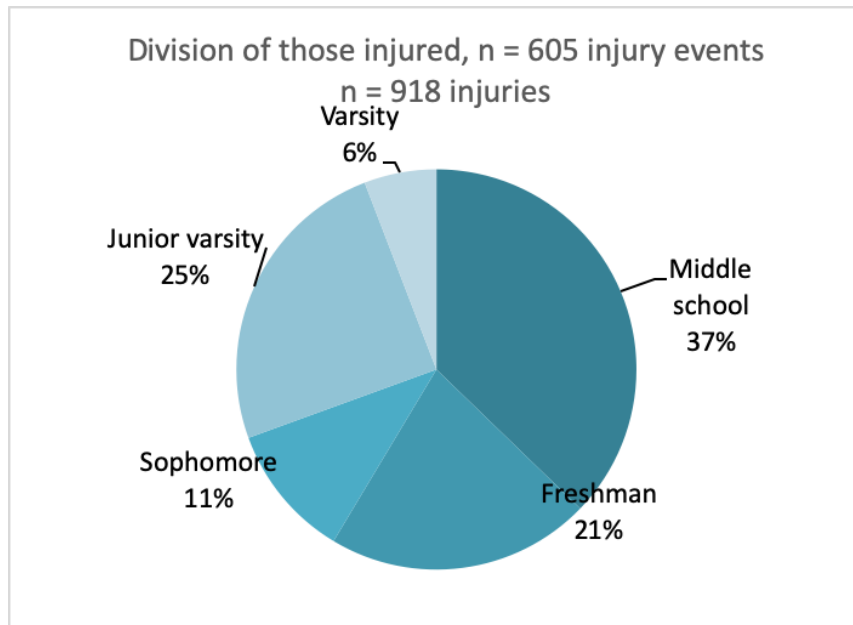


Figure A1. Percent of injury events by race category. The percentages refer to the number of injured student-athletes per total number of student-athletes.

Injury Proportion by Race Category

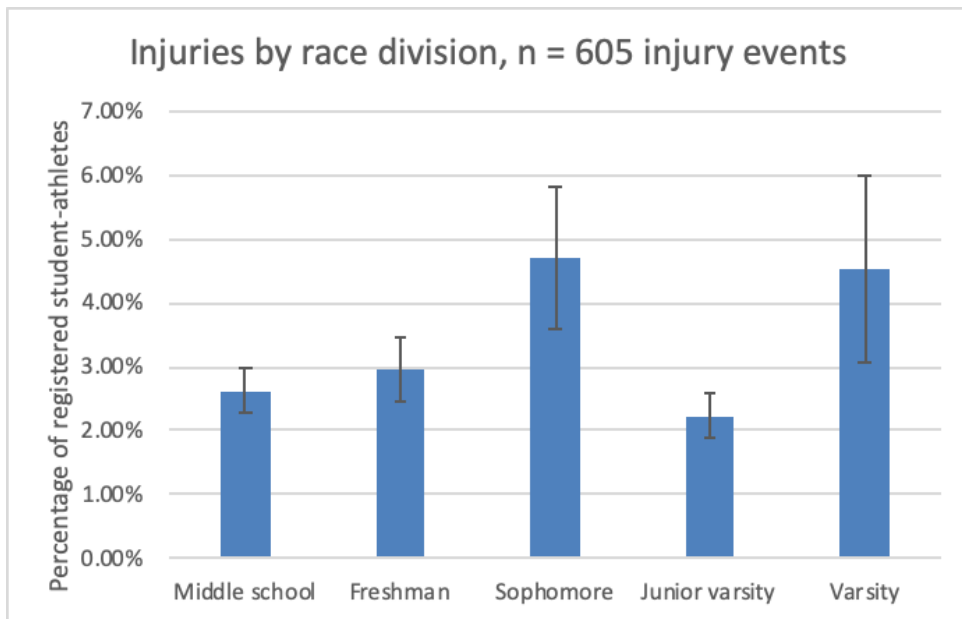


Figure A2. Injury proportion by category. The vertical thin black lines are confidence intervals. When there is no overlap in the confidence intervals between two different bars, it means that the differences between the bars is statistically significant.

Student-Athlete Injuries by Body Part

Which body part(s) did the student-athletes injure?	All student-athletes		Male student-athletes		Female student-athletes	
	n	%	n	%	n	%
Head/brain	151	25.0%	113	24.5%	38	26.6%
Head/superficial	25	4.1%	17	3.7%	8	5.6%
Face	54	8.9%	47	10.2%	7	4.9%
Neck	17	2.8%	12	2.6%	5	3.5%
Shoulder	93	15.4%	78	16.9%	15	10.5%
Arm	35	5.8%	25	5.4%	10	7.0%
Elbow	60	9.9%	41	8.9%	19	13.3%
Forearm	65	10.7%	52	11.3%	13	9.1%
Wrist/hand	153	25.3%	121	26.2%	32	22.4%
Thoracic	9	1.5%	5	1.1%	4	2.8%
Lumbar	7	1.2%	3	0.6%	4	2.8%
Abdomen/chest	25	4.1%	21	4.5%	4	2.8%
Pelvis/hip	40	6.6%	31	6.7%	9	6.3%
Thigh	27	4.5%	18	3.9%	9	6.3%
Knee	86	14.2%	63	13.6%	23	16.1%
Leg	39	6.4%	30	6.5%	9	6.3%
Foot/ankle	13	2.1%	7	1.5%	6	4.2%
Other	19	3.1%	16	3.5%	3	2.1%
Total # and % of injuries	918	151.7%	700	151.5%	218	152.4%

Table A2. Student-athlete injuries by body part. The first category, “Head/brain,” refers to concussions. The second category, “Head/superficial” refers to other injuries to the head and face, such as abrasions (scrapes), but without a concussion. The total number of injuries (918) is greater than the total number of injury events listed in Table 1 (605) because a single injury event can result in more than one injury.



Student-Athlete Injuries by Body Part

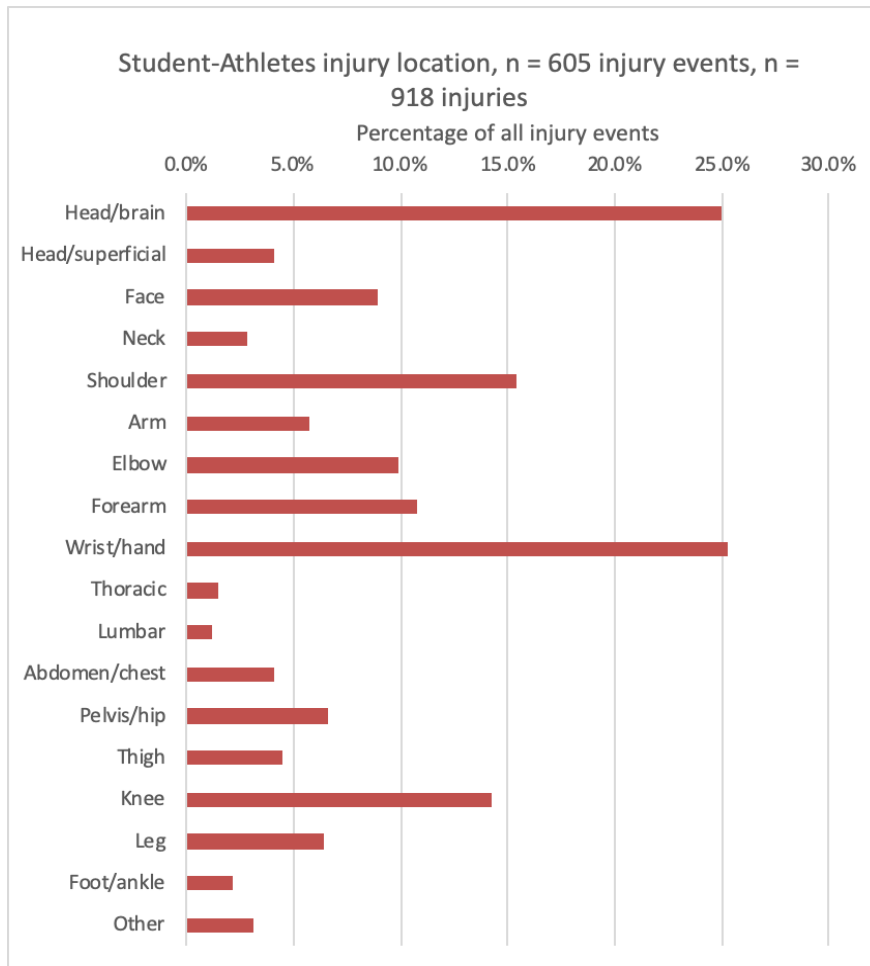


Figure A3. Bar chart representation of the same information presented in Table B2.

Student-Athlete Injury Diagnosis

What was the diagnosis?	All student-athletes		Male student-athletes		Female student-athletes	
	n	%	n	%	n	%
Contusion	123	20.3%	90	19.5%	33	23.1%
Abrasion	142	23.5%	107	23.2%	35	24.5%
Laceration	89	14.7%	64	13.9%	25	17.5%
Ligament sprain	65	10.7%	45	9.7%	20	14.0%
Muscle/tendon strain	27	4.5%	21	4.5%	6	4.2%
Fracture	190	31.4%	162	35.1%	28	19.6%
Dislocation	17	2.8%	14	3.0%	3	2.1%
Unknown	42	6.9%	33	7.1%	9	6.3%
Other	32	5.3%	19	4.1%	13	9.1%
Total # and % of injuries	727	120.2%	555	120.1%	172	120.3%

Table A3. Number and percentage of student-athlete injuries by type of injury, excluding concussions. There were a high number of relatively mild injuries such as contusion (bruise) and abrasion (scrape). However, there were also a high number of more significant injuries such as fracture (broken bone) and laceration (cut). The total number of diagnoses (727) is greater than the total number of injury events listed in Table 1 (605) because a single injury event can result in more than one type of injury.

Student-Athlete Injury Diagnosis

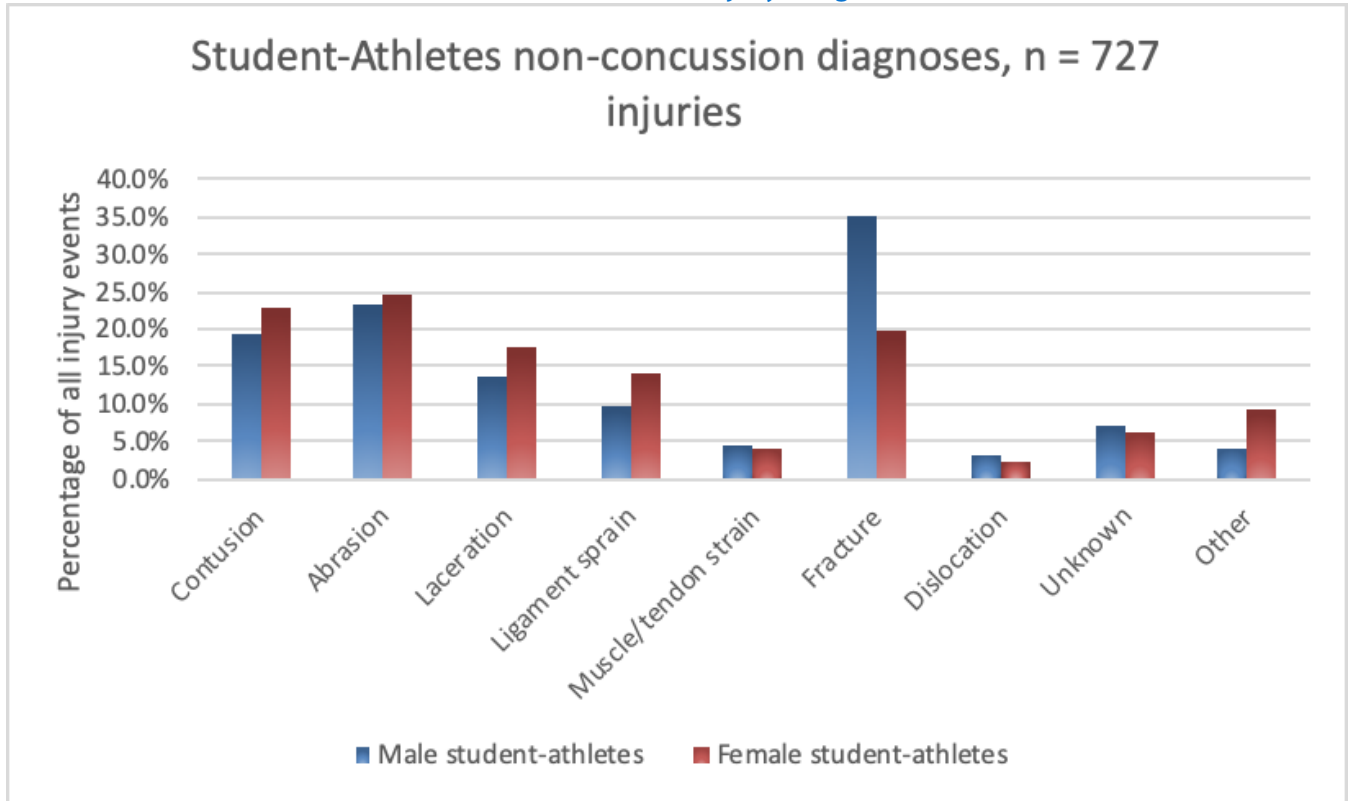


Figure A4. Bar chart representation of the same information presented in Table 3: percentage of injury types in male and female student-athletes. The total number of diagnoses (727) is greater than the total number of injury events listed in Table 1 (605) because a single injury event can result in more than one type of injury.



Student-Athletes Who Were and Were Not Able to Complete the Training Session or Race

Were the student-athletes able to complete the training session or race?	All student-athletes		Male student-athletes		Female student-athletes	
	n	%	n	%	n	%
Completed	158	26.1%	106	22.9%	52	36.4%
Did not complete	438	72.4%	348	75.3%	90	62.9%
Total	596	98.5%	454	98.3%	142	99.3%

Table A5. Number and percentage of student-athletes who were and were not able to complete their practice ride or race after a reportable injury. The events in which the student-athlete was able to complete the training session or race likely resulted in less severe injuries to the student-athlete compared with the events in which the student-athlete was unable to complete the training session or race.

Mode of Transportation From Injury Site

How were the student-athletes transported from the site where the injury occurred?	All student-athletes		Male student-athletes		Female student-athletes	
	n	%	n	%	n	%
Ambulance	32	5.3%	23	5.0%	9	6.3%
Helicopter	6	1.0%	5	1.1%	1	0.7%
Private vehicle	13	2.1%	13	2.8%	0	0.0%
ATV	20	3.3%	16	3.5%	4	2.8%
Other	6	1.0%	3	0.6%	3	2.1%
Total	77	12.7%	60	13.0%	17	11.9%

Table A5. Number and percentage of all injured student-athletes who required transport from the site of an injury. Only 12.7% of all injured student-athletes required assisted transportation from the injury site.

Disposition Following Injury

Disposition following injury	All student-athletes		Male student-athletes		Female student-athletes	
	n	%	n	%	n	%
Did not go to emergency room (ER)	271	44.8%	199	43.1%	72	50.3%
Went to ER, then sent home	279	46.1%	216	46.8%	63	44.1%
Went to ER, then admitted to hospital	27	4.5%	25	5.4%	2	1.4%
Unknown	28	4.6%	22	4.8%	6	4.2%
Total	605	100.0%	462	100.0%	143	100.0%

Table A6. Disposition of injured student-athletes. Close to half of all injured student-athletes sought emergency evaluation, but only a small percentage (4.5%) of injured student-athletes required admission to the hospital

Type of Activity at which Injury Occurred

At which type of ride did the injury occur?	All student-athletes		Male student-athletes		Female student-athletes	
	n	%	n	%	n	%
Team practice (on mountain bike trails)	340	56.2%	271	58.7%	69	48.3%
Race	170	28.1%	123	26.6%	47	32.9%
Team practice (riding on paved roads)	27	4.5%	20	4.3%	7	4.9%
Team practice (skills training)	38	6.3%	29	6.3%	9	6.3%
NICA On-the-Bike Skills	1	0.2%	1	0.2%	0	0.0%
Total	576	95.2%	444	96.1%	132	92.3%

Table A7. Type of ride or other NICA sanctioned activity at which student-athletes were injured. Over half (56.2%) of all injury events occurred during practice rides on mountain bike trails. Just under one-third (28.1%) of all injury events occurred during races. The high percentage of injury events that occurred during practice rides likely reflects the fact that student-athletes are exposed to more practice rides than other types of rides, including races. Not all student-athletes participate in their League's race series. As exposure reporting improves, the NICA Safety Report will be better able to calculate injury incidence by factoring in exposure.

Trail Familiarity

Was the venue or route familiar to the injured rider?	All student-athletes		Male student-athletes		Female student-athletes	
	n	%	n	%	n	%
Yes, the rider had ridden on this trail	454	75.0%	349	75.5%	105	73.4%
No, the rider had not ridden on this trail	96	15.9%	69	14.9%	27	18.9%
N/A or unsure	55	9.1%	44	9.5%	11	7.7%
Total	605	100.0%	462	100.0%	143	100.0%

Table A8. Trail familiarity at time of injury event: The majority of injuries (75.0%) occurred on a trail that was familiar to the student-athlete. As in Table 7, the high percentage of injury events that occurred on trails with which the student-athlete was familiar may reflect the greater amount of time spent riding on familiar trails, as opposed to time spent riding on unfamiliar trails. Alternatively, these data could indicate that student-athletes take more risk when riding on familiar trails versus unfamiliar trails.

Trail Incline

What was the trail incline where the injury occurred?	All student-athletes		Male student-athletes		Female student-athletes	
	n	%	n	%	n	%
Uphill / ascending	30	5.0%	22	4.8%	8	5.6%
Flat	208	34.4%	158	34.2%	50	35.0%
Downhill / descending	318	52.6%	240	51.9%	78	54.5%
Total	556	91.9%	420	90.9%	136	95.1%

Table A9. Incline of trail at time of injury: Nearly one-half (52.6%) of injury events occurred when riding downhill. Nearly one-third (34.4%) of injury events occurred on flat section of trails. Trail incline at time of injury was not available for 8.1% of injury events.

Time Off Due to Injury

Time lost from injury for student-athletes	All student-athletes		Male student-athletes		Female student-athletes	
	n	%	n	%	n	%
Less than 1 week	184	35.8%	135	34.8%	49	38.9%
1-2 weeks	108	21.0%	80	20.6%	28	22.2%
2-4 weeks	74	14.4%	54	13.9%	20	15.9%
At least 4 weeks	148	28.8%	119	30.7%	29	23.0%
Total	514	100.0%	388	100.0%	126	100.0%

Table A10. Time lost from injury. More than a third (35.8%) of injuries resulted in less than a week off the bike. More than a quarter (28.8%) of injuries resulted in more than a month off the bike.

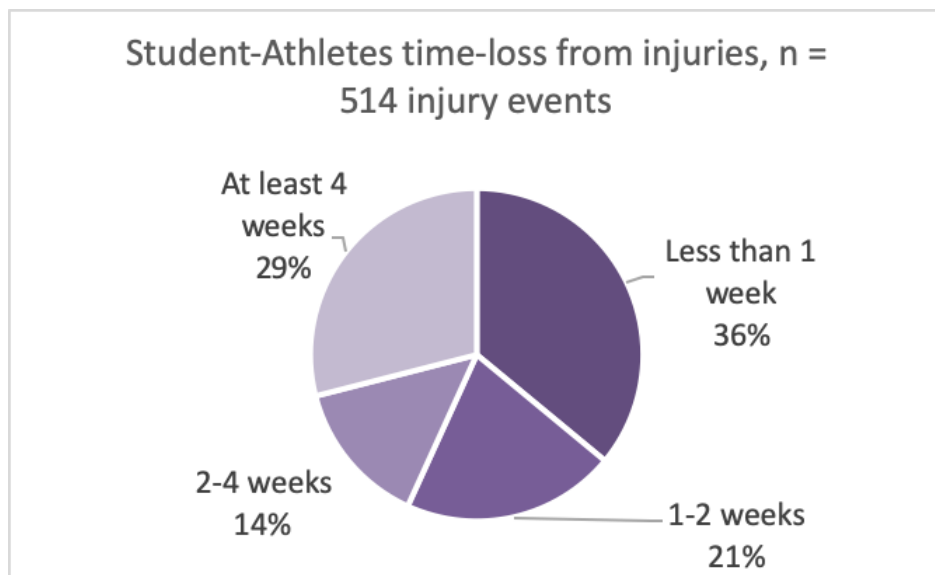


Figure A5. Pie chart representing percentages of time that student-athletes lost from practices and races following an injury event.

Links clicked for student-athletes	All student-athletes	
	n	%
NICA website	316	52.2%
Blank field from email	35	5.8%
Unique field from email	254	42.0%
Total	605	100.0%

Table A11. How the injury reporting form was accessed. A greater number of injury reporting forms were accessed through the NICA website compared with from the weekly email received by coaches. Completing the injury reporting form directly from the weekly email is strongly preferred because the student-athlete's demographic information is pre-populated in the form and because the injury reporting form accessed from the weekly email decreases the amount of missing and/or inaccurate data.

Injury Associated with Internal Conditions

Were any of the following internal conditions associated with the injury?	All student-athletes		Male student-athletes		Female student-athletes	
	n	%	n	%	n	%
Dehydration	4	0.7%	4	0.9%	0	0.0%
Lack of sleep	1	0.2%	1	0.2%	0	0.0%
Improper nutrition	1	0.2%	1	0.2%	0	0.0%
Illness at time of the ride	0	0.0%	0	0.0%	0	0.0%
Rider too hot	2	0.3%	2	0.4%	0	0.0%
Rider too cold	0	0.0%	0	0.0%	0	0.0%

Table A12: Student-athlete conditions that were felt to contribute to the injury event. These include preventable conditions including dehydration, lack of sleep, improper nutrition and medical illness at the time of the ride.

Injury Associated with External Conditions

Were any of the following external conditions associated with the injury?	All student-athletes		Male student-athletes		Female student-athletes	
	n	%	n	%	n	%
Injury occurred on a turn	134	22.1%	99	21.4%	35	24.5%
Weather	15	2.5%	12	2.6%	3	2.1%
Passing	54	8.9%	41	8.9%	13	9.1%
Mechanical	17	2.8%	13	2.8%	4	2.8%
Technical nature of trail	124	20.5%	95	20.6%	29	20.3%
Inexperience	132	21.8%	104	22.5%	28	19.6%
Nothing	162	26.8%	126	27.3%	36	25.2%
Other	80	13.2%	58	12.6%	22	15.4%

Table A13: Student-athlete conditions that were felt to contribute to the injury event. Technial trails, rider inexperience and negotiating turns were all felt to contribute to injury events.



Injuries by Division in Races versus Practices

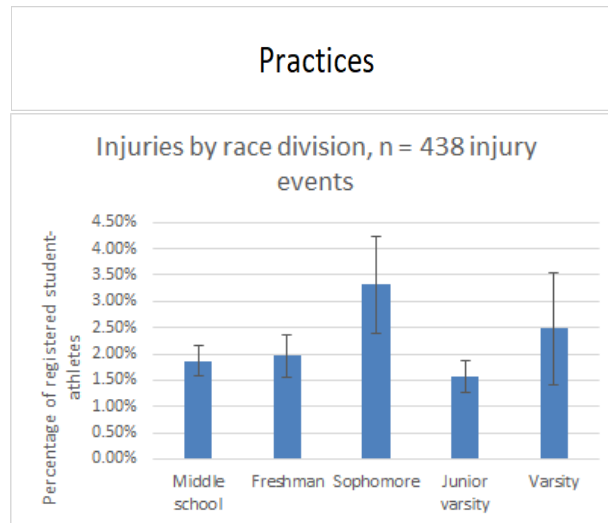
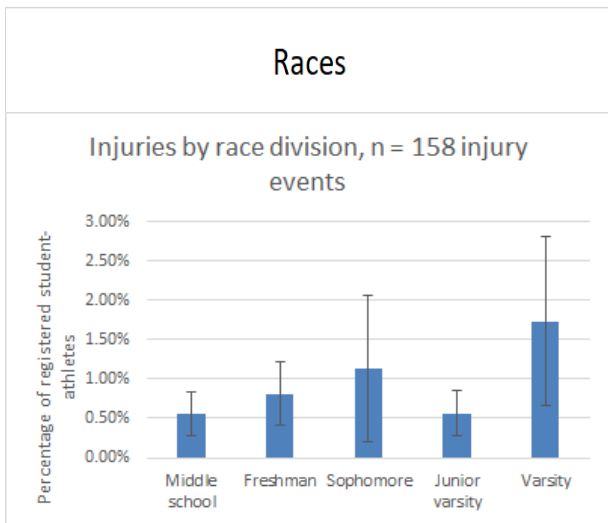


Figure 6a

Figure 6b

Figure A6 a and b: Student-athlete injuries during races (a) versus practices (b), broken out by competition division. Younger student-athletes (middle school, freshman, sophomore divisions) appear to be at higher risk of injury during practices.

Injuries by Body Part in Races versus Practices

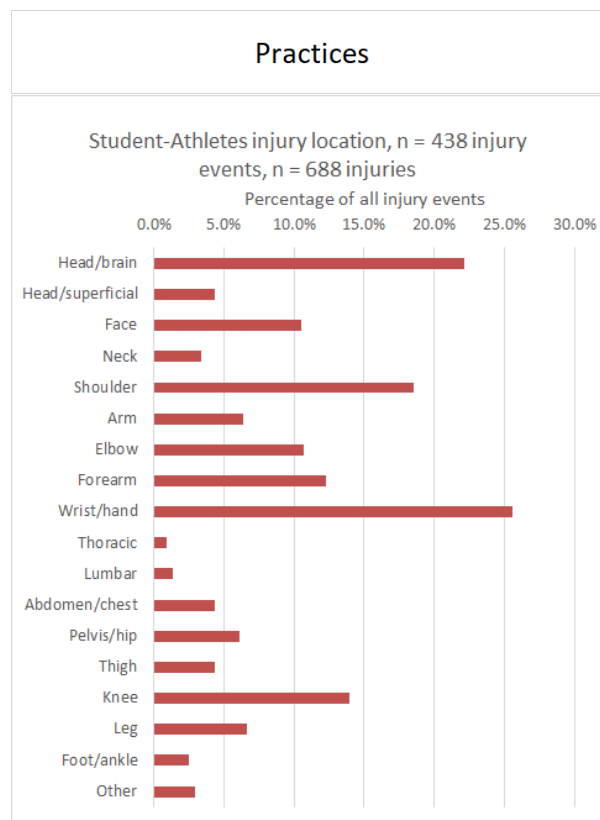
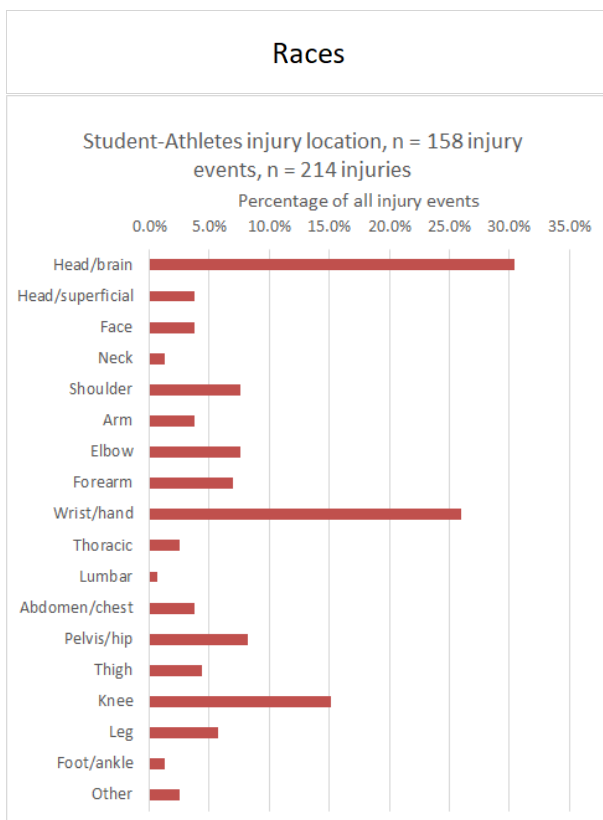


Figure 7a

Figure 7b

Figure A7 a and b: Anatomic location of student-athlete injuries during races (7a) versus practices (7b). Riders sustain fewer wrist/hand injuries (p=0.04) and more concussions (p=0) during races compared with practices.

Injuries by Trail Incline in Races versus Practices

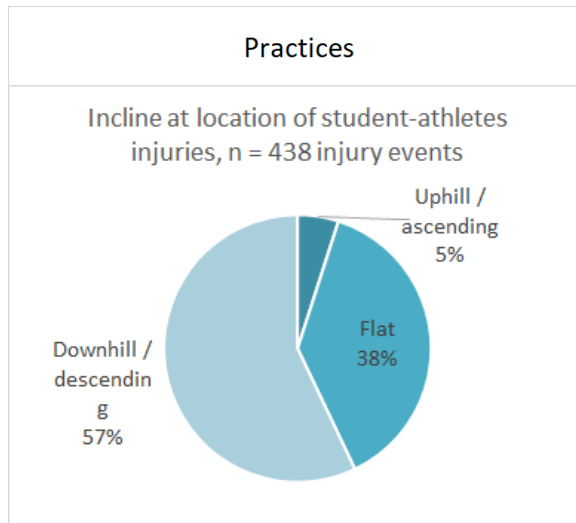
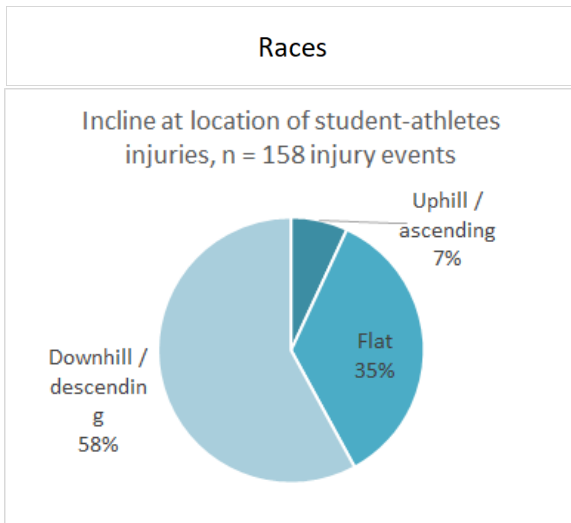


Figure 8a

Figure 8b

Figure A8 a and b: Percentage of injuries that occurred on flat, downhill and uphill terrain. Injuries during practice were more likely to occur on downhill terrain compared with injuries that happened during racing (p=0)

Student-Athlete Non-Concussion Injuries in Races versus Practices

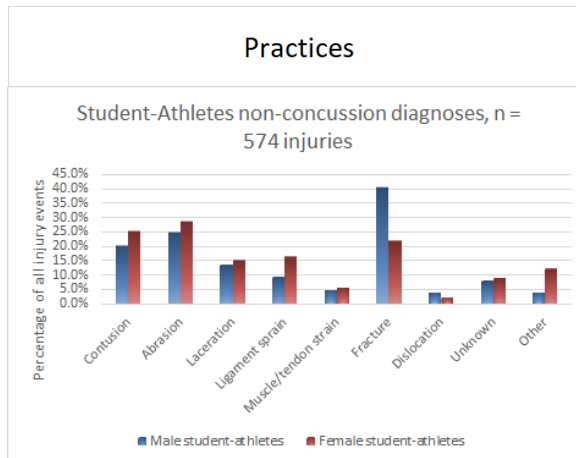
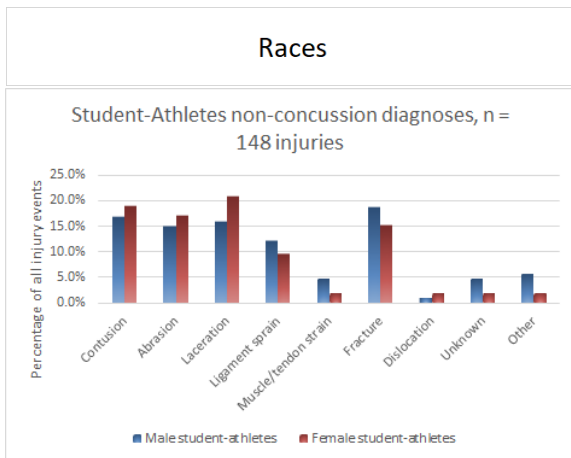


Figure 9a

Figure 9b

Figure A9 a and b: Percentage of non-concussion injury diagnoses in races (A9a) versus practices (A9b): Males appeared to have more fractures during practices than races.

DATA SECTION B:

2019 COACH INJURY DATA

Introduction: To our knowledge, the NICA Safety Report is the first injury surveillance system that tracks injuries among coaches, who ride with the student-athletes during practice but not during races.

2019 coaches summary data	n	%
Total n of coaches Nationwide:	12,191	
Total n of male coaches Nationwide:	9,261	76%
Total n of female coaches Nationwide:	2,930	24%

Table B1. Number and percentage of NICA registered coaches, male coaches and female coaches. The percentages refer to the number of injuries per 100 coaches.

Coach Injury by Sex

Coach Injuries by sex	n	%
n and % of injured coaches Nationwide:	81	0.66%
n and % of injured male coaches Nationwide:	61	0.66%
n and % of injured female coaches Nationwide:	20	0.68%

Table B2. Number and percentage of NICA registered male and female coaches who sustained injuries during NICA sanctioned rides. Overall, the percentage of injuries among coaches was very low. Please note that coaches do not participate in as many NICA sanctioned rides and other activities as the student-athlete, and do not race in NICA sanctioned races.



Coach Injuries by Body Part

Which body part(s) did the coaches injure?	All coaches		Male coaches		Female coaches	
	n	%	n	%	n	%
Head/brain	16	19.8%	11	18.0%	5	25.0%
Head/superficial	7	8.6%	6	9.8%	1	5.0%
Face	7	8.6%	5	8.2%	2	10.0%
Neck	3	3.7%	2	3.3%	1	5.0%
Shoulder	23	28.4%	18	29.5%	5	25.0%
Arm	8	9.9%	6	9.8%	2	10.0%
Elbow	6	7.4%	6	9.8%	0	0.0%
Forearm	7	8.6%	5	8.2%	2	10.0%
Wrist/hand	18	22.2%	15	24.6%	3	15.0%
Thoracic	2	2.5%	2	3.3%	0	0.0%
Lumbar	4	4.9%	3	4.9%	1	5.0%
Abdomen/chest	10	12.3%	9	14.8%	1	5.0%
Pelvis/hip	5	6.2%	4	6.6%	1	5.0%
Thigh	4	4.9%	2	3.3%	2	10.0%
Knee	6	7.4%	3	4.9%	3	15.0%
Leg	1	1.2%	0	0.0%	1	5.0%
Foot/ankle	5	6.2%	2	3.3%	3	15.0%
Other	1	1.2%	0	0.0%	1	5.0%
Total	133	164.2%	99	162.3%	34	170.0%

Table B3. Coach injuries by body part. The first category, “Head/brain,” refers to concussions. The second category, “Head/superficial” refers to other injuries to the head and face, such as abrasions (scrapes), but without a concussion. The total number of injuries (133) is greater than the total number of injury events listed in Table 15 (81) because a single injury event can result in more than one injury. For the same reason, the total percentage of injuries is greater than 100%.

Coach Injury Diagnosis

What was the diagnosis?	All coaches		Male coaches		Female coaches	
	n	%	n	%	n	%
Contusion	16	19.8%	11	18.0%	5	25.0%
Abrasion	17	21.0%	8	13.1%	9	45.0%
Laceration	2	2.5%	0	0.0%	2	10.0%
Ligament sprain	12	14.8%	9	14.8%	3	15.0%
Muscle/tendon strain	9	11.1%	8	13.1%	1	5.0%
Fracture	28	34.6%	23	37.7%	5	25.0%
Dislocation	6	7.4%	5	8.2%	1	5.0%
Unknown	15	18.5%	11	18.0%	4	20.0%
Other	3	3.7%	2	3.3%	1	5.0%
Total	108	133.3%	77	126.2%	31	155.0%

Table B4. Number and percentage of coach injuries by type of injury, excluding concussions. There were a high number of relatively mild injuries such as contusion (bruise) and abrasion (scrape). However, there were also a high number of more significant injuries such as fracture (broken bone) and laceration (cut). The total number of diagnoses (108) is greater than the total number of injury events listed in Table 16 (81) because a single injury event can result in more than one type of injury.

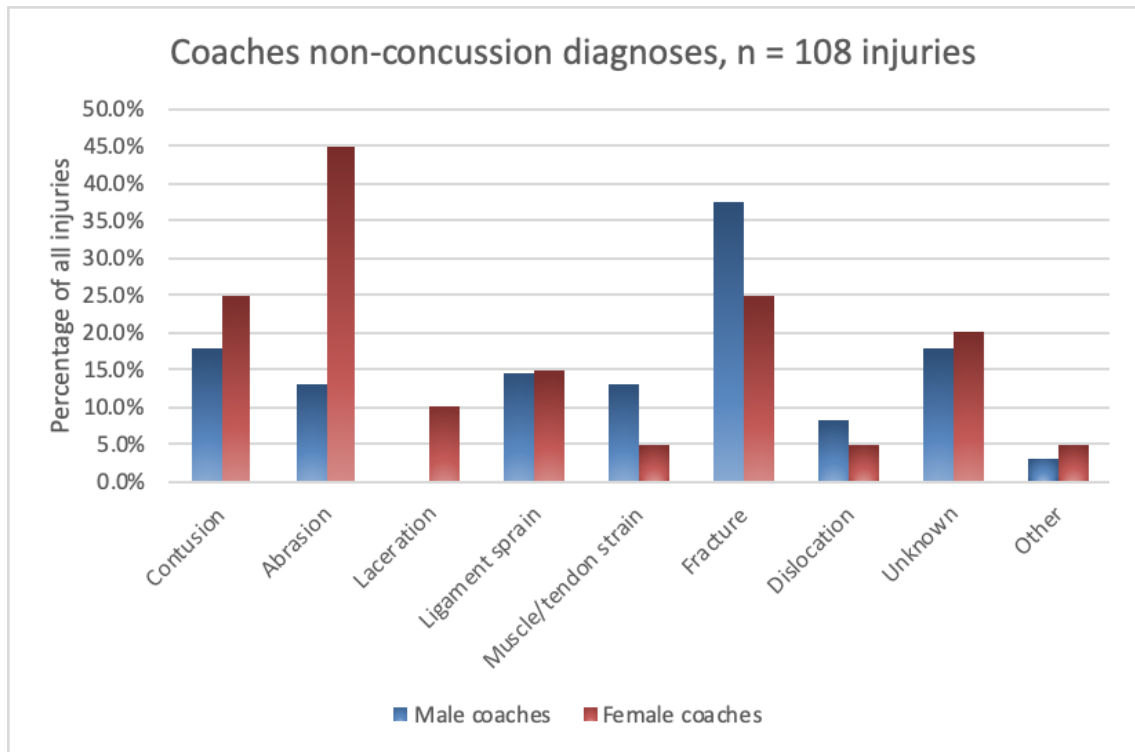


Figure . Non-concussion coach injuries by diagnosis.

Mode of Transportation From Injury Site

How was the coaches transported from the site where the injury occurred?	All coaches		Male coaches		Female coaches	
	n	%	n	%	n	%
Ambulance	5	6.2%	5	8.2%	0	0.0%
Helicopter	1	1.2%	1	1.6%	0	0.0%
Private vehicle	2	2.5%	2	3.3%	0	0.0%
ATV	2	2.5%	0	0.0%	2	10.0%
Other	1	1.2%	1	1.6%	0	0.0%
Total	11	13.6%	9	14.8%	2	10.0%

Table B5. Number and percentage of all coaches who required transport from the site of an injury. 13.6% of all injured coaches required assisted transportation from the injury site.

Disposition Following Injury

Disposition following injury	All coaches		Male coaches		Female coaches	
	n	%	n	%	n	%
Did not go to emergency room (ER)	37	45.7%	26	42.6%	11	55.0%
Went to ER, then sent home	36	44.4%	28	45.9%	8	40.0%
Went to ER, then admitted to hospital	6	7.4%	6	9.8%	0	0.0%
Unknown	2	2.5%	1	1.6%	1	5.0%
Total	81	100.0%	61	100.0%	20	100.0%

Table B6. Disposition of injured coaches. Over half (51.8%) of all injured coaches sought emergency evaluation. 7.4% of all injuries sustained by coaches required admission to the hospital.

Trail Incline

What was the trail incline where the injury occurred?	All coaches		Male coaches		Female coaches	
	n	%	n	%	n	%
Uphill / ascending	5	6.2%	3	4.9%	2	10.0%
Flat	24	29.6%	17	27.9%	7	35.0%
Downhill / descending	44	54.3%	36	59.0%	8	40.0%
Total	73	90.1%	56	91.8%	17	85.0%

Table B7. Incline of trail at time of injury: 54.3% of coaches’ injury events occurred when riding downhill. Over a quarter (29.6%) of injury events occurred on flat section of trails.

Time Off Due to Injury

Time lost from injury for coaches	All coaches	
	n	%
Less than 1 week	20	31.3%
1-2 weeks	11	17.2%
2-4 weeks	5	7.8%
At least 4 weeks	28	43.8%
Total	64	100.0%

Table B8. Time lost from injury for coaches. Time-lost data was available for 64 of 81 coach injury events. More than a third (43.8%) of injuries resulted in more than a month off the bike.

Time Off Due to Injury

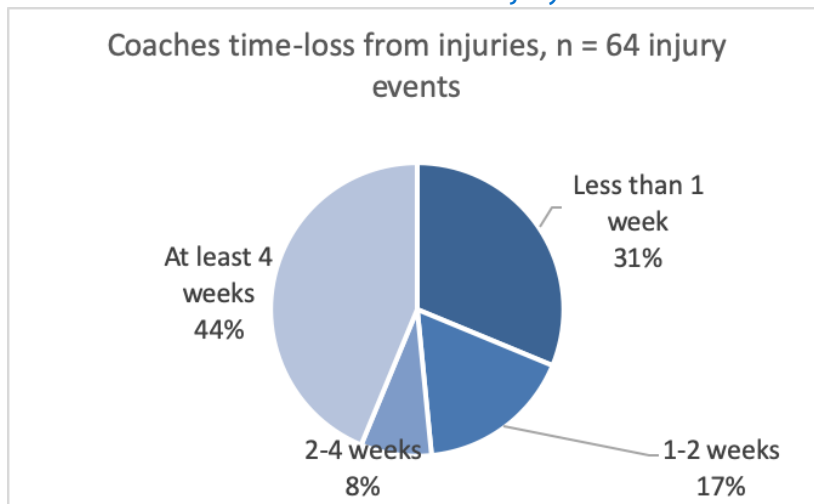


Figure B2. Pie chart representing percentages of time that student-athletes lost from practices and races following an injury event.

LIMITATIONS

As with all sports epidemiology endeavors, the NICA Safety Report is not without limitations. It is necessary to understand the limitations in order to appropriately interpret the data. It is also necessary to understand, accept and find ways to decrease these limitations in order to lessen the impact of the limitations on data analysis and improve the value of the data.

One primary limitation is that the information entered into the Safety Report is not usually entered by medical personnel, but rather by each team's Designated Reporter, who may or may not have medical training. The Safety Report does not collect primary source clinical documentation such as physician's clinic notes and x-ray reports. However, the Designated Reporter who is entering the information into the Safety Report is instructed to consult with the student-athlete, the student-athlete's parents/guardians and others so that they have the best information possible about the circumstances of the injury. A key component of the Safety Report is that the electronic injury reporting form allows the Designated Reporter to return to the injury form and update it at a later time as they obtain additional information about the injury and its outcome. In the first two years of data collection (2018 and 2019), the information entered into the database regarding injuries was deemed to be of high quality, despite not having primary source medical documentation.

A second important limitation involves the challenges of obtaining exposure data. Exposure is a very important concept in sports epidemiology. A basic definition of exposure is the amount that an athlete is exposed to risk. Exposure can be estimated in different ways. In mountain biking, exposure can be a count of number of practices and races, or the amount of time that student-athletes are on their bikes, or the distance ridden in a given period of time. For practical reasons, the simplest estimate of exposure for the purposes of the NICA Safety Report is estimated as the number of student-athletes at each NICA sanctioned practice and race. This information is supposed to be provided by a team designee such as the team director, and entered into the system by the Designated Reporter. Unfortunately, during the first two years of data collection (2018 and 2019), compliance with reporting exposure information was not adequate for use in data analyses. NICA and its partners are actively working with all stakeholders to improve the capture of exposure information. Without adequate exposure data, the NICA Safety Report will remain limited in its ability to draw firm conclusions about when and why injuries are occurring, and how to decrease the risk of injury.

A third limitation involves the challenges of communicating and coordinating with hundreds of teams and thousands of student-athletes and coaches across the country. The NICA Safety Report will be most effective if all stakeholders understand the importance of contributing to the effort. NICA will continue to have regular communications with all stakeholders and will post reports such as this one on the NICA Safety Report web page.

Another limitation is that the NICA Safety Report currently focuses on acute traumatic injuries. This is because acute injuries are by far the most common type of injury sustained in mountain biking. Depending on the results of data analysis, it is possible that an additional focus on insidious onset, overuse injuries will be added in the future. It is also possible that additional questions regarding medical illness in mountain biking will also be added in the future.

As with all large injury surveillance systems, there are some incomplete fields in the database. These missing data are primarily the result of the manner in which the designated reporters complete the injury incident forms. Ongoing communications with the designated reports should decrease the number of missing fields.

Finally, the NICA Safety Report is limited by time, money and brainpower. The sports medicine researchers at the University of Utah have been volunteering their time and expertise in order to find ways to make the sport safer. NICA and its collaborators continually seek research grant funding and other funding to support this important project.

SUMMARY AND FUTURE DIRECTIONS

Thanks to the hard work of many individuals, the first two years of data collection for the NICA Safety Report was a tremendous success. The NICA Safety Report is the largest and most comprehensive mountain biking injury surveillance system in the world. It is also the first injury surveillance system to track injuries among coaches. With the knowledge gained from this report, NICA is leading the way in efforts to make the great sport of mountain biking safer, and to protect the health of the student-athletes and all others involved in this sport. Over the next 2 years, NICA and its partners will be pursuing the following steps for the NICA Safety Report:

- Continue to communicate with all stakeholders about the importance of the project and the importance of obtaining quality exposure and injury data;
- Solicit feedback from stakeholders and safety experts for more insights on how to improve the effectiveness of the project;
- Post reports of findings to the NICA Safety Report web page;
- Review and improve the web-based injury reporting form;
- Carry out sub-analyses of the 2018-2019 data;
- Pursue increased compliance with reporting of exposure data;
- Add analyses of race versus practice injuries;
- Pursue research grant funding and other sources of funding to support the project;
- Start planning future safety interventions;
- NICA and its partners at the University of Utah plan to conduct a large-scale, prospective, controlled safety intervention study in select leagues in the fall of 2020. More information will be provided as this exciting initiative develops.



The NICA Safety Report is the largest and most comprehensive mountain bike injury surveillance system in the world.

FUN - NICA inspires friendship, joy, and adventure.

INCLUSIVITY - NICA believes everyone should be able to participate in our programs and feel welcomed, respected, and supported.

EQUITY - NICA is committed to fair treatment, equal access, opportunity, advancement, and elimination of barriers to encourage participation for all.

RESPECT - NICA expects consideration for all others, oneself, and the outdoors.

COMMUNITY - NICA unites diverse people, families, and communities through cycling by creating fun and welcoming experiences



Endnotes:

1. For the purposes of this report, the term “concussion” generally refers to a sports concussion, or a mild traumatic brain injury that occurs as the result of sports participation. However, there were a very small number of concussions that occurred that were more than mild. At the present time, the NICA Safety Report does not have the ability to assess the severity of these injuries. For questions regarding the use of the term concussion, please contact the NICA Director of Risk Management and Training.
2. For the purposes of this report, the term “activity” is an inclusive term that covers all NICA sanctioned activities that participants are involved with, including NICA sanctioned races, team practices on mountain biking trails, team practices on dirt or paved roads, skills training for student-athletes and coaches, and other activities during which a mountain biking injury might occur, such as Grit rides and “Adventure Days.”
3. <http://www.ucdenver.edu/academics/colleges/PublicHealth/research/ResearchProjects/piper/projects/RIO/Documents/2017-18.pdf>



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TREK

