

NATIONAL
SKI AREAS
ASSOCIATION



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Facts About Skiing / Snowboarding Safety

LAKEWOOD, CO – October 1, 2016 – Skiing and snowboarding enjoy an excellent safety record, and are less dangerous than other high-energy participation sports—less so than some common activities, in fact. However, skiing and snowboarding are still challenging and require physical skills that are only learned over time with practice. The sports of skiing and snowboarding involve inherent risks, but in some measure, it is the thrill itself, and the enjoyment of being out in natural splendor, that entices most skiers and snowboarders to pursue these sports. Even with the attendant risks, people of all ages continue to reap the health and fitness benefits of skiing and snowboarding each season.

STATISTICS ON SKIING / SNOWBOARDING

For purposes of compiling accurate information on fatalities and catastrophic injuries, the National Ski Areas Association (NSAA) collects data from all ski areas in the United States annually.

Fatalities - According to NSAA, during the past 10 years, an average of 38 people per season have died while skiing or snowboarding at a ski area in the United States. NSAA collects fatality data from every ski area in the United States, either directly or through one of the four main insurance companies that provide coverage for ski areas.

During the 2015/16 season, 39 fatalities occurred out of the 52.8 million skier/snowboarder days reported for the season, a slight increase over the 2014/15 season when there were 35 fatalities. Of the 39 fatalities last season, 31 were skiers, and 7 were snowboarders (one equipment type was unknown). Of the 39 fatalities, 31 of the fatalities were male, and 8 fatalities were female. Regarding helmet use, 23 of the fatalities had been wearing helmets at the time of the incident, and 15 of the fatalities did not wear helmets; for one fatality, it was unknown if they were wearing a helmet. For those fatality incidents, 59 percent were wearing helmets. Comparatively, overall, 80 percent of all skiers and snowboarders in the U.S. wore helmets last season.

The rate of fatality during the 2015/16 season converts to 0.74 fatalities per one million skier/snowboarder visits, which is near the 10-year average fatality rate of 0.67 fatalities per

one million skier visits (see Table 1). While there were 52.8 million skier visits in 2015/16 season (which is below the 10-year industry average), last season's 39 fatalities were near the 10-year industry average of 38 fatalities during a season (similarly, in 2016, there have been 35 fatalities from lightning strikes in the United States, according to the National Oceanic & Atmospheric Administration).

Catastrophic Injuries – Skiers and snowboarders suffer an average of 49 catastrophic injuries (paralysis, broken neck and back, and life-altering severe head injury) per season, according to the last 10 years of data collected by NSAA. During the 2015/16 season, there were 45 catastrophic injuries, below the 10-year average, but above the 42 catastrophic injuries reported in 2014/15 season. Based on 52.8 million skier visits last season, the rate of catastrophic injury in the 2015/16 season was 0.85 catastrophic injuries per one million skier/snowboarder visits, which is very near the 10-year average of 0.87 catastrophic injuries per one million skier visits. Skiers accounted for 62 percent of these catastrophic injuries, while snowboarders accounted for 38 percent of the incidents.

Furthermore, 65 percent of those catastrophically injured last season were wearing helmets. Overall, 80 percent of all skiers and snowboarders in the U.S. wore helmets last season. Without individualized data, however, it is unknown whether helmet use played a role in these catastrophic injuries.

Given the small numbers of annual fatality and catastrophic injuries, the data fluctuates somewhat over the span of many years, and can be highly variable from one season to another, for no immediately discernible reason. From the 2006/07 season through the 2015/16 season (i.e., the last 10 years), there were 489 catastrophic injuries occurring at U.S. ski areas, or 49 catastrophic injuries on average. In that same span, there were, on average, 56.4 million skier visits annually.

During the 2015/16 season, 74 percent of fatalities and catastrophic injuries were the result of collisions (with trees, objects, or other skiers or riders), or with an impact with the snow. There were no fatalities related to in-bounds avalanches last season, but there were four fatalities attributed to a Snow Immersion Suffocation (or "SIS") incident (see NSAA's Snow Immersion Suffocation Fact Sheet for more information).

Gender played a significant role in the total number of fatalities and catastrophic injuries. In 2015/16, 73 of the 84 total fatalities and catastrophic injuries—or 87 percent—were male. By comparison, 11 of the fatalities and catastrophic injuries were female.

ADDITIONAL PERSPECTIVE

To place skiing and snowboarding safety into context (and keeping in mind that this is not statistically significant) it helps to offer the following perspective. For example, the National Safety Council (*Injury Facts, 2016 edition*) points out that in 2014:

- 42,000 died from unintentional poisoning
- 35,400 Americans died in motor vehicle accidents
- 32,000 died from unintentional falls

- 6,300 pedestrians were killed
- 3,400 people drowned in swimming pools or bodies of water
- 1,000 died from bicycle collisions with automobiles

FREQUENTLY ASKED QUESTIONS

Are skiing and snowboarding injuries increasing or decreasing?

According to Jasper Shealy, PhD, professor emeritus of the Rochester Institute of Technology in Rochester, New York, injuries from both skiing and snowboarding are on the decline. Dr. Shealy's most recent study, released in 2011, found that the rate of incidents for skiers has been dropping steadily since 1980. Dr. Shealy has conducted a 10-year injury study of skiing injuries for NSAA going back to 1980, analyzing data provided by a cross-section of ski areas in the United States, ranging in size and geography (in 1990, Dr. Shealy included snowboarding injuries in his studies). According to Dr. Shealy's study, the rate of incidents for skiing (suspected injury responded to by ski patrol) has dropped consistently: in 1980, the incident rate for skiing was 3.1 incidents per 1,000 skier visits; in 1990, the rate dropped to 2.66 incidents per 1,000 visits, and 2.63 incidents in 2000. By the 2010/2011 ski season, the rate of skiing incidents dropped to 2.5 incidents per 1,000 skier visits. This amounts to a 20 percent decline in suspected skiing injuries since 1980, according to Dr. Shealy.

Snowboarders have also experienced a decline in injuries. Dr. Shealy began studying snowboarding injuries as part of his 10-year interval injury study in 1990, when the sport was just becoming popular (there was no snowboarding in 1980). In 1990, the rate of suspected injury for snowboarders was 3.4 incidents per 1,000 visits. As snowboarding grew significantly in popularity, the incident rate climbed to 6.97 incidents per 1,000 visits by the 2000/01 season, but the rate declined to 6.1 incidents per 1,000 visits by the 2010/11 season (in that season, snowboarders accounted for 31 percent of all visits to ski areas).

Are the rates of collisions among skiers and snowboarders on the rise?

Collisions with another person, as a percent of all accidents, have not changed significantly over time, according to Dr. Shealy's 10-Year Injury Study. Collisions with fixed objects (trees, lift towers, signage, fences, snowmaking equipment, etc), however, are on the decline. Roughly 7 percent of all incidents involve collisions with another person, and this rate has generally held steady since 1980. Collisions with fixed objects, however, have dropped from a high of 7.2 percent of all incidents in 1990 to 4.5 percent of all incidents in the 2010/11 ski season.

Furthermore, according to Dr. Shealy's study, skiers are more likely to be involved in a collision with another person than snowboarders. According to Dr. Shealy's most recent 10-year Injury Study, skiers were nearly twice as likely as snowboarders to collide with another person. Of all incidents reported, 9.3 percent of incidents were skiers colliding with another person, compared to 4.8 percent of snowboarders colliding with another person.

Who tends to be fatally injured while skiing and snowboarding?

Most fatalities occur in the same population that engages in high-risk behavior. Fatalities from skiing or snowboarding are predominantly male—on average, about 85 percent of fatalities are male. During the 2015/16 season, there were a total of 35 fatalities from skiing or snowboarding at U.S. ski areas, 31 fatalities were male, and 8 were female. Most fatalities and catastrophic injuries occur overwhelmingly on groomed, intermediate blue square trails.

Has the introduction of helmets made any difference in terms of head injury and fatalities in skiing and snowboarding?

The most recent helmet usage data clearly indicates that skiers and snowboarders already understand the importance of helmets. According to the 2015/16 NSAA National Demographic Study, 80 percent of skiers and snowboarders nationally wore helmets while skiing or riding, which has dramatically increased since the 2002/03 season, when only 25 percent of skiers and snowboarders wore helmets (see NSAA's Helmet Usage and Safety Fact Sheet at www.nsa.org/press/industry-stats). According to the 2015/16 NSAA National Demographic Study, data also shows:

- 93 percent of children 9 years old or younger wear ski/snowboard helmets
- 93 percent of children between 10 and 14 wear ski/snowboard helmets
- 87 percent of adults over the age of 65 wear ski/snowboard helmets
- Skiers and snowboarders aged 18 to 24 have traditionally represented the lowest percentage of helmet use among all age groups. In 2015/16, 73 percent of all 18 to 24 year olds wore helmets, representing a dramatic increase in usage for this age group since the 2002/03 season, when only 18 percent wore helmets.

According to a recent scientific paper, researchers studied 17 seasons of ski helmet usage data from 1995 through 2012, and concluded that as helmet usage increased over that span, potentially serious head injuries (PSHI) dropped from 4.2 percent of all ski injuries to 3 percent of all injuries over the course of the study. (See “Role of Helmets in Mitigation of Head Injuries,” Dr. Jasper Shealy, Dr. Robert Johnson, Carl Ettlinger, Dr. Irving Scher, *Skiing Trauma and Safety: 20th Volume, STP 1582, 2015*). As the study concluded, while helmet usage increased in the last ten years, there was a dramatic improvement in the decline of potentially serious head injuries, particularly in concussions. According to the study's authors, three quarters of all PSHI from skiing or snowboarding are mild concussions, and 90 percent of PSHI are typically treated and released from hospitals or clinics within four hours. The study concluded that ski and snowboard helmets are extremely effective at preventing skull fractures, and have virtually eliminated scalp lacerations. To contact the lead researcher of this study, contact Dr. Jasper Shealy with the Rochester Institute of Technology, at jeseie@rit.edu, or by phone at (585) 739-4250.

This trend in helmet usage emphasizes the importance of not increasing risk-taking behavior simply because you are wearing a helmet. Skiing and riding in control and adhering to the industry's “Your Responsibility Code” is the best way to minimize the risk of injury while skiing or snowboarding.

What is the best way to avoid a collision with another skier or snowboarder?

The best way to avoid a collision is to follow the steps of Your Responsibility Code including: stay in control, stop in a safe place for you and others and when starting downhill or merging, and look uphill and yield. It is also important to obey signs designating slow zones and intersecting areas. Also, minimize distractions (avoid headphones, loud music, texting or Smartphone use) in order to maintain total awareness of your surroundings. It is recommended that all skiers and snowboarders share the slopes, and always show respect for others.

What is being done to improve safety?

Skiers at NSAA member resorts (currently 321 alpine resorts in the U.S.) are given several opportunities to learn how to ski safely. All ski areas endorse and are asked to display the Your Responsibility Code, which encourages skiers and snowboarders to ski and ride within their ability, watch for skiers and snowboarders downhill, look uphill before entering a trail, move to the side of the trail when stopping, use devices to help prevent runaway equipment, observe all posted signs and warnings, have the ability to load and unload lifts, and practice courteous ski habits. Those who break the code or violate rules at ski areas are routinely stripped of their passes and ski area privileges by ski patrollers.

Ski areas have undertaken several programs to increase ski safety. Those programs have established family ski areas and slow zones, increased the presence of monitors of reckless skiers, to increasing the number of monitors and patrollers on the slopes, especially during high volumes periods. Moreover, ski areas are encouraging opportunities for ski and snowboard lessons, both individual and group lessons, which can greatly aid in reducing injuries. During the 2015/16 season, according to NSAA's *Kottke National End-of-Season Survey*, there were on average approximately 20,900 lessons given on average per resort, with about 33 percent of these lessons were Level I (first time skiing or snowboarding).

What do ski areas do to address the safety issue of skiing and boarding?

Mountain resorts expend tremendous energy and expense educating their guests about skier and snowboarder safety. Below are some of the many slope safety campaigns.

“HEADS UP” CAMPAIGN AND THE RESPONSIBILITY CODE

NSAA created the “**Heads Up**” campaign to support ski area safety education efforts and provide a unified platform for which to proactively reach skiers and snowboarders with timely slope safety information. The objective of the campaign is to further reduce the frequency of incidents through education. The campaign emphasizes the seven points of the skier and snowboarder Responsibility Code. Those points include:

1. Always stay in control.
2. People ahead of you have the right of way.
3. Stop in a safe place for you and others.
4. Whenever starting downhill or merging, look uphill and yield.
5. Use devices to help prevent runaway equipment.

6. Observe signs and warnings, and keep off closed trails.
7. Know how to use the lifts safely.

Additionally, resorts nationwide continue to recognize and celebrate NSAA's annual **National Safety Awareness Month**, now in its 16th year. In 2013, NSAA expanded this initiative from "Safety Week" to "Safety Month," in order to provide ski areas more opportunities for education and interaction with more guests over the course of the month. While Safety Month activities are based largely on the Heads Up safety initiative and Responsibility Code, resorts continue to expand upon and add their own creativity to the overall messaging, including avalanche awareness, terrain park guest education, and reckless skiing initiatives.

Moreover, each season NSAA recognizes member ski areas that have implemented particularly effective safety campaigns focused in a number of areas, including helmet safety, chairlift safety, terrain park safety, avalanche safety, best safety website, and best Safety Month campaign. Find more information on NSAA's safety education efforts and initiatives under the Safety and Education menu at www.nsaa.org.

KIDS ON LIFTS

In 2012, NSAA developed the **Kids on Lifts** educational website. NSAA views using and riding chairlifts in a responsible manner as one of the primary safety considerations for all skiers and boarders. A guest's behavior has as much or more to do with the safety of the sport as does any piece of equipment from helmet to chairlift. The website www.KidsonLifts.org contains FAQ's and safety tips on how to load, ride, and unload responsibly, general skiing and riding tips, coloring pages for kids, public service announcements and more. The tagline "No Horsing Around" is a motto we hope to ingrain not only in children but in every skier and boarder.

SMART STYLE

NSAA and Burton Snowboards created the **Smart Style Terrain Park Safety** initiative in 2004 designed to help resorts enforce a code of conduct in terrain parks. The elements encourage participants to make a plan, look for others before using the jumps, respect other participants, and participate at their own level of skill. This venture is a cooperative effort to continue to heighten the awareness of the proper use of terrain parks at mountain resorts, while also delivering a unified message that is clear, concise, and effective. The Smart Style program includes four main messages: **Make a Plan, Look Before You Leap, Easy Style It, and Respect Gets Respect**. These messages encourage participants to scope around jumps first, to be aware of their landing areas, to start with the basics and to respect other participants.

PARK SMART

NSAA developed the **Park Smart Freestyle Terrain Resource Guide** in 2008, and updated the materials and signage in 2014 to make the signage more consumer-friendly and readable. The guide provides freestyle terrain users with useful safety information including the four

points of Smart Style, the ATML method, the seven points of Your Responsibility Code, and safety points to consider when using freestyle terrain.

Objects are Closer Than They Appear

In 2008, NSAA developed an additional component to its Heads Up safety education campaign billed “**Objects are Closer Than They Appear**” to further highlight the first tenet of Your Responsibility Code: Always stay in control and be able to stop or avoid other people or objects. The campaign emphasizes the role that speed plays in staying in control and overtly addresses the risk posed by collisions with trees or other fixed objects on the slopes.

TerrainParkSafety.org

NSAA launched a new consumer website: www.terrainparksafety.org in October 2004. The site incorporates up-to-date information on freestyle terrain safety, and encourages consumers to educate themselves about the use of terrain parks, halfpipes, and other freestyle areas at snowsports resorts. As the sport grows in popularity, the elements of the site are meant to educate the consumer about various aspects of freestyle terrain.

LIDS ON KIDS CAMPAIGN

NSAA promotes the use of helmets on the slopes. We urge skiers and riders to wear a helmet – but to ski or ride as if they are *not* wearing a helmet. NSAA views skiing and boarding in a controlled and responsible manner – not helmets only – as the primary safety consideration for all skiers and boarders. A guest’s behavior has as much or more to do with the safety of the sport as does any piece of equipment. In 2002, Lids on Kids www.lidsonkids.org debuted as a resource for consumers to learn about helmet use in skiing and snowboarding. The site contains FAQs about helmet use, fit and sizing information, general slope safety information, related articles and games, and testimonials about helmet use from well-known athletes, including members of the U.S. Ski and Snowboard Teams.

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