UNDER THE RADAR:
Exploiting "New School" Media to Capture Unreported Avalanche Incidents

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ABSTRACT: Unless you're a sheriff or coroner, it's not easy getting details on avalanche incidents. Many success stories go unreported, skewing publicly available statistics toward fatalities and worst-case scenarios. The growing social media environment, however, provides instant access to those who have been on the ground in avalanche incidents, whether or not these incidents were reported. This can provide valuable insights into what's really happening on the debris pile: techniques and gear that are working and not working, human factors in avalanche rescues, and what the real-life challenges are in "live combat."

Through North American social media, including internet forums, blogs, and Facebook pages, we gathered information from 97 respondents that have been in avalanche rescues–in many cases, live recoveries. Our key findings: 1) almost 40 percent of the companion rescue incidents went unreported; 2) over 25 respondents had performed live recoveries with avalanche beacons–almost a third of which went unreported; and 3) shoveling and evacuation were the most time-consuming phases of most incidents.

1. TRADITIONAL STATISTICS

Reports on avalanche statistics traditionally have been based on incidents documented by avalanche centers, sheriff's departments, and coroner reports. Examples include papers published by this author (Edgerly, 2008) and by Dieter Stopper (Stopper, 2008) at the 2008 International Snow Science Workshop (ISSW).

Both of these papers analyzed several years of statistics in North America and Tyrol, Austria, focusing mainly on multiple burial incidents. These statistics were gathered from reports made available from avalanche centers. During the course of this research, however, it became obvious that the reports that were available to the public mainly involved fatalities and that many avalanche rescue incidents were not being reported. This can severely skew statistics toward worst-case incidents, including the deepest burials, incidents without transceivers, and incidents with multiple victims.

Finally, written reports also do not always contain enough detail to be of value to avalanche researchers, scientists, or snow safety manufacturers. In an attempt to get further details on the incidents regarding search times, excavation times, and other factors, both authors attempted to interview the individuals involved in the incidents. This was quite difficult, as none of these reports contain contact information for the rescuers or the buried persons. This had to be obtained by other means, including phone directories and internet search engines.

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After analyzing the statistics and interviewing as many involved parties as possible, the authors concluded that shoveling–not beacon searching–was the crux of most avalanche rescues, including multiple burials. They also both pointed out that the study was somewhat skewed toward worst-case incidents. We determined that to get a clearer picture of what was really going on in real avalanche rescues–including successful recoveries–it would be necessary to reach out directly to those involved instead of going through published incident reports. In recent years, this has become much more realistic with the rapid adoption of Facebook and other social media networks.

2. SOCIAL MEDIA SURVEY

In the winter of 2010, we developed a survey that included roughly 75 questions about what equipment, techniques, and organizational methods were used in avalanche incidents involving burials. This was created through independent contractor Survey Gizmo and respondents were recruited from over 25 social media networks. This included blogs, forums, and Facebook pages including Wildsnow.com, Tetongravity.com, Telemarktips.com, Biglines.com, Mountainproject.com, Transworld Snowboarding, National Ski Patrol, AIARE, Snowest.com, and Snowandmud.com. We attempted to get the survey out to a wide range of both recreational and professional backcountry users, to minimize any potential bias that could be created by a preponderance of responses from one user group over another. This survey was made available to snowmobilers as well as skiers, snowboarders, and climbers.

The objective of the survey was to analyze a better cross-section of incidents than the 2008 research, which focused on published reports and multiple-burial incidents. The motivation was to determine what the most important issues are in avalanche rescues and what can be improved in the way of equipment, training or education to increase survival rates.

3. SURVEY RESULTS

Since the survey went out to such a wide cross-section of recipients, it was necessary to segment the responses by rescue type, to provide better resolution. About two-thirds of the respondents were involved in companion rescues (63 percent) involving members of their own party. Fifteen percent were involved in a search for someone from another nearby party. Seventeen percent of the respondents came from participants of organized SAR (search-and-rescue) teams called to the scene well after the accident took place.

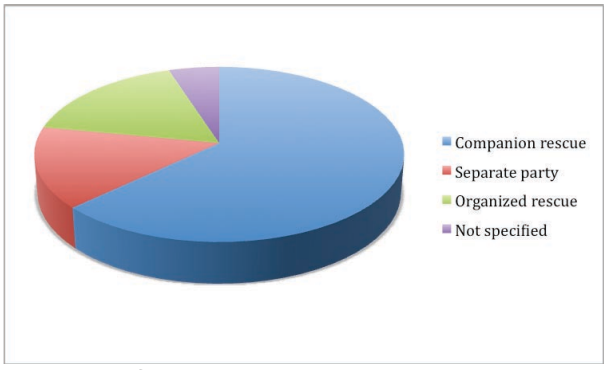

Figure 1: Companion vs. organized and separate-party rescues.

3.1 Reported vs. Unreported Incidents

Of these groups, companion rescues were the least likely to be reported. Nearly 40 percent of these went “under the radar.” Only 12 percent of the organized

rescues went unreported. These mainly involved injuries and non-complete burials.

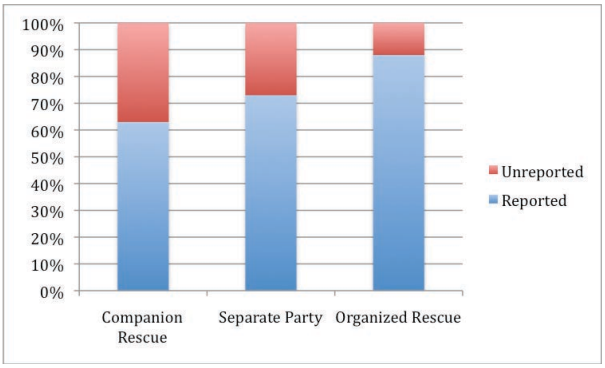

Figure 2: Reported vs. unreported incidents.

The likelihood of the incident being reported is highly dependent on the outcome of the rescue. All incidents were reported if they involved fatalities. However, of incidents involving complete burials, 40 percent of the successful live recoveries were not reported.

The overall fatality rate was 28 percent in our survey. Of reported incidents, the fatality rate was 41 percent. Of unreported incidents, the fatality rate was zero, as mentioned above. These statistics support our belief that published reports are skewed toward worst-case incidents.

3.2 Survival Rates

As can be expected, companion rescue incidents had the highest survival rates. Organized rescues were the least successful, the obvious reason being their longer response times. The survival rate was zero for complete burials involving organized rescues that were not within or adjacent to a ski area.

The cause of fatality was cited as asphyxiation in the majority of incidents. Of course, none of the respondents were coroners, so this data is inexact. Trauma was cited in less than half the incidents. Both trauma and asphyxiation were cited in several cases.

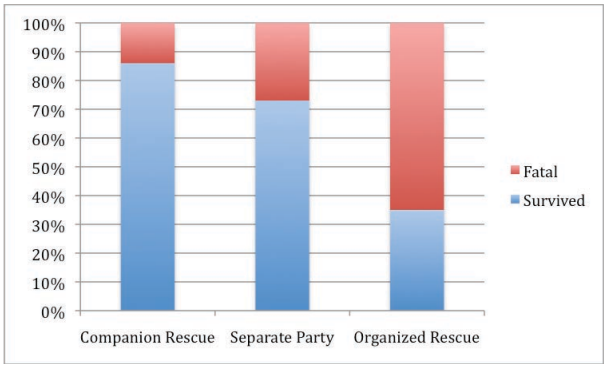

Figure 3: Survival rates of companion, separate-party, and organized rescues. This includes all incidents, including those not involving burials.

3.3 Number of Victims

Just under half of the incidents involved complete burials with no surface clues. Just six percent of the incidents (12 percent of the complete burials) involved multiple buried victims. This is slightly lower than the 14 percent that we reported in our 2008 research.

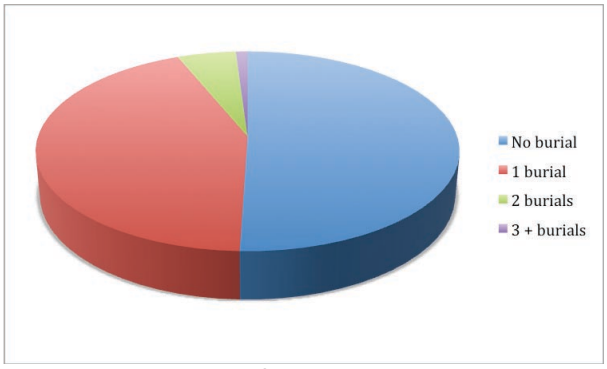

Figure 4: Number of buried victims.

Of these complete burials, just four involved multiple-victim beacon searches. Two respondents reported complications in the beacon search due to multiple signals. These both involved searchers using analog transceivers.

3.4 Overall Incident Time

Shoveling and evacuation, respectively, were by far the most time-consuming aspects of the incidents in our survey. This was followed by recovering equipment, reaching the victim safely (most often due to secondary avalanche hazard), victim assessment, and CPR or first aid.

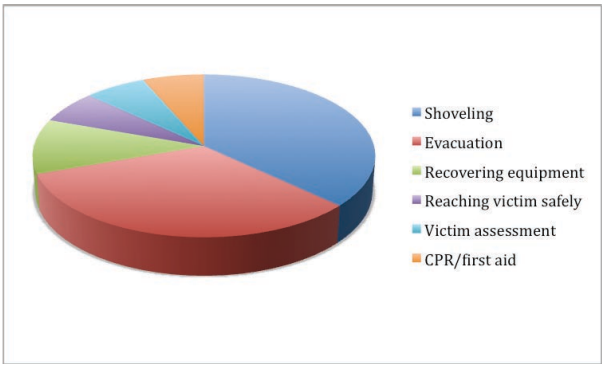

Figure 5: Most time-consuming aspects of the search (by number of respondents).

3.5 Debris Hardness

Although shoveling was cited as being very time-consuming, the debris was not as difficult to penetrate as is often described. There were very few cases where the debris was characterized as “very hard.” In fact, in non-organized rescues, the debris was described as “very soft” more often than it was described as “very hard.” The bulk of respondents described the debris as “firm” and “hard.”

In organized SAR responses, only one respondent described the debris as “very hard.” When asked by telephone, he said the snow could be moved simply by chopping and shoveling and did not require prying, as is sometimes taught in specialized training courses.

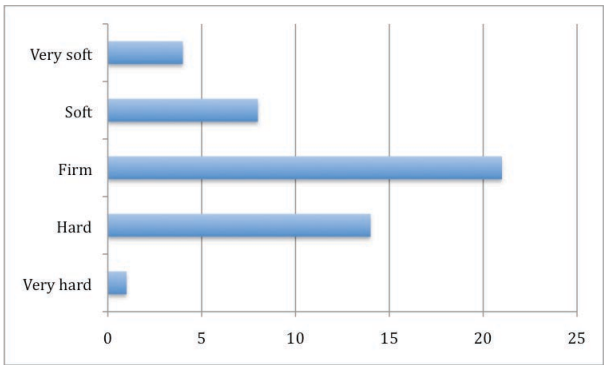

Figure 6: Relative debris hardness in companion and separate-party rescue incidents (by number of respondents).

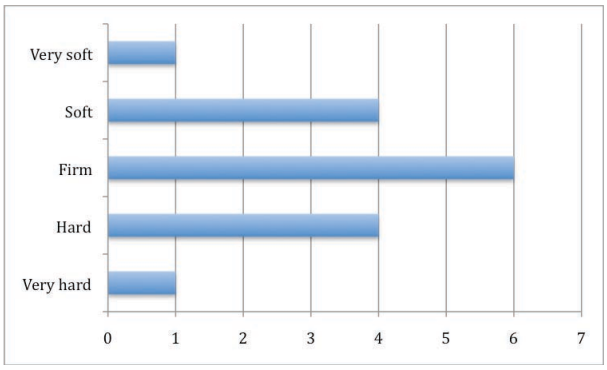

Figure 7: Debris hardness in organized rescue incidents (by number of respondents).

One of the more surprising results of the survey was that there were no incidents in which shovels were broken. Two respondents said they bent their shovels and five respondents said their plastic shovels were not very effective. But there were no complete failures.

3.6 Rescue Management/Site Control

In the area of overall rescue management and site control, secondary avalanche hazard was cited the most often (17 incidents) as complicating the search, followed by lack of leadership or communication (9 incidents), renegade signals (6 incidents), and panic/chaos (5 incidents).

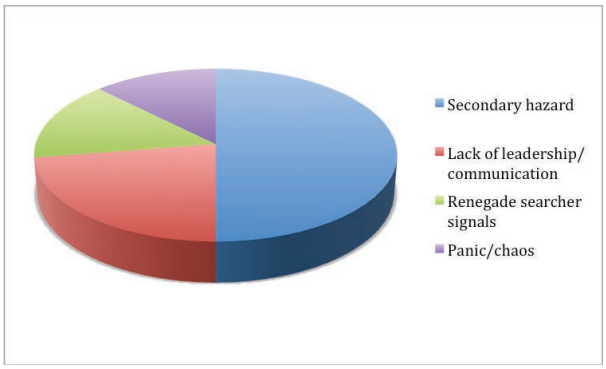

Figure 8: Rescue management issues cited.

Secondary hazard and group leadership are part of most avalanche trainings. However, an important additional point is that signals being transmitted from people above the surface, within the searching parties, were cited three times more often for complicating a search than signals from multiple buried victims beneath the surface.

3.7 Transceiver rescue times

Another interesting point is that the beacon search is cited very rarely as a complicating factor in avalanche rescues. In six complete burial cases, the victim did not have a transceiver. But in the remaining incidents, the average search times were on the order of five minutes from the beginning of the signal search (if applicable) to the probe strike. This does not include organized rescues and two companion rescues in which there was a delayed response due to long distances between members of the involved party.

It should be noted that all times provided by respondents were estimates and are therefore not precise. The perception of time, furthermore, can vary widely between individuals, especially under stress.

These times include both live recoveries and fatalities. If you analyze the times for

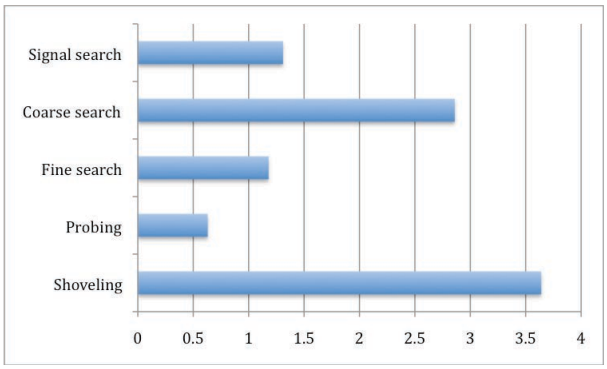

Figure 9: Average transceiver rescue times (in minutes) for companion and separate-party rescues.

live recoveries versus fatalities from asphyxiation, then it is clear that burial depth and excavation time–not beacon search time–make the difference between life and death (assuming beacons are used; otherwise, fatality is guaranteed).

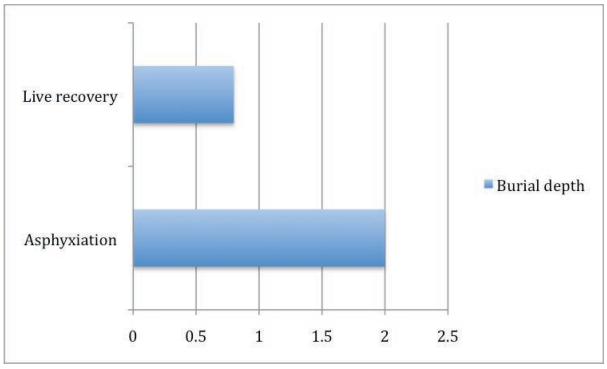

Figure 10: Average burial depth (in meters) for live recoveries and fatalities by asphyxiation; non-organized rescues.

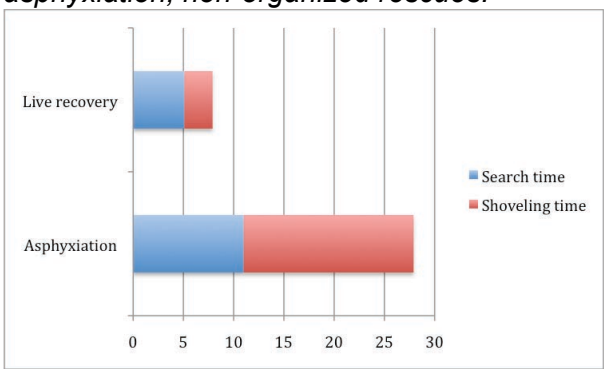

Figure 11: Average beacon search and shoveling times (in minutes) for live recoveries and for fatalities by asphyxiation; non-organized rescues.

3.8 Airbags and Avalungs

With the paramount importance of burial depth and excavation time, it makes sense to analyze the effectiveness of newer devices that address these issues, such as avalanche airbags and Avalung systems. Avalanche airbags are proactive systems designed to keep the potential victim on top of the debris, to prevent burial. The Avalung is designed to prolong the amount of time a buried victim can survive after burial.

Avalanche airbags were deployed in three incidents in the survey, by seven people caught in avalanches. Six of those seven stayed on the surface and survived with no injuries. The seventh person was pushed through trees and his airbag punctured. He died from asphyxiation.

In five incidents, the buried subject was wearing an Avalung. In two cases, the victim kept the mouthpiece in his or her mouth and could utilize the device after burial. In three cases, the user was not able to keep the mouthpiece in, so was not able to take advantage of the device.

4. CONCLUSION

By using social media to go directly to those who have been in real avalanches, we have been able to capture many incidents that previously flew “under the radar” of traditional avalanche reporting.

Secondary avalanche hazard, leadership, renegade transmit signals, shoveling, and evacuation are the real challenges for those facing “live combat” on the debris field. These are important subjects that avalanche educators should emphasize in their avalanche courses.

The most encouraging finding in this study could be that, hidden among the annual procession of highly publicized avalanche fatalities, there are a surprising number of unreported success stories. With greater opportunities for education, the growing adoption of proactive safety devices like airbags, and the rapidly growing use of social media, we may be hearing about even more success stories in the future.

Instead of getting our reports from distant sheriffs and coroners, we can now hear and learn directly from those who have engaged in real avalanche rescue combat. By getting their inspiring examples out to the public, we can further motivate backcountry users to get educated, learn good decision making, and practice with their safety equipment.

5. REFERENCES

Edgerly, B, 2008. “Digging Deeper: Uncovering the Real Issues in North American Multiple Burials.” ISSW Proceedings, 2008.

Stopper, D. and Mullen, J., 2008. “Specialized Multiple Burial Techniques: Reality Versus Myth; the European Perspective.” ISSW Proceedings, 2008.