



# How Common are Multiple Burials?

Tirol Avalanches from 1997 to 2003

# Research on multiple burials

- ☞ What do we mean by “multiple burials”?
- ☞ Are these multiple burial situations common?
- ☞ How often are special techniques needed to solve a multiple burial situation?
- ☞ What was the biggest problem while locating and excavating victims in a multiple burial situation?



# Research on multiple burials

- ☛ Database: Reports of the Tirol avalanche forecasters
- ☛ Winter seasons: 97/98 – 02/03  
(6 winters)
- ☛ Analysis of the reports
- ☛ Interview the searchers of multiple burial situation, where a beacon search was possible and helpful

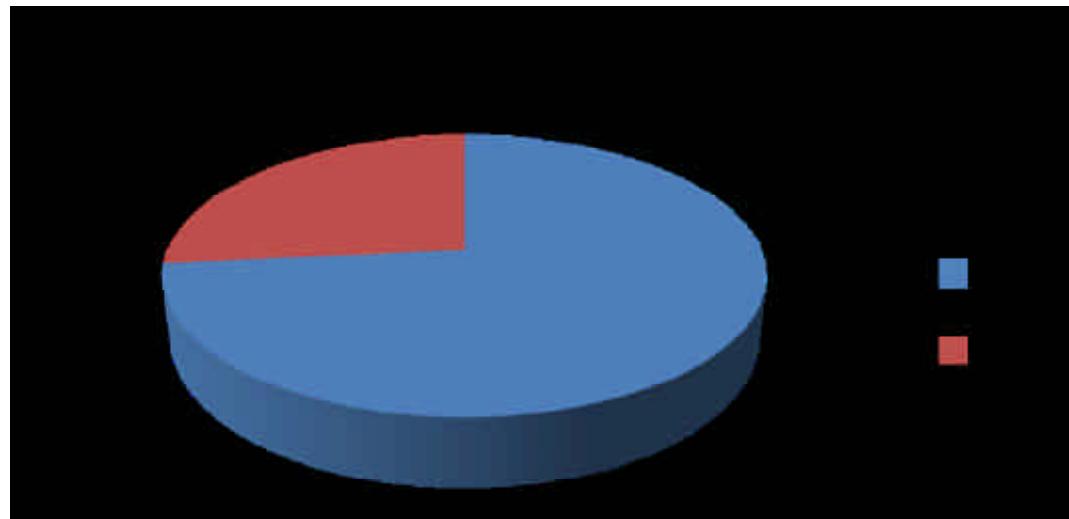


# Avalanches with people involved

432 avalanches reported

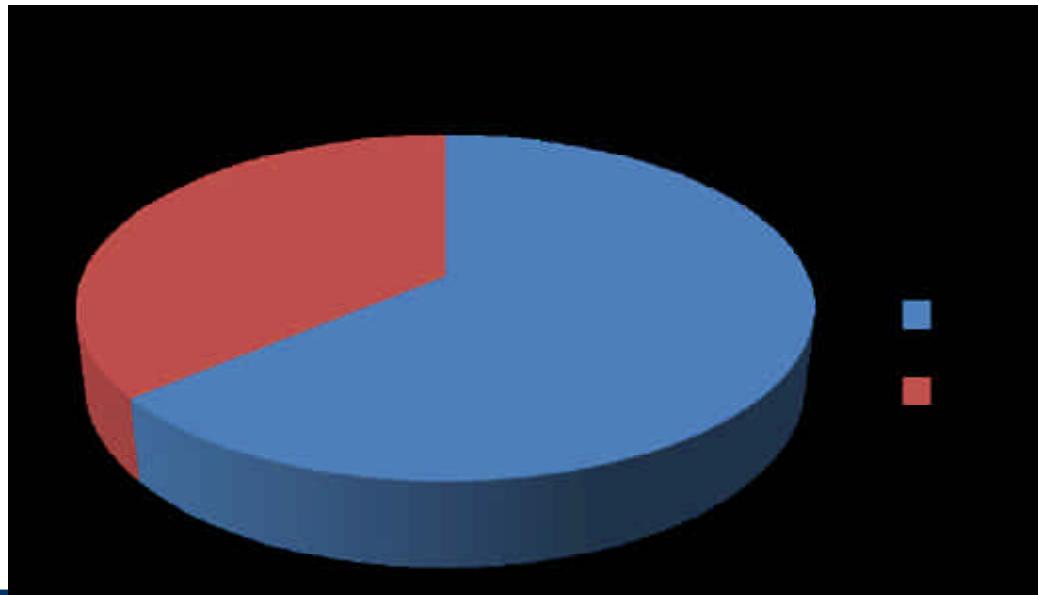
256 avalanches with people involved

**188 avalanches where people had been  
carried by the avalanche**



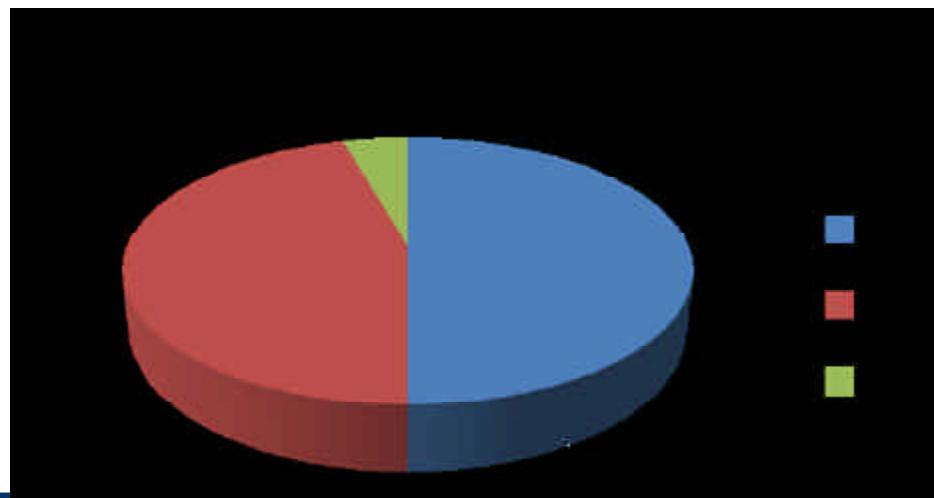
# Avalanches where people were caught, but not necessarily buried

- 188 avalanches where people had been carried by the avalanche
- 120 avalanches with no completely buried person
- 68 avalanches with at least one completely buried person**



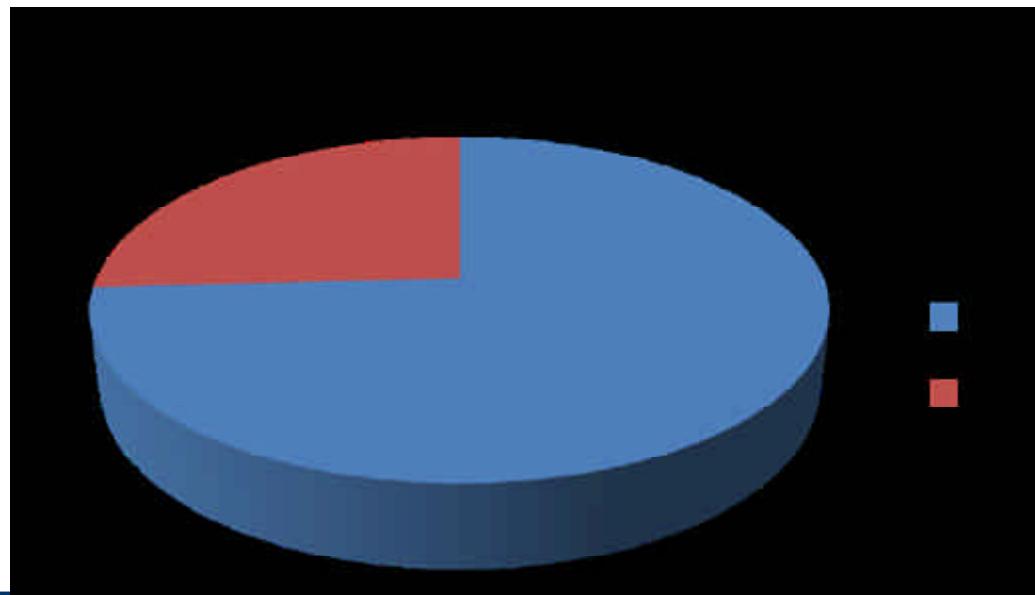
# Avalanches with at least one complete burial

- 68 avalanches with at least one completely buried person
- 34 avalanches where a beacon search was not possible
- 3 avalanches with insufficient data
- 31 avalanches where a beacon search was possible**



# Avalanches with a possibility of a beacon search

- 31 avalanches where a beacon search was possible
- 23 avalanches with 1 complete burial with beacon
- 8 avalanches with 2 or more complete burials (with beacons) reported**



# Multiple burial research: Case by Case

- ❖ Analyze the eight avalanches case by case
- ❖ I contacted six searchers and in one case a victim



# Case 1

- ☞ 1 person could excavate himself
- ☞ 1 person was not completely buried, his arm was over the snow surface
- ☞ 1 person was completely buried, but he wasn't using his beacon
- ☞ **Special multiple-burial technique was not necessary**

"We could not find him, because he had no transmitting beacon!"



## Case 2

- ☛ 2 people were completely buried, but with a distance between them of 10 to 20 meters
- ☛ The 2 people had been buried very deep; over 2 and 4 meters
- ☛ The searcher had no interfering signals
- ☛ **Special multiple-burial technique was not necessary**

"I had no interfering signals ... I knew that there are two victims ... the search was quick. But the shoveling has took very long, because the victims have been buried that deep."



## Case 3

- ☞ 5 people were completely buried in a line, with a distance of about 10 meters between them
- ☞ The people were caught in a flat area where they had been standing
- ☞ The searcher knew the location of the burials quite accurately
- ☞ **Special multiple-burial technique was not necessary**

“I knew the location of the victims quite well ... all in one line with a distance of about 10 meter ... to locate the victims was not a problem .... shoveling has hell!”



# Case 4

- ↗ 3 people were completely buried
- ↗ There was only one searcher
- ↗ He excavated one person at a time and turned off each beacon before continuing the search
- ↗ **Special multiple-burial technique was not used**

"I located the burial, excavated her, first aid, turned off the beacon, and looked than for the next signal ... It was ... a multiple single burial situation."



## Case 5

↗ 14 people were completely buried, most of them in close proximity

↗ **Special multiple-burial technique was used**

"I went back and forth and attended to a loud signal and the lowest reading of the distance. Then I have probed ... the locating was quite quick the ...excavation has took about 90 % of the time."



## Case 6

☞ 2 people were completely buried in close proximity

☞ **Special multiple-burial technique was not used**

"We have located and excavated the first victim quickly. Because he was just half of a meter buried ... we turned off his beacon and located the second. To excavate him has took very long, because he was deep buried (1.6 m)."



## Case 7

2 people were caught; 1 completely buried and one with his ski on the snow surface to see. The distance between the victims was about 15 to 20 meters

**Special multiple-burial technique was not used**

"My ski was on the snow surface ... to locate the second victim was no problem, because the rescuer knew that there was just one more victim ... the main problem was shoveling! "



# Case 8

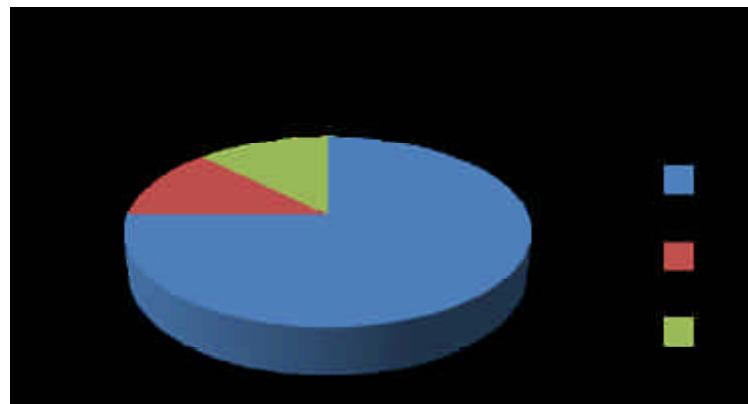
- ☞ The report tells about 4 completely buried people
- ☞ Insufficient data!
- ☞ Special multiple-burial technique used?
- ☞ Or not?



# Multiple burial research: Case by Case

**After interviewing six searchers and  
one victim out of eight cases:**

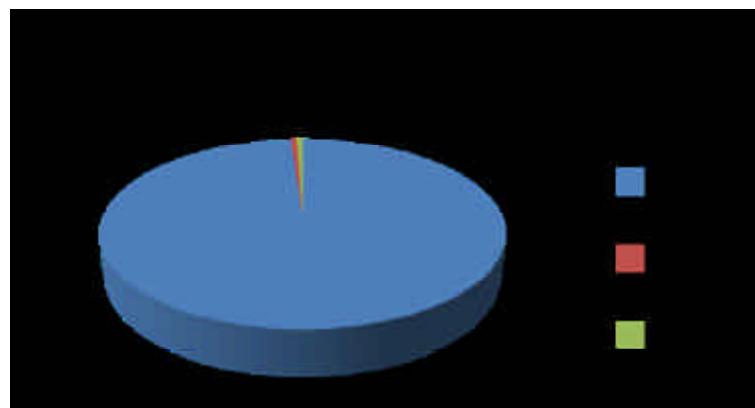
- ☛ 6 cases where a multiple-burial technique has not been used
- ☛ **1 case where a multiple-burial technique has been used**
- ☛ 1 case with insufficient data



# Research on multiple burials

**After analyzing the Tirol data and doing the interviews:**

- ☞ 188 avalanches with people caught
- ☞ 1 case with insufficient data (has a multiple-burial technique been used?)
- ☞ 1 case where a multiple-burial technique has been used**



# Conclusions

- ☞ About 42% of the complete burials had no beacon
- ☞ Everyone in the backcountry should carry a beacon, a shovel and a probe
- ☞ There was just one case in which a multiple-burial technique had surely been employed
- ☞ Shoveling takes the majority of time while locating and excavating victims in multiple burial situations
- ☞ The main goal is that the recreationists can solve a single burial situation and know a good shoveling technique to save time, while excavating the victim



# **How Common are Multiple Burials?**

Thank you for  
your attention!

Dieter Stopper  
Jon Mullen

