

# Revisiting Multiple Burial Statistics: U.S. Avalanche Incidents 1995-2007

By Bruce Edgerly

*"Tragedy in the alpine: seven killed as massive snowslide buries guided party."* Unfortunate headlines like this are printed all too often in North America. A single avalanche fatality is unfortunate enough; multiple fatalities are even more tragic. But as tragic as these incidents are, they can also be sensationalized by the media, manufacturers, and even avalanche educators. While epic multiple-burial scenarios like this have occurred in guided parties in various alpine countries, how prevalent are multiple burials in the U.S., especially in a typical recreational setting? How much time and effort should educators devote to teaching special techniques and technologies for performing complex multiple-victim transceiver rescues?

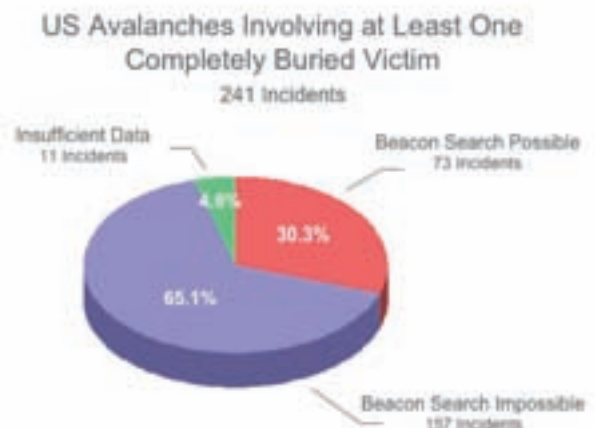
This is an important question for educators, who need to efficiently allocate their time when teaching courses. It's also important for manufacturers and consumers, who must prioritize important features when designing and purchasing equipment, respectively. Finally, we must address a basic issue of terminology. When teaching transceiver rescue, should a "multiple burial" really be called a "multiple burial" if the technique used to solve the burial is no different than the technique used for a single burial?

In an effort to better define the significance of multiple burials in the U.S., we analyzed 12 years of incidents, from December 1997 through March 2007, listed on the database of the American Avalanche Association ([www.avalanche.org](http://www.avalanche.org)). In some cases, this was supplemented with further research and witness interviews. The goal was to answer the questions above by determining a) how many incidents truly involve completely buried multiple victims using transceivers and b) of these, how many are "special case" multiple burials that lend themselves to a special search technique or technology.

Our findings show that it is more valuable for avalanche educators to get their students to own beacons, to master single burials, and to learn strategic shoveling than it is to invest time on special cases.

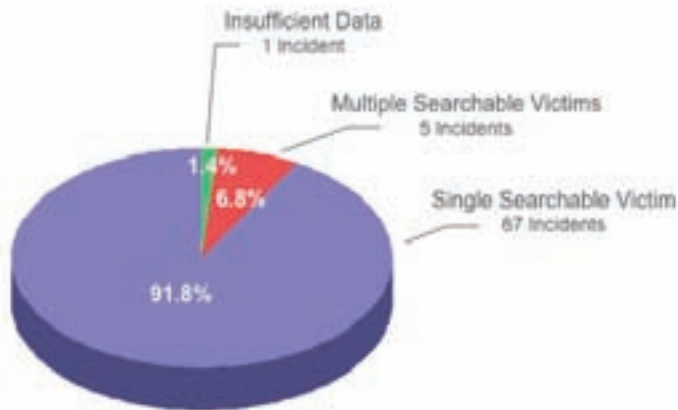
## DEFINING MULTIPLE BURIALS

"More than 50 percent of avalanche accidents involve multiple victims." This is a popular statement commonly heard in the snow safety industry. While this is a valid statistic on the surface, it can be very misleading, depending on how you define a "victim." The U.S. statistics show that several people are often "involved" in an avalanche, but the number that are completely buried is much smaller. Of 366 incidents involving people reported from 1995 to 2007, 48 percent were reported to involve "multiple victims." But these victims often escape the slide or are only partially buried. Only 7.7 percent of the reported incidents involved completely buried multiple victims. Less than half of these were using transceivers. Of these, only a few, if any, would have benefited from using a special transceiver search technique.



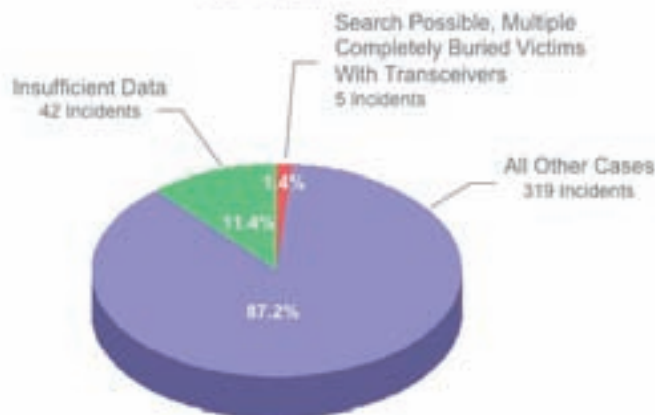
## Beacon Search Possible

73 Incidents



## US Avalanches Involving People

366 Total Incidents



In our analysis, we draw clear distinctions between cases involving "multiple victims," cases involving legitimate multiple-victim beacon searches, and cases in which a special multiple-burial technique or technology could be applied. Legitimate multiple-victim beacon searches require the following conditions:

- More than one victim must be completely buried, with no visual clues above the surface;
- More than one completely buried victim must be carrying a transceiver;
- At least one searcher with a transceiver and shovel must be on scene within 15 minutes.

Even when the above conditions are met, all victims will be found by the traditional practice of locating and excavating the nearest victim, turning off his or her beacon, then proceeding to search for the next closest victim. Additional factors must be present to

make use of a special technique or technology:

- If the rescuer is alone, he or she cannot turn off the first victim's beacon once the airway has been established, either because the beacon is too difficult to access or the victim is too deep to excavate within the window of survivability. (This brings up the difficult issue of multiple-victim "triage," a separate subject that introduces a challenging ethical debate—and should only be considered by experienced professionals.)
- If a second rescuer is available, then one can begin excavating while the other begins searching for the next victim; and
- The victims must be buried close enough together so both of their signals are captured at once and both searchers are led to the same victim. If they are located farther apart, then each searcher can simply isolate and excavate a separate victim as if it were a single burial.

For purposes of clear terminology, we call any case meeting all of these criteria a "special case multiple burial."

## RESULTS

To classify and analyze the U.S. incidents, we hired a computer scientist to develop a database, flow chart and algorithm to sort the data. He then appointed assistants to pull information from the avalanche incident databases. This was done not only for U.S. incidents, but for incidents in Canada and Tyrol, Austria (results of the Tyrolean study can be found at [www.backcountryaccess.com/research](http://www.backcountryaccess.com/research)). The U.S. results are shown in the pie charts above.

In numerous cases, when incident reports and further research did not provide enough information to classify the incident, it was classified as having "insufficient data." These cases were always removed from the numerator and denominator when calculating proportions.

The analysis resulted in the following observations:

- 1) Transceivers are still not considered essential equipment in the U.S., Canada or Austria. Only 36 percent of completely buried victims in the U.S. were wearing transceivers. This was significantly lower than in Canada (56 percent) and Tyrol/Austria (58 percent).
- 2) Of 366 reported U.S. incidents, just 1.4 percent (5 cases) involved multiple victims

that were completely buried and a transceiver-equipped rescuer was available.

3) Multiple burials are lowest in the U.S., but also extremely low in Tyrol (3.7 percent) and Canada (7.8 percent). In Canada, these are mainly found in guided groups. When non-guided groups are removed from the analysis, then the results are similar to those in the U.S.

4) "Special case" multiple burials are an even smaller subset, comprising less than one percent of reported U.S. avalanche incidents.

5) When performing further research on the incidents, there was a clear message from witnesses that beacon searching was the "easy part." The most difficult and time-consuming aspect of the rescue is invariably the excavation phase, which was described as "hell" on more than one occasion. This is consistent with previous research (see "Strategic Shoveling" and "The Big Dig" at [www.backcountryaccess.com/research](http://www.backcountryaccess.com/research)).

## CONCLUSION

The most recent twelve years of U.S. avalanche statistics show that incidents involving multiple victims with transceivers are extremely rare. "Special cases" where a special technique or technology could come into play are even less common, comprising less than one percent of reported U.S. incidents. The greater issue is that not enough backcountry users own avalanche beacons and not enough emphasis is placed on excavation strategy. These fundamentals should be mastered and reinforced in recreational avalanche courses. Special-case multiple burials should be addressed only at the professional level.

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