

Interactive comment on “Spatial and temporal analysis of fatal off-piste and backcountry avalanche accidents in Austria with a comparison of results in Switzerland, France, Italy and the United States” by Christian Pfeifer et al.

Anonymous Referee #2

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For clarification: I was asked to do this review about 3 months after the first reviewer finished his/her review. RC1 is very detailed, and I strongly agree with reviewer 1, so I will just add some comments that I find worth to add:

The authors explore trends in the annual number of backcountry avalanche fatalities in Austria and compare these to four other countries. 2 types of studies were executed. While the temporal analysis has some new findings and seems interesting for publication (when the concerns of reviewer 1 are addressed) the regional, spatial analysis is in my opinion not acceptable for publication (I would just skip that part). As reviewer 1

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already mentioned, the spatial analysis lacks of correlation to actual skier/snowboarder frequency data, the maps (figure 7 and 8) are misleading in the current form, as the just represent where in Austria popular ski and free ride resorts are, but have no meaning if the chance is actual higher to have an avalanche accident in this particular regions (what the authors claim). If we just look at the 2 hot spots found (Arlberg and southern Ötztal) snow pack conditions are very different. While in Sölden, for example, an inner-alpine snow pack allows for rather dangerous avalanche conditions (shallow cold high altitude snow packs), the Arlberg has often completely different snow pack conditions (warm, heavy snow fall at the border of the Alps with lower altitude). At the Arlberg the huge amount of skiers going off-piste and back country skiing rather explain the frequency of avalanche accidents. I am completely aware that skiers/snowboarder frequency data is difficult to get in a meaningful way (reviewer 1 had some good ideas). I could also suggest using data of ski-tickets sold per day (available from the ski resorts) or statistics of guest-nights (overnight statistics available at the Austrian chamber for tourism) but I think it will be still very difficult to create a meaningful map, so as mentioned I would skip the regional analysis.

In the temporal analysis I would add at least in the discussion that the number of skiers/snowboarders or winter tourists increased in the period investigated (for example in Tirol winter guests increased from 1986 being 2.922.842 to 2016 being 5.819.984 <https://www.tirol.gv.at/statistik-budget/statistik/tourismus/>) or use alternative statistics. That fact needs to be discussed in more detail (as reviewer 1 already mentioned) as clearly a boom in back country skiing and off-piste skiing has happened in the last decades. So even if you see a slightly increasing trend of fatalities in Austria it is definitely not an increasing trend when we account for skier/snowboarder frequency.

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