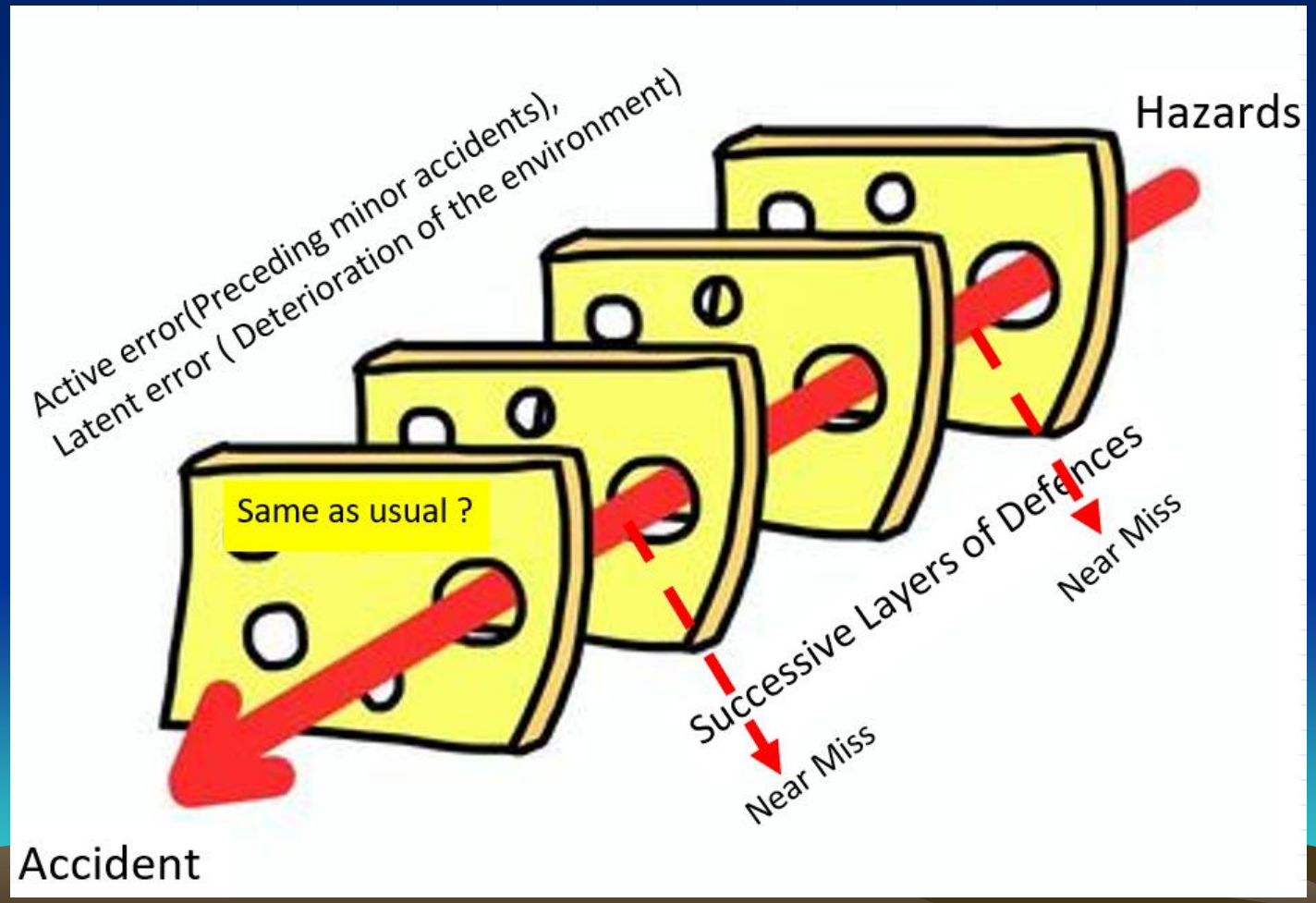
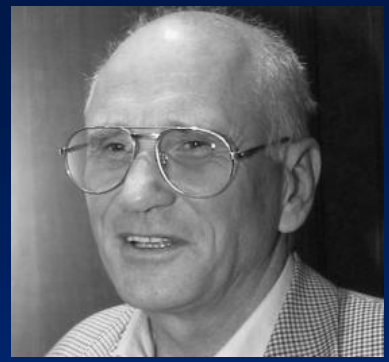
# 21st Mountain accident report (Japan)




UIAA (ARWG / MountCom.)
JMSCA, JWAF, and IMSARJ
Chiaki Aoyama

# Remembering Pit Shubert



Pit Schubert, author of "The Crossroads of Life and Death," passed away.

In 1968 , he established the Safety Committee of the German Alpine Club DAV , and subsequently served as chairman of the UIAA Safety Committee ( 1973-2004 ). By analyzing and studying the causes of accidents and thoroughly testing technical materials, he succeeded in establishing UIAA standards for mountaineering equipment. His research results on safety helped prevent countless accidents, and his footprints can now be seen on the UIAA safety labels that guarantee the safety of various mountaineering equipment we use.

This mountain accident report system was ever prepared with the support of Mr. Pit and his fellow researchers in safe mountaineering. We are deeply grateful and pray for the repose of his soul.

# Main flow

Chapter 1 : About U IAA's ARWG

Chapter 2 : Overview of the symposium "Considering Mountain Trails for Safe hiking in Japan"

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Chapter 5: Analysis of National Police Agency accident data in 2023.

Chapter 6: Results of the analysis of the mountain accident database ( characteristics of the 282 newly registered individuals )

4. Case analysis of the sudden increase in female accidents

Chapter 7 : The structure of mountain accidents as seen from data analysis of 4,951 people

7.2 Extraction and analysis of related factors leading up to mountain accidents

# Chapter 1: About UIAA 's ARWG

(Accident Reporting Working Group)

If we estimate the occurrence of mountain accidents on a global scale based on available information , we can assume that a huge number of accidents ( more than 50,000 ) occur every year. However, few countries or mountain organizations conduct surveys using a uniform method on a national scale like the National Police Agency‘s mountain accident statistics in Japan.

In Europe and the United States, it is common for multiple mountain organizations in one country to conduct surveys, so there is no uniformity in the survey items, and even if we try to tally up the number of accidents that occur nationwide, we cannot grasp the reality.

The same can be said about comparisons of mountain accidents between countries. Because there are no uniform survey items at the global level, it is difficult to make comparisons between countries that have already built mountain accident databases. Furthermore, even the subject matters of accident, incident, and near-miss lack a unified definition of the terms.

As a result, when comparing data, it is difficult to know whether the "number of accidents" should be counted as "total incidents " or " total accidents ." In Japan, medical institutions often consider incidents to mean near misses, but in mountain accident statistics in Europe and the United States, incidents are considered to be any accident in which rescue teams are dispatched, and include injuries and fatalities from "getting lost" to "falling and slipping."

On the other hand, mountaineering is said to be a “complex system”, and there are so many factors related to one accident, covering many fields such as topography, geology, weather, medical care, psychology, education, safety, and use of equipment, etc. In addition, the mountaineering environment changes from moment to moment, making it impossible to reproduce and verify accidents.

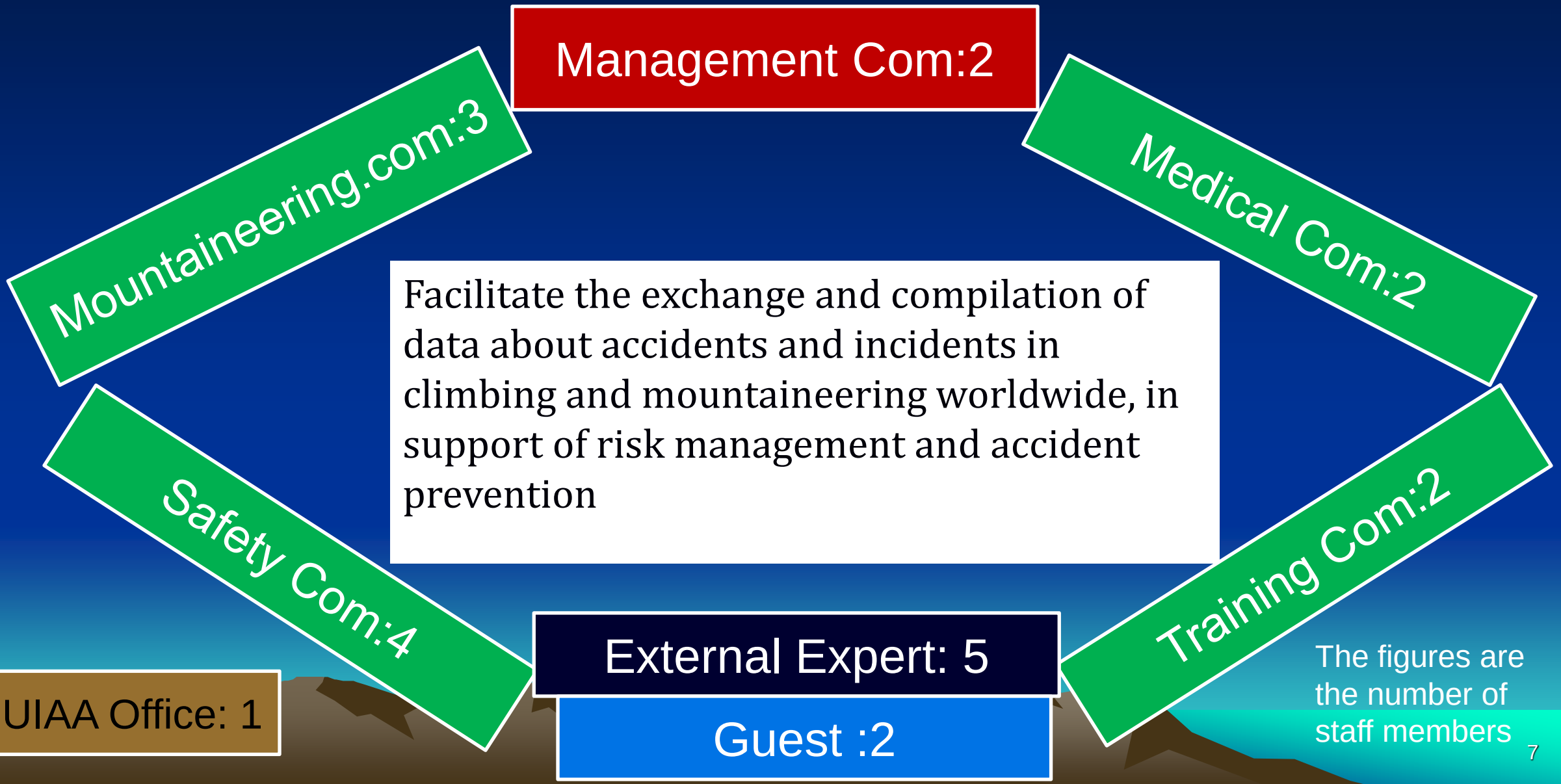
Despite the huge number of accidents and the many deaths, there are very few mountain accident investigation organizations and researchers worldwide due to the above background. As a result, even the International Mountaineering Federation (UIAA) did not take it seriously for a long time.

Therefore, UIAA has set the following objectives: (1) To promote the exchange and collection of data on mountaineering accidents around the world to assist in risk management. (2) The group set the goal of "supporting member organizations in developing and implementing compatible accident reporting systems to obtain more and better data on the causes of mountaineering accidents," and began operating as the Accident Reporting Working Group (ARWG) in 2022.

The main feature of the ARWG is that it is composed of 20 members from various fields, including the representatives of the five committees and external experts, as shown in Figure 1. Currently, the WG are carrying out activities that have set 18 themes in line with the objectives (Examples of results: Figure 2).

If the results of this activity are applied to Japan, it is hoped that it will provide an opportunity to observe mountain climbing & hiking accidents, which have currently been viewed from one angle, from a different perspective.

# FIG. 1 UIAA Accident Reporting Working Group (ARWG)



# Figure 2 Various results

Incident database for climbing and mountaineering

Odd Magne Øgreid, board member and head of safety commision,

Norwegian Climbing Federation

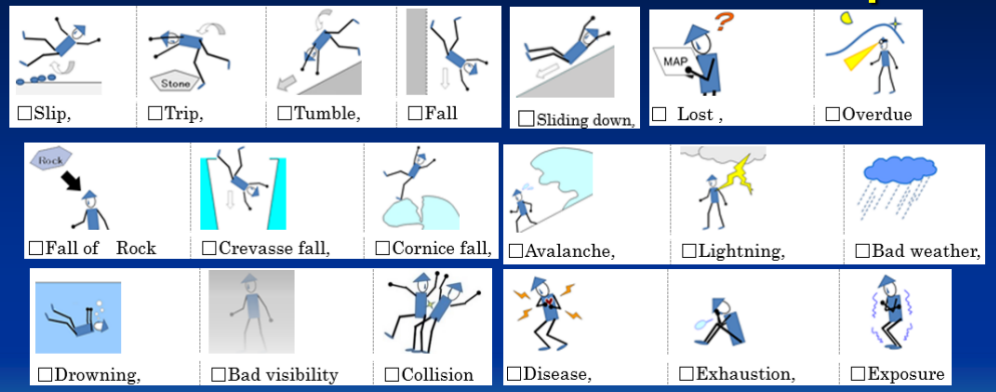
Norway Accident Report

NORGES KLATREFORBUND




Current status and trends of accident investigation reporting around the world

## 20th Mountain accident report




The icons are part of the accident factors used in International Mountaineering Federation accident investigations.

UIAA MountCom, JMSCA ,JWAF and IMSARJ
Chiaki Aoyama

# 2 : Overview of the symposium “Considering mountain trails for safe hiking“ in 2024

## Subtitle: " Reducing accidents and Mountain Trails Act"

Organized by Institute for Mountain Search and Rescue -Japan ( IMSARJ ) , co-organized by JMSCA , JWAF, and supported by the Japanese Society of Mountain Culture.

"When considering safe mountaineering, the issue of mountain trails is of utmost importance, but it is a difficult research area to tackle due to the various land ownership issues and maintenance and management issues in the vast mountain areas. In addition, the ability of hikers and the risk of mountain trails have not been sufficiently studied due to the complexity of determining the difficulty level associated with topographical features."

The "Mountain Trail Issues" symposium held on September 7th, 2024 contains important content related to this report, so I will introduce some of its contents (①-⑤) below .

# Research areas related to mountain trails from the perspective of safe mountaineering

① Legal interpretation of mountain trails and issues of maintenance and management

② Trail grading

③ Mechanisms behind accidents that occur on mountain trails

④ Reducing accidents on mountain trails

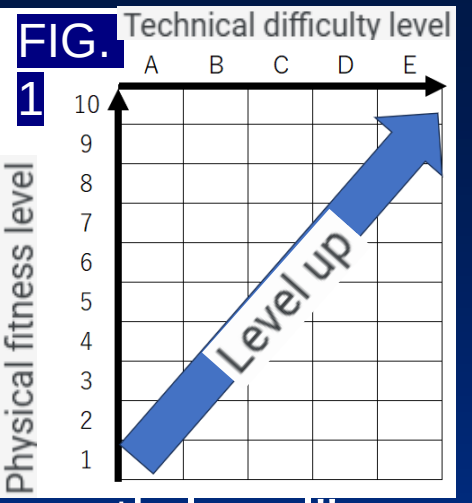
⑤ Nature conservation issues around hiking trails

# 1. " Legal interpretation of mountain trails and issues of their maintenance and management "

The Mountain Trail Law Study Group has taken the lead in approaching the question, "Who maintains and manages mountain trails?" from various perspectives and has achieved great results. These efforts include:

1) The philosophy, form *, and maintenance status of mountain trails.
   * the status form of use ( mountain trails, nature trails, sightseeing trails, promenades ), etc.
2) Management responsibility for hiking trails
3) Current status and maintenance costs of mountain trails
4) Status of and precedents for problems and accidents
5) The need for legislation

# ② Trail grading




The grading system was proposed by Nagano Prefecture to "allow people to objectively understand the difficulty of mountains," and has been adopted by 10 prefectures and 2 mountain areas, becoming a well-established method for expressing the difficulty of mountain trails. The y-axis of the right diagram shows the "physical strength level" divided into 10 levels by calculating route constants using the Yamamoto method , while the x-axis shows the "technical difficulty" level, which is a 5- level scale that represents the skills and abilities required of hikers based on the conditions of the mountain trail . This system is extremely useful as a resource for considering “mountaineering that matches your abilities" at the planning stage of a mountain hiking.

Meanwhile, in Europe and the United States, mountain trail evaluation methods are used according to the region, such as the UIAA route evaluation based on party and leader abilities, the Swiss Alpine Club Scale based on terrain and hiking style , and the US YDS and Climbing ratings.

# ③ Mechanisms behind accidents that occur on mountain trails

There are few studies on the mechanisms of accidents, but accident trends and mechanism research obtained from analysis of the mountain accident database compiled by IMSARJ ( as of 2024 : 4,951 registered cases , from JMSCA + JWAF accident data ) are reported annually on the JMSCA website.

( JMSCA Mountain Accident Investigation Report

https: //www.jma-sangaku.or.jp/sangaku/safe_climb/report/)

According to the accident analysis results, "the majority of climbers & hikers are careful and do not push themselves too hard," and therefore do not choose routes that are beyond their capabilities. As a result, the number of accidents is low under environmental conditions that are considered dangerous. It is believed that the cause of the majority of accidents is related to human error.

# 4. Activities to reduce accidents on mountain trails

The "accident reduction activities" were started around 2013 to quantitatively reduce "getting lost," which accounts for about half of all mountain accidents. At the same time, the JMSCA launched the “Stop the 1000” campaign, setting model areas of Osaka, Hyogo, and Okutama. The scope of the campaign was then expanded to include falls and slips and continues to this day. Grading is also part of the accident reduction activities, as it reduces the risk of accidents from the planning stage.

Meanwhile, in response to the sharp increase in falls and slips among elderly women, the " Fall and Slip Stop Research Group " was launched, which has achieved some success and is proposing effective training methods to prevent accidents.

# ⑤ Nature conservation issues around hiking trails

Nature conservation issues were not covered at the symposium because they are a broad research area, but they are closely related to ① to ④.

In Switzerland, there is Article 4, Section 2 of the Federal Law (FWG) on footpaths and hiking trails, which states, "Hiking trails strive to guide hikers to observation decks, historical sites, and nature, while preventing access to all areas. In other words, they help protect nature from undue human impact." This idea is shared by other European and American countries, and mountain trails are handled by effectively combining mountain trails with reserved areas .

Nature conservation is the key to solving the mountain trail problem.

# Chapter 3:
# Organizational information of mountaineering organizations (JMSCA , JWAF)
# and Accident investigation

# 1. Number of members and accident occurrence status in JMSCA and JWAF

The combined membership numbers of JMSCA and JWAF in 2023 will be 57,509 (Table 1), a decrease of 1,481 from the previous year . However, JWAF has had a long-term slight decrease, but has since increased by 379 this year . On the other hand, JMSCA has seen a much slower decline compared to the period of major declines during the COVID-19 pandemic, but still has a decrease of 1860.

The number of accidents is the large increase at 985 , despite a decrease in the number of members . As a result, the ratio of accidents to members in 2023 is (1:58) , nearly double the ratio in 2012-2013 , which was (1 : 106-121) . There were also a large number of deaths, at 18. Perhaps we have moved beyond the effects of COVID- 19 and are entering a new era of mountaineering activity .

# Table 1. Number of JMSCA/ JWAF; Members and changes in accidents over time

| 2003－2023 | Year | Num.of Member | Num.of Accidents | Fatalities | Quantity of Responses | Recover rate | Accident ratio to members 1:x | Death to member ratio 1:x | Death/accident person |
|---|---|---|---|---|---|---|---|---|---|
| JMSCA,JWAF, Togakuren | 2003 | 59428 | 528 | 23 | 199 | 37.7 | 112 | 2584 | 4.4 |
| | 2004 | 65238 | 420 | 11 | 169 | 40.2 | 155 | 5931 | 2.6 |
| | 2005 | 68430 | 446 | 28 | 96 | 21.5 | 153 | 2444 | 6.3 |
| | 2006 | 70417 | 479 | 31 | 230 | 48.0 | 147 | 2272 | 6.5 |
| | 2007 | 73448 | 516 | 24 | 227 | 40.9 | 142 | 3060 | 4.7 |
| JMSCA,JWAF, JRO | 2008 | 73668 | 527 | 22 | 218 | 46.9 | 139 | 3349 | 4.2 |
| | 2009 | 79390 | 530 | 37 | 179 | 29.4 | 149 | 2146 | 7.0 |
| | 2010 | 85454 | 574 | 24 | 188 | 34.1 | 148 | 3561 | 4.2 |
| | 2011 | 89751 | 629 | 21 | 190 | 34.1 | 142 | 4274 | 3.3 |
| JMSCA,JWAF | 2012 | 74405 | 613 | 18 | 214 | 34.9 | 121 | 4134 | 2.9 |
| | 2013 | 74835 | 703 | 31 | 220 | 31.3 | 106 | 2414 | 4.4 |
| JMSCA,JWAF, JRO | 2014 | 110516 | 850 | 38 | 221 | 26.0 | 130 | 2908 | 4.5 |
| | 2015 | 130111 | 940 | 37 | 247 | 26.3 | 138 | 3517 | 3.9 |
| | 2016 | 138960 | 1090 | 30 | 228 | 20.9 | 127 | 4632 | 2.8 |
| | 2017 | 148153 | 1077 | 37 | 382 | 35.5 | 137 | 4004 | 3.4 |
| | 2018 | 156601 | 1077 | 42 | 315 | 29.2 | 145 | 3729 | 3.9 |
| | 2019 | 163419 | 1038 | 30 | 251 | 24.2 | 157 | 5447 | 2.9 |
| JMSCA,JWAF | 2020 | 63981 | 801 | 16 | 239 | 29.8 | 79 | 3999 | 2.0 |
| | 2021 | 60585 | 837 | 14 | 229 | 27.4 | 72 | 4328 | 1.7 |
| | 2022 | 58990 | 747 | 12 | 232 | 31.1 | 78 | 4916 | 1.6 |
| | 2023 | 57509 | 985 | 18 | 282 | 28.6 | 58 | 3195 | 1.8 |

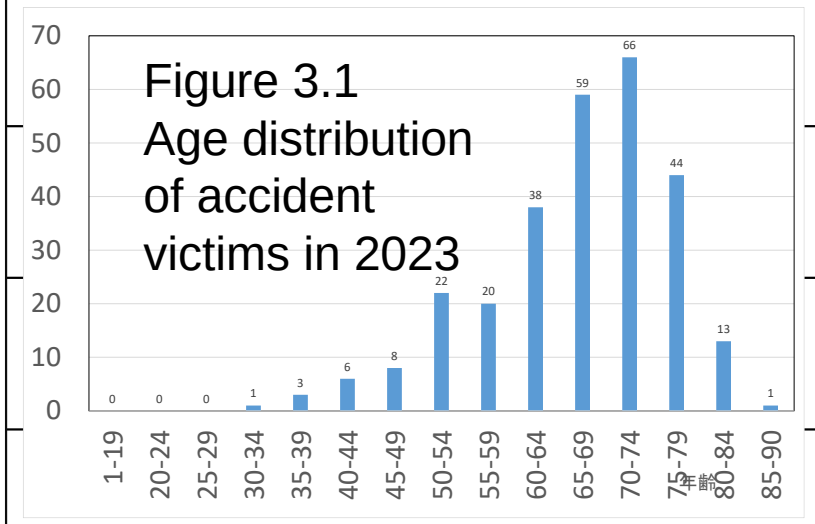
# Estimating the age distribution of general hikers and climbers based on the age distribution of JMSCA members

The age distribution of JMSCA members (provided by the Mutual Aid Association,JMSCA), along with the age distribution of JWAF, which draws a similar curve, is interpreted as a reference age distribution curve (Figure 3) for understanding the trends in the age distribution of climbers & hikers in Japan.

As can be seen in the figure , the annual membership age curve shows a clear shift in the shape of the curve and the peak over time.

For comparison with the membership curve for 2023 , the age distribution curve of accident victims for that year is attached in the figure (Figure 3.1 ) . It can be seen that the distribution shapes for each age group show a good correlation. In addition, this membership curve shows an upward trend for those aged 75 and over. It is unlikely that the peak will shift to 75-80 years old, but if it does, the healthy age of climbers & hikers will rise significantly.

# Figure 3 JMSCA Members 2016-2023




16000
14000
12000
10000
8000
6000
4000
2000
0

2016
2017
2018
2019
2020
2021
2022
2023

The age group in which women will outnumber men in accidents in 2023 is 54 to 77 years old

1-19 20-24 25-29 30-34 35-39 40-44 45-49 50-54 55-59 60-64 65-69 70-74 75-79 80-84 85-

# Chapter 4 Mountaineering activities as seen in the Leisure White Paper in Japan

The Leisure White Paper has been conducted since 1979 , targeting approximately 3,000 men and women aged 15 and over using a home visit questionnaire survey method, and then switched to an internet survey in .

The survey results here are mainly used to estimate the mountaineering population.

Since the Leisure White Paper is published in October , the " 2023 edition" reported here is data for 2022 , when the effects of COVID-19 will continue .

# Estimation of mountaineering population

The number of people climbing and hiking mountains fell to 4.4 million in the previous fiscal year, but recovered to 5 million by 2022 ( Figure 4 ).
According to the white paper, the average number of mountain activities per year was 7.2 , the average annual activity cost was 31,700 yen.

In addition to the "mountain climbing & hiking" category, the Leisure White Paper, which uses statistical methods, also has an item called "picnics, hiking, outdoor walks." This item has over 15 million entries, but has been interpreted as general outdoor activities and ignored.

On the other hand, the Ministry of Internal Affairs and Communications' irregular mountaineering population survey lists it as "mountain climbing and hiking." In Japan, "hiking" is interpreted as being similar to a picnic, and includes outdoor activities, so it is difficult to interpret whether it should be considered as mountain climbing population.

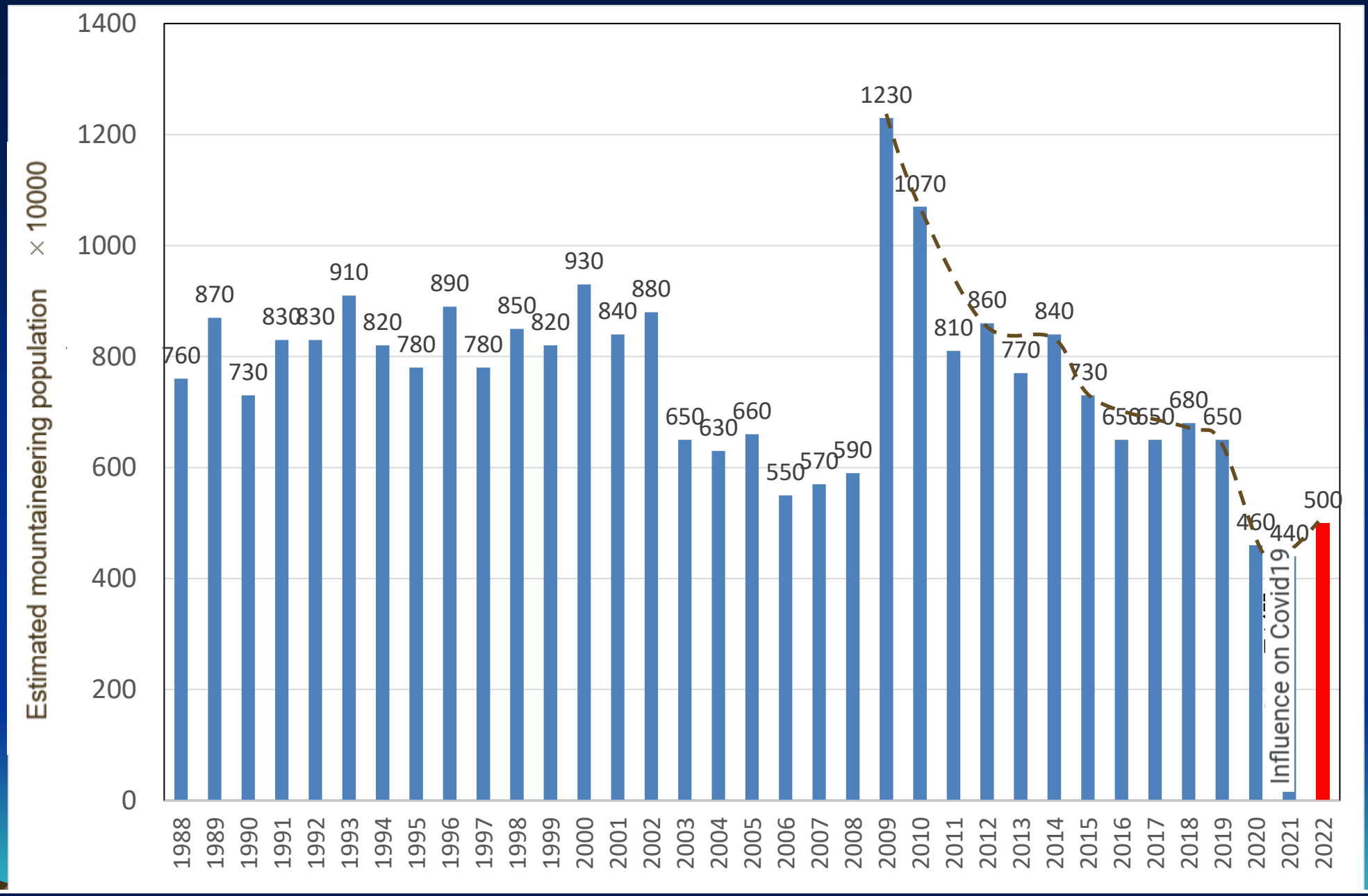



Figure 4: Estimated mountaineering population in Japan based on the Leisure White Paper

# Chapter 5 : Results of the National Police Agency's accident data analysis

This data has been reanalyzed and processed based on the National Police Agency's accident statistics published every June.

Police Agency's survey results are from January to December in 2023.

# 1. Trends in mountain accidents in 2023

In 2023 , the number of mountain accidents increased by 62 people compared to the previous year, and the number of accidents increased by 111 (Figure 5). As a result, the number of accidents was 3126.

The mountain baby boomers ( 1940-1955 ) who climb & hike mountains enter the late elderly generation, it has been predicted that the number of accidents would begin to decrease due to a decline in the number of elderly climbers & hikers, but it appears that the number of accidents has not yet started to decrease.
However, there has been a sharp increase in the number of accidents involving foreign visitors to Japan, with 100 cases and a total number of accidents was 145 people. Adjusting for the six- year period, as can be seen in Figure 6, there is a 16 - case increase in the number of people lost in mountain mountaineering compared to the previous year, the highest number ever, but the total number of people lost in mountain climbing & hiking has decreased by 130 people, showing a slight but downward trend. We would like to keep an eye on future changes.

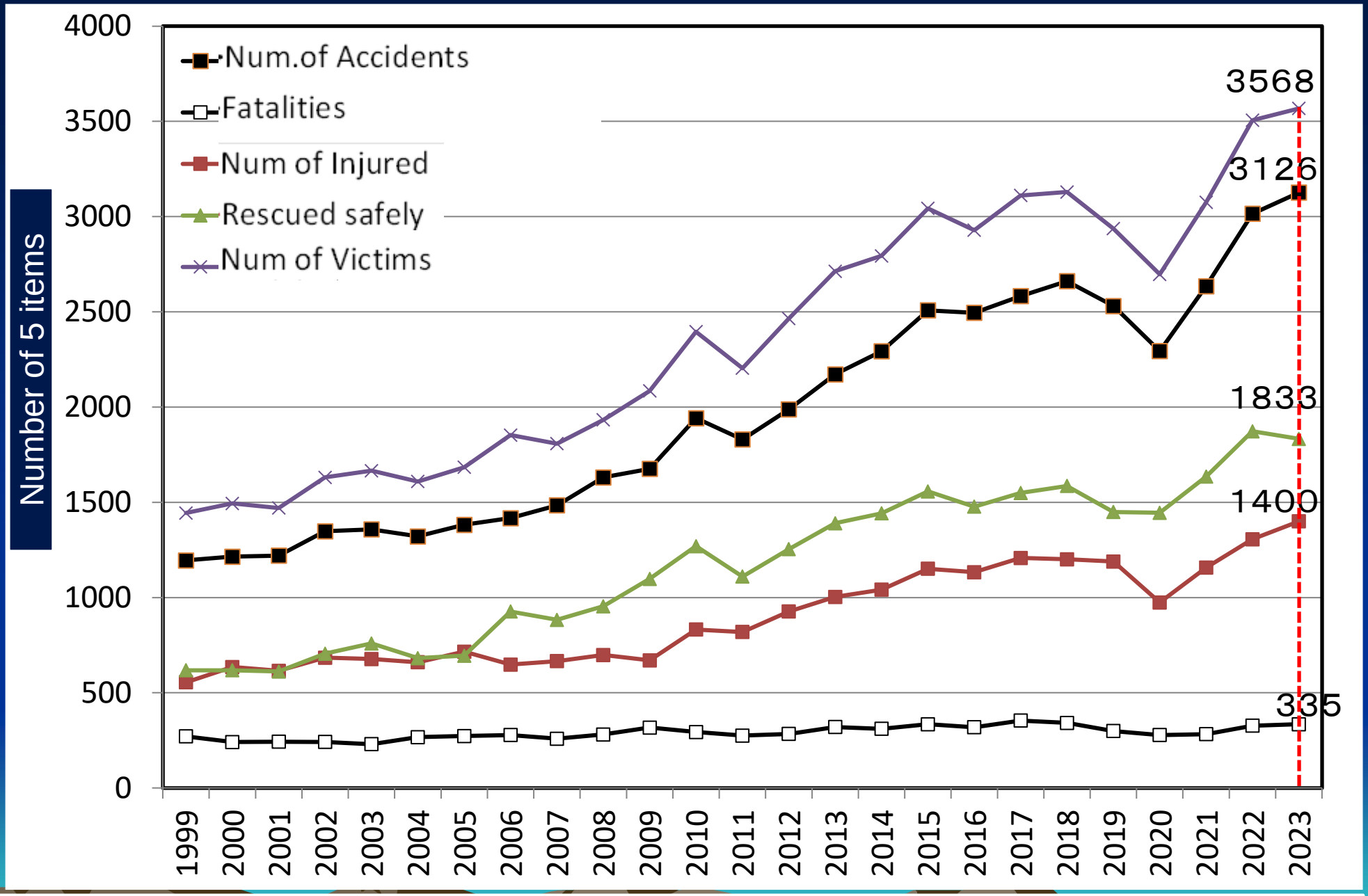



Figure 5. Mountaineering accident occurrence status in 2023.

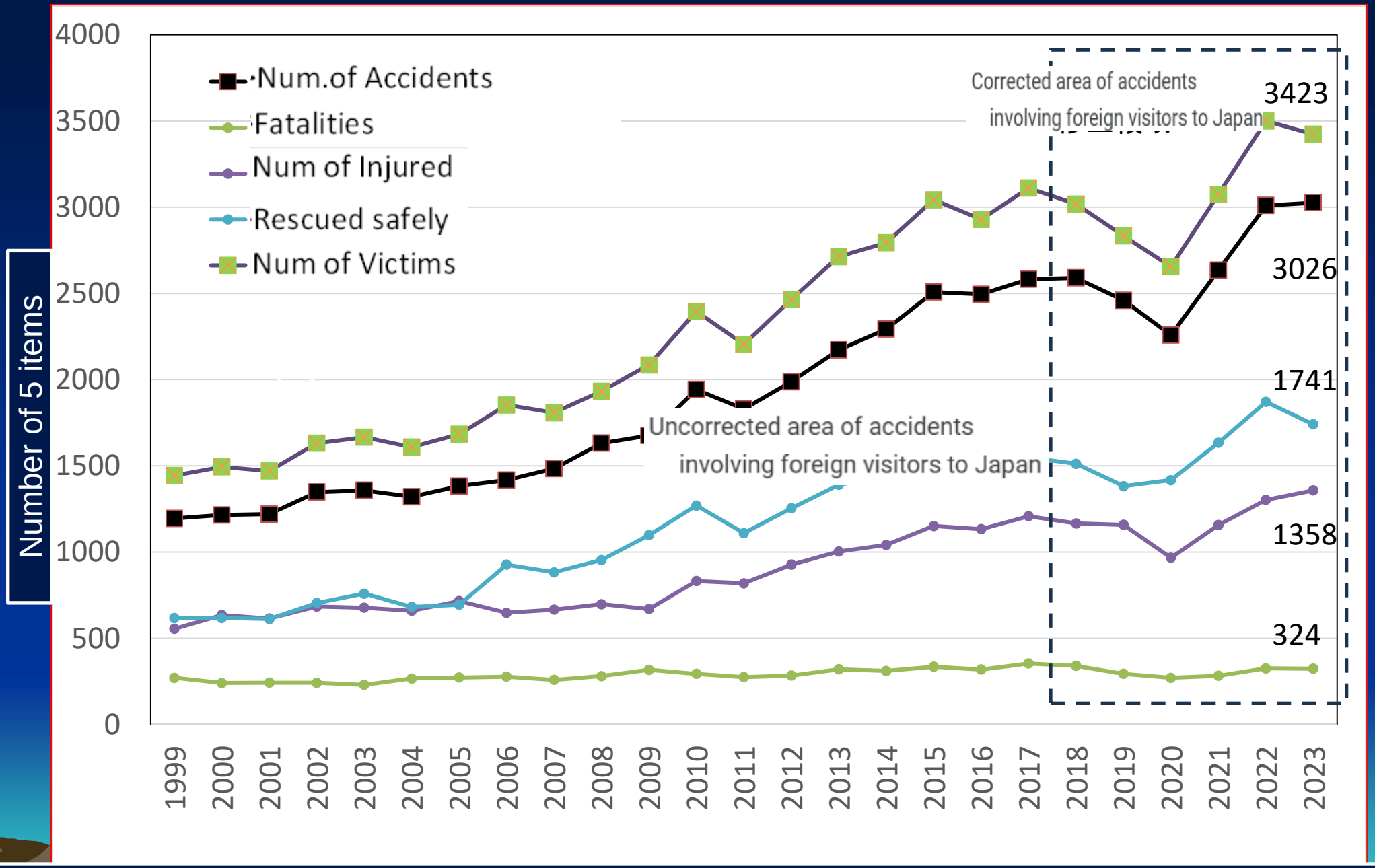



Figure 6 Accident occurrence status excluding foreign visitors to Japan

# 2. Age distribution of accident victims

In Figure 7, the age distribution of accident victims was the same as in the previous year, with half of the victims aged 60 or over, and the peak age group being in their 70s ( 22.1% ). The typical trend of accident victims being older remains unchanged. (See Figure 3: Age Distribution of JMSCA Members)

Figure 8 shows the age-related changes in accident victims by age group. The proportion of people in their 70s and 80s, which had been increasing significantly, is now showing a slight trend of remaining constant and then decreasing. This is an important change to watch when predicting future trends.

The mountaineering baby boomer generation (born between 1940 and 1955) is now 69 to 84 years old. This generation is still the key generation for understanding the age distribution trends of accident victims, and is the defining characteristic of their activities. Considering that the healthy life expectancy is 72.7 years for men and 75.4 years for women in Japan, continuing mountaineering activities may be the key to maintaining the health of the elderly.

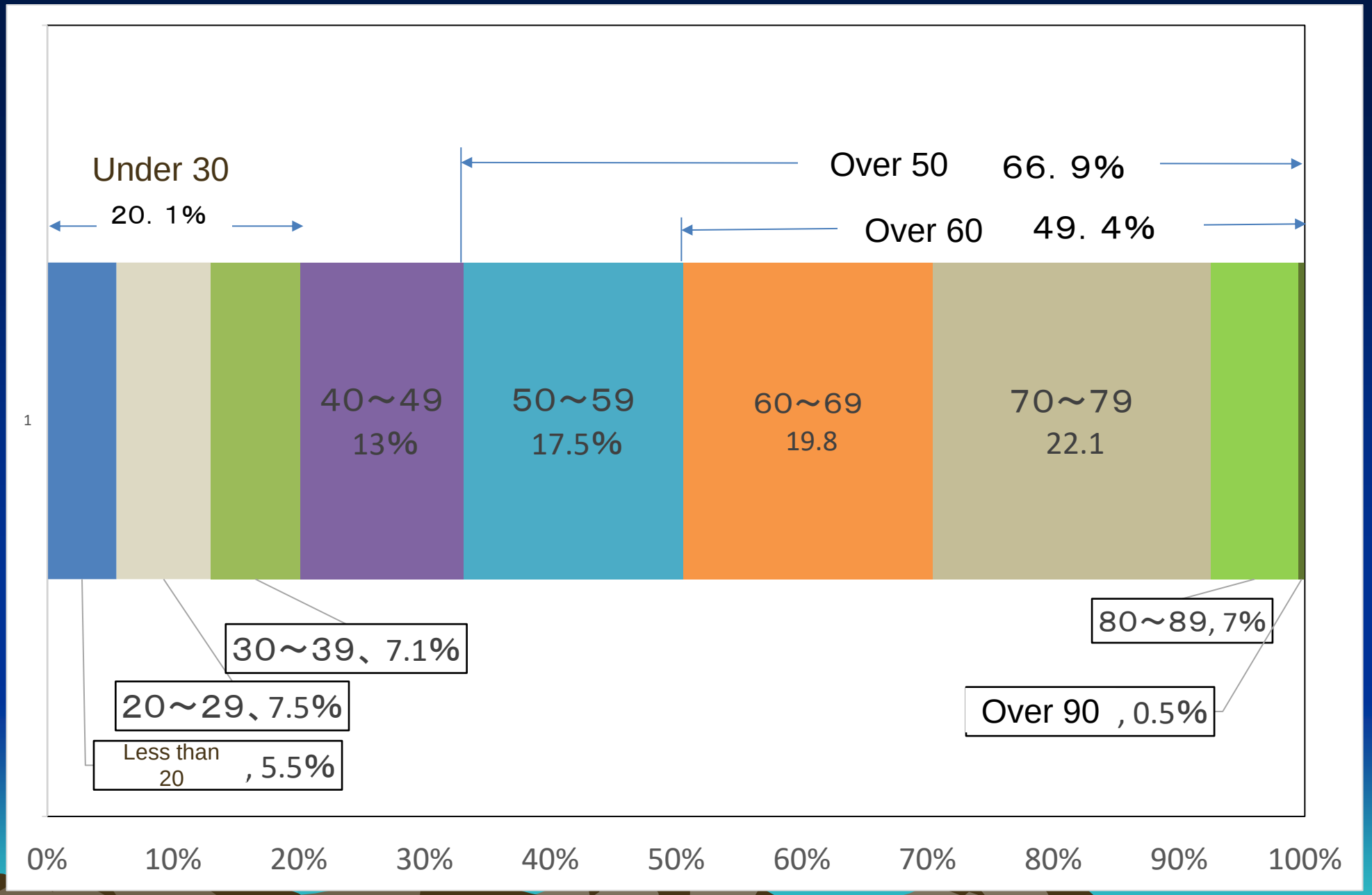



Figure 7 Age distribution of accident victims

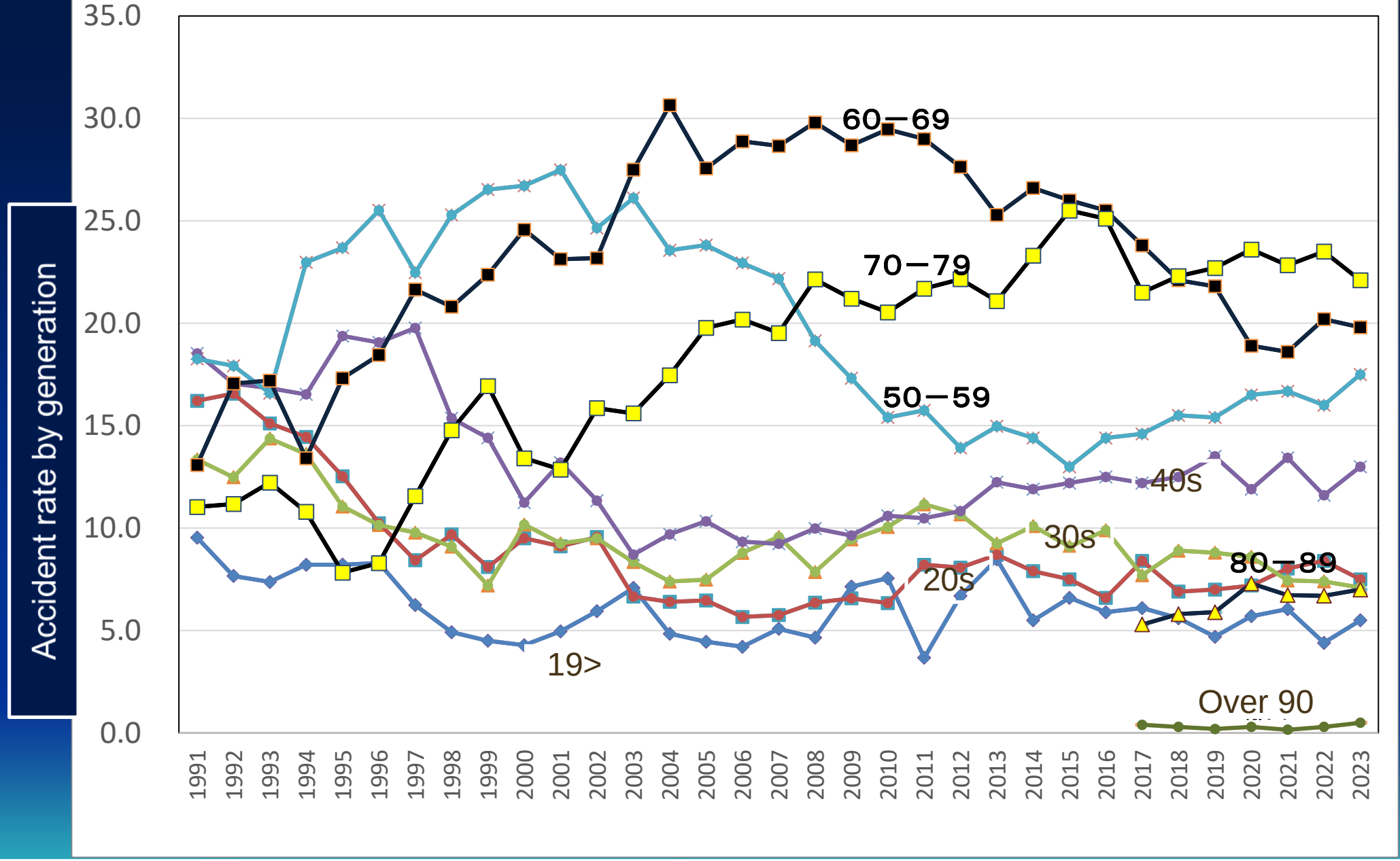



Figure 8. Secular changes by mountain accident generation

# 3. Victims by mountaineering activity

Table 2. Mountaineering Purposes in 2023

| | | 2023 |
|---|---|---|
| Mountaineering | Hiking | 2365 |
| | Walking | 224 |
| | Mountain Ski | 66 |
| | Canyoning | 70 |
| | Climbing | 36 |
| Non-mountaineering | Vegetable Picking | 334 |
| | Fishing | 38 |
| | Job | 57 |
| | Sightseeing | 86 |
| | Photography | 28 |
| | Montain Faith | 19 |
| | Sightseeing | 30 |
| | Hunting | 6 |
| | Other | 209 |

Climbing & hiking styles of mountaineering activity in 2023 are expected to return to pre-COVID-19 conditions, with the number of mountaineering-related accidents reaching a record high of 2,365 . This is an increase of 684 from 1,681 cases in 2020, the year most affected by the coronavirus.

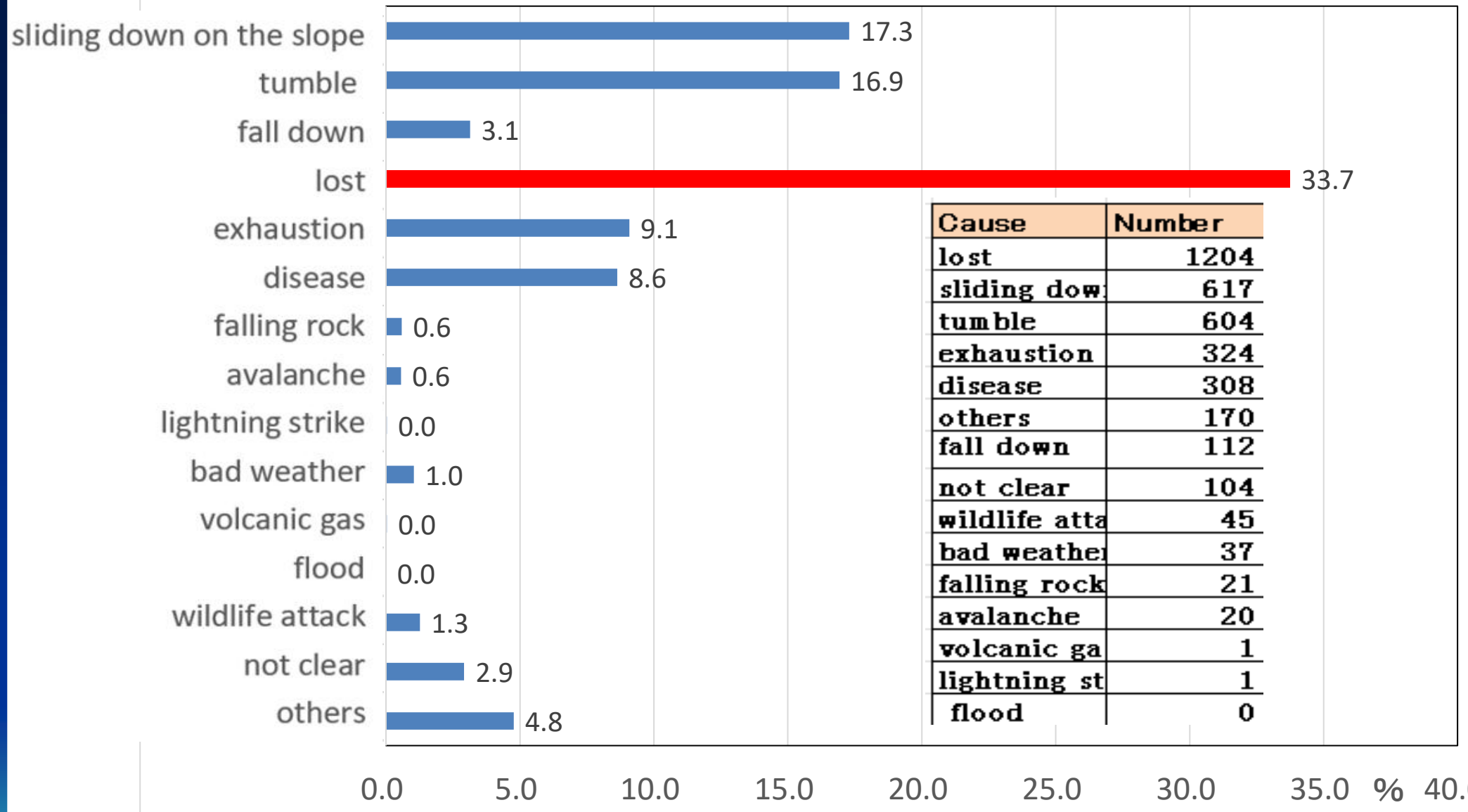
Other mountaineering-related activities have not been affected by the coronavirus. On the contrary, hiking accidents have increased and taken over from mountaineering.

Among non-mountain mountaineers, the number of people gathering wild plants has been gradually decreasing, which is one of the reasons for the decrease in the number of accidents involving people getting lost. There has been little change over the years in other areas.

# 4. Cause of mountain climbing & hiking accidents

Figure 9 shows the cause of mountain accidents in 2023. As is clear from the figure, "getting lost" stands out at 1204 (33.7%).

However, the proportion of "getting lost" among all incidents has been decreasing since recording 44 % in 2020. However, as shown in Figure 10 , which shows the relationship between "trips, slips, falls," "illness/fatigue," and "getting lost," this is not due to a decrease in the number of accidents involving getting lost, but rather a sharp increase in the number of accidents caused by "trips, slips, falls" and "illness/fatigue." In the past, as we entered the era of aging mountaineers, we predicted that falls, illness, and getting lost due to aging would increase, but it seems that this has come late.




| Cause | Number |
|---|---|
| lost | 1204 |
| sliding dow | 617 |
| tumble | 604 |
| exhaustion | 324 |
| disease | 308 |
| others | 170 |
| fall down | 112 |
| not clear | 104 |
| wildlife atta | 45 |
| bad weathe | 37 |
| falling rock | 21 |
| avalanche | 20 |
| volcanic ga | 1 |
| lightning st | 1 |
| flood | 0 |

Figure 9 Cause of Accident details

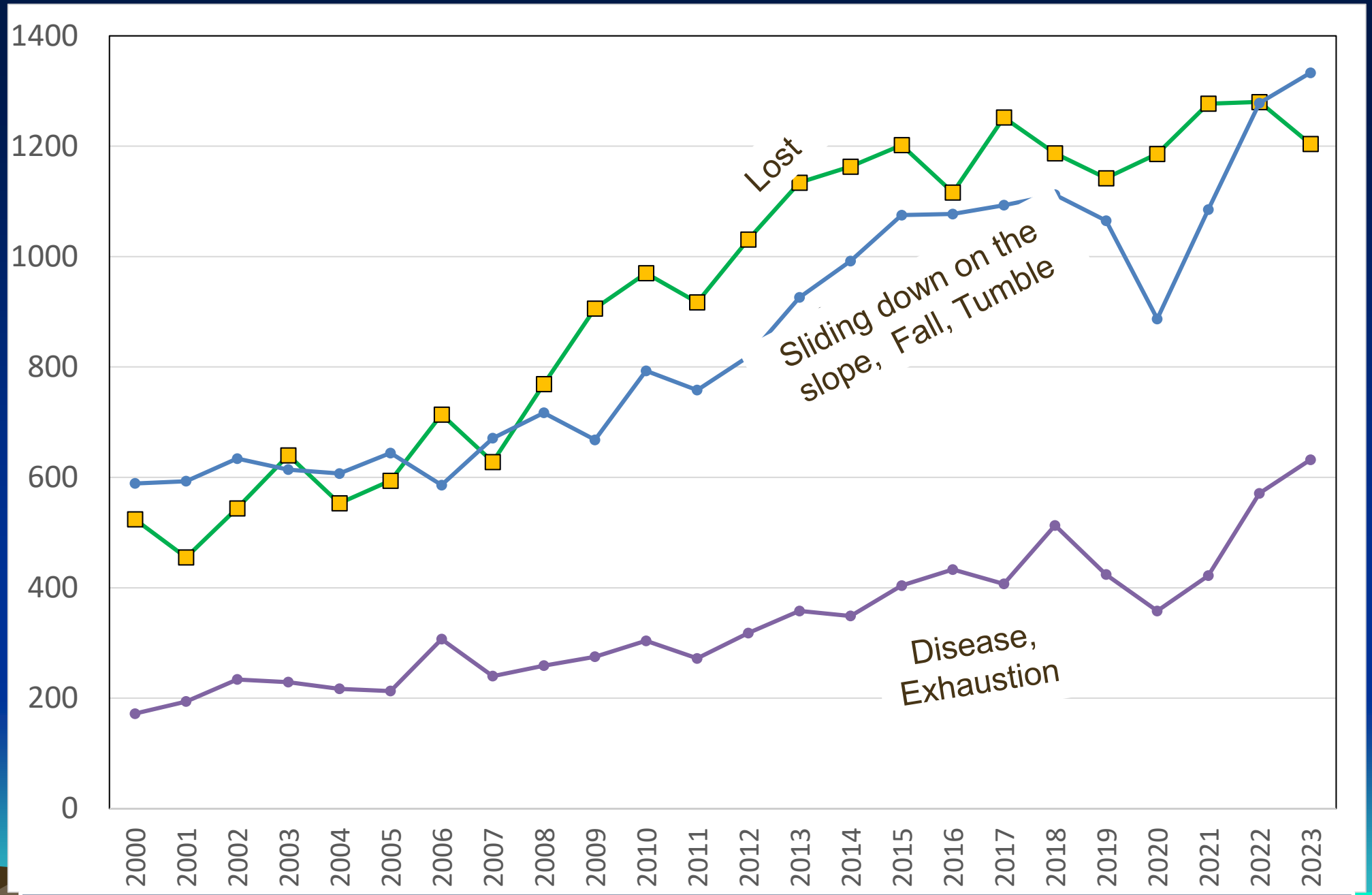



Figure 10. Changes over time in factors behind accidents involving getting lost, illness, fatigue, tripping, falling, and slipping

# 5. Accident occurrence status and accident trends by prefecture

Since mountain accident data is a minor source of information, there is some reluctance to make the top 10 prefectures public, but the number of accidents is heavily influenced by the number of hikers & climbers, which is the base number, so it is also an indicator of the level of mountaineering activity by prefecture.
Table 3 shows the top 10 prefectures in terms of the number of accidents, total number, and fatalities and missing persons . Table 4 is small and difficult to read , but it shows the number of accidents from 2012 to 2023. Nagano Prefecture has always shown outstanding values, even in years when it has been affected by COVID-19, indicating that it is

To see how the proportion of people safely rescued, injured, and dead/missing across the country has changed over time, we have plotted it in a triangular graph in Figure 11. The relationship between the three has generally been moving toward the safe side, but in 2023 , the proportion of people safely rescued, injured, and dead/missing significantly exceeded the proportion of people safely rescued, and began to move toward the dangerous side.

# Table 3 Top 10 prefectures for number of victims, incidents, deaths and missing persons

| | Area. | Fatalities |
|---|---|---|
| 1 | Nagano pref. | 40 |
| 2 | Hokkaido. | 33 |
| 3 | Gifu pref. | 22 |
| 4 | Yamanashi pref. | 20 |
| 5 | Tokyo pref. | 16 |
| 6 | Kanagawa pref. | 15 |
| 7 | Nigata pref. | 15 |
| 8 | Aomori pref. | 13 |
| 9 | Akita pref. | 13 |
| 10 | Gunma pref. | 12 |

| | Area. | Num. of Victims |
|---|---|---|
| 1 | Nagano pref. | 332 |
| 2 | Hokkaido. | 245 |
| 3 | Tokyo pref. | 233 |
| 4 | Kanagawa pref. | 204 |
| 5 | Gunma pref. | 159 |
| 6 | Yamanashi pref. | 157 |
| 7 | Shizuoka pref. | 150 |
| 8 | Hyogo pref. | 145 |
| 9 | Nigata pref. | 144 |
| 10 | Toyama pref. | 144 |

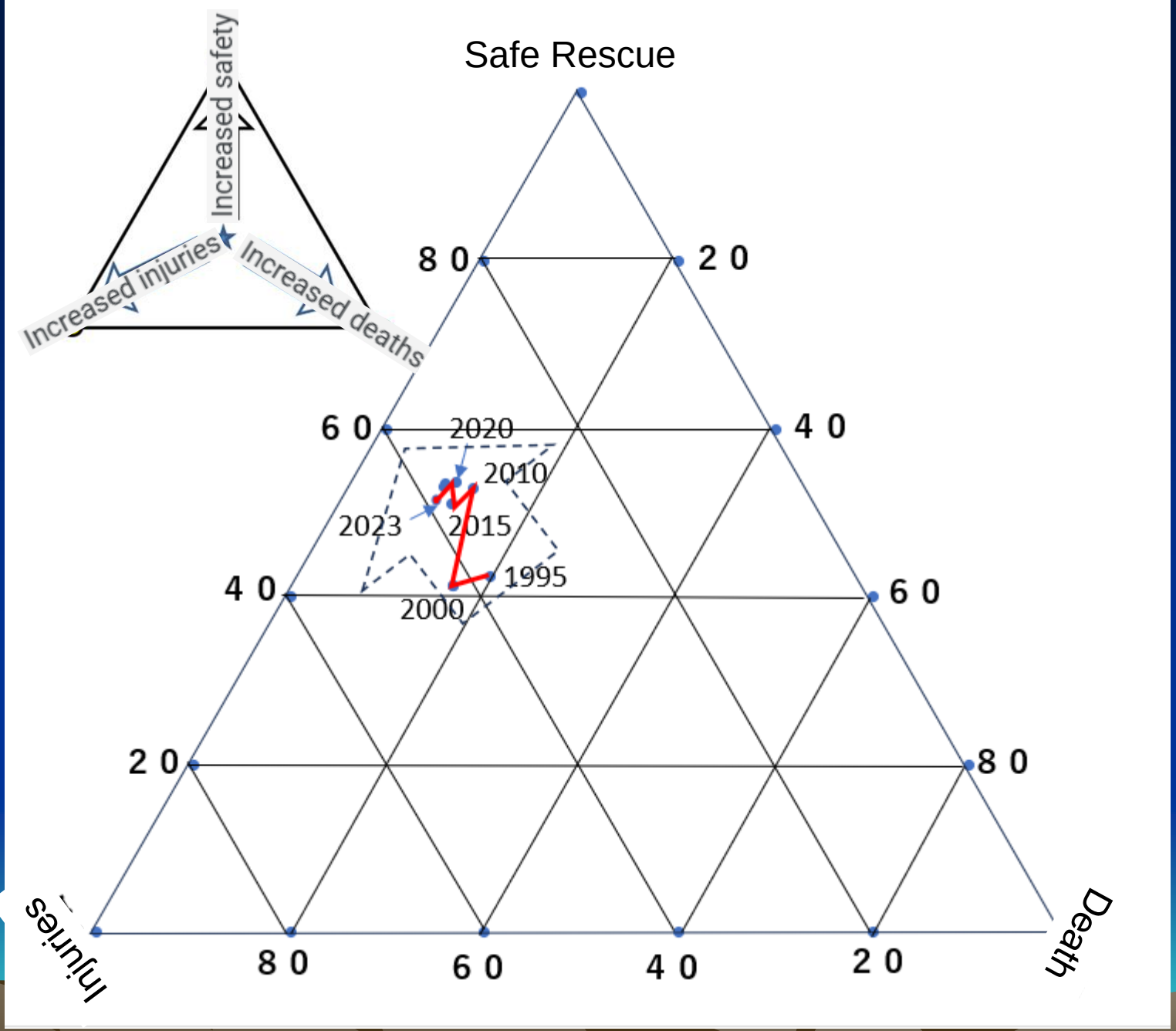
| | Area. | Num of Accident |
|---|---|---|
| 1 | Nagano pref. | 302 |
| 2 | Tokyo pref. | 214 |
| 3 | Hokkaido. | 212 |
| 4 | Kanagawa pref. | 179 |
| 5 | Gunma pref. | 147 |
| 6 | Yamanashi pref. | 145 |
| 7 | Toyama pref. | 134 |
| 8 | Gifu pref. | 133 |
| 9 | Shizuoka pref. | 129 |
| 10 | Nigata pref. | 126 |

The situation has almost returned to pre-COVID-19 levels. Tokyo's ranking for accidents occurring near urban areas has risen sharply.

Table 4

Changes in the number of accident victims in 47 prefectures over time

| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 北海道 | 138 | 155 | 132 | 120 | 175 | 206 | 201 | 202 | 176 | 197 | 192 | 212 |
| 青森県 | 67 | 64 | 50 | 52 | 66 | 53 | 45 | 64 | 82 | 52 | 47 | 81 |
| 岩手県 | 44 | 36 | 43 | 32 | 47 | 43 | 42 | 43 | 39 | 40 | 52 | 63 |
| 宮城県 | 16 | 19 | 20 | 22 | 17 | 20 | 28 | 25 | 38 | 42 | 30 | 20 |
| 秋田県 | 68 | 89 | 70 | 67 | 67 | 68 | 45 | 62 | 57 | 49 | 57 | 49 |
| 山形県 | 61 | 96 | 68 | 77 | 79 | 72 | 88 | 77 | 55 | 59 | 71 | 68 |
| 福島県 | 34 | 49 | 53 | 52 | 82 | 70 | 69 | 80 | 54 | 57 | 74 | 66 |
| 東京都 | 87 | 78 | 106 | 108 | 135 | 151 | 147 | 106 | 110 | 157 | 205 | 214 |
| 茨城県 | 2 | 5 | 11 | 15 | 22 | 24 | 21 | 11 | 28 | 32 | 21 | 29 |
| 栃木県 | 35 | 25 | 24 | 41 | 62 | 36 | 40 | 55 | 56 | 51 | 86 | 72 |
| 群馬県 | 74 | 71 | 74 | 88 | 120 | 77 | 132 | 81 | 85 | 115 | 130 | 147 |
| 埼玉県 | 39 | 45 | 67 | 69 | 62 | 56 | 51 | 50 | 58 | 82 | 87 | 94 |
| 千葉県 | 1 | 1 | 3 | 5 | 9 | 13 | 10 | 17 | 15 | 5 | 15 | 22 |
| 神奈川 | 70 | 93 | 89 | 97 | 93 | 111 | 132 | 104 | 144 | 135 | 151 | 179 |
| 新潟県 | 92 | 71 | 78 | 83 | 123 | 100 | 136 | 109 | 76 | 112 | 114 | 126 |
| 山梨県 | 73 | 83 | 113 | 110 | 107 | 149 | 145 | 165 | 111 | 116 | 155 | 145 |
| 長野県 | 227 | 254 | 300 | 272 | 273 | 272 | 297 | 265 | 183 | 257 | 284 | 302 |
| 静岡県 | 79 | 97 | 139 | 116 | 114 | 132 | 123 | 90 | 34 | 72 | 124 | 129 |
| 富山県 | 116 | 107 | 128 | 133 | 136 | 116 | 123 | 147 | 74 | 104 | 115 | 134 |
| 石川県 | 25 | 41 | 18 | 19 | 24 | 38 | 53 | 32 | 24 | 29 | 34 | 28 |
| 福井県 | 7 | 11 | 14 | 15 | 23 | 11 | 16 | 10 | 15 | 24 | 19 | 24 |
| 岐阜県 | 85 | 65 | 93 | 106 | 93 | 92 | 61 | 84 | 68 | 93 | 129 | 133 |
| 愛知県 | 9 | 8 | 6 | 11 | 8 | 24 | 37 | 25 | 38 | 46 | 37 | 45 |
| 三重県 | 42 | 66 | 51 | 69 | 61 | 57 | 51 | 74 | 66 | 65 | 72 | 57 |
| 滋賀県 | 48 | 40 | 51 | 66 | 60 | 70 | 85 | 67 | 79 | 83 | 86 | 87 |
| 京都府 | 13 | 15 | 21 | 21 | 22 | 15 | 40 | 32 | 33 | 30 | 37 | 26 |
| 大阪府 | 14 | 18 | 14 | 11 | 10 | 8 | 18 | 6 | 15 | 8 | 16 | 16 |
| 兵庫県 | 84 | 75 | 105 | 108 | 92 | 116 | 118 | 126 | 114 | 126 | 123 | 120 |
| 奈良県 | 32 | 36 | 33 | 38 | 48 | 44 | 53 | 46 | 56 | 56 | 63 | 55 |
| 和歌山 | 5 | 6 | 6 | 12 | 7 | 8 | 7 | 8 | 8 | 11 | 13 | 13 |
| 鳥取県 | 9 | 27 | 24 | 24 | 27 | 23 | 22 | 26 | 26 | 37 | 31 | 41 |
| 島根県 | 1 | 6 | 1 | 4 | 7 | 7 | 6 | 12 | 9 | 12 | 9 | 8 |
| 岡山県 | 4 | 3 | 3 | 9 | 6 | 4 | 3 | 11 | 9 | 8 | 16 | 16 |
| 広島県 | 11 | 14 | 13 | 14 | 19 | 14 | 19 | 22 | 26 | 42 | 29 | 34 |
| 山口県 | 3 | 1 | 1 | 2 | 5 | 6 | 6 | 5 | 10 | 6 | 14 | 16 |
| 徳島県 | 10 | 11 | 16 | 18 | 14 | 12 | 12 | 11 | 9 | 12 | 15 | 14 |
| 香川県 | 0 | 0 | 5 | 3 | 5 | 5 | 3 | 5 | 4 | 7 | 9 | 2 |
| 愛媛県 | 19 | 23 | 11 | 23 | 25 | 24 | 20 | 18 | 17 | 16 | 20 | 19 |
| 高知県 | 3 | 2 | 0 | 6 | 4 | 5 | 7 | 4 | 7 | 5 | 12 | 7 |
| 福岡県 | 11 | 4 | 21 | 30 | 28 | 33 | 36 | 33 | 44 | 46 | 54 | 55 |
| 佐賀県 | 7 | 7 | 3 | 15 | 9 | 8 | 8 | 8 | 10 | 16 | 10 | 6 |
| 長崎県 | 1 | 2 | 2 | 9 | 10 | 13 | 10 | 13 | 12 | 13 | 15 | 17 |
| 熊本県 | 11 | 9 | 10 | 15 | 19 | 10 | 13 | 11 | 13 | 11 | 19 | 18 |
| 大分県 | 27 | 29 | 32 | 37 | 51 | 27 | 35 | 35 | 45 | 40 | 51 | 45 |
| 宮崎県 | 8 | 13 | 13 | 16 | 10 | 18 | 15 | 27 | 20 | 13 | 23 | 22 |
| 鹿児島 | 18 | 17 | 32 | 32 | 32 | 33 | 24 | 18 | 33 | 32 | 26 | 41 |
| 沖縄県 | 0 | 1 | 5 | 1 | 0 | 1 | 8 | 9 | 9 | 14 | 23 | 9 |




| | injuries | Rescued | deaths |
|---|---|---|---|
| 1995 | 390 | 434 | 198 |
| 2000 | 635 | 618 | 241 |
| 2005 | 716 | 695 | 273 |
| 2010 | 832 | 1270 | 294 |
| 2015 | 1151 | 1557 | 335 |
| 2020 | 974 | 1445 | 278 |
| 2021 | 1157 | 1635 | 283 |
| 2022 | 1306 | 1873 | 327 |
| 2023 | 1400 | 1833 | 335 |

Figure 11. The proportion of deaths, injuries, and safe rescues based on police data has generally shifted toward the safe side, with each passing year shifting toward the upper left of the triangle. However, in 2023 , the number of safe rescues has decreased, while the number of injuries and deaths has increased.

# Chapter 6　Mountaineering accident database analysis results

## Characteristics of the 282 new registrants

June 2024 , new accident data has been added, with 282 cases registered, bringing the total to 4,951 .

121 people from JMSCA , 161 people from JWAF,
Total data: 4952 people

Number of Excel cells used ( 3,402,024 data )

687fields × 4952records

# 1. Basic information for new registrants

Of the 292 newly registered accident victims, 104 were men ( 37 %) and 178 ( 63 %) were women, 1.7 times as many . The results are shown in Figure 12 , with details in Table 5.

In this database, there has been a tendency for the number of women to slightly exceed the number of men in certain age groups for many years, but since around 2020 , the number of accidents involving women has suddenly exceeded that of men.

As is clear from Figure 12 , the new data shows that the number of accidents involving women is higher in the 35–39 and 45–49 age groups , and in most generations except for those aged 80 and over . This trend is common to both JMSCA & JWAF.

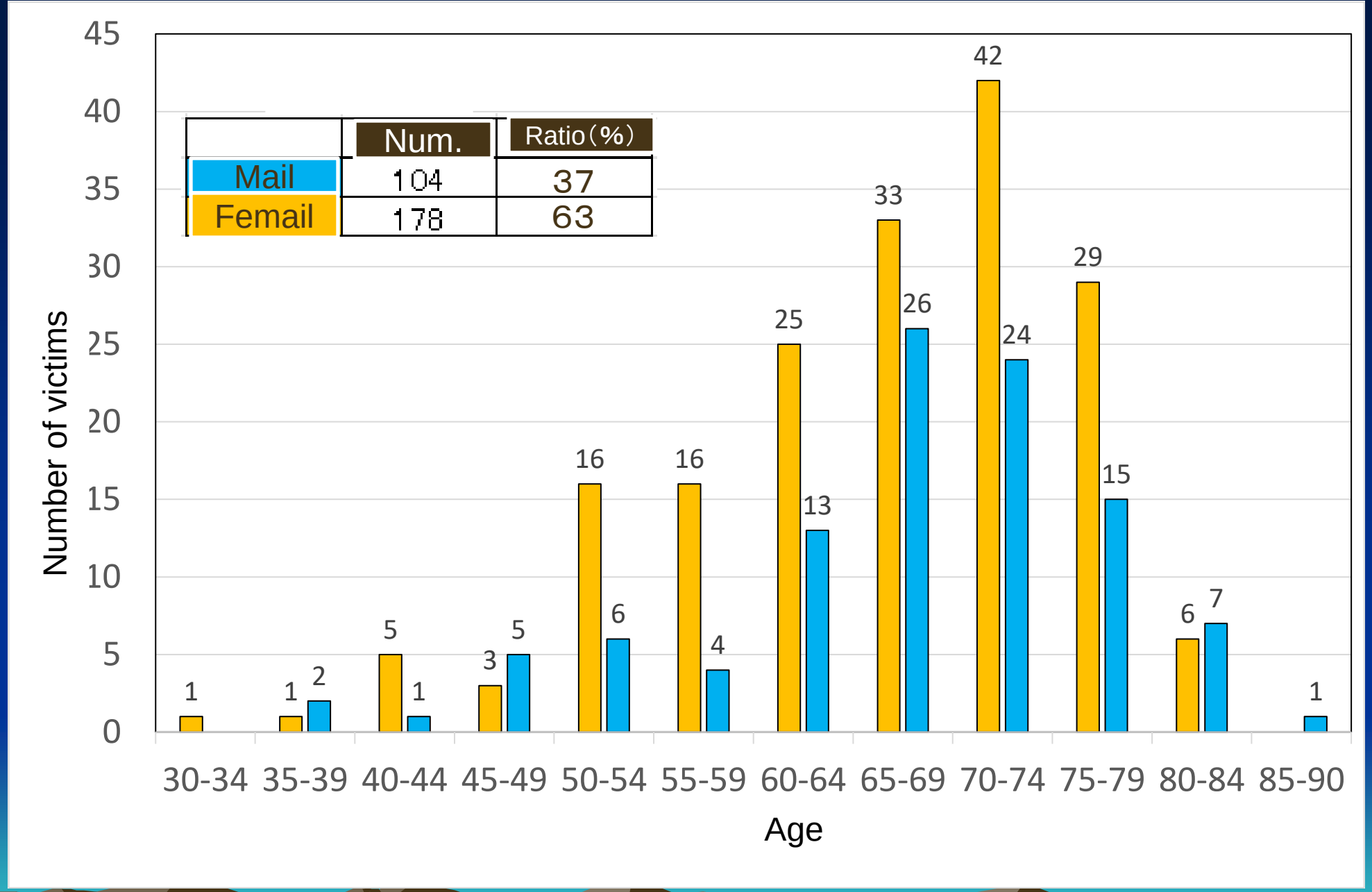



Figure 12: Distribution of accident victims by gender and generation

# Table 5. JMSCA/ JWAF accident generation distribution by gender

| | JMSCA | | | | JWAF | | | Sum | |
|---|---|---|---|---|---|---|---|---|---|
| | Femail | Mail | Ratio | | Femail | Mail | Ratio | Femail | Mail |
| 30−34 | 1 | | Femail only | 30−34 | | | | 1 | 0 |
| 35−39 | | | | 35−39 | 1 | 2 | 0.5 | 1 | 2 |
| 40−44 | | 1 | Mail only | 40−44 | 5 | | Femail only | 5 | 1 |
| 45−49 | 1 | | Femail only | 45−49 | 2 | 5 | 0.4 | 3 | 5 |
| 50−54 | 1 | 2 | 0.5 | 50−54 | 15 | 4 | 3.8 | 16 | 6 |
| 55−59 | 6 | | Femail only | 55−59 | 10 | 4 | 2.5 | 16 | 4 |
| 60−64 | 5 | 4 | 1.3 | 60−64 | 20 | 9 | 2.2 | 25 | 13 |
| 65−69 | 15 | 8 | 1.9 | 65−69 | 18 | 18 | 1.0 | 33 | 26 |
| 70−74 | 27 | 9 | 3.0 | 70−74 | 15 | 15 | 1.0 | 42 | 24 |
| 75−79 | 18 | 10 | 1.8 | 75−79 | 11 | 5 | 2.2 | 29 | 15 |
| 80−84 | 6 | 5 | 1.2 | 80−84 | | 2 | Mail only | 6 | 7 |
| 85−90 | | 1 | Mail only | 85−90 | | | | 0 | 1 |
| Not clear | 1 | | | | | | | 1 | 0 |
| Sum | 81 | 40 | 2.0 | Sum | 97 | 64 | 1.5 | 178 | 104 |

The female/male ratio is shown in the table. The yellow parts are the generations where the number of female accidents is higher. Until a few years ago, the number of female accidents tended to be higher only in the 60-70 generation , but now it is higher in most generations. The peak age for women is 70-74 years old, and for men it is 65-69 years old .

According to the JMSCA Mutual Aid Association, the male to female member ratio is 21,301 men to 19,561 women, with a slight male preponderance. By age, the number of women exceeds the number of members in the 55-75 age group. Meanwhile, in JWAF, the number of men (9,839 ) and women ( 10,205 ) is almost equal, with more female members in their 50s and 60s .

The 1.7 times higher number of female accidents than men is the result of a large increase in the number of accidents involving women in their 50s to 70s , but this difference is so large that it has become a serious problem. The level of disability shown in Table 6 is also becoming more serious among women. Both JMSCA and JWAF need to make the sudden increase in female accidents an urgent issue.

Regarding this issue, it has been reported that Hyogo JWAF has implemented training focusing on the decline in muscle strength in elderly women, which is caused by aging ( Chapter 2 , ④), and has achieved good results.

# Table 6: Disability status of newly registered applicants by gender and generation

| Age | IIC | | | | | | | | | | Sum | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1: mild symptoms | | 2: moderate symptoms | | 3: severe sym | | 4: critical condition | | 5death | | | |
| | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ |
| 30–34 | | | | | | | 0 | 1 | | | 0 | 1 |
| 35–39 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | | | 2 | 1 |
| 40–44 | 0 | 0 | 0 | 1 | 1 | 3 | 0 | 1 | | | 1 | 5 |
| 45–49 | 1 | 1 | 0 | 0 | 2 | 2 | 2 | 0 | | | 5 | 3 |
| 50–54 | 0 | 3 | 1 | 3 | 5 | 8 | 0 | 2 | | | 6 | 16 |
| 55–59 | 0 | 1 | 2 | 2 | 2 | 10 | 0 | 2 | 0 | 1 | 4 | 16 |
| 60–64 | 1 | 5 | 1 | 4 | 8 | 11 | 3 | 5 | | | 13 | 25 |
| 65–69 | 1 | 9 | 6 | 10 | 17 | 12 | 2 | 2 | | | 26 | 33 |
| 70–74 | 4 | 6 | 8 | 9 | 8 | 21 | 2 | 6 | 2 | 0 | 24 | 42 |
| 75–79 | 2 | 3 | 7 | 5 | 6 | 17 | 0 | 4 | | | 15 | 29 |
| 80–84 | 0 | 2 | 2 | 0 | 4 | 3 | 1 | 1 | | | 7 | 6 |
| 85–90 | 0 | 0 | 1 | 0 | 0 | 0 | | | | | 1 | 0 |
| Not clear | | | | | 0 | 1 | | | | | 0 | 1 |
| Sum | 10 | 30 | 28 | 35 | 54 | 88 | 10 | 24 | 2 | 1 | 104 | 178 |

Perhaps because there are 1.7 times as many women , the number of women involved in accidents is higher for IIC 1 to 4. Until a few years ago, most of the serious injuries in IIC 4 were men, but now women with serious disabilities are becoming more noticeable. The number of deaths has decreased significantly .

# 2. New registrants' hiking & climbing activities and cause of accident

In terms of accidents by activities of mountain hiking & climbing (Table 7), 63.7 % were mountain walking/hiking-type accidents, and 20 % were climbing-type accidents. There were almost no cases of non-mountain climbing alone, with most combining mountain walking or climbing with other activities.

In terms of cause of accident type (Table 8), tumbles, slips and falls accounted for 80 %. As in the previous year, there were twice as many female ( 117 people) as male ( 56 people) falls. In previous years, there were more males who slipped than females, but this year's figure was higher for females, perhaps due to a significant increase in the number of female accident victims. This result is also reflected in IIC4 (serious injury) in Table 6 , where the ratio of females to males is 24:10 (9:12 in the previous year ) .

## Table 7 Activity of hiking & climbing

| | Items | Num. |
|---|---|---|
| Mountaineering | Mountain ski | 15 |
| | Alpine climbing | 24 |
| | Canyoning | 29 |
| | Ice Climbing | 9 |
| | Free climbing | 14 |
| | Walking | 196 |
| | Hiking | 93 |
| Non-Mountaineering | Sightseeing | 33 |
| | Sightseeing landscape | 0 |
| | Sightseeing flowers | 0 |
| | Sightseeing autumn leaves | 0 |
| | Wild vegetable picking | 8 |
| | Plant picking | 0 |
| | Mushroom picking | 0 |
| | Fishing | 3 |
| | Phot | 15 |
| | Mountain worship | 0 |
| | Hunting | 0 |
| | Camping | 2 |
| | Working | 2 |
| | Job,cleaning forest | 0 |
| | Job, Mowig | 0 |
| | Job, research | 0 |
| | Other | 11 |

## Table 8: Cause of accident by gender

Multiple answers allowed

| Items | Num. | Mail | Femail | Ratio (%) Mail | Ratio (%) Femail |
|---|---|---|---|---|---|
| Sliding down | 51 | 25 | 26 | 22.1 | 14.8 |
| Tumble | 173 | 56 | 117 | 49.6 | 66.5 |
| Fall down | 6 | 3 | 3 | 2.7 | 1.7 |
| Lost | 4 | 2 | 2 | 1.8 | 1.1 |
| Fatigue | 17 | 9 | 8 | 8.0 | 4.5 |
| Disease | 4 | 3 | 1 | 2.7 | 0.6 |
| Falling rocks | 5 | 3 | 2 | 2.7 | 1.1 |
| Avalanche | 0 | 0 | 0 | 0.0 | 0.0 |
| Lighhting | 1 | 0 | 1 | 0.0 | 0.6 |
| Bad weather | 1 | 1 | 0 | 0.9 | 0.0 |
| Volcanic gass | 0 | 0 | 0 | 0.0 | 0.0 |
| Flood | 0 | 0 | 0 | 0.0 | 0.0 |
| Fight | 0 | 0 | 0 | 0.0 | 0.0 |
| Wild life attack | 1 | 1 | 0 | 0.9 | 0.0 |
| Not clear | 3 | 0 | 3 | 0.0 | 1.7 |
| Others | 23 | 10 | 13 | 8.8 | 7.4 |
| | 289 | 113 | 176 | 100.0 | 100.0 |

# 3. New registrants' mountain areas (clusters) where accidents occurred

The mountain areas where accidents occurred recovered quickly to pre-COVID levels, with the COVID-19 period in between. Table 9 shows the ranking of mountain areas where accidents occurred over a five- year period.

To summarize the impact of COVID-19 on mountain hiking & climbing activity, "When COVID-19 first occurred, hikers & climbers suddenly withdrew from the main mountain areas, and the number of accidents also dropped dramatically. Instead, accidents began to occur in mountain areas around urban areas. With the end of COVID-19, people returned to hiking & climbing mountain areas again, but the ranking pattern of the mountain areas where accidents occurred before is no longer the same." This trend can be clearly seen in the five- year changes in the Northern Alps. Figure 13 shows the mountain areas where accidents occurred among newly registered hikers & climbers in central Japan, which have recovered from the effects of COVID-19.

# Table 9. Changes in mountain areas where accidents occurred over the past five years and recovery from COVID-19

| 2023 | |
|---|---|
| Mountains | |
| Northen Alps | 32 |
| Chichibu | 20 |
| Central Alps | 9 |
| Southen Alps | 9 |
| Yatsugamine | 9 |
| Oou | 7 |
| Echigo | 6 |
| Suzuka | 6 |
| Tanzawa | 6 |
| Independent peaks | 5 |
| Nikou Volcano | 5 |

| 2022 | |
|---|---|
| Mountains | |
| Chichibu | 23 |
| Northen Alps | 22 |
| independent peak | 11 |
| Tanzawa Mountains | 8 |
| Yatsugatake Mountains | 6 |
| Southern Alps | 6 |
| Rokou | 5 |
| Mikuni Mountains | 5 |
| Yamizo Mountains | 4 |
| Ryohaku Mountains | 4 |
| Suzuka Mountains | 4 |

| 2021 | |
|---|---|
| Mountains | |
| Chichibu | 28 |
| Northen Alps | 19 |
| Oou | 8 |
| Mikuni | 7 |
| Tanzawa | 4 |
| Hira | 4 |
| Rokou | 4 |
| suzuka | 4 |
| Iitoyo | 3 |
| Kitayama | 3 |
| Daisen | 3 |
| Central Alps | 3 |

| 2020 | |
|---|---|
| Mountains | |
| Northern Alps | 21 |
| Chichibu | 20 |
| Yatsugadake | 14 |
| Rokou | 11 |
| Mikuni | 8 |
| Oou | 7 |
| Ishikar | 5 |
| Ryouhaku | 4 |
| Daisen | 4 |
| Daisetru | 4 |
| Suzuka | 4 |

| 2019 | |
|---|---|
| 山系、山地、山脈 | |
| Northen Alps | 47 |
| Yatsugadake | 18 |
| Chichibu | 17 |
| Oou | 11 |
| Mikuni | 11 |
| Independent peaks | 8 |
| Southen Alps | 8 |
| Ushiro Tateyama | 5 |
| Misakayama | 5 |
| Rokou | 5 |
| Suzuka | 5 |
| Ryouhaku | 4 |

Most affected by Corona Year

Alps

COVID19

Rokou & Chichibu is mountains near urban

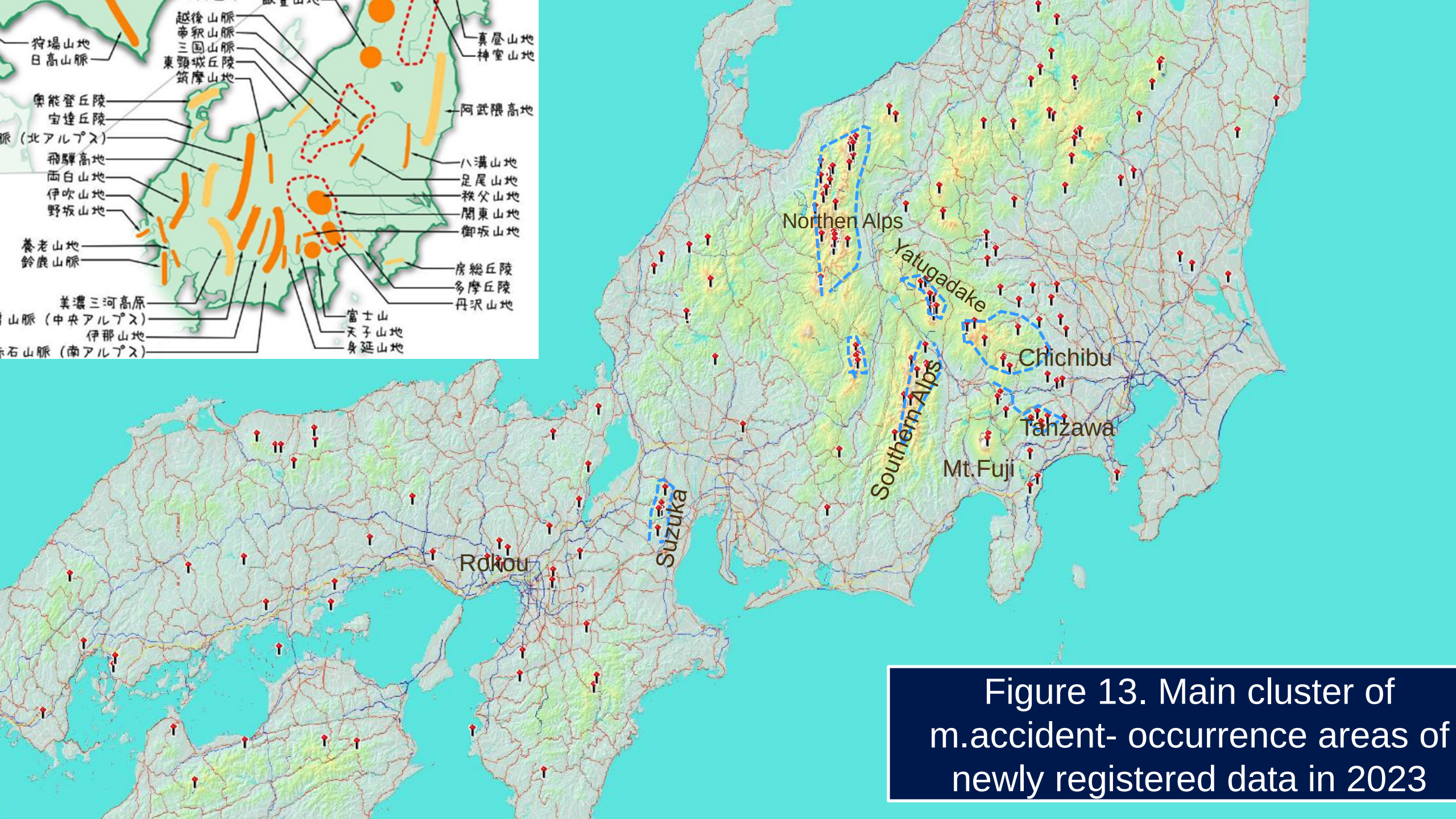



Figure 13. Main cluster of m.accident- occurrence areas of newly registered data in 2023

# 4. Case analysis of the sudden increase in female accidents

In order to get an overview of the types of accidents that occurred due to the sudden increase in female accidents, I analyzed two free-text questions:

"Question 4.1 : Where? What were you doing?"

"Question 4.2 : Details of the accident and identification of problems."

Question 4.1 gave Figure 14 and Table 10 , and question 4.2 gave Figure 15 and Table 11. Each figure shows three generations ( 70s and over, 60s , and 50s and under). The figures show the number of keywords extracted from the free-description answer, and the tables show representative examples of some of the most common answer.

For supplementary information, the basic abilities and risk responses of 178 female accident victims are shown in Tables 12 to 15 , the accident type and weather, and the location of the accident (uphill/downhill) are shown in Tables 16 to 18 , external injuries are shown in Table 19 , and human error is shown in Table 20 .

The results of the accident analysis of women of three generations show that the most distinctive trend is the 70s and older, which is the peak value of the female accident victim age distribution curve (Figure 12 ). 15 related items were extracted from the accident description in Figure 15. Comparing the three generations for each item, it shows that the 70s and older have more problems with "human error," especially "visual recognition ability" and "balance."

Responses regarding visual recognition (Table 11 ) include "loss of concentration," "looking elsewhere," and "not looking carefully at one's feet." In addition, in the "lost attention" category in Table 10 , which is the cause of accidents, the respondents answered that there were moments when their attention was drawn to things other than walking, such as "calling out," "receiving a smartphone," "flowers at their feet," and "the bridge ahead." It is estimated that these declines in visual recognition and attention are also related to the decline in hearing ( Table 13) and eyesight (Table 14 ) in the 70s and older.

On the other hand, in the "considering escape routes" category as a risk response in Table 15 , it can be seen that many people are no longer paying attention to risks, perhaps because they have become accustomed to mountain hiking & climbing.

Next, in terms of muscle strength, the maximum weight that can be carried (Table 12 ) drops to 5-10kg for people in their 70s and older, but many people still carry more than 10kg . Perhaps because they continue to hike mountains, there are few reports of problems with "muscle strength." However, there are many reports of unstable "balance." Typical responses include "losing balance and falling," "being blown around by strong winds," and "not being able to brace my knees."

Balance problems are related to muscle strength, as well as sensory function and flexibility of the ankle and knee joints. As many experts point out, the reason why accidents occur frequently during descents (Figure 14 , Table 18 ) is probably related to the balance problems and inability to brace oneself that elderly people have.

When hazard factors such as "dead leaves, trees, tree roots, moss, + (wetness, snow)" overlap with balance problem, "slips" and "trips" occur. Also, although walking sticks are originally meant to prevent loss of balance, there have been cases where they have been a cause of slipping.

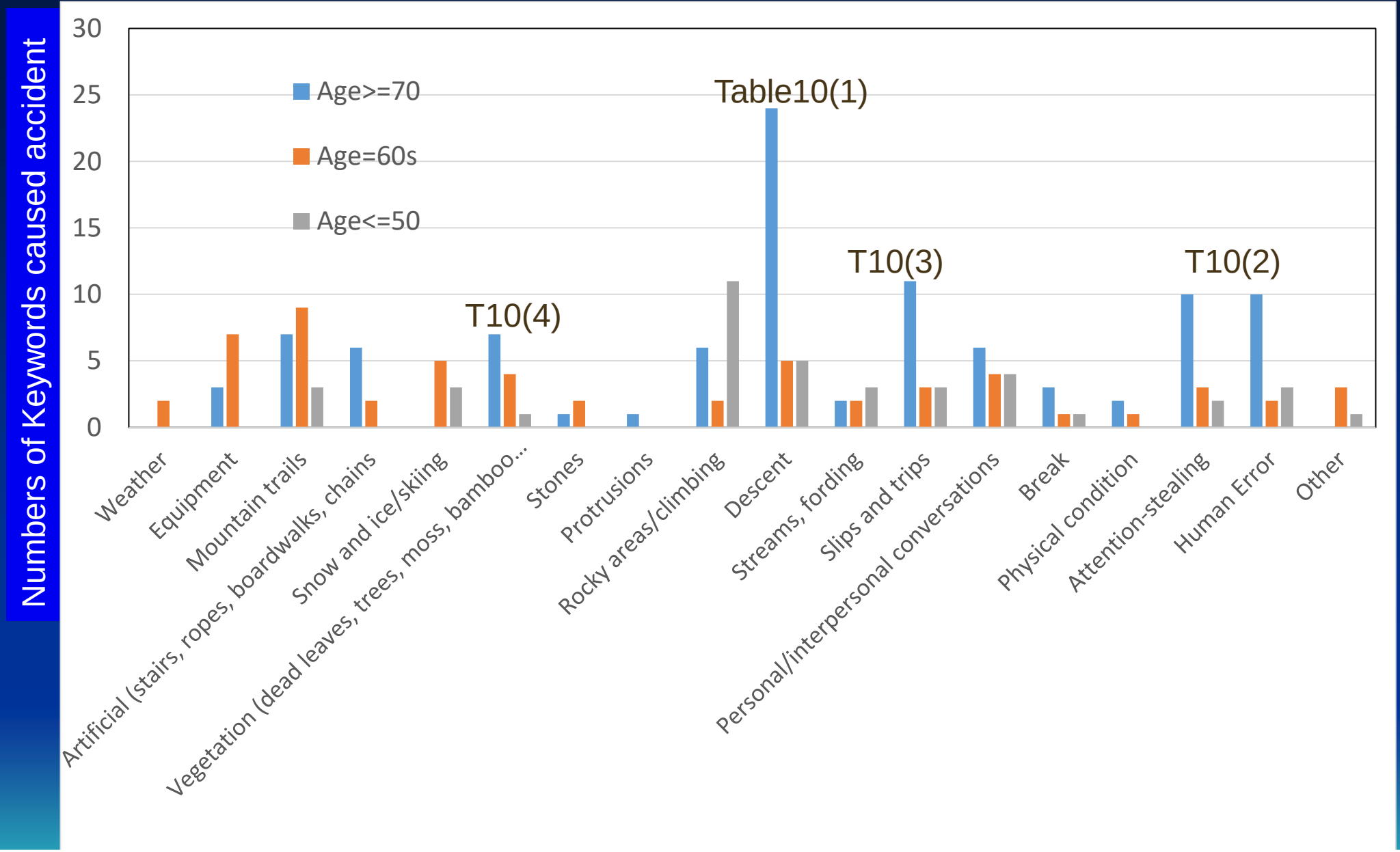



Figure 14: "Where and what were you doing" when the accident occurred for three generations of women

# Question: "Where were you and what were you doing when the accident occurred?"

## Table 10 Representative examples of free-form responses that received a large number of responses in Figure 14

### (1) Situation during descent

On the way down, I slipped because I was in a hurry even though the dead grass was wet.----- (age>=70)
I felt relieved that I only had 30 minutes to make the descent. (age>=70)
Halfway down, just before reaching the bus path. ----(age>=70)
As I was descending, I had to hold my hat down with my left hand because of the strong wind. ----- (age=60s)
On the way down, I warned my sister, who was following me, about loose rocks, but one fell. ----- (age=60s)
As we were running late, we changed our route and shortly after the start of the descent. -----(age<=50)

### (2) When your attention is involved ( HumanErr)

It occurred after I told a young group “good luck” as they were making a round trip to Mt. Dainichi in one day. --- (age>=70)
I took their smartphone to take a photo of them. ----(age>=70)
As we were walking, I was more interested in the flowers than what was under my feet. ---(age>=70)
We were chatting as we walked. --(age>=70)
I had placed my backpack on the valley side and it fell off, so I tried to retrieve it. ----(age=60s)
We changed our route due to delays and were approaching the downward path. ---(x<=50)

### (3) Slipping and tripping

Slipped and fell on snow and leaves on a downhill mountain trail. (age >= 70)
Slipped on grass after descending the mountain. (age >= 70)
Stumbled on a flat path while descending the mountain.
Slipped on the boardwalk. (age=60s)
Slipped and dislocated right shoulder despite being belayed in the valley. (age <= 50)
Attempted to stop two people from sliding after they fell. (age <= 60)
Fell after being distracted by companion's fall. (age <= 60)

### ( 4 ) Vegetation ( dead leaves, trees, moss, bamboo, flowers )

Slipping on fallen leaves and tumbling. ---(x>=70)
Catching my foot on a tree branch beneath me. ---(x>=70)
When the stairs were covered in moss, I descended without holding onto the handrail. ---(x>=70)
When I stepped on a fallen tree trunk. ---(x=60s)
When you walked down a slick boardwalk. ---(x=60s)
When you skied through the wooded area on a ridge. ---(x=60s)

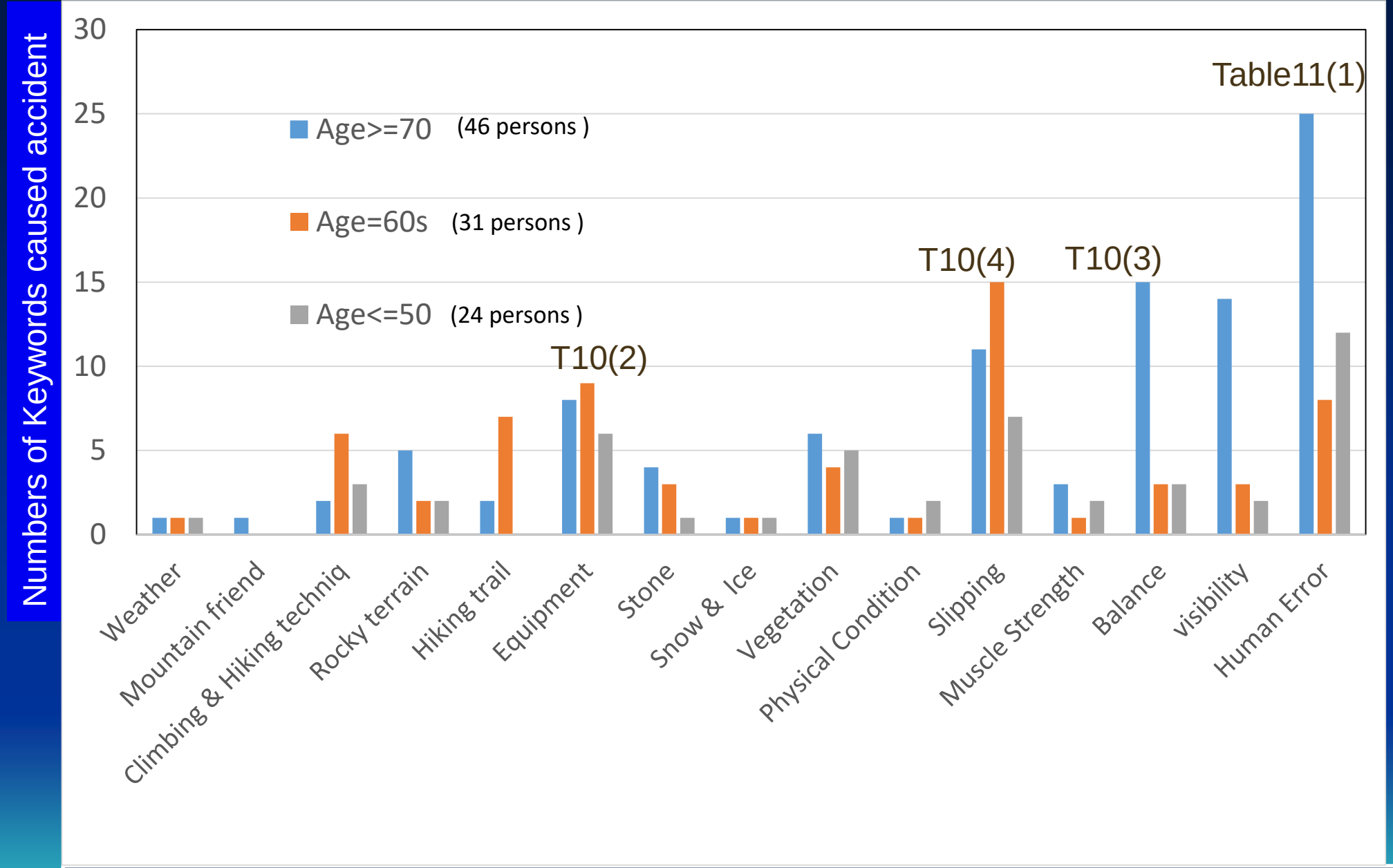



Figure 15: "Accident details and problems pointed out" regarding women of three generations

# Question: "Details of the accident and problems"

## Table 11: Representative examples of free-form responses that were most common in Figure 15

### (1) Visual recognition and human error

My concentration on what was under my feet was broken for a moment. ---(age>=70)
There were a series of stones and I looked away for a moment and slipped. ---(age>=70)
I entered a flat path, but I let my guard down and didn't look carefully at my feet. ---(age>=70)
I stepped forward without looking at my feet and landed on a large floating stone. ---(age>=70)
I was thinking about a lot of things and couldn't see my feet well because of the bamboo grass. ---(age=60s)

### (2) Problems with various equipment

I usually use double poles, but on this day I was unable to maintain my balance on the rocky ridge. ---(Age>=70)
I was not used to wearing crampons on rocky terrain. ---(Age=60s)
The gentle slope made it difficult to remove my skis. ---(Age=60s)
The weight of my backpack caused me to fall. ---(Age=60s)
The SLCD were not inserted properly to the joint. ---(Age<=50)
The belay was looser than expected. ---(Age<=50)
The rocks at the attachment point caused me to collapse. ---(Age<=50)

### (3) Loss of balance

I lost my balance and fell. ---(Age>=70)
I was blown off balance by the strong wind. ---(Age>=70)
I lost my balance because it was a dead branch. ---(Age>=70)
I couldn't get my knees to brace myself. ---(Age>=70)
I frantically tried to stop, but I lost my balance and fell. ---(Age<=50)

### (4) Slipping or stumbling

My foot slipped on fallen leaves and I fell on my bottom. ---(Age>=70)
I couldn't keep my knees steady.---(Age>=70)
I was looking away and slipped.---(Age>=70)
I didn't realize the rocks were slippery and lost my balance. -(Age=60s)
My foot got caught on a tree root. --(Age=60s)
I got caught on a rock under my feet and fell.--(Age=60s)
I lost my footing and slipped. --(Age<=50)
I slipped, lost my balance, and fell. --(Age<=50)

Comparing the three generations of women, the human error analysis (Table 20 ) using Tanimura's psychological analysis method shows that "I didn't notice" and "I thought it was okay" start to be common among those in their 60s and above, and become more common among those in their 70s and above.

A similar trend is also seen in poor balance. Meanwhile, in the younger generations, although the difference is slight, "panic" and "tiredness" are characteristic of those in their 50s and below. As for injuries after accidents (Table 19 ), there are many falls and slips, so "fractures" are common. Even those who "looked away for a moment," as mentioned earlier, fell and suffered serious fractures. As Sugisaka points out later, this is a typical accident pattern among older women.

In addition, in the comparison of age distribution in Figure 12 , the generation with higher female accidents is expanding year by year to those in their 50s and under. By choosing hiking & climbing styles that require easy hiking ability, human error is more likely to occur, and this may be similar to that of those in their 70s and over.

However, unlike the other two generations, those under 50 mainly report climbing-related accidents related to issues inherent to mountain climbing, such as "attaching anchors," "belaying," and "cams."

Section 5 , I summarized the issues surrounding women hiking & climbing as seen by Guide Sugisaka . From her experience as a guide, she has pointed out the decline in cognitive ability from the age of 70 onwards. It is interesting to note that this is similar to the results of this analysis, which found that the main cause is an increase in human error.

# Basic physical fitness and risk response of female accident victims

## Table 12 Maximum load (muscle strength)

The maximum load that can be carried without interfering with mountain walking (kg)

| Age 年齢幅 | 0–5 | 5–10 | 10–15 | 15–20 | 20–25 | 25–30 | 30–35 |
|---|---|---|---|---|---|---|---|
| 30–34 | | | | 1 | | | |
| 35–39 | | | | 1 | | | |
| 40–44 | | | 2 | 2 | 1 | | |
| 45–49 | | | | | 1 | 1 | 1 |
| 50–54 | | | 8 | 5 | 2 | | 1 |
| 55–59 | | 1 | 8 | 3 | 2 | | |
| 60–64 | | 1 | 12 | 5 | 2 | | |
| 65–69 | | 8 | 7 | 5 | 3 | | |
| 70–74 | 1 | 7 | 17 | 7 | 1 | 2 | |
| 75–79 | | 13 | 10 | 4 | | | |
| | | 2 | 1 | | | | |
| Sum 計 | 1 | 32 | 66 | 33 | 12 | 3 | 2 |

黄色は各世代の最高値

## Table 13 Hearing Ability

| Age | I can hear it. | A little | Not at all |
|---|---|---|---|
| 30–34 | 1 | | |
| 35–39 | 1 | | |
| 40–44 | 5 | | |
| 45–49 | 3 | | |
| 50–54 | 16 | | |
| 55–59 | 14 | 2 | |
| 60–64 | 23 | 1 | |
| 65–69 | 24 | 4 | |
| 70–74 | 32 | 8 | |
| 75–79 | 24 | 4 | 1 |
| 80–84 | 3 | 2 | |
| Sum | 147 | 21 | 1 |

## Table 14. Visual acuity

The symbols on the map

| Age | I can read it | a little | Not at all |
|---|---|---|---|
| 30–34 | 1 | | |
| 35–39 | 1 | | |
| 40–44 | 5 | | |
| 45–49 | 2 | 1 | |
| 50–54 | 4 | 12 | |
| 55–59 | 9 | 6 | |
| 60–64 | 9 | 13 | 2 |
| 65–69 | 10 | 16 | |
| 70–74 | 21 | 14 | 3 |
| 75–79 | 7 | 21 | 1 |
| 80–84 | 3 | 1 | 1 |
| Sum | 72 | 84 | 7 |

## Table 15 Risk Response

Escape route (for risk control)

| Age | I thought it | A little | Not at all |
|---|---|---|---|
| 30–34 | 1 | | |
| 35–39 | 1 | | |
| 40–44 | 5 | | |
| 45–49 | 2 | | 1 |
| 50–54 | 9 | 2 | 1 |
| 55–59 | 8 | | 4 |
| 60–64 | 11 | | 4 |
| 65–69 | 12 | 3 | 5 |
| 70–74 | 17 | 3 | 7 |
| 75–79 | 10 | 4 | 8 |
| 80–84 | 1 | | 1 |
| Sum | 77 | 11 | 32 |

# Accident type of female accident victim , weather, ascent / descent

## Table 16 Accident Mode

1=sliding down,2=tumble,3=fall, 4=lost, 5=exhaustion, 6=disease, 7=falling rock , 8=lightning

| | Cause of accident | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Age | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 30–34 | 1 | | | | | | | |
| 35–39 | | | 1 | | | | | |
| 40–44 | 1 | 3 | | | | | | |
| 45–49 | 1 | 2 | | | | | | |
| 50–54 | 3 | 7 | 1 | | 1 | | | |
| 55–59 | 5 | 8 | | | | | 1 | |
| 60–64 | 4 | 14 | 1 | | 1 | 1 | | |
| 65–69 | 7 | 23 | | | 2 | | 1 | 1 |
| 70–74 | 2 | 30 | | 2 | 3 | | | |
| 75–79 | 2 | 25 | | | 1 | | | |
| 80–84 | | 5 | | | | | | |
| Sum | 26 | 117 | 3 | 2 | 8 | 1 | 2 | 1 |

## Table 17 Weather at the time of the accident

| | Normal w. | | | Bad weather | | | |
|---|---|---|---|---|---|---|---|
| 年齢幅 | Clear | Sunny | Cloudy | Rain | Hard Rain | Blizzard | Sleet |
| 30–34 | | 1 | | | | | |
| 35–39 | | 1 | | | | | |
| 40–44 | 2 | 1 | 1 | 1 | | | |
| 45–49 | | 3 | | | | | |
| 50–54 | 4 | 5 | 3 | | 1 | | |
| 55–59 | 3 | 6 | 4 | 2 | | | |
| 60–64 | 5 | 8 | 3 | 3 | | 1 | |
| 65–69 | 5 | 15 | 4 | 4 | | | 1 |
| 70–74 | 5 | 19 | 7 | 5 | | | |
| 75–79 | 4 | 21 | 3 | 1 | | | |
| 80–84 | 2 | 3 | | 1 | | | |
| Sum | 30 | 83 | 25 | 17 | 1 | 1 | 1 |
| Ratio(%) | 87.3 | | | 12.7 | | | |

## Table 18 Hiking & Climbing and descending at the time of the accident

| Age | ascent | descent |
|---|---|---|
| 30–34 | 1 | |
| 35–39 | | |
| 40–44 | 2 | 2 |
| 45–49 | | 2 |
| 50–54 | 5 | 6 |
| 55–59 | 3 | 9 |
| 60–64 | 8 | 12 |
| 65–69 | 6 | 21 |
| 70–74 | 4 | 25 |
| 75–79 | 3 | 19 |
| 80–84 | | 6 |
| Sum | 32 | 103 |

## Table 19 Trauma

| Injury | 30–39 | 40–49 | 50–59 | 60–69 | 70–79 | 80–90 |
|---|---|---|---|---|---|---|
| fracture | | 1 | 13 | 21 | 35 | 4 |
| Fracture neurological-disorder | | | 1 | | | 1 |
| contusion | | 2 | 5 | 3 | 7 | |
| Contusion fracture | | 1 | 1 | 6 | 5 | |
| Contusing neurological-disorder | | | | | 1 | |
| Contrusin dislocation | | | | 1 | | |
| Contusion laceration | | | 2 | 3 | 1 | |
| Contusion fracture laceration | | 1 | | | 4 | |
| Contusion laceration mass-bleeding | | | | | | 1 |
| Contusion fracture laceration mass-bleeding | | | 1 | | | |
| Contusion fracture laceration dislocation | | | 1 | 1 | | |
| dislocation | | | 2 | | | |
| dislocation / fracture | | | | 4 | 3 | |
| sprain | | | | 2 | 2 | |
| laceration | | | 3 | 6 | 10 | |
| Laceration / fracture | 1 | 1 | | | | |

## Table 20 Characteristic human error

| | Women's human error | | | | | |
|---|---|---|---|---|---|---|
| Age | I did not notice. | it was okay | Panic | I was tired | I could not see. | Lost my balance |
| 40–44 | | 1 | | | 1 | 1 |
| 45–49 | | | | | | 1 |
| 50–54 | | 1 | 3 | 2 | | 4 |
| 55–59 | 1 | 1 | 1 | 1 | 1 | 1 |
| 60–64 | 1 | 2 | 1 | 1 | 1 | 10 |
| 65–69 | 3 | 5 | 1 | 2 | | 7 |
| 70–74 | 3 | 8 | 2 | | 1 | 11 |
| 75–79 | 7 | 3 | | 1 | 2 | 4 |
| 80–84 | 1 | | | | | 3 |

# 5. Problems facing women in mountains as seen by Sugisaka, a guide for female hikers and climbers

- Generally speaking, women have less muscle mass and are thought to be weaker than men, and this tendency accelerates with age, and as hikers age, there are more accidents than in the past. I often feel that there is a lack of hikining technique, and that instantaneous footwork and reactions are slow. I sometimes think that 70 years old is the turning point. When passing by others, they do not know the reasonable distance between them, and do not know how good they need to be to not get in the way. I often see people who cannot move unless they are specifically told to do so.
- I sometimes think that women tend to see mountain hiking as an extension of traveling. I wonder if that is what is leading to them taking mountain hiking too lightly.
- People have a less optimistic image of mountain hiking than they used to. They misjudge their own abilities. People who say they can take 1.2 times the course time actually take 1.5 to 1.8 times as long.
  If we think about it simply, women's bones become weaker as they age, and so a fall means an immediate fracture. In that respect, men are more likely to end up with a sprain than a straight fracture, and the injury is more likely to become serious.

# Chapter 7:

## The structure of mountain accidents as seen from data analysis of 4,951 people from 2003 to 2023.

As of June 2024

# 7.1 Overview of basic data

June 2024 , the total number of registered data has increased by 282 to 4,951. Of these, 2,300 are male and 2,623 are female ( 28 unknown ) (Table 21 ). As introduced in Chapter 6 , the number of female accident victims has increased significantly and now exceeds the number of males. The gap is expected to widen further in the future.

Using the UIAA injury and illness classification IIC , 150 deaths and 558 serious injuries were registered in particularly serious cases (Table 22 ). Figures 16 and 17 show the accident locations in central Japan . Together with relevant parties, we would like to consider an analysis that takes advantage of the characteristics of this database from cluster mountain areas.

We are also considering using it for the international mountain accident comparison currently planned by the UIAA ARWG .

# Number of registered data (by generation, gender, IIC )

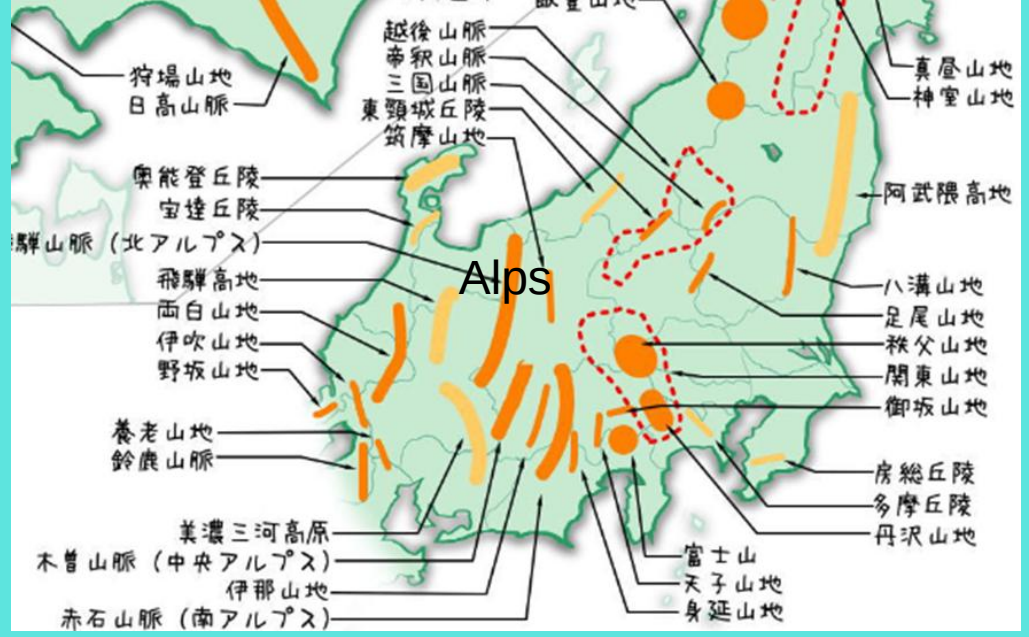
Table 21 Number of people in each generation by gender

| | Femail | Mail | Sum |
|---|---|---|---|
| 0–9 | | 1 | 1 |
| 10–19 | 1 | 7 | 8 |
| 20–29 | 23 | 41 | 64 |
| 30–39 | 108 | 147 | 255 |
| 40–49 | 223 | 265 | 488 |
| 50–59 | 648 | 472 | 1120 |
| 60–69 | 1114 | 826 | 1940 |
| 70–79 | 490 | 487 | 977 |
| 80–89 | 16 | 54 | 70 |
| Not clear | 28 | | 28 |
| Sum | 2623 | 2300 | 4951 |

Data is age at time of accident

Table 22 Relationship between IIC and number of generations

| | IIC (Injured and Illness Classification) by UIAA MedCom | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 年齢層 | (0) No symp. | (1) Mild symp. | (2) Moderate symp. | (3) Sever symp. | (4) Critical symp. | (5) Death | (6) Instant death | Sum |
| 0-9 | | 1 | | | | | | 1 |
| 10-19 | | 1 | 4 | 1 | 2 | | | 8 |
| 20-29 | | 6 | 13 | 26 | 13 | 2 | 4 | 64 |
| 30-39 | | 42 | 54 | 115 | 30 | 7 | 7 | 255 |
| 40-49 | 4 | 82 | 110 | 213 | 57 | 9 | 13 | 488 |
| 50-59 | 5 | 155 | 232 | 567 | 117 | 22 | 21 | 1120 |
| 60-69 | 4 | 348 | 421 | 895 | 227 | 24 | 18 | 1940 |
| 70-79 | 1 | 196 | 233 | 425 | 104 | 11 | 9 | 979 |
| 80-89 | | 10 | 21 | 28 | 8 | 2 | 1 | 70 |
| 計 | 14 | 841 | 1088 | 2270 | 558 | 77 | 73 | 4925 |
| Data is age at time of accident | | | | | Not clear 26 | | Sum | 4951 |




Hokuriku

Kanto

Chugoku

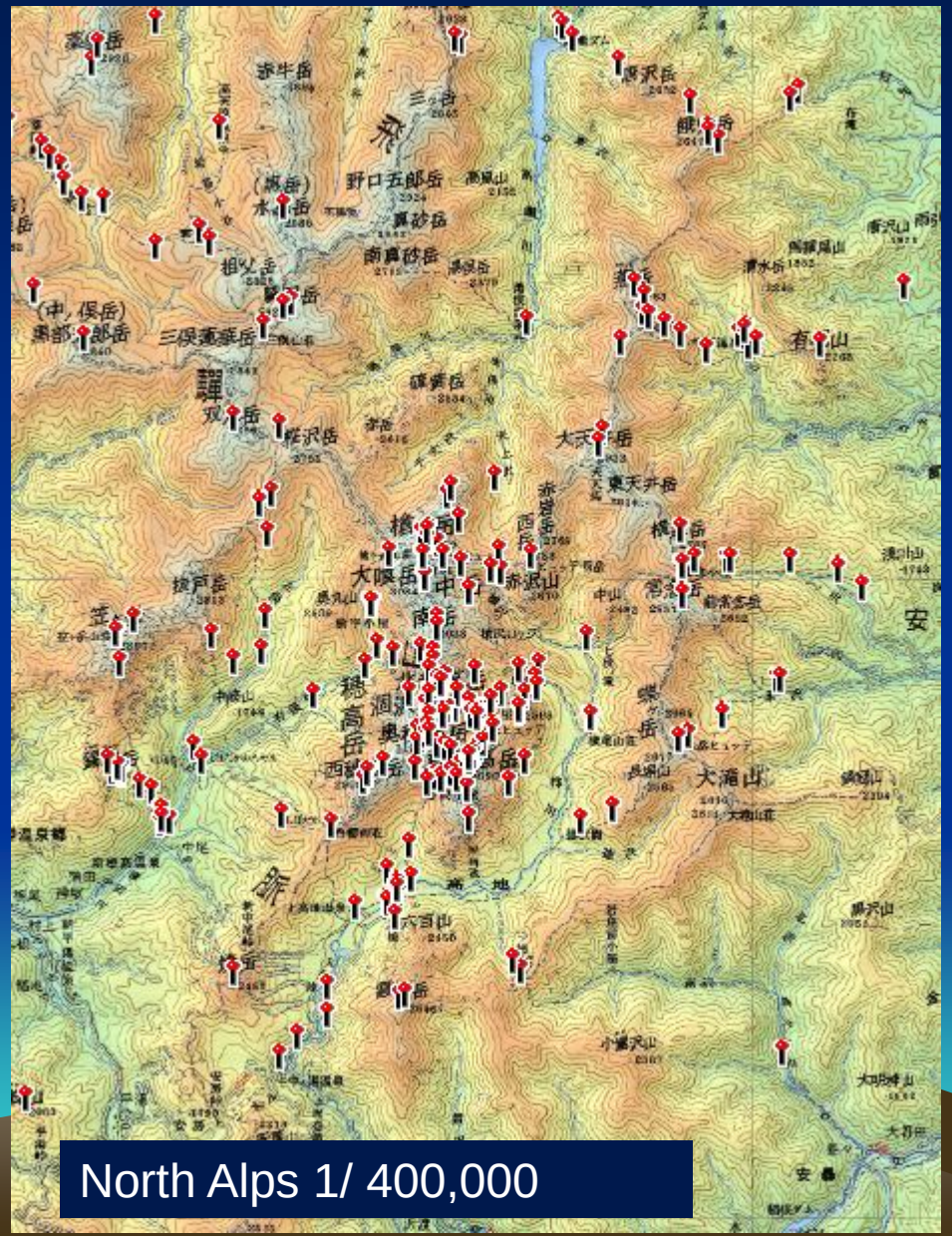
Chubu

Kinki

Shikoku

Accident occurrence status in Kanto, Chubu, Hokuriku, Kinki, Chugoku, and Shikoku, 2003-2023

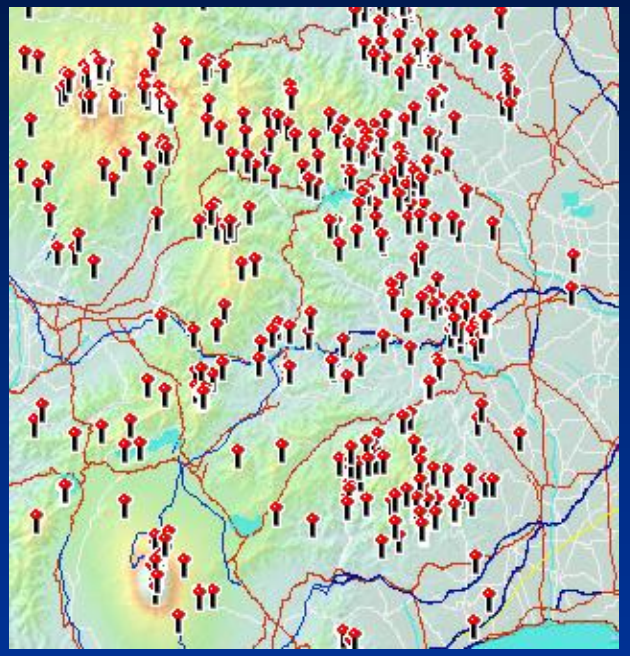
# Figure 17. Some of the representative cluster mountain areas in our database



North Alps 1/ 400,000

Yatsugatake 1 / 200,000

Mt. Rokko 1/200,000



Chichibu, Tanzawa, Mt. Fuji
1 / 800,000

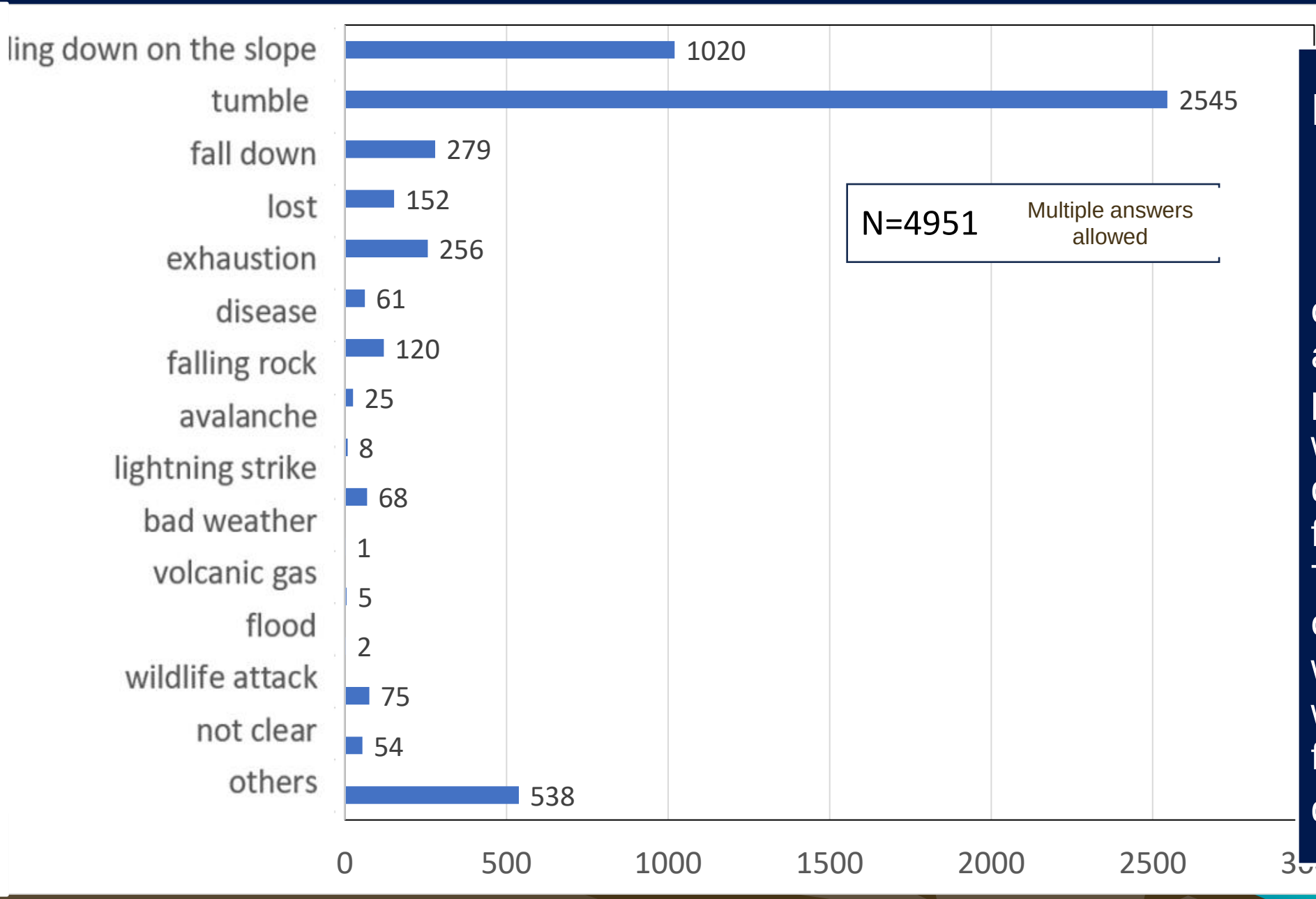
Tanigawadake 1 / 200,000

| | | | |
|---|---|---|---|
| Mountaineering | Mountain ski | 370 | 370 |
| | Alpine climbing | 571 | 1871 |
| | Canyoning | 708 | |
| | Ice Climbing | 182 | |
| | Free climbing | 410 | |
| | Walking | 2917 | 4708 |
| | Hiking | 1791 | |
| Non-Mountaineering | Sightseeing | 449 | 1698 |
| | Sightseeing landscape | 79 | |
| | Sightseeing flowers | 130 | |
| | Sightseeing autumn leaves | 101 | |
| | Wild vegetable picking | 165 | |
| | Plant picking | 15 | |
| | Mushroom picking | 10 | |
| | Fishing | 70 | |
| | Phot | 290 | |
| | Mountain worship | 17 | |
| | Hunting | 4 | |
| | Camping | 66 | |
| | Working | 14 | |
| | Job,cleaning forest | 2 | |
| | Job, Mowig | 4 | |
| | Job, research | 4 | |
| | Other | 278 | |
| | | | 8647 |

# Table 23 Activity

For the mountain activity, multiple answers were given. For non-mountainneering related questions, the majority of answers were combined with mountain climbing and hiking activity related questions.

The serious injury rates for climbing and hiking are 13.4 % and 11% , respectively, and the fatality rates are 4.8% and 2% . There is not as much difference between the two as you might expect from the image of hiking & climbing.




# FIG.24

Cause of Accident

Because this is organizational accident data, 152 people got lost, which was serious damage, but only a few cases occurred. The majority of cases, 3,565 people, were slips or falls, which is a distinctive feature of the database.

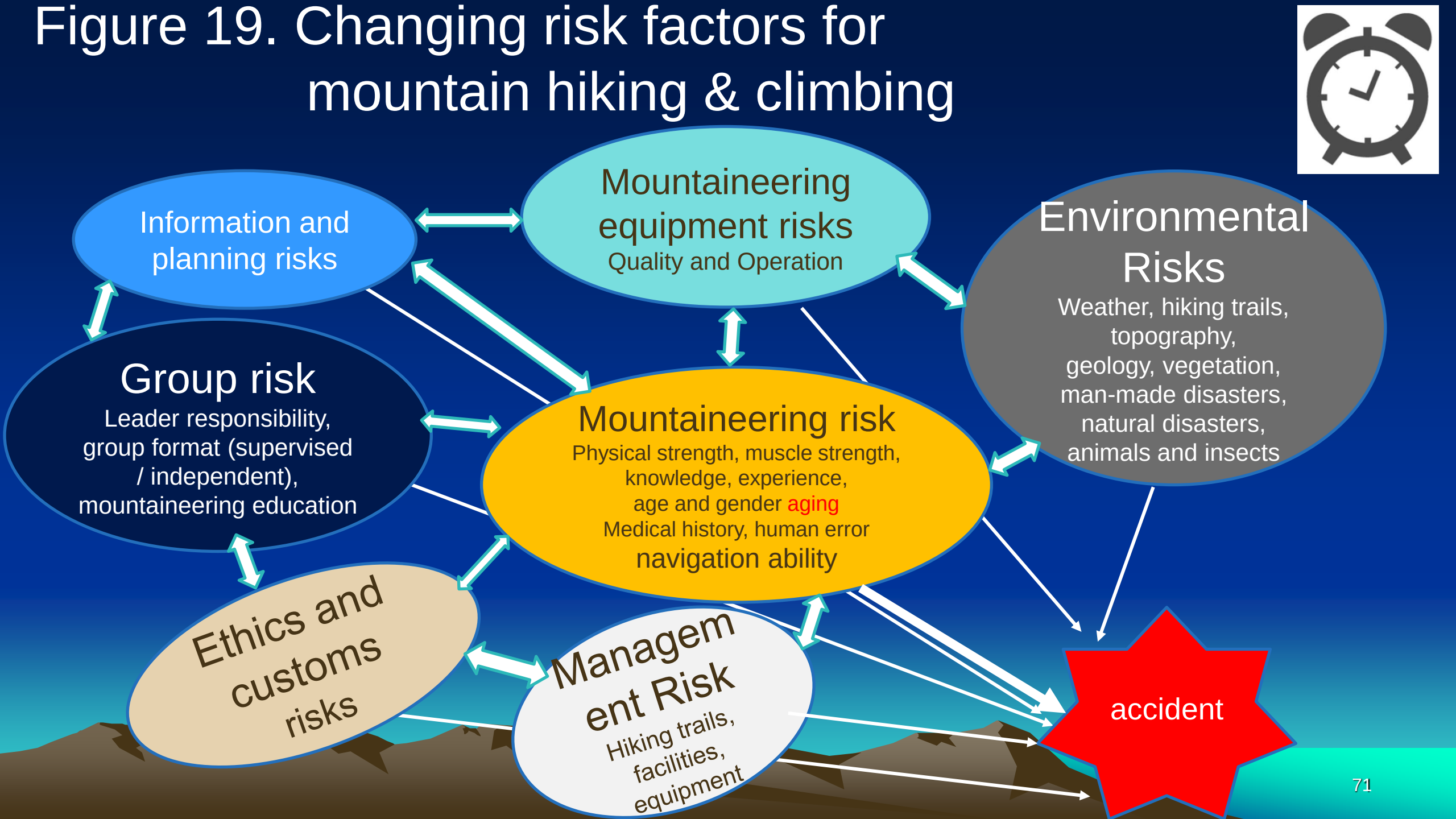
# 7.2 Extraction and analysis of related factors leading up to mountain accidents

# 7.2.1 Method for extracting accident causes

Mountain accidents are thought to occur as a result of a chain reaction of multiple factors, but even if the conditions for an accident, such as exhaustion, bad weather, and dangerous rocky terrain, are met, it does not necessarily mean that an accident will occur. This is because the majority of people act cautiously in dangerous environments. The difficulty of setting these conditions is a major obstacle to considering the mechanisms of mountain accidents, making it difficult to take measures.

The reason for this is that there are "changing mountaineering risk factors" as shown in Figure 19 , making it difficult to extract all of the multiple factors related to accidents. In particular, this is because at this stage it is nearly impossible to specifically extract and quantify human factors related to human error.

# Figure 19. Changing risk factors for mountain hiking & climbing



Let us now consider human factors, based on the cases introduced in Chapter 6. The simplest accident case is one in which, "on a sunny day, while walking along a mountain path , two people were engrossed in chatting when they slipped on dead leaves and fell." Human factors such as the decline in the instantaneous judgment ability, balance, and muscle strength due to age, and mistakes due to age-related human error are involved. It is believed that this human factor, combined with the environmental factors of a slope of dead leaves that does not appear dangerous and stable weather, led to the person coming to a slippery slope of dead leaves, being unable to stop slipping, and falling.

The question to pay attention to here is, "Why couldn't they stop chatting?" Since it is not possible to continue chatting in a dangerous place, it is believed that a kind of normalcy bias was at work, with "overconfidence in one's own crisis response capabilities and the belief that it is okay to chat on the slope in front of one's eyes." In a situation of bad weather and an unstable mountain trail,

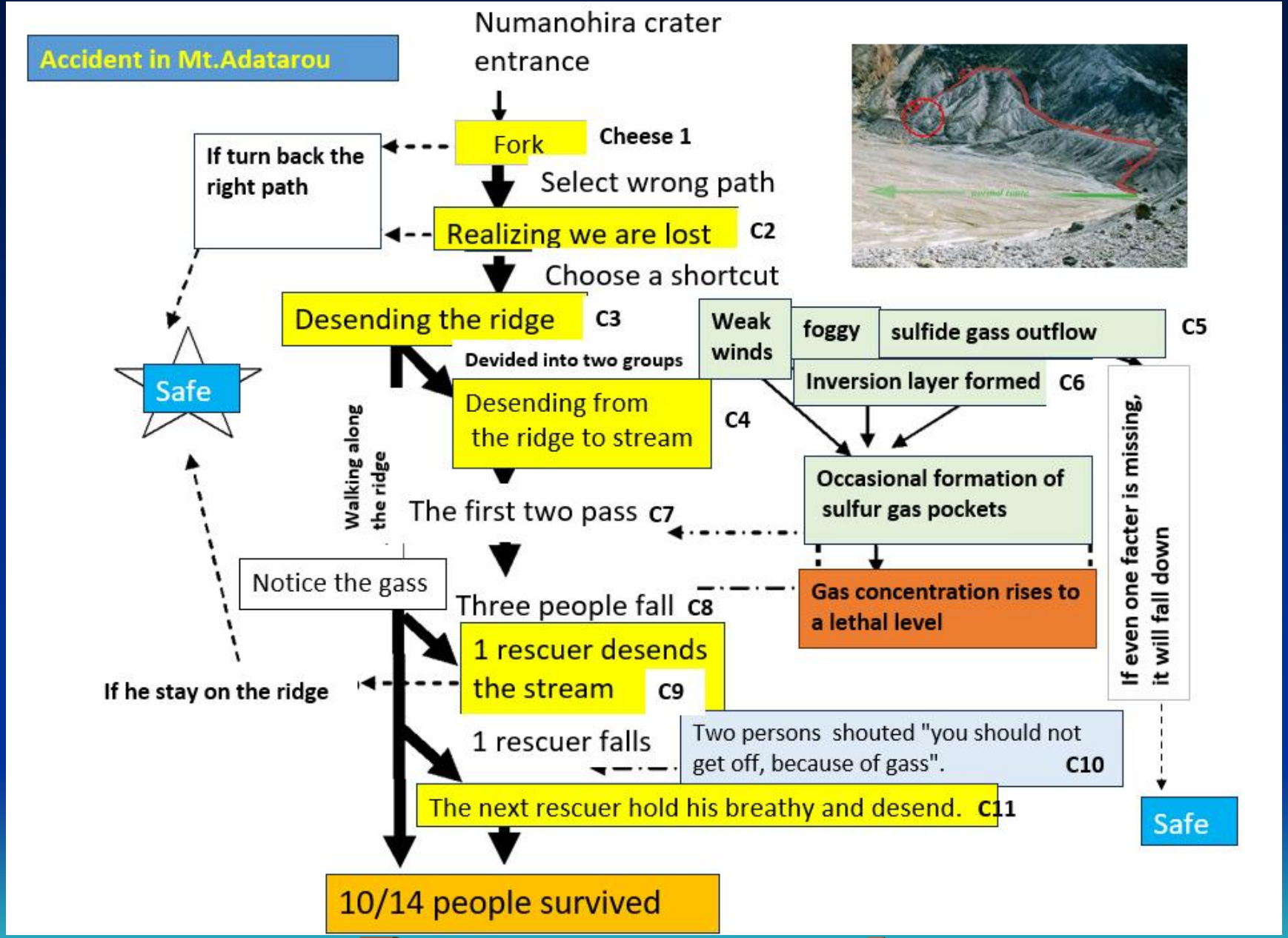
Some people think it is dangerous and cancel their plans. Others think it is okay and continue the mountain hike & climb. It seems that the range of "acceptable risk*" that each person is willing to accept for the expected risk is different.

The Swiss cheese model is a way to easily express the chain of accidents caused by multiple factors. The idea is that accidents do not occur alone, but occur as a result of a chain of multiple events. Sliced cheese is expressed as a protective wall, and each wall is thought to have irregular "holes". The idea is that an accident occurs when all of these holes are penetrated (Figure 20 attached).

However, since this is a model that is applied after an accident, in one model, when you hit a wall, it ends as a near miss. It is not possible to express the content as a revision midway.

Therefore, I have expressed the process of the accident in a flow chart while keeping in mind which factors can become protective walls and considered the elements that can become protective walls and the acceptable risks. (Modified Swiss Cheese Model)

Figure 20 is an example of application to the process of the Mt. Adatara accident.






September 15 , 1997, four out of 14 members of a mountaineering club died from hydrogen sulfide poisoning due to inhalation of volcanic gases while hiking Mt. Adatara . The diagram is a flow chart, and C1 to C11 in the diagram correspond to the protective walls.

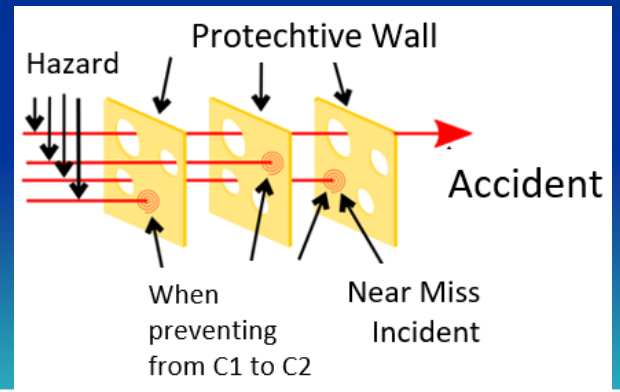



Figure 20: Accident flow diagram assuming the modified Swiss Cheese Model

C5,C6

C3

C2

C4

C10

C9

C8

C7

Choose the wrong trail

Adatara Mountain Crater Route

normal route

Cheese1

Fig 20+

The crater of Mt.Adatara

# A simple chattering fall sequence is assumed using a modified Swiss cheese model.

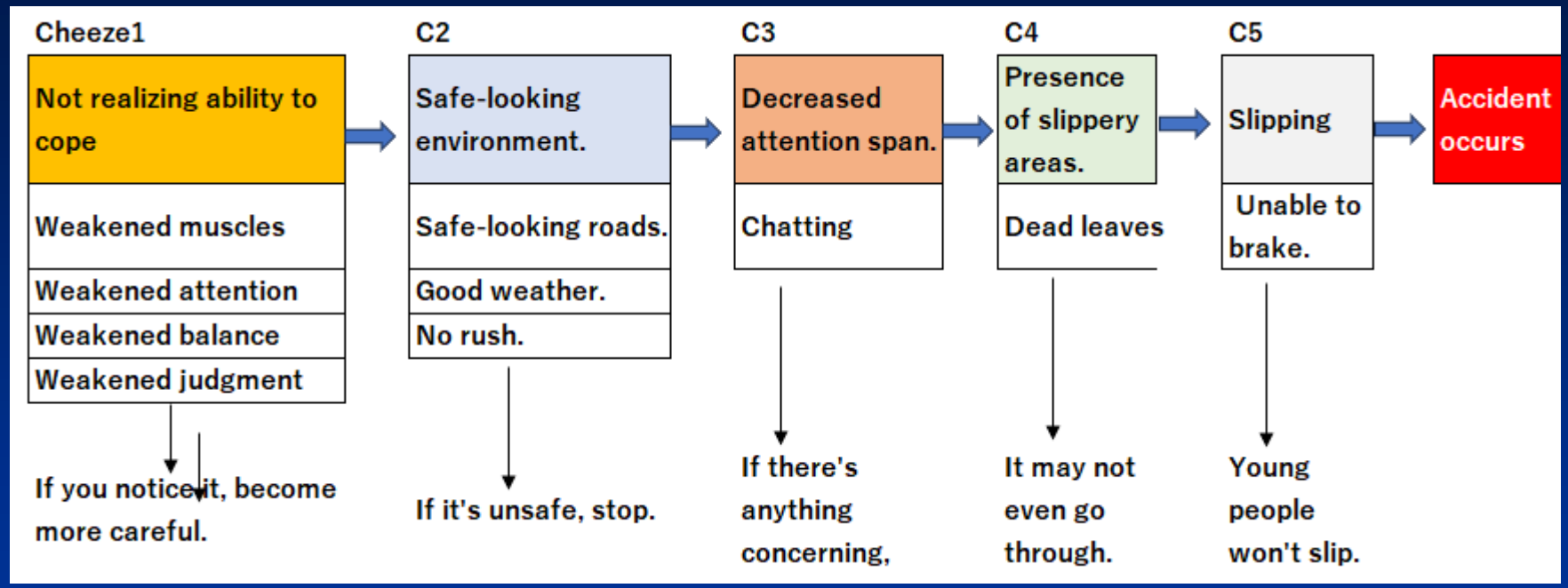



Figure 21: Flow of accidents involving chatter and falls

So, what mechanism caused the 4,951 mountaineering accidents? It is expected that there are 4,951 Swiss cheese models, but we decided to first comprehensively extract factors that could become the sliced cheese wall from each accident.

*Acceptable risk: Since it is impossible to respond to all risks , there is no choice but to accept small risks, that is, risks with small damage and low occurrence frequency. This is called acceptable risk .

In the accident investigation questionnaire, questions are arranged in chronological order. Therefore, I focused on three questions:
"Question A: Problems that occurred before the accident occurred,"
"Question B: Conditions immediately before the accident,"
"Question C: Actions and environment at the time of the fall or slip."

Questions A and C had 1,401 "Other" items in which participants could write freely , which delayed the analysis. Multiple keyword items were extracted from the written text of each answer and analyzed with the selected items' results.

### 7.2.2 Characteristics of problems that occurred before the accident

When sorting out the problems that occurred before the accident, as shown in Figure 22 , they were categorized into "human factors" and "environmental factors and actions," and 23 items were extracted.

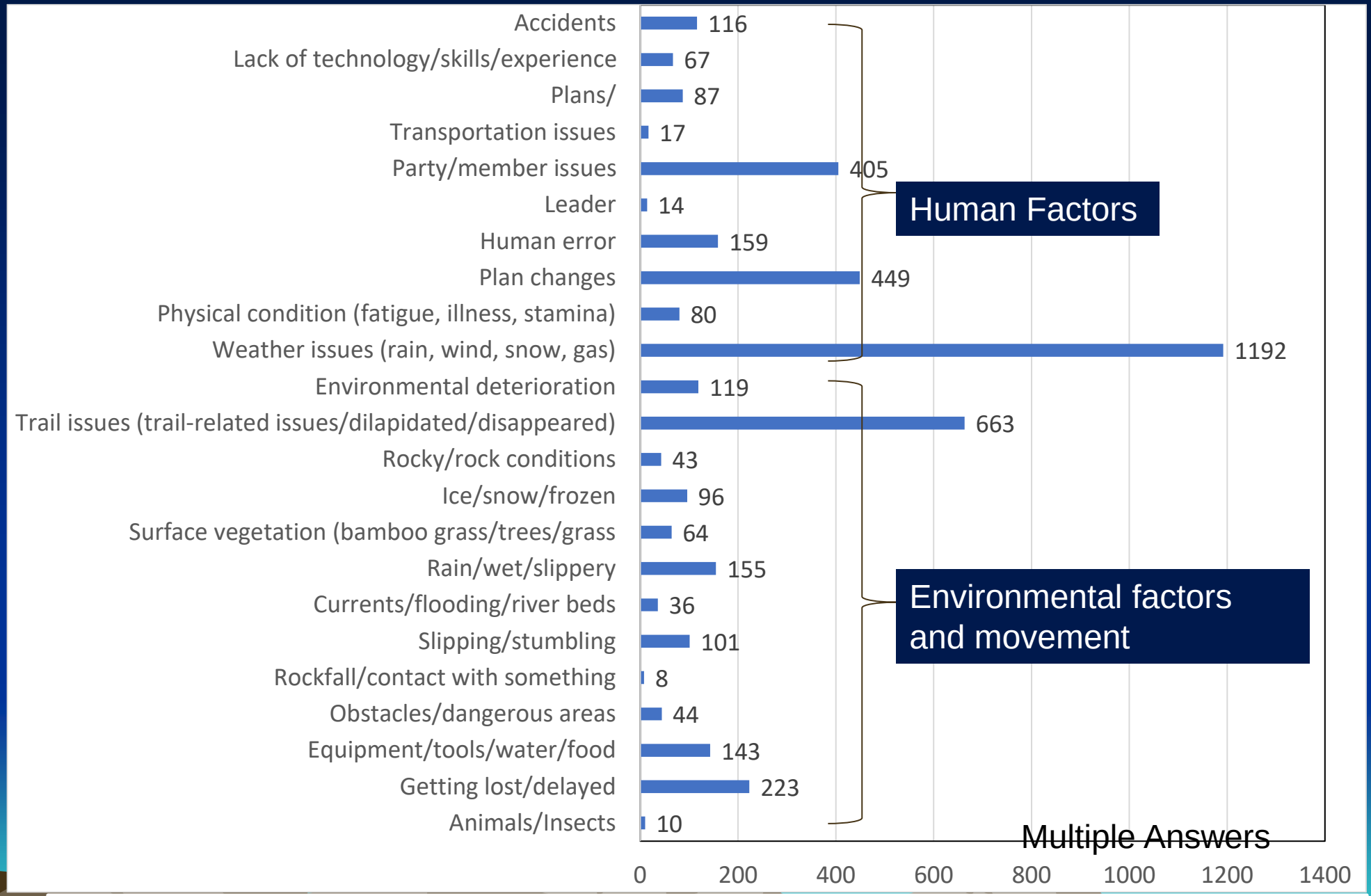



Figure 22 Problems that aroused before the accident

The figure shows that "weather problems" stand out. There were few cases where bad weather continued from before the accident to the time of the accident, and the weather had mostly improved at the time of the accident. The impact of the 1,192 weather problems (snow, rain, wind, gas) was significant, affecting other human and environmental factors. Examples reported included changes/cancellations of plans, slippery conditions due to wetness, responses to rising rivers, and responses to icy roads. Table 24 shows the descriptive responses of typical items. They were classified as whether or not they were accepted. Although the changes/cancellations of plans functioned as a protective barrier at the time, in new cheeses, there are many cases where the changes induce accidents.

Next, let's look at the "accident" item. Since this is a preceding item that occurred before the accident, regardless of the severity of the accident, the person accepted it and continued hiking. For example, the cases of falls and falling rocks in the table seem to have been minor, but up to what level of injury would the person be willing to continue hiking?

# Table 24 : Examples of major problems that occurred before the accident (Decision-making in response to ambiguous risks)

## Examples of weather impacts

A short course was taken as worsening weather was expected. ----(B)
On the first day, the course was shortened due to rain. -----(B)
Strong winds caused us to turn back from the planned route. ----(A)
The blizzard made walking difficult, so we gave up on the go to the hut. ----(B)
It was slippery after the rain. ---(A)
It had rained the day before, so the boardwalk and ladders were wet and slippery. ---(A)
There was a little snow on the ground, so the conditions were slippery. ----(A)
We had to ford a swollen stream and got injured. ---(B)
The fallen leaves hid the ice burn.----(A)

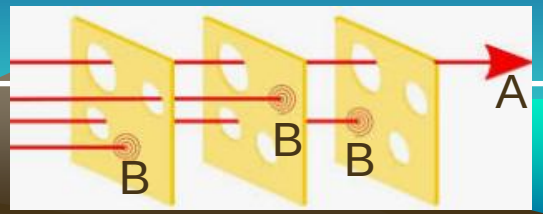
## accident

An accidental misstep. --- (A)
Losing balance and falling. --- (A)
Slipping on a tree root. ----(A)
A rock fell due to a careless hiker. --- (B)
Stepping on the roots of melting bamboo grass and slipping and falling. --(B)

## Mountain trail problem

The road was frozen after snowfall. -- (A)
The path to the top of the rock face was unclear, and we got lost at the fork in the road. ---(B)
The mountain trail was slippery and full of puddles due to the previous day's rain. ---- (A)
We were going slower than planned due to the remaining snow. ---(A)/(B)
We got lost and had to bivouac. We were late in descending the mountain.---(B)
There was a hikeing event party of over 300 people, so it was a bit crowded. ----- (A)

B : Block the passage of cheese protection wall
(Stop or change the activity)
A: Accept （Continuing the activity）



It's difficult to judge.

The "Mountain trail" category has many applicable responses, but many of them are vague. We divided them into "Trail condition" and "Events occurring on the trail." The former includes responses such as "The trail was unclear" and "The trail was frozen," which includes issues such as frozen trails, deterioration, snow cover, vegetation, and signposts. The latter includes issues such as "accidents, changes of plans, getting lost, congestion, and friends." A notable feature is that, like "weather," the "Mountain trail" category is strongly linked to other categories.

There are very few individual items among the 23 above, and they are all interrelated. Because the hikers had been continuing hiking until this accident occurred, it is believed that the level of injury was low, but there is a considerable proportion of small-scale prior accidents. However, how do prior accidents affect subsequent accidents? Although we can understand the physical effects, such as fatigue, we are unable to grasp the mental effects. We believe this is an important issue for the future.

# 7.2.3 Conditions just before the accident

Figure 22 , many people had experienced problematic events before the accident occurred. However, when investigating “condition just before the accident,” as is clear from Figure 23 , 3,684 people ( 90 %) answered “ same as usual .” This is a surprising result, even though many people answer this question with an interpretation that leans more toward physical condition than mental condition. Furthermore , 230 people ( 5.6% ) said “pain in the knees, back, or shoulders” had affected them during their mountain trip before the accident. The condition thought to be most likely to cause an accident was "too tired to move, panting, or unable to think" which was chosen by 135 people (only 4.0%).

If it's "the same as usual," you won't be on guard against an accident. If something bothers you, you'll be on guard. This state may be the final hole (cause) that lets the cheese's protective wall slip through just before an accident occurs.

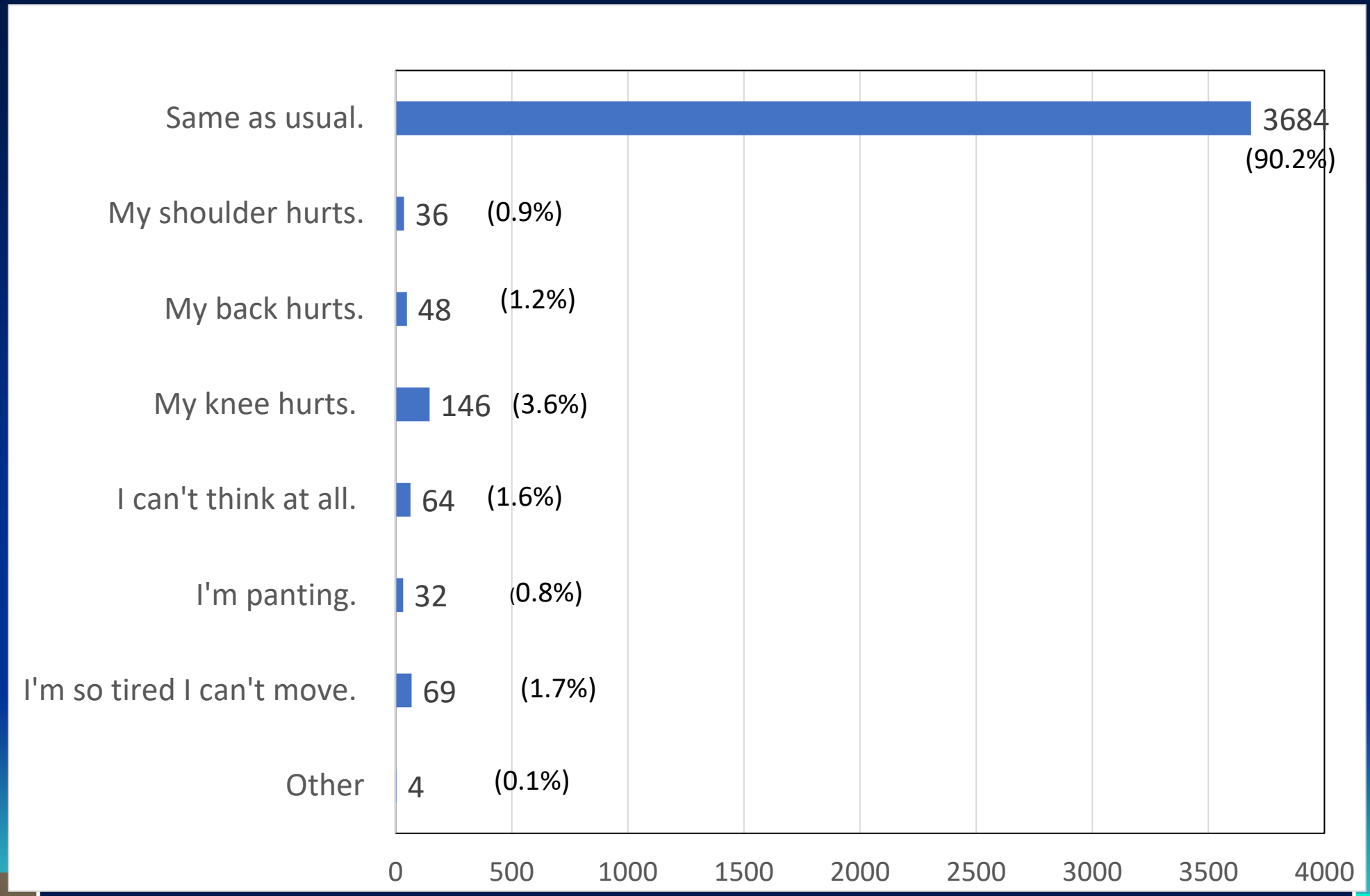



Figure 23 Conditions just before the accident

# 7.2.4 Actions and environment when falling or slipping

The question "What actions and circumstances caused the fall/slip accident?" mean an investigation of the first stage of the accident occurrence process, the "causative process."

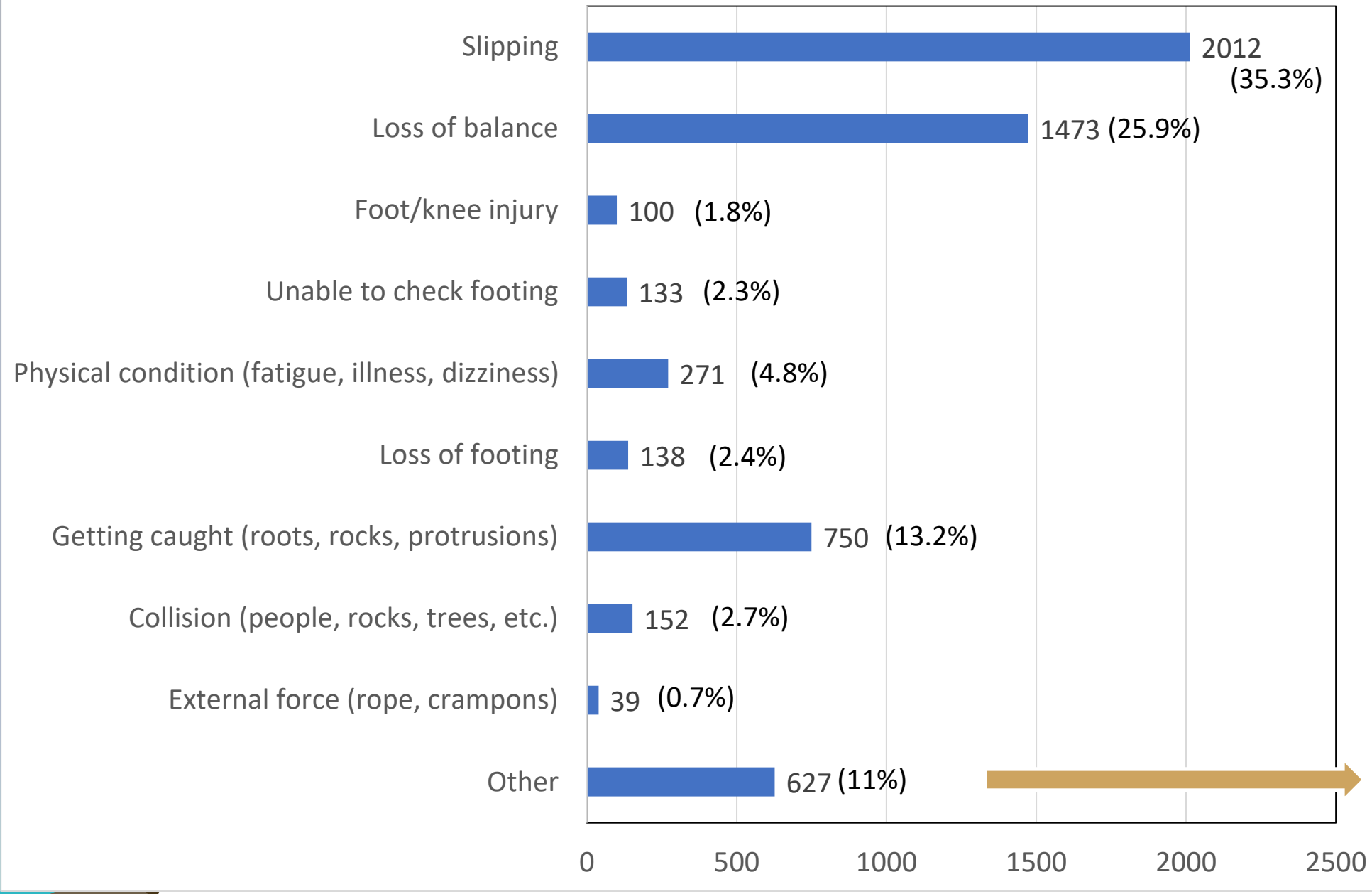
In this process, a passive action responds to the initial unstable movement. However, braking fails, and the body loses balance. The final process transitions to the action process of moving down the slope, which involves falling/slipping.

The causative process has many small steps . There is a hazard point ( a slippery place, a place where you can trip, or the presence of an external force such as a colliding object heading toward that point), and hikers & climbers with various risk response capabilities move toward that point and lose their balance. This then leads to the passive process. This period will be very short. The answer "same as usual" mentioned in 2.3 is considered to be the final wall hole just before the passive action fails and the causative process begins.

As shown in Figure 24 , the results of the question on the causal process, "actions and environment at the time of falling ," included "slipping" at 35 % and "losing balance" at 25.9 %. Together, these account for 61 %.

Hazards that cause "slipping" include wet dead leaves, rocks, stones, mud, ice, snow, etc. Causes of "losing balance" range widely from "slipping" to failure to use climbing holds. Hazards that cause "getting caught," which account for 13 %, stand out as tree roots, rock corners, and crampons. Crampons are often used on rock corners, snow surfaces, and one of the climbers' own feet.

Finally, the 627 cases in the "other matters" category in the figure were classified and listed in Table 25. Most of the accidents were skiing and climbing, and there were many equipment-related accidents. These included accidents involving crampons, skis and poles, ropes, pitons, and failure to belay. There is a lot of information, so I would like to introduce it on another occasion.




| Items in "others" | |
|---|---|
| Climbing techniques | 35 |
| Problems with others | 20 |
| Weather | 22 |
| Protrusions | 4 |
| Equipment | 103 |
| Artificial objects/facilities | 15 |
| Ice and snow | 29 |
| Getting wet | 11 |
| Vegetation (bamboo/trees/roots/moss | 49 |
| Rocks/when climbing | 35 |
| Stones (including falling rocks) | 39 |
| Problems with footing/holds | 18 |
| Streams, currents | 10 |
| Surface shape | 10 |
| Tipping/falling | 36 |
| Collision/getting caught | 21 |
| Movement/movement/slipping/coming off/breaking/grabbing | 58 |
| HE | 26 |
| Problems with the body | 53 |
| Other | 33 |

Figure 24: Actions and environment when falling or slipping (Table 25 : Classification of other matters)

# 8. Conclusion

The 21st Mountain Accident Report began with an introduction to the Accident Reporting Working Group , which began with UIAA to investigate and collect data on mountain accidents around the world and make international comparisons, and an introduction to the Mountain Trail Symposium hosted by IMSARJ .

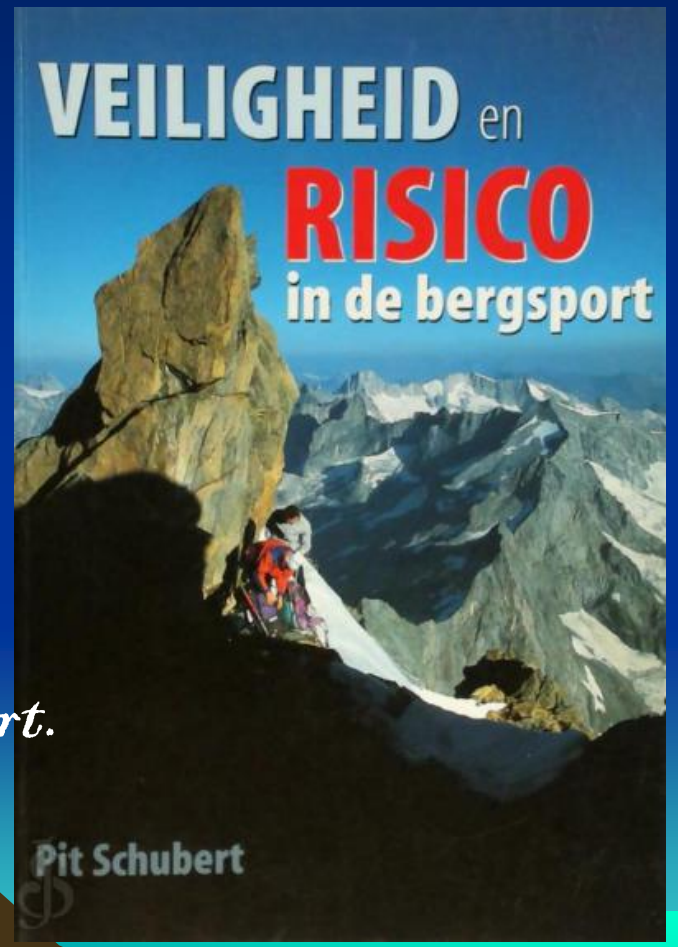
In Japan, the number of foreign hikers & climbers has also increased sharply due to inbound tourism, with as many as 145 accidents occurring annually. Hikers & climbers from countries with different climates have different hiking & climbing habits, so the types of accidents also change.

I believe that we are now in an era where we should consider mountain accidents from an international perspective.

Meanwhile, in Japan, the mountaineering baby boom generation (born between 1940 and 1955 ) was now that most people are elderly, we have entered the era of (super) elderly mountaineers.

The number of mountain accidents is now entering a period of transition due to this trend. The sharp increase in the number of women involved in mountain accidents is also seen as part of this trend.

If the 26th Mountain Accident Report is compiled five years from now in 2029, it will likely report accident types that are completely different from today in Japan.




*Dear friend, Pit*
*Thank you for your kind support.*
*From Chiaki*