

CHANGES IN ATTITUDES TO RISK AND KNOWLEDGE ABOUT AVALANCHES AMONG SWEDISH SKIERS AFTER THE INTRODUCTION OF A NATIONAL AVALANCHE SAFETY PROGRAM

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ABSTRACT

In 2013, a web survey was conducted together with Freeride.se, aimed towards Swedish off-piste skiers in order to identify the target group's knowledge, experience and attitudes towards off-piste skiing and avalanches. 1047 skiers participated.

The results of the survey gave new important knowledge about different target groups prior to the start of the Swedish avalanche forecast program and also more knowledge regarding the level of avalanche awareness among skiers in general.

In 2016 Sweden launched the first national avalanche forecasting program and the same year, a revised avalanche education program was developed and presented. Both constitute important tools for prevention of future avalanche accidents among Swedish skiers.

In April 2017, a repetition of the first survey was initiated, with nearly the same questionnaire, to see if there had been any change in behavior, attitudes to risk and knowledge about avalanche awareness among Swedish skiers since 2013.

With 1028 participants, the results of the new survey showed some interesting changes that probably could be seen as early effects of the introduction of a new public avalanche forecasting service together with the revised avalanche education program.

KEYWORDS: Avalanche Education, Human Factors, Avalanche Accidents

1. INTRODUCTION

Since 2001, 35 Swedish skiers and snowboarders have died in avalanche related accidents. This means, on average, 1.9 persons per winter season.

Of the accidents, 30 of those have occurred outside Sweden, most in the Alps but also in Canada, the United States, Chile and India, so in a sense Sweden, is exporting avalanche victims.

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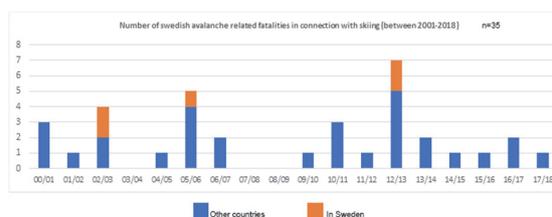


Figure 1. Number of avalanche related fatalities in connection with skiing 2001-2018

In 2010, the Swedish Environmental Protection Agency and their Mountain Safety Council started a project with its aim to reduce the number of Swedish deaths and injuries in avalanches.

The project was aiming to operate in the classic dimensions of avalanche safety; snowpack, terrain, people and education.

In the winter of 2016, Sweden's first national avalanche forecasting program was launched and several areas is covered with daily forecasts during the winter season. Besides that, avalanche terrain has been classified in

around 15 regions using the Canadian Avalanche Terrain Exposure Scale (ATES).

In addition to this, a new and revised national avalanche education system was launched in 2015. Important avalanche prevention tools are now finally in place, and Sweden has improved their safety measures and are better equipped for long-term focusing in preventing avalanche accidents and also with increasing knowledge about avalanches, our target groups behavior and attitudes to risk and what is causing accidents.

2. METHOD

In April 2017, the Swedish Mountain Safety Council initiated a web-based survey aimed towards Swedish skiers, also this time the members of the website Freeride.se were acting as respondents.

The purpose was to map skills, attitudes and behaviors related to off-piste skiing and avalanches among Swedish off-piste skiers (alpine and snowboard). Firstly, questions that were included in the previous study in 2013 were asked to study changes, and new questions were raised to raise awareness of Swedish off-piste riders.

The survey was conducted between April 12th to May 19th with the members and users of Swedish largest website and forum for Swedish skiers - www.freeride.se as main respondents. Freeride.se which was founded in 1998 is today, with its 250 000 unique visitors each month of the season, by far Sweden's largest website for dedicated skier and a natural meeting place on the web for Swedish skiers and snowboarders.

In total, the survey was answered by 1 213 respondents. Of these, 1,028 responded that they mainly go off-piste (three quarters usually ski off-piste close to skiareas and a quarter mainly goes ski-touring), which is the basis on which the report is based.

Respondents were asked to answer a total of 33 questions. The topics highlighted various aspects of off-piste skiing such as skiers profile, experience of skiing, location of skiing, type and use of avalanche equipment, risk-taking, avalanche awareness, avalanche accidents, changes in behavior

3. VALIDITY

The question of the representativeness of the sample is central to whether the results can be considered relevant to Swedish off-road users in a broader perspective. The respondent group

was compared with the age, gender statistics for Swedish riders who died in avalanches between 2001 and 2017.

The results, which should be interpreted with caution in view of the fact that the fatalities are only 35 in number, showed a good match for the parameters that has been studied.



Figure 2. Gender distribution, avalanche fatalities 2001-2017, respectively distribution

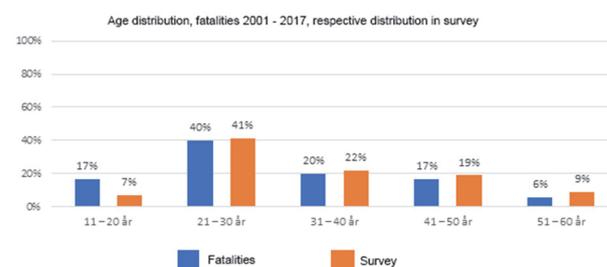


Figure 3. Age distribution, fatalities 2001-2017, respectively distribution in survey

Our conclusion is that the sample in the current survey is representative of Swedish skiers who have died in avalanche related accidents during the past 17 years. A comparison of the results for the three parameters between the surveys in 2013 and 2017 was therefore also made. It showed great consistency between the results of the studied parameters, gender and age.

The proportion of women in the previous study was 14 % and has increased marginally to 16 % in the new study.

The age distribution between the two studies also showed great consistency. 48 % of respondents were 30 years or younger, compared with 56 % in 2013. 28 % were 41 years or older compared to 17 % in the previous survey.

The group of respondents consists of experienced skiers. Nine out of ten have been skiing off-piste for at least ten years. Three out of ten respond to their own experience of avalanches. Five out of ten knows someone who has experienced avalanche accidents.

4. RESULTS

To compare and to see if there have been any major changes since the last survey and after different avalanche safety measures had begun, we present below the answers to the some of the key questions from the survey in the form of charts and comments.

4.1 Use of avalanche safety equipment

The respondent group is generally equipped with a full setup of avalanche equipment. Compared with 2013, the use of ABS backpacks has almost doubled, from 20% to 35% in 2017. Other equipment such as probe, transceiver and shovel as well as helmet are used by nearly 90% of the respondents.

The group of respondents is generally equipped with a solid avalanche equipment. A worrying development is that fewer exercises with their avalanche equipment. Only 57% practice at least once a year or more often. One out of ten respondents reply that they never practice. They can expose themselves and their teammates to great danger if an avalanche accident occurs and could expose themselves and their friends to great danger if a avalanche accident occurs.

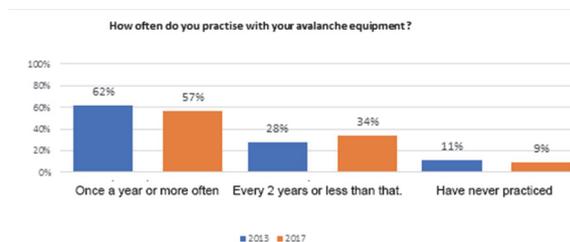


Figure 4: How often do the respondents practise with their avalanche equipment?

4.2 Avalanche Knowledge and Awareness

Even though the respondents are skiers with long experience, only one third of them believe that they have good avalanche skills.

Men generally value their avalanche skills higher than women do. 37 percent indicate that they are "good" or "very good" compared with 30 percent among women.

Avalanche courses are becoming increasingly popular and are an essential way to increase your avalanche knowledge. Six out of ten have taken a course, which is an increase compared with the survey in 2013. Women are slightly overrepresented with seven out of ten against almost six out of ten regarding men.

The most common source of avalanche information is when distributed from the current ski resort, which nearly nine out of ten uses. Almost as many people look at the weather report, and an equal amount answers that they make a total assessment together with the friends they are going to go with the current day. Around half of the respondents use the Swedish Environmental Protection Agency's avalanche forecasts, which were introduced in 2016 for the Swedish mountains.

In the survey of 2013, the question was asked how easily respondents considered it to find information about avalanche danger when skiing in Sweden. Nearly two out of ten answered that it was "very easy" or "rather easy". In 2017, the proportion has more than doubled to almost half. The most likely explanation for this change is the introduction of the Swedish Environmental Protection Agency's avalanche forecast program along the Swedish mountain range's most well-visited areas.

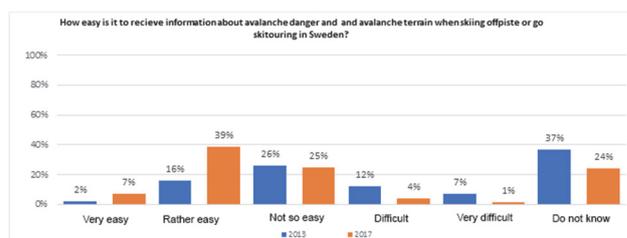


Figure 5: How do respondents experience the availability of avalanche information?

4.3 Accidents and Incidents

A large percentage has their own experience of avalanche accidents, as many as 36 % of the respondents have been caught in an avalanche. When asked if they have any friends who have been captured, 62 % answered that it is the case.

Some single percent of the respondents have been involved in avalanche accidents where they have been completely buried. A slightly larger proportion has experienced a larger avalanche but managed to stay on the surface and not be buried.

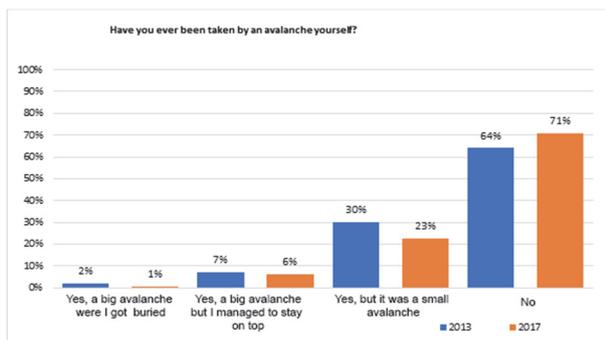


Figure 6: Respondents experience of avalanche accidents and incidents

Men are clearly overrepresented among those who have been involved in a avalanche. The pattern of the off-piste skiers who are reluctantly taken by avalanches becomes even clearer when even their friends' experiences are added. Half of respondents respond that they have friends taken in a avalanche. At the same time, it is a decrease of six out of ten in the measurement in 2013.

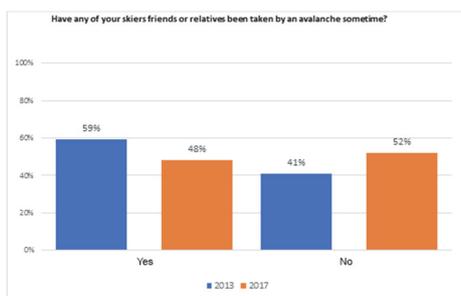


Figure 7: Respondents friends experience of avalanche accidents and incidents

4.4 Risk-taking and behavior

Two out of three are prepared to take risks to get good off-piste skiing. This is a decrease compared with the previous study. The risk is also calculated. Four out of ten often disappoints or always from an off-piste yard due to suspected low-risk.

Risk-taking is a key factor in the likelihood of an avalanche accident, or any other type of accident, in the event of off-piste skiing. In the survey conducted in 2013, three out of four (74 percent) agreed in whole or in part: "If I want a good off-piste, I must be prepared to take risks." This proportion has fallen to 66 percent in the new study.

There may be several explanations for the change. One possible explanation is the establishment of the avalanche forecasting service in 2016, which has raised increased attention for avalanche awareness and prevention in Sweden.

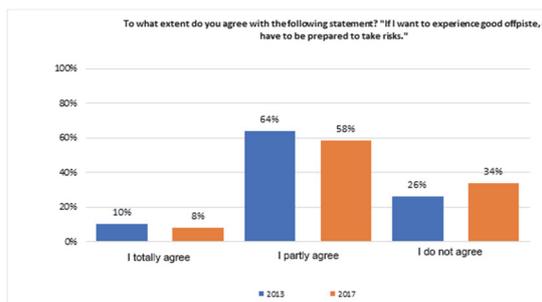


Figure 8: Respondents willingness to take risks for better off-piste

5. CONCLUSIONS

Why do experienced Swedish skiers get into avalanche accidents? What makes them, despite relatively good avalanche skills, take wrong decisions in crucial moments with fatal consequences?

These are questions without simple answers but equally important to ask in order to increase our understanding. Risk awareness is undoubtedly the most central factor for safer skiing in avalanche terrain. Risk awareness includes both knowledge, attitudes and behavior.

The most important outcome compared with the study in 2013 is that the willingness to take risks has decreased since 2013, which is a step towards safer skiing in avalanche terrain.

The previous study was conducted after a winter with many fatalities. Since then, the fatality rate has decreased, which is hopefully heading into a positive trend. However, one aspect has been strengthened.

All Swedish skiers that has been killed in avalanches since 2013/2014, have died outside Sweden. There is often spoken opinion at the ski areas in the Alps that Swedes are more willing to take higher risk compared to skiers from other countries. Therefore, the results of the risk assessment from the survey, presented, are urgent.

In the winter of 2016, Sweden introduced its first avalanche forecasting program. This was an important step in the Swedish avalanche safety work.

However, neither the avalanche forecasts nor education programs imply any guarantees. At the same time, there are interesting results in the survey, which indicate that the avalanche forecasts have already had a positive impact on the riders' risk attitudes and behavior. In that case, it is a very pleasing development.

The result reflects what respondents responded. The results show a good match with a person profile that is close to that of the experienced Swedish skiers, which makes the study interesting and useful for preventive work.

The ambition is that this knowledge should spread and be discussed by those who come in contact with skiers and have an interest in avalanche issues, thus contributing to the increased exchange of knowledge, changing attitudes and the most behavioral change towards safer skiing in the avalanched terrain.

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