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New Zealand Search and Rescue Environmental Scan

Introduction

This version of the New Zealand Search and Rescue (NZSAR) Environmental Scan (referred to as the *scan*) was finalised in July 2022 and updated in August 2023. It refreshes the information in the previous versions of the scan about the trends and developments that affect search and rescue services in Aotearoa New Zealand and highlights their implications for the search and rescue sector.

The information about the impacts and implications of the COVID-19 pandemic has also been updated. Information about search and rescue in the Antarctic and Pacific regions has been included in the scan for the first time.

The influences of social, technological, economic, environmental, and political trends and developments are considered holistically in terms of demand for, and supply of, search and rescue services within the New Zealand Search and Rescue Region.

Looking at the broader context

Before looking at Aotearoa New Zealand's search and rescue environment, it is helpful to consider the broader societal context of the nature of the changes we are currently experiencing. Our society is always facing and responding to change. Populations, technologies, the economy, and politics are always in states of flux with variation only in the pace and nature of change.

We typically refer to the present as a state of unprecedented change, however this reflects a poor historical awareness. The late 19th and early 20th centuries experienced similar, if not more, change in some respects.¹

What we are experiencing now is more like a range of transitions which reflect a shift from decades of relative stability in the second half of the last century towards more rapid change and greater instability. Alongside this shift, the effects of climate change will trigger or amplify a suite of risks, opportunities, and impacts.

These transitions began decades ago and are interrelated to varying degrees. One commentator considers that the term *transitions*, in relation to climate change and other environmental issues, sends the wrong message. And, incremental change and traditional political and business approaches to managing these issues will not be effective. It is better, in their view, to look at these issues as *discontinuities*, where the nature, scope, scale, and pace of change require new and different approaches.²

The general public is becoming less confident that its leaders are able to enable these approaches. Many senior leaders in the public and private sectors may not have the skills and abilities to address these types of transitions (or discontinuities), and some of them admit it.³

1. ScienceDirect
2. Alex Steffen
3. Thinking the Unthinkable

Key transitions currently underway include:

- a reshaping of societal and community values, identities, and aspirations due to social, economic, environmental, and technological factors. This includes the development of political and social biculturalism in Aotearoa New Zealand.
- The desire to move away from extractive and destructive production and consumption towards more sustainable and resilient lifestyles.
- The prevailing economic paradigm and the roles of social safety nets are being reconsidered; and
- Disrupted climate, weather and biodiversity patterns that will affect social, economic, and political structures and systems.

The pandemic has exacerbated the challenges associated with some of these transitions. It has also reinforced the desirability of, or need for, other societal changes.

A diverse range of social, economic, and political ideas, possibilities and contentions are emerging, or reemerging. These highlight that many existing institutions, structures, and processes will not be suitable to address this century's challenges and opportunities. However, there is also considerable inertia around reshaping these societal structures.⁴

The key drivers, trends, and societal implications for Aotearoa New Zealand are summarised below.



4. Oxford Martin School

Key implications for the search and rescue sector

A detailed analysis of how these drivers, trends, and societal implications affect the search and rescue sector is provided throughout this scan. The scan first considers the factors influencing demand for search and rescue services and then the factors influencing the supply of these services.

Key implications that can be drawn from the scan are:

1. Improving mobility, and accessibility to the outdoors, are driving increased participation in some outdoor recreational activities.
2. As more people participate in these outdoor recreational activities, their attitudes, inexperience, and behaviours could increase the risk of accidents or misadventures which may lead to search and rescue operations. Time and economic pressures may also contribute to poor preparation and decision-making.
3. More effective and targeted education and awareness campaigns are required to change the behaviours of groups most at risk of requiring search and rescue services.
4. Climate change is viewed as an amplifier or trigger for other risks, reducing predictability and potentially leading to a cascading series of impacts that may increase demand for search and rescue services. The effects of climate change may also create a more complex and challenging search and rescue operational environment.
5. In the Pacific region, this operational environment is likely to be increasingly complex and challenging because of evolving economic and political tensions.
6. Antarctica and the Southern Ocean are also likely to experience greater air and maritime activity due to increased scientific, commercial, and political interests.
7. The development and wider adoption of new communication and other technologies are leading to less searching and more rescues, in some cases. But technology alone doesn't solve most of the demand and supply challenges faced by the search and rescue sector.
8. Improved strategies are required to attract, retain, and train search and rescue personnel so that they are better prepared for the adoption of new technologies and the evolving search and rescue operational environment.
9. Search and rescue organisations and operations are likely to come under increasing financial pressures due to rising costs and more constrained or competitive funding environments.
10. Increasing regulatory and administrative requirements, complexity of operations, and changing public expectations will also influence search and rescue organisations. These organisations will need to continue to adapt their business, governance, and operating models.

Impacts of the COVID-19 pandemic

The COVID-19 pandemic has affected both the demand and supply of search and rescue services. Significant changes in people's activities and behaviours, and the availability of resources, were observed during the pandemic. The search and rescue sector will need to monitor the resulting supply and demand pressures as the longer-term effects of the pandemic unfold.

The pandemic contributed to some people reevaluating their lifestyles. After the lockdowns, some people felt the need to get outside and experience the outdoors. Some analyses indicate that physical activity levels decreased during the pandemic.⁵ This can be attributed to lockdown restrictions affecting team sports, some outdoor activities, gym attendance, and travel. On the other hand, some people increased the level of their outdoor activities (such as walking), although this was often only temporary.⁶ The pace at which levels of physical activities rebound or change post-COVID-19 remains to be seen.

Restricted international travel during the pandemic led to increased interest in domestic tourist activities such as tramping, cycling, and boating. This trend has been attributed to affluent Kiwis being unable to spend money on international travel and therefore making new lifestyle choices. It could lead to more people getting into trouble in the bush or on the water because of a lack of skills and experience.

There is considerable uncertainty about how international (and domestic) tourism will be affected by the pandemic over the medium and long-term.

All of these impacts of the pandemic affect demand for search and rescue services in different ways.

The supply of search and rescue services has also been affected by the impacts of the pandemic. In general, the pandemic placed considerable financial burdens on the public, private and charitable sectors, as well as many households. For some search and rescue organisations, funding was affected. The availability of search and rescue personnel may have been affected by their financial circumstances. These circumstances may have led to some of these people moving out of the cities or changing jobs. These disruptions could affect the supply of capabilities and capacities in some search and rescue organisations over the medium-term.

The pandemic may have impacted the recruitment and training of search and rescue personnel and also delayed the certification of assets – all of which could affect search and rescue capacity in the short-term.

The impacts of the pandemic cannot be considered in isolation. They have the potential to reinforce, or undermine, some of the other factors discussed in the scan.

Finally, the impacts of long COVID on Kiwis' physical and mental health are beginning to be examined and understood. These impacts could affect both the demand and supply of search and rescue services.

5. Sport New Zealand Ihi Aotearoa

6. Lincoln University Te Whare Wānaka o Aoraki

Factors influencing demand for search and rescue services

A variety of factors influence the demand for search and rescue services. These factors generally differ between outdoor recreational activities and commercial activities.

This section of the scan firstly covers outdoor recreational activities and how they affect demand for search and rescue services. Secondly, commercial activities are considered, and then the overarching influences on demand for search and rescue services.

Outdoor recreational activities

In terms of outdoor recreational activities, the five main factors that influence demand for search and rescue services are:

- the number of people participating in outdoor recreational activities.
- The types of outdoor recreational activities people are undertaking.
- People's abilities and levels of experience; and
- People's attitudes and behaviours.

Commercial activities

In terms of commercial activities, the two main factors that influence demand for search and rescue services are:

- commercial maritime vessels and aircraft; and
- Types of commercial, research, and exploration activities.

Overarching influences on demand for search and rescue services

The overarching influences on demand for search and rescue services are:

- the effects of climate change and other environmental changes; and
- Geopolitical influences and tensions.

The number of people participating in outdoor recreational activities

Social, technological, economic, environmental, and political trends and developments shape the number of people engaging in the kinds of outdoor recreational activities which may lead to demand for search and rescue services. Demographics also play a role in affecting demand for search and rescue services, but other social factors can be more influential.

The population is increasing, but it isn't the most influential factor

Aotearoa New Zealand's population is growing, but at a slower rate than in previous decades.⁷ A larger population can lead to more people being involved in outdoor recreational activities, and therefore greater demand for search and rescue services. However, between 2015 and 2021, the number of Land Search and Rescue New Zealand Rapa Taiwhenua operations tended to decline.⁸ Therefore, a range of other factors also needs to be considered when assessing this demand.

Most of our population growth now comes from migration, although our non-European, Māori, and Pasifika populations are also increasing. Migration fell dramatically over 2020 and 2021 because of the pandemic.

7. Stats NZ Tatauranga Aotearoa

8. Land Search and Rescue New Zealand Rapa Taiwhenua Annual Report 2021

As the world begins to remove pandemic-related restrictions, the consequences for immigration to, and emigration from, Aotearoa New Zealand are uncertain. There is expected to be strong international demand for talent and skills which may lead to greater emigration. Immigration may remain low for similar reasons.

In 2021, The New Zealand Productivity Commission Te Kōmihana Whai Hua o Aotearoa recommended a review of migration strategy and policy to ensure Aotearoa New Zealand remains an attractive place for skilled workers.⁹

Changes in age, ethnicity, and mental health are more likely to affect outdoor recreational participation

Age and ethnicity are important demographic factors that affect outdoor recreational participation and therefore demand for search and rescue services. Older people and people from particular ethnic backgrounds are more likely to be associated with certain types of search and rescue operations.

Demographic changes are shifting the age and ethnicity profiles in the regions, and across the country too. The proportion of people aged over 65 is growing. By 2030, it is expected that 19-21% of New Zealanders will be aged 65 and over, compared with 16% in 2020. This proportion is expected to reach 21-26% by 2048.¹⁰ It is useful to note, though, that the aging of our population has been occurring for some time. The number of people aged over 65 doubled between 1991 and 2020: the beginning of the so-called *silver tsunami*.

Of greater potential significance is the increasing number of people expected to live beyond the age of 85 over the next 30 years. This number is expected to rise from 88,000 in 2020 to 270,000-320,000 by 2048. This demographic trend is associated with a rise in dementia and is likely to lead to a rise in the number of elderly people who are at risk of going missing: wanderers. The use of tracking devices often helps to find wanderers quickly, though they are not yet widely used.^{11,12}

Social changes (such as young people facing mental health challenges) are of increasing concern in Aotearoa New Zealand. The proportion of adults experiencing high or very high levels of psychological distress increased from 4.6% in 2011 to 7.5% in 2019, and rose to 9.6% in 2021.¹³ For young people, between 15 and 24, the situation is worse. 19% of these people experienced high or very high levels of psychological distress in 2021, compared with 11% in 2020.¹⁴

Some migrant communities are at greater risk of drowning

Pākehā, or European New Zealanders, typically represent the majority of people who participate in many of the outdoor recreational activities that can lead to search and rescue operations: tramping, fishing, mountaineering, snow and watersports, for example.¹⁵

However, according to Surf Life Saving New Zealand's research, people from migrant communities are at the greatest risk of drowning, then Pasifika people, and then Māori.¹⁶ New migrants, unfamiliar with water activities or local conditions, appear to be at higher risk around rivers, lakes and the ocean. Consequently, the arrival of more migrants and/or refugees, may lead to a rise in water-related search and rescue operations.

9. New Zealand Productivity Commission Te Kōmihana Whai Hua o Aotearoa

10. Stats NZ Tatauranga Aotearoa

11. Dementia Economic Impact Report 2020

12. An Evaluation of the WanderSearch Programme in Aotearoa New Zealand

13. Ministry of Health Manatū Hauora Annual Health Survey

14. Child and Youth Wellbeing Strategy Annual Report 2021

15. Recreation Aotearoa Te Whai Oranga

16. Surf Life Saving New Zealand

Efforts are being made to improve the levels of physical activity for everyone

While European New Zealanders tend to dominate participation in outdoor recreational activities, efforts are underway to improve participation levels within other communities.

In the past, most of the national strategies and programmes aimed at changing the levels of physical activity have failed. This could be due to failures in aligning national policies with local communities. Most regions are now investing in tailored initiatives to improve levels of physical activity within specific communities, such as ActivAsian in Auckland.¹⁷ In addition, increases in outdoor physical activity within Māori communities are being stimulated by the growing popularity of sports like waka ama, and events such as IRONMĀORI.^{18,19}

Sport New Zealand Ihi Aotearoa has also established Te Aho, an activation plan to improve Māori participation and leadership in sport and recreation.²⁰

Over 1 million adults in Aotearoa New Zealand identify as disabled and are less likely to participate in physical activities than non-disabled adults. Sport New Zealand Ihi Aotearoa has therefore developed a plan to improve the range and quality of physical activities for people with disabilities.²¹

These initiatives and plans are generally expected to lead to increased outdoor recreational participation. If these initiatives and plans succeed, then the sector may need to consider the specific needs of people with disabilities when being searched for or rescued – and this might have implications for the types of equipment and training required.

Physical health is generally improving

Being healthier can increase the likelihood that people will engage in outdoor recreational activities that may require search and rescue services. A combination of improved nutrition, other lifestyle changes, and scientific and technological advances means that our physical health is getting better for longer.

However, people living with social and economic deprivation can miss out on these physical (and mental) health benefits.²²

Advances in artificial organs and xenotransplants (using organs from other species), and cancer diagnostics and therapies, for example, indicate that over the coming decades older people may be able to be more active for longer than before.

On the other hand, nearly half of Kiwi adults do not meet the recommended minimum of 2.5 hours of physical activity each week, and one-third of Kiwis are obese.²³

Mobility is also improving, so more people are likely to be active outdoors

Improvements in design, materials, and procedures for joint replacement (and also in exoskeletons and robotic assistive devices) are helping to restore or enhance mobility for injured or older people. However, the high cost of exoskeletons and robotic assistive devices currently inhibits large-scale adoption. As with other recently introduced consumer products, price and performance may rapidly improve which could lead to greater adoption of these products and improved participation in outdoor recreational activities and sports.

There is also a mobility revolution underway. Electric bikes (or e-bikes), when combined with better cycleways or roading systems, are increasing the mobility of the young, elderly and less physically active. This could lead to more people being involved in ambitious outdoor activities, or simply heading further into the outdoors.

17. ActivAsian

18. Growth of Waka Ama case study

19. IRONMĀORI

20. Sport New Zealand Ihi Aotearoa

21. Sport New Zealand Ihi Aotearoa

22. New Zealand Index of Deprivation

23. New Zealand Health Survey

Flying cars have long been a futuristic dream. However, several companies are developing prototypes of these kinds of vehicles, some of which may become autonomous or semi-autonomous so that little training is required to drive them.²⁴ One of these vehicles recently gained its airworthiness certification in Slovakia (but only for qualified pilots).²⁵ Technological, regulatory, and economic factors will influence their uptake.

Just as the availability and affordability of e-scooters and e-bikes have boosted mobility, electric paddleboards and surfboards may also encourage more people into the water – or to get to places they previously wouldn't – if they can afford this new technology.²⁶

Similarly, electric motors for kayaks are now on the market.²⁷ Greater adoption is likely when these motors become more affordable. Like with e-scooters and e-bikes, there may be an increase in demand for search and rescue services if inexperienced people begin to use these products and get into difficulty in the water.

Access to the great outdoors is also on the increase

Aotearoa New Zealand's increasing social and political focus on wellbeing, including the importance of the environment for people's physical, mental and cultural health, is contributing to improved accessibility to some natural and managed environments.²⁸

For example, more walking and cycle trails are being developed, and the usage of these trails is increasing.²⁹ Access to climbing sites is also improving.³⁰ These initiatives, along with environmental restoration projects, have been boosted by the Mahi mō te Taiao Jobs for Nature government programme introduced during the pandemic.³¹

The changing nature of work-life balance will affect demand for search and rescue services

Considerable discussion has been devoted to the changing nature of work-life balance, but no clear trends have yet been identified. For some people, a more flexible mix of time spent in the office and working from home may become common. In some organisations, there is also growing interest in implementing four-day working weeks. Therefore, changes in how we work could provide more opportunities for outdoor recreational activities in future, although the future impact of these changes on demand for search and rescue services remains to be seen.

Some discussions about the evolution in flexible working arrangements suggest that more Kiwis may leave the cities for rural areas. There is little evidence of a strong link between where people live and where they hike or tramp – and land-based search and rescue operations tend to be concentrated in a few specific areas.³² However, if more people move to rural areas because they can work from home, this could result in a long-term increase in hiking and tramping activity due to the ease of access to mountains and bush.

Rising costs of living could both decrease and increase demand for search and rescue services

Due to low wages, the rising cost of living, and inflation, people are finding that they need to work longer to make ends meet.

Research by Sport New Zealand Ihi Aotearoa indicates that economically deprived people are less engaged in physical recreation.³³ They may not have the money, transport, equipment, energy, motivation, and/or time to participate in outdoor recreational activities.

24. GeekWire

25. BBC News

26. NZ Herald

27. Canoe and Kayak

28. Te Tai Ōhanga The Treasury

29. MBIE Hikina Whakatutuki

30. Aotearoa Climbing Access Trust

31. Department of Conservation Te Papa Atawhai

32. Mountain Safety Council New Zealand

33. Sport New Zealand Ihi Aotearoa

There is debate about whether socioeconomic inequalities are increasing, or not. But there is more agreement that these inequalities are here to stay. Te Ope Whakaora The Salvation Army's 2022 State of the Nation report notes the persistence of social and economic inequalities.³⁴ Stats NZ Tatauranga Aotearoa also highlights increasing pressures on low income whānau/families as a result of the rising cost of living.³⁴ And, while there has been some progress on addressing aspects of child poverty, the extent to which the pandemic has affected this progress isn't yet clear.³⁶

People on low incomes may need to work at multiple jobs to make ends meet.³⁷ This can reduce the time they have available for outdoor recreational activities. But they may be more tired or distracted, and/or less prepared, when they do find time to get outdoors – resulting in an increased risk of accidents or poor decision-making.

Sport New Zealand Ihi Aotearoa's Active NZ Survey 2019 report also identifies that reduced recreational participation is often the result of other commitments taking precedence, and also people feeling too tired or unmotivated.³⁸

Increasing fuel prices could reduce participation in some outdoor recreational activities through discouraging travel both on the road and on the water. We aren't yet seeing a marked reduction in outdoor recreation participation because of rising fuel prices. However, over the medium-term there could be a shift towards more local recreational activities if the cost of fuel continues to grow relative to incomes. This may result on reduced demand for search and rescue services.

The increased cost of living (or a greater interest in providing, rather than buying, food for the whānau/family) may lead to more people fishing, foraging, or hunting to put food on the table.³⁹ These kinds of activities could potentially increase demand for search and rescue services.

International tourism has a significant influence on outdoor recreational participation

International visitors make up a significant proportion of the people who go walking and tramping in Aotearoa New Zealand. The number of these visitors increased by about a third between 2014 and 2017. International tourists who require search and rescue services are more likely than Kiwis to require these services during day walks. They are also more likely to be solo trampers or have been separated from their group. Unlike New Zealanders, they are more likely to require search and rescue services at specific popular locations.⁴⁰

While the pandemic effectively halted international tourism for about two years, tourism will increase as the pandemic recedes and restrictions end. It is not obvious whether, or when, the number of international tourists will return to pre-pandemic levels. It is also uncertain whether these tourists will continue to undertake the same types of activities as before.

In 2019, the Labour government signalled that it wanted to encourage a greater proportion of higher value tourists.⁴¹ It is uncertain whether this goal will be achieved and what kinds of activities these tourists would engage in.

Without international tourists, there has been strong domestic interest in the great walks, and Tourism New Zealand has increased its domestic advertising.⁴² This may lead to increased domestic outdoor recreational participation, and demand for search and rescue services, over the short-term at least.

The cruise ship sector is forecasting a return to global pre-pandemic patronage levels by 2023, although that forecast is subject to a range of assumptions.⁴³ Energy prices, job security, geopolitical conflict, and the effects of climate change all influence cruise ship activity.

34. State of the Nation report 2022

35. Stats NZ Tatauranga Aotearoa

36. Child and Youth Wellbeing Strategy
Annual Report 2021

37. Stats NZ Tatauranga Aotearoa

38. Active NZ survey 2019

39. Wahine Toa Hunting

40. Mountain Safety Council New Zealand

41. MBIE Hikina Whakatutuki

42. Department of Conservation Te Papa Atawhai

43. State of the Cruise Industry Report 2022

An increase in the number of cruise ships means an increase in the possibility of people falling overboard or experiencing similar accidents. Demand for cruises has grown strongly in this century and the average size of cruise ships has also increased.⁴⁴ Larger cruise ships that get into trouble within the New Zealand Search and Rescue Region may lead to more complex future search and rescue operations.

Tourism in and around Antarctica is also increasing. The International Association of Antarctica Tour Operators reported that there were 56,000 visitors to Antarctica in the 2018/19 financial year.⁴⁵

According to the Antarctic and Southern Ocean Coalition, the number of people visiting the Antarctic Peninsula increased from 40,000 in 2015 to over 74,000 in 2020. Demand is expected to keep increasing.⁴⁶ In 2021, the Coalition noted that there were 16 to 20 new cruise vessels being built and due for delivery around 2025. Some of these new vessels will replace older ones already operating in the Southern Ocean.

An increase in tourist activity in Antarctica and the Southern Ocean could result in an increase in demand for search and rescue services in the Antarctic region, although search and rescue operations in the area are rare (but usually complex). The majority of incidents involving tourists in the region are emergency medical evacuations (medevac) instead of search and rescue operations.

The types of outdoor recreational activities people are undertaking

Activities involving walks, water, or wings (planes and helicopters) are the main types of activities that can lead to search and rescue operations. We can expect some changes in the number of people undertaking these types of activities. However, there is not a direct correlation between the popularity of these types of outdoor recreational activities and demand for search and rescue services.

Tramping injuries increased substantially over the 2000s but the number of search and rescue operations rose less sharply, and annual fatalities remained more or less the same over this period.⁴⁷

Similarly, between 2016 and 2021 recreational boating participation increased by 10% but annual fatalities did not change significantly. This is attributed (at least partially) to better safety campaigns.⁴⁸

During the pandemic there was a boating boom: Kiwis bought boats and got out on the water.⁴⁹ This boom has been attributed to affluent Kiwis being unable to spend money on international travel, and also shifts in lifestyle choices. In 2021, the Maritime New Zealand Recreational Boating Monitor Report survey revealed that about one-third of the survey respondents had only recently taken up boating, or had changed their boating habits, because of the pandemic. If more Kiwis take up boating as a new leisure activity they may find themselves in situations beyond their experience or abilities and require search and rescue organisations to come to their aid.⁵⁰

Following the Whakaari/White Island eruption on 9 December 2019, health and safety requirements were strengthened and regulatory reform in the registered adventure activities sector was triggered.^{51,52} Insurance costs are likely to increase for some of these adventure activities. These regulatory changes and insurance costs may discourage people from undertaking potentially hazardous adventure activities which may require search and rescue services.

The effects of climate change will influence the types of outdoor recreational activities Kiwis undertake, but these effects are evolving. Warmer weather encourages more people to spend time in and around the water. Wetter or stormier weather may (or may not) result in fewer people tramping, swimming, or boating. Some people may be excited by the additional challenges that changing weather patterns bring, such as larger waves to surf.⁵³

44. Cruzely

45. International Association of Antarctica Tour Operators

46. Antarctic and Southern Ocean Coalition

47. Mountain Safety Council New Zealand

48. Maritime New Zealand Annual Report 2020/21

49. The Guardian

50. Maritime New Zealand

51. Beehive.govt.nz

52. MBIE Hīkina Whakatutuki

53. NZ Surf Journal

People's abilities and levels of experience

People who do not have the experience or abilities to prepare for the outdoor conditions they encounter when recreating can be more at risk of requiring search and rescue services.

Membership of clubs and organisations is declining in general – this includes tramping clubs.⁵⁴ This decline reflects a societal shift towards greater independence and individualism which may skew Kiwis' perception of their abilities and levels of experience and lead to demand for search and rescue services

And in the water, most New Zealanders have poor swimming abilities. About half cannot float or swim for long, according to a 2021 survey. Most the survey respondents were not able to correctly identify rips or strong currents. The results of the survey indicate that many people, especially young men, overestimate their swimming abilities and underestimate the hazards and risks involved with swimming in the sea. However, the greatest number of fatalities tend to occur in the 35-to-54 and over-65 age groups.⁵⁵

People's attitudes and behaviours

Poor decision-making, preparation, and/or risk assessment are important contributors to demand for search and rescue services. Social factors and technologies also influence attitudes and behaviours.

Rulebreakers and risk-takers

Some people choose not to follow the rules. In a 2021 survey, about one-third of boaties didn't plan their trips, although people over the age of 65 were more likely to do so. About one-quarter of the respondents did not check the weather before going out and less than one-quarter of them carried a distress beacon. Twenty percent never wore, or only occasionally wore, a lifejacket.⁵⁶

Gender influences risk-taking and behaviour. In the water, men (particularly younger men) are more likely to take risks, and less likely to follow safety rules and guidance than women.⁵⁷ This often applies out of the water as well.

Solo or separated trampers make up a significant proportion of people who die, or require search and rescue services, and men are much more likely than women to die while tramping.⁵⁸

People can also be reluctant to change their plans. Because of competing demands on people's time and finances, there are anecdotal reports of people going ahead with tramping or boating trips without checking weather forecasts, or not postponing their trips despite bad weather forecasts. The predictability of weather conditions may in future be negatively affected due to the effects of climate change.

In Aotearoa New Zealand we often consider the effects of climate change to include more storms and bad weather, but parts of the country are predicted to become hotter and drier.⁵⁹ This will require people to be aware of new risks – taking adequate water supplies when tramping to avoid heat stroke, for example.

What if trust in institutions declines?

Aotearoa New Zealand prides itself on having high levels of trust in government. There is, however, increasing uncertainty about our social, economic, and environmental landscapes. Social media is being used to polarise opinions, promote misinformation, and to undermine experts and institutions. Therefore, there is concern about growing distrust in government, other established institutions, and subject-matter experts.

54. Mountain Safety Council New Zealand

55. Surf Life Saving New Zealand

56. Maritime New Zealand

57. Surf Life Saving New Zealand

58. Mountain Safety Council New Zealand

59. Ministry for the Environment Manatū Mō Te Taiao

Resistance to, or avoidance of, laws and regulations isn't new. In the past, there have been violent or obstructive reactions to emergency services staff (due to alcohol, drugs, or other factors) and Department of Conservation Te Papa Atawhai staff (due to opposition to poisoning campaigns), although these incidents are rare. However, during the pandemic some people resisted government guidelines (social distancing and vaccination requirements, for example) while other people's behaviour was more obstructive, mirroring behaviours seen overseas.

Decline in trust in authorities and institutions could lead to greater deliberate avoidance of safety and regulatory requirements. People who choose to avoid or ignore safety guidance may fail to adequately prepare for outdoor conditions. These kinds of behaviours may increase demand for search and rescue services and will need to be carefully monitored by search and rescue organisations.

Nowadays, there are a variety of information sources available to people who choose to recreate outdoors. For example, there has been an increase in people seeking advice from online discussion groups and social media rather than through more established channels such as Department of Conservation Te Papa Atawhai visitor centres, tramping clubs, or guidebooks. People who post information online may not provide correct information or they may share other people's incorrect information. Official agencies then scramble to correct this information which can put people's lives at risk and place demand on search and rescue services.⁶⁰

Technologies can both reduce and increase risks

The use of technologies, old and new, provides benefits as well as drawbacks and can both reduce and increase risks. If risks increase, then an increase in demand for search and rescue services is likely. Newer technologies, such as GPS, cellphones, and emergency locator beacons can improve navigation or communication in emergencies. But the critical factor is how the technology is used.

Cellphones and emergency locator beacons can help to initiate searches more rapidly. Emergency locator beacons are becoming more popular, although cellphones are still the most common means of calling for help on land.⁶¹ However, cellphones and other technologies can also contribute to poor preparedness, and/or riskier behaviours in the outdoors, on both land and water, in the early stages of their adoption.⁶²

Normally, the number of accidents associated with a new technology increases as it becomes more accessible to the public (e-scooters, for example). However, the number of these accidents usually declines as better risk assessment, education programmes, and sometimes the introduction of regulations, improve behaviours.^{63,64}

E-bikes, for example, can provide riders with a false sense of confidence in their ability. They may therefore go on rides that pose a greater risk of getting lost or injured. Increased rates of more complex injuries are already being seen in users of both urban and off-road e-bikes in the Netherlands.⁶⁵

And, the continuing popularity of social media is driving an increasing public awareness of remote or treacherous picturesque locations. Unprepared and/or unexperienced people who venture into the outdoors to replicate photos which they have seen on Facebook or Instagram can require search and rescue services when they find themselves in trouble (and without network coverage).

Augmented Reality (AR) for outdoor pursuits has been in development by tech companies for many years, but few products have made it to market. A variety of factors have contributed to this delay: privacy concerns and technical performance, for example. Poor broadband or connectivity in non-urban settings also hinders the uptake of AR applications. Pokémon GO is currently the most successful consumer application of AR.

60. Newshub.

61. New Zealand Search and Rescue Council Annual Report 2020-21

62. International Journal of Wilderness

63. ACC

64. ACC

65. European Journal of Trauma and Emergency Surgery

AR ski goggles are being promoted to consumers; however they are not yet available in shops.⁶⁶ While the manufacturers of these goggles claim that they will improve the skiing experience, they could also be distracting and, like Pokémon GO, result in more accidents.⁶⁷ Distraction and lack of awareness of technology limitations are issues for semi-autonomous vehicles.⁶⁸ Similar issues are anticipated for other products that seek to support or augment people's decision-making in the outdoors.

People do not always comply with the rules and regulations associated with new technologies. Recreational drone users, for example, are less likely to comply with rules than commercial operators.⁶⁹ Careless or reckless drone use creates risks for other aircraft and people. Drones have disrupted airport flights and helicopter activity during firefighting operations, for example.

The search and rescue sector should continue to focus on targeted education programmes to improve behaviours and attitudes

Despite the increasing levels of outdoor recreational activity, education and awareness campaigns, and enforcement activities and peer pressure, can help to reduce the number of accidents and incidents. For example, despite a 10 percent increase in recreational boating activity between 2017 and 2021, there was not a proportional increase in fatalities in this period.⁷⁰

In some cases, awareness campaigns seem to have little effect. In 2022, the New Zealand Automobile Association concluded that about half of our fatal car crashes were due to extreme and reckless behaviour.⁷¹

Search and rescue organisations are considering the best way to influence the general public's decision-making (and also that of commercial operators). A review by Maritime New Zealand identified the need to consider decision-making as less of an individual cognitive act and more of a social or collective act.⁷² Growing national interest in tikanga and te ao Māori, which emphasise collective approaches, may lead to awareness campaigns that are more effective in changing behaviours.

Commercial maritime vessels and aircraft

The numbers, types, and activities of the commercial maritime vessels and aircraft operating in the New Zealand Search and Rescue Region all influence demand for search and rescue services.

Apart from a resurgence in the numbers of commercial maritime vessels and aircraft as pandemic restrictions ease and trade increases, significant changes in the types and activities of these vessels and aircraft are not anticipated over the medium-term.

In general, the number of commercial maritime vessels and aircraft operating in the New Zealand Search and Rescue Region isn't an accurate predictor of demand for search and rescue services. This demand instead varies with the types of vessels or aircraft in the region, their activities, and also their crews' abilities and behaviours.

Commercial maritime vessel activity

Container and bulk carrier ships are the most common types of non-fishing foreign vessels to visit Aotearoa New Zealand. The number of annual container ship visits was declining before the pandemic, while bulk carrier ship visits were increasing. In 2021, 685 container ships and 801 bulk carrier ships visited our ports.⁷³

66. RideOn

67. New Scientist

68. ScienceDirect

69. Airways

70. Maritime New Zealand Annual Report 2020/21

71. RNZ

72. Recreational Boating Literature Review

73. Te Manatū Waka Ministry of Transport

In 2021, the *Review of Maritime Transport* by the United Nations Conference on Trade and Development predicted that international shipping volumes would increase by 4.3 percent in 2021, exceeding 2019 levels.⁷⁴ This review noted that the long-term global shipping outlook will be shaped by a range of factors. These factors include: changing patterns of globalisation, development of more resilient supply chains, changes in consumer spending and the growth of ecommerce, environmental sustainability, the global energy transition, and the continuing uptake of digitalisation.

An increase in coastal shipping is possible if the government invests in a blue highway to improve economic development and provide more stable supply chains.⁷⁵

In 2017, there were over 1,500 fishing vessels registered to fish commercially in our waters.⁷⁶ More recent numbers are not available, but the numbers do not appear to have fluctuated much over the last few years.

In general, the number of powered industrial fishing vessels quadrupled in Oceania between 1950 and 2015; growing from 1,000 to 4,000. In the same period, the number of powered artisanal crafts (small local boats) grew from 6,000 to 45,000.⁷⁷

China's fishing fleet in the Pacific region, which focuses on tuna, increased 500% over the 2010s.⁷⁸ In 2016, Chinese-registered industrial fishing vessels made up more than one-quarter of the fishing vessels in the region.⁷⁹

The pandemic's impacts on supply chains highlighted the fragility of global trade and is leading to supply chain reconfigurations. These reconfigurations will affect the number, types and size of commercial maritime vessels, their ports of call, and the distances they travel.

Cruise ship activity is predicted to continue to increase

As cruising has become more popular over the last 30 years, the size of cruise ships has significantly increased. In the 90s, the average cruise ship weighed around 70,000 to 80,000 gross tonnes. After 2015, the average weight of ships operated by the larger cruise companies increased to 164,000 gross tonnes.⁸⁰

Before the pandemic, up to 41 cruise ships visited Aotearoa New Zealand annually and there was a total of 176 cruise ship voyages in the 2018/19 financial year.⁸¹ The cruise industry is forecasting a rapid rebound in international passenger volumes by 2023, returning to or exceeding 2019 levels.⁸² This forecast should be taken with a pinch of sea salt – a variety of economic, social, and geopolitical factors will influence future demand for cruising holidays.

The pandemic is likely to increase in the popularity of cruising holidays in smaller vessels, where passengers can have more confidence that they will be looked after in case of disruptions. These types of cruises allow for more flexibility in sudden changes in destinations.⁸³

Search and rescue operations associated with cruise ships usually involve searching for people who have fallen overboard and the emergency transport of crew or passengers to hospitals. These types of search and rescue operations are rare – however it is possible that the number of these operations may increase if the number of people cruising continues to increase. Mass rescues are even more rare, but often require considerable resources and coordination, particularly if they occur in the Southern Ocean, or during a severe storm.

74. UNCTAD

75. Coastal Shipping Investment Approach Report

76. Fisheries New Zealand Tini o Tangaroa

77. PNAS

78. The Guardian

79. The Brookings Institution

80. Cruzely

81. New Zealand Cruise Association He Waka Eke Noa

82. State of the Cruise Industry Report 2022

83. Ship Technology

Aircraft accident and fatality rates are expected to remain low

In general, crashed or lost small planes and helicopters are the main types of air incidents that place demand on search and rescue services.

Analysis from the Civil Aviation Authority of New Zealand Te Mana Rererangi Tūmatanui o Aotearoa shows that accident and fatality rates for all types of aircraft have declined during the 21st century, while overall flight hours have remained more or less the same. However, there can be considerable annual variation in flight hours. Most reported aircraft accidents do not require search and rescue operations. Since 2015, there have been about ten fatalities annually.

The decline in accident rates can be attributed to adoption of new aviation technologies, regulatory interventions more effectively targeting risks, and the improved detection and minimisation of risks by aircraft operator.⁸⁴

In general, the pandemic reduced aircraft traffic. In the 2020/2021 financial year there were just under half a million flights in our airspace, compared with just under one million in the 2018/19 financial year.⁸⁵ With borders reopening, however, air traffic is increasing.

Types of commercial, research, and exploration activities

New technologies and economic drivers will lead to new types of commercial, research, and exploration activities within the New Zealand Search and Rescue Region. These activities may affect demand for search and rescue services.

The Global Marine Technology Trends 2030 report suggests that a combination of emerging technologies, capabilities, and regulatory frameworks will lead to a transformed marine vessel environment by 2030.⁸⁶ This report also anticipates developments in ocean exploration and exploitation. It predicts significant changes in global defensive and offensive capabilities and the ability to deliver humanitarian aid and disaster relief. Not all of the report's predictions will be embedded by 2030, however its direction of travel appears to be realistic.

Uncrewed surface and submersible ocean vessels (autonomous ships) are expected to become more common: for commercial uses, research, and surveillance.^{87,88}

Open ocean fish farming, where sea cages are set up more than two kilometres offshore, is increasing in some parts of the world.⁸⁹ None of these operations currently exist in Aotearoa New Zealand, but New Zealand King Salmon has applied for resource consents.⁹⁰

These technologies and developments could add novel elements into our marine environment. They could malfunction or fail, creating additional hazards, or other vessels may collide with them.

Activities in the Antarctic region

In general, maritime vessel and aircraft activity in the Southern Ocean are expected to increase. This increase will be driven by increased scientific monitoring of the effects of climate change in and around Antarctica, and also by commercial interests such as the harvesting of krill.⁹¹

International interest in resource exploitation in the region is likely to increase, despite the current prohibition of such activities in and around Antarctica. The Conservation of Antarctic Marine Living Resources Convention attempts to regulate activity in the region. Substantial change to the activities which are permitted under this convention are unlikely in the short to medium-term.

84. Civil Aviation Authority 2020-2021 Annual Report

85. Airways

86. Global Marine Technology Trends 2030 Report

87. Open Ocean Robotics

88. MSUBS

89. Food and Agriculture Organization of the United Nations

90. New Zealand King Salmon

91. Manatū Kaupapa Waonga NZDF

In spite of the convention, illegal activity associated with mineral extraction may start up in the Antarctic region if extraction commences in other regions. And, because of the growing global demand for food, illegal fishing activities may increase.

The International Maritime Organisation's Polar Code, introduced in 2017, requires ships operating in the Antarctic region to carry equipment which enables five days' survival on land or ice.⁹² This code is easier to enforce and monitor on larger vessels owned by reputable companies than with illegal operators and smaller vessels.

Overall, an increase in legal and illegal activities in the Southern Ocean has the potential to increase the risk of the types of accidents that may require search and rescue services.

The effects of climate change and other environmental factors

The effects of climate change, and other environmental factors, are likely to increasingly influence demand for search and rescue services, both directly and indirectly. This increase in demand is likely to be especially relevant in the Pacific region.

The increasing severity and the frequency of storms in the region are likely to increase risk to human life and destruction of infrastructure.⁹³

In addition, warming oceans are affecting marine species, fishing, and also food production in the Pacific Islands.⁹⁴ Industrial fishing in the region, and/or loss of other income, increases pressure on local fishers to venture further out (or to new and unfamiliar locations) to catch fish. This multiplies the risk of accidents or poor decision-making.

On top of an increase in storms and flooding, parts of Aotearoa New Zealand are likely to become hotter and drier. This could result in greater heat stress for people walking, hiking, or climbing who are not prepared for the conditions.

Changing weather patterns may also result in additional stress on the mental health of farmers, which could lead to more search and rescue operations in rural areas.⁹⁵

Frustrations with the lack, or pace of, meaningful action (real or perceived) by government and/or corporate actors to reduce CO₂ emissions and other environmental threats (such as pollution) may lead to more direct actions by protestors and activists. These could include aggressive offshore actions such as those undertaken by Sea Shepherd against whaling and fishing in the Southern Ocean. These actions may increase the risk of accidents or misadventure and place demand on search and rescue services.

Overall, our search and rescue sector's service model has developed organically over time and this model has generally met demand. However, this service model has developed in response to meet the SAR requirements of a relatively stable domestic population within a relatively stable physical environment. It is possible that the effects of climate change and other environmental factors will place stress on this service model – especially as Aotearoa New Zealand experiences more and more frequent adverse weather events.

Geopolitical influences and tensions

The increasingly complex regional security environment in the Pacific region was recognised by the 2018 Boe Declaration on Regional Security, and also by more recent defence assessments.^{96,97} There are also concerns from Pacific leaders, and others, about the greater militarisation occurring in the region.⁹⁸ This militarisation increases the risk of military actions in the medium-term which could potentially lead to extraordinary involvement by search and rescue organisations.

92. IMO Polar Code

93. ipcc

94. ipcc

95. Environment Aotearoa 2022 report

96. Pacific Islands Forum

97. RNZ

98. The Lowy Institute

Developments in this regional security environment are likely to lead to more naval and air force activity in the Pacific region which could affect demand for search and rescue services in various ways.⁹⁹ On the other hand, the supply of search and rescue services could increase if the numbers of military vessels and aircraft in the region grow.

Trends and developments affecting the supply of search and rescue services

Social, technological, economic, environmental, and political trends and developments can influence search and rescue organisations and how they supply search and rescue services. They can affect preparation for, and execution of, search and rescue operations by impacting search and rescue organisations’:

- Capacity (people and assets); and/or
- Capability (skills and training).

These trends and developments also influence search and rescue organisations’ funding, business, and governance models.

Capacity

Search and rescue services depend on the availability of suitably skilled and experienced people, and aircraft, boats, and other specialist equipment and technologies.

The search and rescue workforce is under increasing strain

Three key trends that affect the search and rescue workforce are the decrease in volunteering, the ageing of search and rescue personnel, and changes in where people choose to live.

The amount of time that Kiwis spend volunteering is decreasing. This trend is mainly due to increasing work, leisure, and whānau/family demands.¹⁰⁰ There has also been a shift towards people opting for more flexible, short-term volunteering opportunities.¹⁰¹

Innovative strategies are required to attract a more diverse volunteer workforce, and to adapt to volunteers’ needs and availability. In addition, the age profile of search and rescue personnel is increasing. This means that more effort needs to be invested in recruiting and training younger personnel to ensure long-term viability.

Attracting younger and more diverse volunteers into search and rescue organisations is a critical long-term strategy. Sport New Zealand Ihi Aotearoa, for example, has developed guidance about how to recruit and retain volunteers. Interviews with young volunteers suggest that, in general, their aspirations and expectations may not align with those of established organisations. Search and rescue organisations will need to be aware of, and responsive to, these aspirations and expectations if they want to attract young people.¹⁰²

A 2022 survey of not-for-profit organisations in Aotearoa New Zealand found that their employees’ passion for their work does not overcome the desire for the higher remuneration that exists in the private sector. It may become increasingly harder to retain or attract competent employees if remuneration in not-for-profit organisations does not keep up with the market rate. This challenge is likely to be relevant for search and rescue organisations.¹⁰³

99. Manatū Kaupapa Waonga NZDF

100. New Zealand Red Cross Rīpeka Whero Aotearoa

101. mpconsulting

102. Journal of Youth Studies

103. 2022 Not for Profit sector report

While we have seen an urban drift in Aotearoa New Zealand over the last 50 years, this pattern is beginning to change to some extent because of our evolving economic and social landscapes. Technological and environmental drivers, as well as the pandemic, are leading Kiwis to reevaluate their lifestyles and consider moving to rural areas.

If more Kiwis begin to move out of the cities and into rural areas, then more people may become involved with search and rescue organisations in these areas. This demographic trend may positively influence the capacity of search and rescue services.

On the other hand, there are concerns that we may see a national trend towards greater emigration – to Australia, for example. Some of this resulting brain drain is likely to include people involved in search and rescue organisation, or potential volunteers, and so may negatively affect search and rescue capacity and capabilities.

Search and rescue assets

Helicopters and small aircraft are critical components of search and rescue operations, but they also carry out other activities. For example, there is increasing demand on rescue helicopters for medical transfers, which could affect their availability for search and rescue operations.

This is partly due to increased specialisation in hospital services which means more patients living in the regions may need to be taken to hospitals in the cities, particularly for life-threatening conditions.¹⁰⁴ This increase in demand has also been attributed to patients (or their whānau/family) expecting rapid transport to hospitals, rather than spending hours in an ambulance.¹⁰⁵

Search and rescue operations often rely heavily on helicopters which are mainly used in the tourism industry. The significant reduction in international tourism, as a result of the pandemic, has resulted in severe economic challenges for tourism operators. Staff have been laid off and reduced flight activity has resulted in pilots and engineers being unable to keep up with the flight hours required for certification and training. At present, it is not clear how for long these challenges will continue to affect search and rescue capacity.

Increasing pressure to reduce the environmental impacts of tourism, as well as other activities, is also likely to challenge aviation operators in the tourism sector.¹⁰⁶ This may significantly impact the availability of helicopters that can participate in search and rescue operations as these operators come under pressure to reduce their carbon emissions.

In addition, rising fuel costs, and the drive to reduce carbon emissions nationally, are likely to lead to greatly increased costs for search and rescue organisations.

Also, because of the pandemic, some aircraft have not been maintained according to their certification schedules. This may result in reduced search and rescue capacity in some regions over the short-term. This issue may linger if international tourist numbers take time to recover, or if relevant pilots and engineers emigrate, or find other jobs.

If the number of private aviation companies which participate in search and rescue operations declines, then these operations may need to rely more on the Manatū Kaupapa Waonga New Zealand Defence Force's aviation assets. These assets tend to be concentrated on a few bases whereas private aviation companies' assets provide greater coverage and more rapid responses because they are spread more widely across the country. Local pilots also usually have better understanding of local conditions and hazards and therefore can often provide more effective search and rescue response in their local environment.

104. NZ Herald

105. stuff.co.nz

106. PCE 2021 Sustainable Tourism Report

107. Manatū Kaupapa Waonga NZDF

Growing geopolitical and/or security tensions in the Pacific region can increase search and rescue capacity. Increased numbers of naval and air force assets, whatever their affiliation, are generally valuable and neutral assets which facilitate the supply of search and rescue services.¹⁰⁷

Capability

Because of changing environmental and geopolitical conditions, and the introduction of new technologies, the capabilities of the people who deliver search and rescue services may also need to change.

Search and rescue is going high-tech

New technologies are enhancing search and rescue capabilities. They allow search and rescue organisations to more efficiently locate people who are lost or injured and they can also improve situational awareness.

New technologies can enhance training opportunities for search and rescue personnel. Use of some of these technologies can also reduce the risk of physical harm to search and rescue personnel. The adoption of these new technologies will require additional training and recruitment of search and rescue personnel with relevant skills and knowledge.

A range of robots is being developed for search and rescue use. Operationally, water and air-based robotic systems are further advanced than land-based systems. Some systems are simple remote-controlled devices, while others are starting to incorporate artificial intelligence so they will be more independent.¹⁰⁸

Drones are being used in urban search and rescue operations to identify hazards, safe entry points, and places to search.¹⁰⁹ Augmented Reality (AR) is also being used to help to plan urban rescues and map out rescue sites.^{110,111} Drones are also being used in more challenging operations, such as searching for mountain climbers, and these applications are expected to increase.¹¹²

AR and virtual reality applications are beginning to be used for various purposes although their general uptake has been slow.¹¹³ These technologies do not yet have practical applications for actual search and rescue operations. They will however allow a variety of search and rescue situations and environments to be simulated during training sessions.

The Manatū Kaupapa Waonga New Zealand Defence Force has undertaken trials using artificial intelligence systems to automatically identify objects of interest.¹¹⁴ These systems make it easier to efficiently search large areas of ocean although this isn't yet standard operating procedure.

The search and rescue sector has begun improving the collection and use of post-incident data through the SARdonyx system.¹¹⁵ There is potential scope for further development of data collection and reporting which will improve future preparation and planning.

Greater adoption and use of emergency locator beacons, and the introduction of newer technologies that expedite searching, may, over the medium to long-term, shift the search and rescue sector's focus towards rescuing people rather than searching for them. However, technologies aren't always reliable, so it will always be necessary to keep search and rescue personnel well trained and ready to conduct search and rescue operations.

108. Emerj

109. The Conversation

110. NS Business

111. ScienceDirect

112. BBC News

113. The Economist

114. Microsoft

115. SARdonyx: SAR Overview

Capability in the Pacific and Antarctic regions is improving

Manatū Kaupapa Waonga New Zealand Defence Force (NZDF) asset upgrades, and Aotearoa New Zealand's increased engagement with our Pacific Island neighbours, are both helping to improve search and rescue capabilities.

The NZDF continues to upgrade its vessels and aircraft – these upgrades improve operational capabilities. For example, in 2020 the HMNZS Aotearoa replenishment vessel was commissioned. This vessel is capable of supporting environmental and scientific programmes in the Antarctic and operating in the Pacific region. It may also be able to assist in search and rescue operations in the New Zealand Search and Rescue Region.¹¹⁶

Our Orion surveillance aircraft are being replaced by Poseidon aircraft which will take part in search and rescue operations.¹¹⁷

Maritime New Zealand is also making efforts to improve its engagement with Pacific Island nations to improve their preparedness and resilience to natural disasters and their search and rescue capabilities and capacity.¹¹⁸

Search and rescue organisations' funding and business models may need to continue to adapt

While search and rescue organisations rely on large volunteer workforces, they still require considerable financial resources. Funding comes from government, corporate sponsorships and contracts, and donations from trusts and the public. As our economic climate evolves and affects these funding streams, search and rescue organisations will have to continue to adapt accordingly.

The pandemic has put increasing pressure on government finances. Looking ahead, the government faces significant financial headwinds linked to demographic changes (the *silver tsunami*) and the effects of climate change.

Some corporate sponsors are also likely to find the next few years economically challenging and may review their sponsorship arrangements with search and rescue organisations. Sectors such as banking, energy, and supermarkets are facing more scrutiny over their levels of profit.¹¹⁹ It is not yet clear how this scrutiny may affect corporate support for search and rescue organisations.

The nature of charitable giving is also changing. Internationally, there is a growing trend towards *geo-located gifting* – supporting local causes or needs – and also for philanthropic organisations to focus on enabling systemic change. Traditionally, New Zealanders have been generous donors, but they have tended towards *micro-giving* (gold-coin donations).¹²⁰

As the typically affluent baby boomer generation retires there is an expectation, based on overseas trends, that there will be an increase in charitable donations and philanthropy.¹²¹ Some of these retirees are likely to be strategic donors, who wish to support systemic changes.

Charitable trusts' business models are changing due to rising administrative costs and/or shifts in their donation strategies.¹²² Internationally, donors are shifting their attention from old-fashioned charities, which simply pass on money, towards more targeted investment in systemic changes to more effectively resolve social issues.¹²³ The pandemic may accelerate these changes to business models.

116. Te Ope Kātua o Aotearoa Defence Force

117. Manatū Kaupapa Waonga New Zealand Ministry of Defence

118. Pacific Maritime Safety Programme

119. Market study into the grocery sector

120. Institute of Directors New Zealand

121. Institute of Directors New Zealand

122. stuff.co.nz

123. Centre for Social Impact

Charitable donations declined significantly during the pandemic. This was a result of reductions in some Kiwis' incomes, and the inability of charities to collect donations on the street or door-to-door. The Life Flight Trust, for example, cancelled many fundraising events during the pandemic.¹²⁴ Gaming trusts, which pass on proceeds to charities including search and rescue organisations, saw significant falls in revenue during the pandemic due to the closures of pubs and bars.¹²⁵

Competition for charitable donations is also rising across the board and there is greater demand for donations from social service charities that help the homeless and people on low incomes.

As their different funding streams evolve, search and rescue organisations will need to continue to adapt their funding and business models to match their financial environments. These evolving environments may affect these organisations' ability to supply search and rescue services and may make strategic planning and investment challenging – therefore impacting on the sector's overall efficiency and effectiveness. The sector's funding model could come under scrutiny in future if the frequency of poor SAR outcomes increases – for example if SAR services were considered to be significantly and continually underfunded.

Governance models may also need to continue to adapt

The operating environment for search and rescue organisations is, like for many other organisations, becoming increasingly complex. Administrative and regulatory requirements for volunteer and other community-based organisations are increasing – workplace health and safety, for example. The level of public external scrutiny is also increasing.¹²⁶

The willingness and ability of search and rescue organisations' boards, senior management, and people directly involved in search and rescue operations to adapt positively to the evolving governance landscape will be critical to the ongoing success of the search and rescue sector.

According to a New Zealand Red Cross Rīpeka Whero Aotearoa survey, volunteer organisations' operating environments are resource and time-poor and this creates management and governance challenges.¹²⁷

There are increasing expectations that organisations appropriately reflect the communities which they serve, and that search and rescue personnel are free to operate without experiencing bullying and harassment. It can be difficult to secure suitably skilled or experienced leaders to make this happen.¹²⁸

Our society expects that search and rescue organisations provide support for search and rescue personnel so that these people are not physically and mentally overwhelmed by the nature of search and rescue operations.

The Charities Act 2005 is being updated, and amendments are expected in 2022 or 2023.¹²⁹ Changes to this Act will have implications for the governance of search and rescue organisations

Workplace health and safety

Operating in a more extreme and more unpredictable environment will consolidate the need for a strong workplace health and safety culture within search and rescue organisations. The pandemic exposed a need for clear, consistent messaging and leadership to ensure understanding of, and adherence to, best practice guidelines to keep search and rescue personnel safe.

124. Life Flight Trust

125. BDO New Zealand

126. Volunteering New Zealand

127. New Zealand Red Cross Rīpeka Whero Aotearoa

128. Volunteering New Zealand

129. Te Tari Taiwhenua Department of Internal Affairs

The warming and pollution of seas, rivers, lakes and streams are leading to increased numbers of toxic algal blooms and more outbreaks of pathogenic microorganisms.¹³⁰ These trends could create health risks for search and rescue personnel and people being searched for, or rescued.

Mental health is likely to be an issue of increasing importance for search and rescue personnel, given the trends identified within the general population; and also the stressful nature of some search and rescue operations.

What next?

This scan is part of an ongoing series of New Zealand Search and Rescue (NZSAR) environmental scans. Carrying out regular environmental scanning helps us to understand the dynamic and unexpected nature of the trends and developments which affect Aotearoa New Zealand's search and rescue sector.

Some of the trends explored in this scan may not unfold as anticipated, and some of their anticipated impacts may not eventuate. New developments can also influence or disrupt established patterns of change. It is equally important not to overlook activities, structures, and behaviours that resist change because these will also influence the future landscape.

130. New Zealand Science Media Centre