

Figure S1. CONSORT flowchart of data acquisition in via ferrata accident

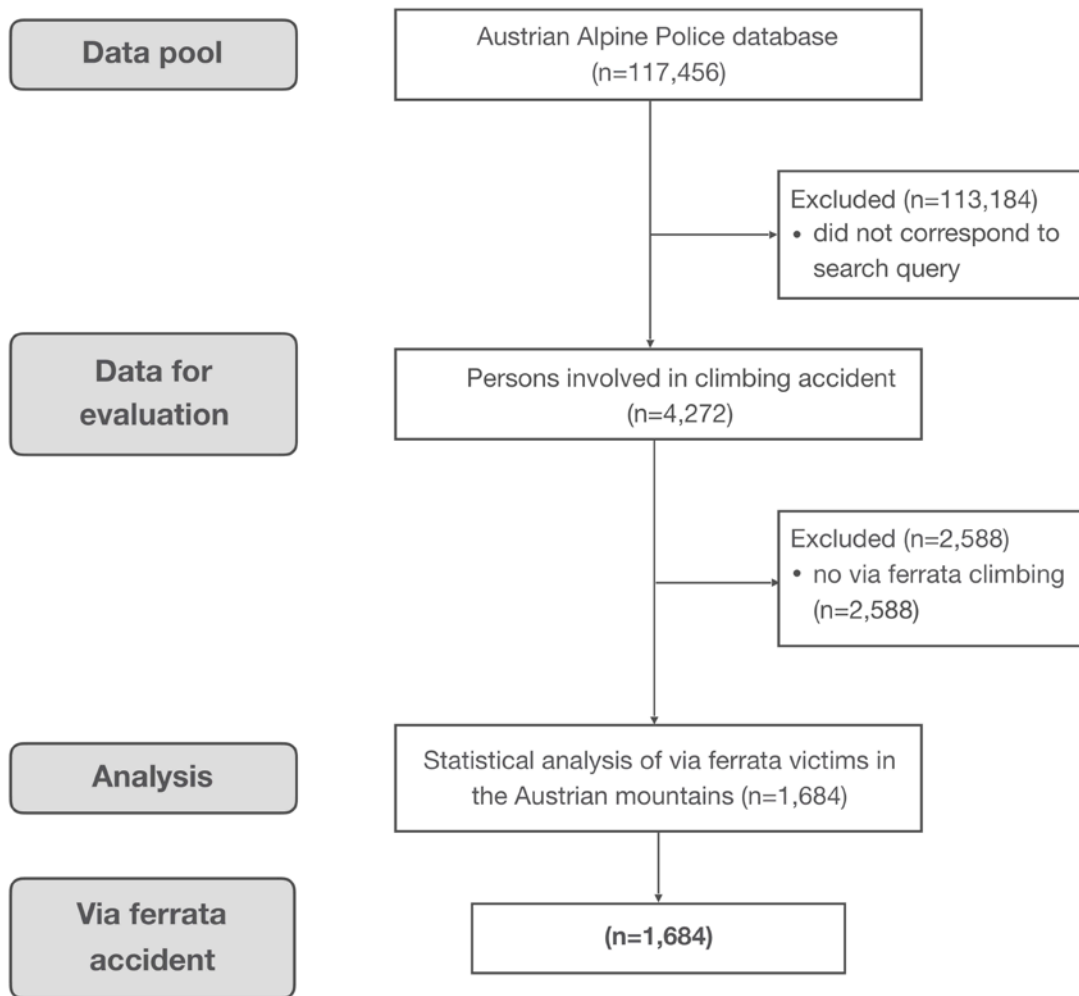


Figure S2. Case Report Form

Case ID: _____ climbing accident in mountainous environment; Ver 1.0 1.10.2018

Case report Form climbing accident in mountainous environment.

Inclusion Criteria:

- Person involved in climbing accident (female/male, 0-120 years of age)

Exclusion Criteria:

- hiking in steep environment

I Person responsible for registration		
I Case		
2. Patient identifier	ID number	
3. Sex	<input type="checkbox"/> male <input type="checkbox"/> female	
4. Year of birth		
5. Nationality		
II Accident and mission		
6. Date and time of accident	date / /	time /
7. Rescue alarm	date / /	time /
8. Primary cause of accident	<input type="checkbox"/> avalanche/ice fall <input type="checkbox"/> cardiovascular disease <input type="checkbox"/> crash into structure or terrain <input type="checkbox"/> fall <input type="checkbox"/> material failure <input type="checkbox"/> neurological disorder <input type="checkbox"/> thunderstorm <input type="checkbox"/> security failure <input type="checkbox"/> rockfall <input type="checkbox"/> other medical condition: <input type="checkbox"/> unknown	
9. Activity	<input type="checkbox"/> artificial wall climbing <input type="checkbox"/> bouldering <input type="checkbox"/> ice climbing <input type="checkbox"/> rock climbing <input type="checkbox"/> via ferrata <input type="checkbox"/> other: <input type="checkbox"/> unknown	
10. Difficulty of Route/Track		
11. Difficulty of Accident Site and further Specification of Accident Site		
12. Altitude of accident site	<input type="checkbox"/> <1500m <input type="checkbox"/> 1500-2500m <input type="checkbox"/> >2500m <input type="checkbox"/> unknown	
13. Direction of Movement	<input type="checkbox"/> lead climb <input type="checkbox"/> second climb <input type="checkbox"/> top rope <input type="checkbox"/> abseiling <input type="checkbox"/> ascent, not further known <input type="checkbox"/> descent, not further known <input type="checkbox"/> other:	
14. Protective Gear		
15. Weather Conditions (sunny, rain,...)		
16. Guided Tour	<input type="checkbox"/> yes <input type="checkbox"/> no	
17. Cell Phone	<input type="checkbox"/> yes <input type="checkbox"/> no	
18. Circumstances of Accident (short report)		
III Out-of hospital care		
19. Duration before Emergency Medical Service (EMS)/mountain rescue (MR) arrival	___ min	<input type="checkbox"/> unknown
20. First treatment before EMS/MR arrival	<input type="checkbox"/> no care <input type="checkbox"/> first aid <input type="checkbox"/> other: <input type="checkbox"/> unknown	
21. Initial assessment of injury severity by EMS/MR	<input type="checkbox"/> unhurt <input type="checkbox"/> minor injuries <input type="checkbox"/> immobilization <input type="checkbox"/> first aid <input type="checkbox"/> analgesics <input type="checkbox"/> basic life support (BLS) <input type="checkbox"/> major injuries <input type="checkbox"/> dead <input type="checkbox"/> advanced life support (ALS) <input type="checkbox"/> other: <input type="checkbox"/> unknown	
22. Initial treatment by EMS/MR	<input type="checkbox"/> immobilization <input type="checkbox"/> first aid <input type="checkbox"/> analgesics <input type="checkbox"/> basic life support (BLS) <input type="checkbox"/> advanced life support (ALS) <input type="checkbox"/> other: <input type="checkbox"/> unknown	

Case ID: _____ climbing accident in mountainous environment; Ver 1.0 1.10.2018

IV Primary transport		
23. Arrival at scene	date / /	
24. Departure time from scene	time / /	
25. Arrival time at hospital	time / /	
26. Mission characteristics	<input type="checkbox"/> air rescue <input type="checkbox"/> terrestrial rescue <input type="checkbox"/> terrestrial rescue with air support <input type="checkbox"/> other: <input type="checkbox"/> unknown	
27. Treatment during transport	<input type="checkbox"/> observation <input type="checkbox"/> fluids <input type="checkbox"/> analgesics <input type="checkbox"/> anesthesia <input type="checkbox"/> BLS <input type="checkbox"/> ALS <input type="checkbox"/> other: <input type="checkbox"/> unknown	
28. NACA Score		
V First Hospital		
29. Name of the Hospital		
30. Further examinations	<input type="checkbox"/> computed tomography scan <input type="checkbox"/> magnetic resonance imaging <input type="checkbox"/> radiography <input type="checkbox"/> ultrasound <input type="checkbox"/> other:	
31. Traumatic injuries (diagnoses)		
32. Location of injuries	<input type="checkbox"/> head <input type="checkbox"/> face <input type="checkbox"/> cervical spine <input type="checkbox"/> thoracic spine <input type="checkbox"/> lumbar spine <input type="checkbox"/> chest <input type="checkbox"/> abdomen <input type="checkbox"/> pelvis <input type="checkbox"/> shoulder <input type="checkbox"/> arm <input type="checkbox"/> hand <input type="checkbox"/> leg <input type="checkbox"/> foot <input type="checkbox"/> other:	
33. Abbreviated Injury Severity Score (AIS)	(0-6) and region: <input type="checkbox"/> unknown	
34. Abbreviated Injury Severity Score (AIS)	(0-6) and region: <input type="checkbox"/> unknown	
35. Abbreviated Injury Severity Score (AIS)	(0-6) and region: <input type="checkbox"/> unknown	
36. Injury Severity Score (ISS)	(0-75) <input type="checkbox"/> unknown	
37. In hospital treatment	<input type="checkbox"/> no treatment needed <input type="checkbox"/> out-patient treatment <input type="checkbox"/> care in the ward <input type="checkbox"/> immobilization <input type="checkbox"/> radiological intervention <input type="checkbox"/> endoscopic intervention <input type="checkbox"/> surgery: <input type="checkbox"/> intensive care treatment <input type="checkbox"/> other: <input type="checkbox"/> unknown	
38. Secondary transport necessary	<input type="checkbox"/> no <input type="checkbox"/> yes	name of secondary hospital
VI Patient's outcome		
39. Survival at last hospital discharge	<input type="checkbox"/> yes <input type="checkbox"/> no	Overall ICU stay ___ days Overall hospital stay ___ days
40. Autopsy (non-survivors)	<input type="checkbox"/> yes <input type="checkbox"/> no	Cause of death
41. Findings at hospital discharge	<input type="checkbox"/> restitutio ad integrum <input type="checkbox"/> movement restrictions <input type="checkbox"/> paresis or plegia <input type="checkbox"/> pain <input type="checkbox"/> residual traumatic brain injury <input type="checkbox"/> residual spinal cord injury <input type="checkbox"/> cerebral performance category (CPC): <input type="checkbox"/> other: <input type="checkbox"/> unknown List of injuries and impairments:	
VII CRF completion		
Completed	date / /	
Name	Signature	

Figure S3. Persons involved in via ferrata emergencies in Austria per year, itemized by cause of accident.

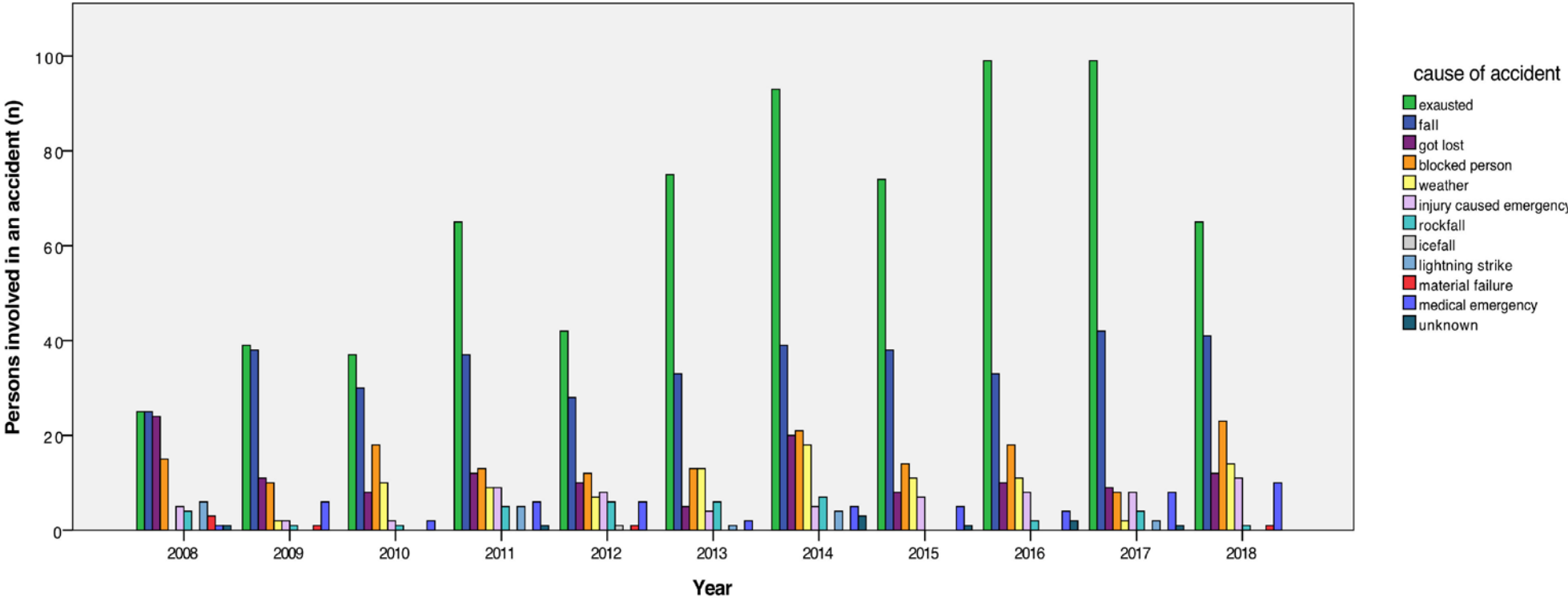


Table S1. Via ferrata grading using the Austrian Scale [4].

Via ferrata	Definition from the Austrian Scale
Grade A	Easy access. Many steps and footholds of good size available. No athletic passages. Itinerary fully equipped, many pegs available.
Grade B	Easy access. Athletic passages alternate with comfortable rests. The route is well equipped, but the spacing of steps or rungs requires good balance.
Grade C	Access is in mountain terrain and may require navigational skills. The itinerary is steep with many athletic passages with small holds. The equipment is safe, but spaced. It requires good physical and mental condition.
Grade D	The access, comparable with level C, may require short climbing sequences. The itinerary offers many exposed vertical or overhanging sections. The equipment is good, but with sections equipped only with cables.
Grade E	Access difficulties are the same as for Level D. The itinerary may have more physical and continuous sections than Level D. Equipment is limited to cables and anchors. No escape.

Table S2. Activity vs. injury classification in via ferrata emergencies from November 1, 2008 to October 31, 2018. Listed according to frequency.

Activity	Uninjured n (%)	Injured n (%)	Dead n (%)	Unknown n (%)	Total n (%)
Ascent	759 (57.6)	388 (29.5)	39 (3.0)	131 (9.9)	1,317 (78.2)
Descent	137 (56.4)	69 (28.4)	13 (5.3)	24 (9.9)	243 (14.4)
Traversing	25 (41.7)	20 (34.0)	6 (10.0)	9 (15.0)	60 (3.6)
Rappelling	4 (36.4)	4 (36.4)	1 (9.1)	2 (18.2)	11 (0.7)
Unknown	35 (66.0)	8 (15.0)	3 (5.7)	7 (13.3)	53 (3.1)
Total	960 (57.0)	489 (29.0)	62 (3.7)	173 (10.3)	1,684 (100.0)

Note: Unknown: police officers were unable to obtain information.

Table S3. Classification of via ferrata difficulty in relation to rescue efforts for via ferrata emergencies from November 1, 2008 to October 31, 2018.

Difficulty level of via ferrata	No rescue n (%)	Ground-based n (%)	Combined n (%)	Helicopter n (%)	Unknown n (%)	Total n (%)
Grade A	3 (3.9)	26 (34.2)	5 (6.6)	41 (53.9)	1 (1.3)	76 (4.5)
Grade B	14 (6.3)	88 (39.5)	20 (9.0)	99 (44.4)	2 (0.9)	223 (13.2)
Grade C	23 (6.0)	171 (44.4)	21 (5.5)	170 (44.4)	0	385 (22.9)
Grade D	19 (4.5)	188 (44.1)	48 (11.3)	167 (39.2)	4 (0.9)	426 (25.3)
Grade E	5 (4.2)	71 (60.2)	13 (11.0)	29 (24.6)	0	118 (7.0)
UIAA Grade	1 (0.8)	52 (39.7)	10 (7.6)	67 (51.1)	1 (0.8)	131 (7.8)
Undefined	18 (7.8)	97 (41.8)	7 (3.0)	108 (46.6)	2 (0.9)	232 (13.8)
Unknown	6 (6.5)	39 (41.9)	3 (3.2)	44 (47.3)	1 (1.1)	93 (5.5)
Total	89 (5.3)	732 (43.5)	127 (7.5)	725 (43.1)	11 (0.7)	1,684 (100.0)

Note: UIAA Grade was used when the terrain was defined according to alpine climbing UIAA Grading. Undefined designated the terrain whose difficulty was not defined by police or rescue teams. Unknown designated the situation when police officers were unable to obtain information.