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Communicating natural hazard risks to Chinese visitors: a case study from New Zealand

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Introduction: Research has shown that tourists are vulnerable to natural hazards during their travels. For this reason, communicating potential natural hazard risks to tourists prior to, and during, their journeys plays an important role in helping visitors safely navigate the natural hazards they may encounter. Tourists have different levels of vulnerability, depending on a range of personal, cultural and experiential factors, so risk communication must be appropriately targeted to particular markets. This research investigates supply side stakeholders' perceptions of the awareness of, and preparedness for, natural hazard risks amongst Chinese visitors to the West Coast of the South Island (Aotearoa New Zealand), and assesses the effectiveness of current risk communication processes and content for Chinese visitors.

Methods: The research questions are addressed through semi-structured interviews with representatives of government agencies and tourism businesses directly and/or indirectly involved in managing Chinese tourists' experiences and risk communication in the region, and supplemented with documentary analysis of strategy documents, social media and website resources

Results: Applying a Mental Models Approach, results reveal that informants have relatively similar perspectives on Chinese tourists' awareness of natural hazard risks, irrespective of the nature of their interaction with the Chinese market, however there are some differences in their views of who should be responsible for risk communication, and when and how that should be delivered.

Discussion: Chinese tourists' awareness and preparedness for natural hazards tends to be influenced by contextual differences more than cultural differences, and this is better understood by tourism stakeholders with personal contact with these tourists. There are perceived barriers to improving natural hazard risk preparedness, including the over-reliance on signage, and tourism stakeholders' reticence about sharing too much information about natural hazard risks with potential, or actual, visitors.

KEYWORDS

natural hazard events, risk awareness, risk preparedness, risk communication, Chinese tourists, New Zealand, tourism stakeholders

1. Introduction

Tourism is particularly vulnerable to natural hazard risks; vulnerability referring to “the extent to which a community, system or asset is susceptible to the damaging effects of a particular hazard” (Becken and Khazai, 2017, p. 97). This vulnerability is perhaps most apparent during sudden-onset natural hazard events, including earthquakes, tsunamis, flooding and landslips (Becken et al., 2014; Hall et al., 2019; Rossello and Becken, 2020). Numerous researchers have explored the effects of natural hazard events on people (residents and tourists alike; Prideaux et al., 2003), on landscapes and destination infrastructure, including roads, bridges, ports and airports, as well as tourism-specific facilities and amenities (Fountain and Cradock-Henry, 2020) and on a destination's reputation (Ritchie, 2004; Mair et al., 2016; Ritchie and Jiang, 2019). Tourists are exposed to a range of natural

hazard risks on a daily basis through the attractions they visit and the activities they participate in, however tourists' awareness of, and preparedness for, these natural hazard risks have been studied less often.

There are a number of reasons for the vulnerability of the tourism system to natural hazards. First, tourism destinations are often located in bio-physically dynamic areas such as coastal or mountainous regions that have high natural hazard exposure, and the attractions and activities that appeal to tourists are often in nature-based settings away from populated areas, reducing access to immediate assistance or communication networks. While natural hazard events have always been prevalent in tourist destinations, the intensification of climate change impacts and the increasing frequency of extreme weather events, is exacerbating risks for tourists in many regions. These impacts are projected to worsen with time as impacts compound and cascade (Becken, 2013; Purdie et al., 2020; Steiger et al., 2022).

Tourists have a range of characteristics which may increase their vulnerability to the natural hazard risks they encounter (Jeuring and Becken, 2013; Nagai et al., 2020). They often have limited knowledge of the region they are visiting, including weather patterns, and may not have experienced local types of natural hazards (Kelman et al., 2008; Ritchie, 2008; Aliperti and Cruz, 2018; Fountain and Cradock-Henry, 2020). Language and communication difficulties, lack of social and community support networks, and limited resources (e.g., clothing, safety equipment, transportation) can restrict tourists' capacity to interpret or respond appropriately to information relating to potential hazards, an imminent event, or routes for self evacuation (Kelman et al., 2008; Becken and Hughey, 2013; Jeuring and Becken, 2013; Cahyanto and Pennington-Gray, 2015; Hall et al., 2019; Fountain and Cradock-Henry, 2020; Gstaettner et al., 2020). Given that tourists will differ in their characteristics, and in the types of activities they choose to undertake, it stands to reason that they will also differ in their exposure to natural hazard risks and their vulnerability to these risks.

It is important that tourists are aware of, and properly prepared for, the natural hazards they could face during their travels; and that they possess the capacity to recognize the warning signs of natural hazard events and understand the appropriate way to respond (Drabek, 2000; Becken and Hughey, 2013; Hall et al., 2019; Bird and Gisladdottir, 2020). Tourists' preparedness includes traveling with appropriate clothing and equipment, knowing how to 'read' natural hazards warning signs, and understanding alert systems and appropriate responses, including evacuation routes for self-evacuation (Becken and Hughey, 2013; Lindell, 2013; Bird and Gisladdottir, 2020). These factors can be quite difficult for tourism managers to change, but it may be possible to influence tourist preparedness through appropriate risk communication messages and communication strategies with tourists prior to exposure to a natural hazard risk or event. This requires the establishment of appropriate risk communication strategies with tourists prior to their experience of a natural hazard or a natural hazard event (Hystad and Keller, 2008; Becken and Hughey, 2013). One size does not fit all when it comes to risk communication messaging, however, therefore developing a risk communication strategy and suitable preparedness messaging requires an understanding of the social, cultural and experiential differences between tourist

markets, as well as the place-specific hazardscape and context of the tourist destination (Mair et al., 2016).

The research on which this paper is based used a case study approach (Yin, 2014) to examine the perspectives of tourism stakeholders of the impact of tourist characteristics and risk communication strategies on natural hazard risk awareness and preparedness in relation to an increasingly important tourist market, Chinese international tourists. A series of semi-structured interviews were conducted with tourism stakeholders, including representatives from national and regional government agencies, the regional tourism organization (RTO), tourism operators and tour guides. All these stakeholders have some responsibility and role in communicating natural hazard risks but differ in terms of the nature of their engagement – as either direct (face to face) or indirect (via marketing material) contact – and also differ in terms of their proximity to significant natural hazards. The case study chosen for this study was the West Coast of New Zealand's South Island; a peripheral destination highly vulnerable to natural hazards, including seismic activity and extreme weather events (Cui, 2022).

The rationale for the focus on Chinese tourists was three-fold. First, the lead researcher on this project is Chinese herself, and therefore had insights into this market from personal experience, and through engagement with Chinese tourists in an employment context. A second major consideration is the increasingly significant role Chinese outbound tourism flows have had on global tourism patterns and development since the early 1990s, to the point that by 2018, the movement of 150 million Chinese international travelers annually saw this market top tourism spending at US\$277 billion (UNWTO, 2022). The New Zealand tourism industry has experienced a similar growth in the Chinese visitor market. Prior to the COVID-19 pandemic, Chinese visitors represented the second largest international visitor market in New Zealand (after Australia). In 2017, there were 419,000 outbound Chinese visitors to New Zealand, who contributed NZ\$1.5 billion to the New Zealand economy (Minister of Business Innovation and Employment, 2018). For the first 20 years, most of the growth in Chinese tourists to New Zealand came from group tourists (Becken, 2013). Over time that shifted, so that by 2018 free independent tourists (FITs) accounted for 40% of Chinese tourists arriving (Tourism New Zealand, 2020). Chinese tourists who join an ADS group tour have very different visitation pattern and characteristics than free independent travelers. They generally visit New Zealand for only 3 or 4 days, they are often in older age groups, and may have limited English language skills, so are very reliant on their tour leader or guide. By contrast, FITs tend to be younger and have better English language skills. They also stay in the country longer and explore more places in New Zealand that are 'off the beaten track' (Draper, 2019). Both types of Chinese tourists tend to live in very different environments to the ones they will experience in New Zealand; most live in Tier 1 cities, meaning they have limited exposure to the natural hazards they may encounter in a peripheral rural region (Christchurch NZ, 2021; Gurden and Stapleton, 2021).

The third consideration is that there is evidence from recent research that Chinese tourists differ from other tourist markets with regards to natural hazard risk awareness and potential response behavior during natural hazard events (Fountain and

[Cradock-Henry, 2020](#)). In a survey conducted with visitors to the destination of Kaikoura, New Zealand, Chinese respondents reported a significantly higher consideration of risk when making holiday destination choices and in their travel behavior than other domestic or international markets ([Fountain and Cradock-Henry, 2020](#)). Other studies of risk perception more generally have found that Chinese differ significantly from Westerners ([Bontempo et al., 1997](#)), and tourists from China are more sensitive to infectious disease, terrorist attack and natural disaster risks than tourists from other origins ([Kozak et al., 2007](#); [Sparks and Pan, 2009](#)). [Fountain and Cradock-Henry \(2020\)](#) report that while Chinese respondents indicated a high awareness of what to do and where to go in the case of a natural disaster when measured by Likert statements, this confidence was not reflected in their responses to open-ended questions on the same issues. The Chinese respondents in this study were also the only market to report that they would rely on their national embassy to help them in the event of a natural disaster, rather than self-evacuate or take some other proactive measures. [Fountain and Cradock-Henry \(2020\)](#) provide some potential explanations for these differences were outlined, however these are not fully explored.

It is important to recognize that the Chinese tourist market is not homogeneous; culture is dynamic, and tourist behavior is culturally complex ([Ooi, 2019](#)). This does not mean denying the influence of cultural differences, such as language or cultural norms – these are elements which can shape tourist behavior (e.g., [Hsu and Huang, 2016](#); [Melubo and Kisasembe, 2022](#)) – but requires acknowledgment that other factors also influence tourist behavior, and this behavior can change depending on the context in which they find themselves ([Ma et al., 2021](#); [Gunawardana et al., 2022](#)).

In summary, given the size and importance of the Chinese visitor market, and evidence of differences in risk awareness and preparedness between Chinese respondents and other markets, this research sought to address the following questions:

1. What are tourism stakeholders' perspectives on the natural hazard risk awareness and preparedness of Chinese tourists, and how do these perspectives differ depending on their role?
2. What do these stakeholders consider the most appropriate processes, tools and methods to communicate natural hazard risks to Chinese tourists? Do these approaches differ from approaches required for other markets?
3. What are the barriers to improved natural hazard risk communication to this tourist market, and how can they be addressed?

The following section presents a literature review which provides an overview of current knowledge about hazard awareness and preparedness of tourists and the efficacy of tourist risk communication strategies. Elements of a mental models approach (MMA) to risk communication (MMARC) ([Bostrom et al., 1992](#); [Boase et al., 2017](#)) are discussed as a potentially useful theoretical lens through which to interpret risk communication in the natural hazards and tourism context. A brief introduction to the case study region and the methodology follows. The findings section begins by presenting informants' perspectives of Chinese tourists' natural hazard awareness and preparedness for their West Coast experience, followed by a discussion of their opinions and

suggestions for risk communication methods and structures. The final section of the paper provides a synthesis of the key themes emerging from the research and the implications for future research and the resilience of the tourism system.

2. Literature review

Natural hazards are a threat to all people, and the places and things they value so understanding, and reducing, vulnerability to natural hazard risks is of interest to scholars, policymakers, and government agencies. When it involves tourists, it is of interest to tourism organizations, businesses and tourism marketers as well. Hazard awareness is the knowledge and understanding of risk in the surrounding environment ([Dalton et al., 2001](#)) as distinct from actual or observed risk. The awareness of risk is associated with the response behavior to natural hazards, including preparedness ([Espiner, 2001](#)), and many studies have suggested that there is a direct link between education or sensitization and awareness (e.g., [Gerdan, 2014](#)).

Hazard preparedness has been defined as “pre-impact actions that provide the human and material resources needed to support active responses at the time of hazard impact” ([Lindell, 2013](#), p. 803). It is considered an important way to reduce people's risk of injury and damage from hazards and to enhance their coping skills in the face of hazards ([Paton, 2003](#)). This preparedness behavior, including the amount of effort people are willing to expend preparing, is also affected by outcome expectancy, that is, an individual's perception that the action they are taking can reduce or mitigate a problem), and self-efficacy (an individual's belief in their skill, knowledge, ability and resources to protect themselves in a threatening situation) ([Paton, 2003](#)). Social, political, and ecological factors also influence hazard preparedness, including the role of a sense of belonging to a community or neighborhood, trust in government and reliance on public hazard protection ([Paton, 2003](#)). Studies have suggested that previous natural hazard exposure should be considered a factor influencing hazard preparedness ([Lindell and Perry, 2000](#)). Clearly, risk communication can play a critical role in creating hazard awareness and, ultimately, improving hazard preparedness ([Lindell and Perry, 2003](#); [Paton, 2006](#); [Gstaettner et al., 2020](#)), and number of frameworks have been developed to explain the contributions of these factors to hazard preparedness ([Paton, 2003](#); e.g., [Lindell and Perry, 2012](#)). The following sections explore these concepts greater detail in the context of natural hazard risk, awareness and preparedness for tourists, tourism providers, and tourism destinations.

2.1. Hazard awareness and preparedness of tourists

Research suggests that tourists' awareness of natural hazards risks differ in similar ways to that identified in the literature more broadly ([Smith and Espiner, 2007](#)). There are individual differences in the way hazards and risks are perceived, based on factors such as personality ([Burton et al., 1993](#)), and some evidence

that urban dwellers may be less informed about natural hazards due to relatively limited experiences in the natural environment (Burton et al., 1993). Perceptions of risk amongst members of the general public differ considerably to individuals with professional knowledge regarding natural hazards, with the latter tending to perceive hazard risks more accurately (International Federation of Red Cross and Red Crescent Societies, 2018). In many outdoor settings, tourists may have low or no experience with the activities or environments they encounter, so their ability to assess natural hazard risks will be limited (Espiner, 2001). This reality is one of the main reasons that ensuring tourists follow hazard warning signs and evacuation alerts is critically important, but also why compliance is often difficult to achieve (Espiner, 2001; Kelly and Ronan, 2018; Hall et al., 2019).

In the context of tourism, hazard preparedness might be thought of in terms of tourists taking appropriate clothing and equipment with them, having good understanding of natural hazard warning signs and hazard alert systems, and knowledge of evacuation routes for self-evacuation (Becken and Hughey, 2013; Hall et al., 2019; Bird and Gisladdottir, 2020). However, research suggests that rather than proactively preparing themselves, by carrying emergency supplies or learning local hazard signs and evacuation routes, visitors will often rely on the tourist information office, accommodation providers and residents as key sources of natural hazard information (Drabek, 2000; Jeuring and Becken, 2013; Cahyanto and Pennington-Gray, 2015; Bird and Gisladdottir, 2020; Fountain and Cradock-Henry, 2020). When a natural hazard event occurs, there is a tendency for tourists to wait for instructions from others on what to do or where to go; this is particularly the case with international and out-of-state visitors to a region (Drabek, 2000; Kelman et al., 2008; Jeuring and Becken, 2013; Cahyanto and Pennington-Gray, 2015; Arce et al., 2017; Bird and Gisladdottir, 2020).

Risk awareness and preparedness of tourists can be enhanced through a diverse range of risk communication methods and strategies, but such strategies rely on the intended audience understanding these messages and the nature of the risks to which they refer. The next section details the current research about effective risk communication methods for tourists, and the potential risks of communication gaps.

2.2. Communicating natural hazard risks to tourists

The purpose of risk communication is to inform at-risk populations about the probability of a natural hazard occurring and its likely consequences, and also to encourage the adoption of measures to reduce risk and enhance safety (Paton, 2006; Gstaettner et al., 2020). In other words, risk communication aims to prompt people to redefine the environment they are in, from one that is safe to one that contains an imminent (disaster warning) or possible threat (hazard education) (Lindell and Perry, 2003). A successful risk communication strategy in a tourism context needs to manage the safety of tourists and ensure they are appropriately prepared, whilst also not unduly worrying them or damaging the destination's appeal (Bird and Gisladdottir, 2020; Gstaettner et al.,

2020). Appropriate distribution channels and message timing for risk communication also need to be considered (Burnside et al., 2007).

Many tourist activities take place in nature-based settings, often removed from areas of high population density, or robust emergency management networks (Sommerfeld, 2020), therefore tourist risk communication is critical during all periods and stages of a trip, including the preparation phase before the tourist leaves home (Faulkner, 2001). Educational information before departure can provide individuals with the opportunity to understand the natural hazards they may face and can bridge the gap between hazard identification (hazard awareness) and genuine preparedness actions, which will help to reduce their vulnerability (Paton et al., 2008).

Hazard warnings, by way of signage or inter-personal messages, are a primary communication method at the destination level during a tourist's trip. Many different sources are used, including weather services, official government agency and tourism organization websites, tourism staff (guides, information centers and accommodation hosts), news and social media. A recent study has found that international tourists are not only unfamiliar with local conditions, they may also have different ways of assessing their personal abilities and differ in their willingness to read or comply with hazard warning (Saunders et al., 2019). Therefore, tourist risk communication needs to consider the background and characteristics of the target audience rather than presume that messaging appropriate for local residents, or that reflects the knowledge and expectations of the scientific community, will be effective for all tourists (Dominey-Howes and Minos-Minopoulos, 2004; Paton, 2006; Haynes et al., 2008).

2.3. A mental models approach to risk communication

As outlined above, a significant challenge of risk communication is that there are often communication gaps between stakeholders (Mair et al., 2016). These gaps have many sources, including differing levels and types of knowledge based on life experience or learning. Challenges also result from incompatible values or goals, or from disparity in values and norms. A review of research in tourism disaster contexts has identified gaps between emergency managers and tourism stakeholders (Hystad and Keller, 2008; Becken and Hughey, 2013); between different tourism stakeholders (Orchiston, 2013); and between tourism providers and tourists (Carlsen and Hughes, 2008; Fountain and Cradock-Henry, 2020).

Following Bostrom et al. (1992), a number of authors have applied a mental models approach (MMA) to risk communication (MMARC) to help inform hazard and risk communication strategies (Boase et al., 2017). At the core of the MMARC is an attempt to understand the cognitive models (or heuristics) that different groups of stakeholders hold about specific risks or hazards. These cognitive models are an individual's internal representations of how the environment is organized which, irrespective of their accuracy, are thought to influence how people perceive, interpret, and respond to risks and hazards (Boase et al., 2017). Recognizing

the dimensions of mental models pertaining to hazards has the potential to contribute to the design of communication aimed at promoting informed decision-making among targeted groups, including people visiting novel environments as tourists.

The MMARC focusses on the alignment between any given communication strategy and the existing associated mental models identified among the target audience. Application of the MMARC methodology involves a structured approach to elicit technically accurate 'expert' perspectives on a given risk, followed by a comparison to the public's mental models of the same risk. Once knowledge gaps and misconceptions are understood, risk communication content can be prioritized (Boase et al., 2017). Hence, the MMARC can be seen as attempt to co-create risk communication that reduces the limitations associated with traditional risk communication approaches where experts (or the public) determined risk communication content independently (Boase et al., 2017). By combining these two strands, risk communicators can potentially improve accuracy, comprehension, and engagement among target audiences through anticipating potential barriers (such as cognitive biases or misconceptions) that may hinder effective risk communication (Skarlatidou et al., 2023).

While the mental models approach has been applied in wide variety of risk settings including those associated with health, technology, crime and environment (Boase et al., 2017; Skarlatidou et al., 2023), there is limited published evidence of its use in understanding risk communication in the tourism context (Aliperti and Cruz, 2018). One exception is a study by Aliperti and Cruz (2018) who used MMA to explore the capacity of risk communication to influence tourists' behavior during an emergency. Starting from the proposition that tourists are often poorly informed about risks and emergency systems, and adapting an approach outlined by Boase et al. (2017) and Aliperti and Cruz (2018) compared the perspectives of three discreet stakeholder categories: government agencies, academic experts, and tourism suppliers in relation to tsunami risk information in Japan. Their analysis focussed on five main themes derived from stakeholder interviews: tourists' disaster preparedness; barriers to the success of risk communication with tourists; opportunities for employing mobile applications for disaster information for tourists; the best timing for delivery of risk information to tourists; and the need for country of origin-specific risk messaging. This allowed the authors to identify commonalities and differences between critical influencers in the risk communication system and ultimately recommend improved dialogue among stakeholders to better identify respective roles within the risk communication system (Aliperti et al., 2020).

Also focussing on the Japanese tourism context, Nagai et al. (2020) used MMA as a guiding framework to explore both experts (accommodation managers and city risk management representatives) and foreign employees' preparedness for disasters. The study revealed that pre-disaster risk communication was limited between managers and foreign workers, as was employees' knowledge about natural disasters (Nagai et al., 2020), a particular problem, given tourism and hospitality operators in many countries rely on a mobile and migrant workforce (Fountain and Cradock-Henry, 2020; Nagai et al., 2020). Based in particular on the insights offered by applying the MMARC framework in these recent

studies of risk communication and preparedness, and the similarity of studies in terms of the range of stakeholders interviewed, a similar framework has been applied to interpret the data from the current study.

3. The case study: the West Coast, New Zealand

As outlined above, The West Coast/ Te Tai Poutini has been specifically chosen as the case study location for this study due to its peripheral location, vulnerability to natural hazards, and appeal as a nature-based tourist destination. This is a region that is renowned for its rugged natural setting: a long, narrow strip of land perched between the Southern Alps and the Tasman Sea on New Zealand's South Island. The spectacular scenery attracts many domestic and international tourists. Among the "must see" attractions are the iconic Franz Josef and Fox Glacier and the "pancake rocks" at Punakaiki, although there are many other opportunities to appreciate the natural scenery on the numerous walking tracks in the region. There are also a range of adventure tourism activities on offer including guided glacier walks and eco rafting. This region is sparsely populated, being home to <33,000 residents, covering approximately 23,245 square kilometers. The economy of the West Coast region has traditionally relied on primary and extractive industries, including forestry, farming and coal mining, and while these are still the main contributors to the region's GDP, the tourist industry and associated economic impact has become increasingly important in recent decades (Development West Coast, 2020). Eighty percent of the region is public conservation land, managed by the Department of Conservation (DOC).

The unique geology and topography of the West Coast exposes the region to a range of natural hazards. Prevailing weather patterns means that the West Coast is New Zealand's wettest region. Annual rainfall totals at high elevations regularly exceed 10,000 mm per annum, with coastal locations at lower elevations receiving between 2,000 and 3,000 mm of rain annually (Macara, 2016). Four major flooding events have occurred within the past 5 years, with significant impacts on road and bridge networks, impacting tourist movements (Cui, 2022).

The Alpine Fault, a massive seismic fault with an estimated 75% probability of rupturing (causing a Mw 8.0 earthquake or more) in the next 50 years (Howarth et al., 2021), lies under the Southern Alps, which border The West Coast to the east. There are many other natural hazard risks at the popular attractions on the West Coast and these risks are increasing, largely due to the impacts of climate change (Somerfield, 2020). Hazards on the northern part of the region include coastal erosion, and storm-related flooding, landslides, and potential dam breaches. In the southern part of the region similar hazards exist, including landslips and bridge washouts, but also include the natural hazard risks associated with the popular tourists attractions of Fox and Franz Josef Glaciers. Climate change is responsible for the rapidly receding glaciers (Purdie et al., 2014), which have lost an estimated 30% of ice volume since the late 1970s (Chinn et al., 2012). The receding glaciers become increasingly "dirty" as ice melt exposes exposing rock, which can cause glacial valley walls to become unstable, increasing

the risk of rockfall, as well as icefalls and river surges (Purdie et al., 2015).

4. Methods

This study has used qualitative interviews with local informants to generate data about (i) tourism stakeholders' perspectives of Chinese tourists' awareness and preparedness for natural hazard risks and events; (ii) current natural hazard risk communication procedures and processes in place on the West Coast; and (iii) current barriers (and potential solutions) to communicating natural hazard risks to Chinese tourists.

Interview subjects were selected from organizations or businesses interacting with Chinese international tourists on the West Coast. Suitable interviewees were identified by a combined sampling method of internet searches, personal recommendations from the local regional tourism organization (RTOs), and snowball sampling of those involved in the industry. Many of the tourism businesses in the case study area have a long history of providing activities to visitors and over 10 years of experience providing services to Chinese tourists. All interviewees had experience of communication with Chinese international tourists on the West Coast, with some of this communication face to face, and some via marketing and other communication channels. Given the timing of these interviews during COVID-19 border closures, some interviewees were not currently working in a tourism role. Interviewees' association with the tourism industry ranged from a few years to over 25 years. Eight of the interviewees were European New Zealanders and five were of Asian-Chinese descent (see [Supplementary Table 1](#)). In total, thirteen interviews were conducted in January and February 2021. While this number is relatively small, it reflects the state of the tourism industry in the region at the time.

Interviews were semi-structured to ensure specific research objectives were addressed and were conducted in a conversational style. Each interview lasted between 40 and 90 min. These interviews were primarily conducted face-to-face at or near the informants' place of work on the West Coast, but a small number of interviews were conducted by telephone, as some informants were not working on the West Coast during the fieldwork period, and one was conducted in Christchurch, where the interviewee was based. Informants were encouraged to share their perspectives of the relative risk awareness and preparedness of Chinese tourists in relation to natural hazards, based on their experience with this market. Informants were also asked about their current natural hazard risk communication procedures, their organization's emergency plans and suggestions for improvements in communicating with visitors – including Chinese tourists – to the West Coast.

All the interviews were audio-recorded, with permission, and then transcribed verbatim. Thematic analysis was first employed to identify broad themes and patterns in the interview transcripts (Nowell et al., 2017), informed by previous research on this topic, with a number of sub-themes identified. Further analysis applied the first stage of the MMARC to explore the differences in perspectives amongst three groups of informants.

To support the findings from qualitative interviews, documentary analysis was undertaken to explore the risk communication strategies and messaging by central and local government agencies involved in tourism management, and by tourism organizations, specifically including the Department of Conservation (DOC), Development West Coast (DWC), Tourism New Zealand (TNZ), and the South programme from Christchurch International Airport (CIAL). This process involved a detailed reading of the various documents to ensure a good understanding of the connections between different agencies, stakeholders and strategies, and resulted in a diagrammatic visualization of these relationships, which enhanced understanding of the context in which the tourism stakeholders operated and allowed a greater appreciation of the risk communication system.

5. Findings

This section begins with an overview of informants' insights regarding Chinese tourists' hazard awareness, their preparedness and finally the challenges of, and opportunities to improve, risk communication to Chinese visitors. Utilizing a mental maps approach, these informants were divided into three groups, reflecting: (i) their distance from the Chinese tourist, and (ii) their distance from natural hazard risks. The first group consisted of informants who worked in marketing or management roles for national or regional tourism organizations or tourism businesses who had no direct contact with Chinese tourists immediately prior to the border closure, although some informants had direct customer contact earlier in their careers. Two of the members of this group were located in urban centers in the region and one was located in Christchurch. This group are referred to as "Managers" ($N = 3$). It should be noted, however, that many informants in management roles *did* have direct contact with Chinese tourists – particularly those working for small organizations or businesses – so they are incorporated in a different group. The second group of informants had regular direct contact with Chinese tourists, but in a location removed from the natural hazards themselves, for example, at tourist accommodation, heritage based tourist attractions or visitor information centers; they are described as "Service Providers" ($N = 5$). The third group of informants were predominantly involved in tour guiding, including in proximity to natural hazards, such as on walkways and glaciers. This group are referred to as "Tour Guides" ($N = 5$). [Supplementary Table 2](#) summarizes the similarities and differences in their 'mental maps' when considering Chinese tourists' natural hazard awareness and preparedness, and appropriate processes for natural hazard risk communication and management. These similarities and differences are discussed in more detail in the following sections.

5.1. Informants' perspectives of Chinese tourists' natural hazard awareness

All informants reported that most Chinese tourists had a low awareness of the natural hazards they might encounter on the West Coast; as one tour guide explained: "*Chinese tourists*

... have zero awareness of natural hazards. After checking into the hotel they only care about the wifi and sharing photos on social media or to their friends". There was also acknowledgment amongst informants, however, that in this regard Chinese tourists did not necessarily differ from other international tourists in the region. As a Department of Conservation (DOC) visitor center supervisor explained:

That's a common trait with all overseas visitors in New Zealand. They don't understand that the weather in New Zealand is very changeable; they think if it's blue sky in the morning it's going to be blue sky in the afternoon. That's not only Chinese; everybody that's coming.

There was recognition, particularly amongst service providers, that some nationalities had greater natural hazard awareness than Chinese tourists, particularly Australian and European visitors. The feeling was that the Australian market share language, cultural similarities and due to proximity, are more familiar with New Zealand and its environment, while European tourists participate in outdoor recreation pursuits in mountainous environments, meaning they have more experience with similar hazards.

All stakeholder groups recognized that Chinese tourists were not homogeneous, and in particular that there were substantial differences between group tourists and free independent travelers (FITs), with the latter generally having greater natural hazard awareness. These FITs were also generally younger, and had stronger English language skills which helped with risk communication. It is noticeable that informants with recent direct contact with Chinese tourists highlighted these differences in the market much more often in their responses than the managers. For example, the following comment from a glacier tour company employee is relatively typical of the comments made about FITs by service providers and tour guides:

The majority of our clients were Free Independent Travelers... These tourists are... mostly younger and social media users, so they've got information mostly before they came to do the tours. They have a better sense of what's happening on the glacier, and more awareness of natural hazards.

By contrast, managers with indirect contact offered more generalizations of the Chinese market, making statements such as: "What we do know from Chinese is you guys like bragging rights" and "Chinese are so connected with technology." This lack of nuance in perspective on Chinese tourists is perhaps due to the rapid growth in the FIT market which these informants hadn't observed first hand, however it is difficult to generalize due to the small sample size.

The main explanation given by informants for the limited natural hazard awareness of the Chinese market was their lack of familiarity with the context of the West Coast. All stakeholder groups agreed that the urban origin of most Chinese tourists meant that they had little experience in rural environments in general, and sparsely populated rural environments in particular. The lack of exposure to rural environments meant Chinese tourists often had limited experience of outdoor activities like hiking. Tour guides, in particular, commented on this characteristic: "In Western countries,

a lot of people are really used to nature, and they are used to outdoor activities, so they've got more understanding than Chinese tourists." This guide went on to explain:

A lot of [Chinese tourists] especially those who come traveling all over the world. Live in the city. So like with all those buildings... far away from nature... I should say they've never worn boots in their whole life.

Service providers and managers described how the rural environments in China differ from those in New Zealand, with the former having more facilities and developed infrastructure. In particular, the internet and communication 'black spots' were issues which this information center manager highlighted:

So the perception of our technology, the reception with phones and wifi... [Chinese tourists] definitely have a lack of knowledge of that... [so there is a] situation where they would need to be more prepared, because you've got no one to rely on but yourself because you can't ring anyone.

An accommodation provider explained how his staff needed to inform their Chinese guests about this issue: "When you travel to Franz Josef, they don't understand they probably would lose [phone/internet] signal... Our staff would keep reminding them 'Just be mindful, you won't have any internet coverage in the next 4 h.'" The large distance between destinations, coupled with the low population density, meant road conditions differed from those experienced in China, and issues with driving were seen as problematic by a couple of respondents. A lack of familiarity with the weather conditions, particularly the changability of the weather, and the difference in temperature at altitude was raised by stakeholders as a natural hazard risk for Chinese tourists. As an i-Site manager explained:

I think they are actually surprised if they experience bad weather... I definitely don't think they were very prepared for the weather changes in New Zealand in particular, because our weather changes so fast. With an hour's drive, you can have a change of weather... hot sunshine here and you can drive for an hour down the road... and it can be pouring down. So you pack for four seasons.

5.2. Informants' perspectives of Chinese tourists' natural hazard preparedness

As the above quotation suggests, a lack of natural hazard awareness amongst Chinese tourists also had implications for preparedness, and the changeable nature of West Coast weather – even in the peak summer season – often caught tourists unprepared in a number of ways. First, this lack of awareness meant many Chinese tourists could not imagine or envisage their own outdoor activities, such as guided glacier tours, being canceled due to adverse weather conditions, despite this being stated very clearly in the product guide, and for coach tourists, in their tour itinerary. Furthermore, informants reported that few Chinese tourists

traveled with travel insurance, unlike other nationalities. Service providers and tour guides recounted experiences of having to tell Chinese tourists about canceled activities. One informant from a glacier guiding operation told a poignant story to illustrate this:

One Chinese lady came to New Zealand for only three days just to visit the glaciers. When we told her the trip was canceled due to weather conditions, she was so shocked; she sat in the café for half day and couldn't believe it... She just didn't believe that a cancellation could happen on her trip.

Just as Chinese tourists assumed that nothing could get in the way of their trip, informants also suggested that these tourists assumed there were limited risks in organized tours. As one glacier guide and emergency management volunteer explained *"The problem with tourism is that people think... if it is an organized tour, it must be safe."* He continued: *"I think most Chinese tourists would expect it to be safe as well. If it's an organized tour it must be safe. That's the perception. But the reality is it's mountains, it's helicopters. And life is not 100% safe."* This failure to recognize the risks was relayed in various ways by tourist guides and service personnel, as they described the risky behavior of some Chinese tourists:

We know when we have people [in a tour] group who have no awareness, because they'll either be at the back, they'll be looking in a place where they shouldn't be, oblivious to noise or movement. And at that point, we always put somebody in a (hi-viz) vest around so that we can actually be seen (attraction provider).

There used to be a rockfall pass hazard and there was an area of track saying 'this is no stopping for 200 m' and it had icons. People would ignore the rock fall warning, they wouldn't even see the signs... particularly Chinese. I've seen them stopping in the middle on the rocks and having a picnic... lunch, picnic, photos etc. It's really risky (general manager and guide, glacier company).

They get very excited, which is difficult sometimes, because if we take a group down to the helicopters ... we need to keep everyone safe and stand still (general manager and guide, glacier company).

A common thread in these comments was that the risky behavior often resulted from a desire to take photos or videos, although again, it was acknowledged that this wasn't limited to Chinese tourists:

You're looking at a viewing point, but you actually hold the selfie stick and you miss a step, you could be over the bank. Even though we put up railing guards, Chinese seem to actually climb over the railing guards. But then that's in every culture – just really depends on what shot they want or what photo they want, or what experience they want, so it is not just Chinese (marketing coordinator RTO).

This failure to recognize the very real risks inherent in many of the nature-based activities available on the West Coast had other implications for Chinese tourists, including the

clothes and shoes worn for outdoor activities. Generally, only informants with direct contact with Chinese tourists commented on this issue, and there were clear differences between the perceptions of service providers and tour guides. A number of service providers suggested that Chinese tourists were generally unprepared for outdoor activities and West Coast weather conditions. A hotel manager observed: *"They come here, wearing bling shoes... New Zealand's selling point is natural; sports shoes normally is more suitable"*. Similarly, a DOC compliance officer reported:

They would actually turn up to sites looking unbelievable. I have to say they look amazing, but they wouldn't necessarily have the gear, the footwear, that would be appropriate for the walk. They wouldn't have factored in that it's sunny now [but] this afternoon will be pouring with rain.

Compared to these comments, informants working as tour guides or with glacier guiding companies were much less critical about the preparedness of Chinese tourists regarding their clothes and shoes; as a glacier company manager and guide explained: *"Most Chinese people would be relatively well prepared, dressed."*

There are a number of explanations given by informants for the lack of appropriate clothing amongst Chinese visitors, and while a failure to understand New Zealand weather conditions is one of them, the small part played by West Coast experiences in an overall New Zealand holiday is also acknowledged by a DOC visitor center supervisor:

A lot of them will come in and they would be prepared for summer holiday in New Zealand. They have jeans and t shirts and shorts and sandals ... but they weren't having any kind of outdoor gear.... It's completely understandable; you're not going to travel halfway around the world [with] big boots, a big jacket, all of that stuff just for a 1 day walk.

A final issue raised by informants regarding Chinese tourists' preparedness related to their perception of the locus of responsibility for managing natural hazard risks during their West Coast trips. Service providers and tour guides were most likely to comment on this, and all generally agreed that Chinese group tourists relied heavily on their tour leader or tour guide to manage risks for them; as a hotel operational manager explained: *Chinese normally heavily rely on the tour leader, and because of the language they didn't come to reception and ask what's going on. They'll go to the tour leaders first [and] as them what's going on."* The same reliance on tour guides was apparent in anecdotes about group tourists' behavior during natural hazard events. For example, an i-Site manager outlined their behavior during flooding events which left roads closed. She reported: *"Chinese tourists in tour groups won't really talk to you so much. They will go through the tour leader. The leader will obviously reassure them. The guides are usually quite experienced already."* The situation is somewhat different for FITs, who will ask questions of service providers. The contrast between visitor types and their source of information is explained by a DOC visitor center supervisor:

A lot of Chinese people that were coming in through the tours ... we wouldn't really need to interact with them too much because they always have a tour guide with them. The guides might stop into the visitor center ... but we never really see the people that were on the tours ... The only time that we see the visitors was when they come in and buy retail.

The numbers of FITS [have] definitely picked up in the last 2 or 3 years... They will usually want to do [one of the] local tracks, rather than just the normal well-known small tracks. They want to do a ... bit more for a day walk rather than just for a small walk to get a really nice photo... [They are] wanting the local perspective and to know what the cool things are that that locals do and then want to know the safety information and things like weather forecast as well.

5.3. Managing risk communication: processes, barriers, and opportunities

When discussing the processes of risk communication, and in particular the barriers to this communication, all three groups of informants acknowledged that language barriers posed particular challenges with the Chinese market, although again, service providers and tour guides acknowledged that FITs, who were generally younger, had better English language skills. As a tour guide explained: *"If there's any younger ones traveling, they have a comprehension of English, but the older ones maybe not so much... the younger generation can speak English quite well."* An attraction operator expressed her concern about the language barrier in the case of a natural hazard event, such as an earthquake:

I think any businesses on the coast who have a lot of Chinese visitors should have somebody who's either from China or familiar with the culture. Because ... if there were 200 people from China here, and not any of them can speak English, and there was an earthquake, what would happen? We'd be in trouble. What would we do? How could we help them? How could we guide them? How could we reassure them?

Interestingly, while the group tourists lacked English language skills, informants were generally less concerned about their lack of natural hazard awareness or preparedness than they were about the Chinese FITs traveling on their own. One accommodation provider explained that coach or group tourists were *"pretty much safeguarded by the tour"*. A tour leader explained his perspective:

My job responsibility is keeping my clients safe with no fear of continuing traveling around New Zealand. Oh! I did have worries; I worried the rain and potential consequences from natural hazards would block my way or the trip [but] I also take the responsibility to calm [my clients] down.

Tour guides seemed even less concerned about the lack of hazard awareness and preparedness of Chinese group or FIT tourists. As one glacier company general manager explained: *"We don't worry about [Chinese tourists' hazard awareness or*

preparedness] too much, because the nature of guiding is about managing the hazards for your clients." Informants from glacier guiding companies all gave detailed accounts of the safety briefings they provided to their Chinese guests. The glacier guides were also less concerned about Chinese tourists' clothing and footwear, as they provided all of the necessary equipment required to visit the top of the glaciers. As one guide explained: *"We give them boots and everything else ... we have everything, because most tourists are never 100% organized"*. This company has also developed processes to help tourists with "gearing up"; the guide observing that very few of the Chinese tourists have any experience wearing outdoor gear; she explained: *"I or the other guide needed to help them a lot; we even had to teach them how to correctly tie up their boot laces during the glacier tour."*

As highlighted above, there is more concern expressed for the Chinese tourists who are traveling independently around the West Coast. This relates to the previously-mentioned lack of preparation and awareness of driving conditions and communication black spots but of most concern – particularly amongst service providers – was Chinese FITs heading 'off the beaten track' for walks; contexts where the appropriateness of clothing and footwear, and awareness of changing weather conditions becomes critically important. A DOC information center supervisor described the tricky situation he found himself in when approached by Chinese visitors wanting to do a longer walk, acknowledging: *"you can't unpack somebody's bag to check they've got enough water, they've got enough food, or they've got the right rain jacket"*. He explained that he would try to ascertain preparedness through the questions he asked, and the information he provided:

(We ask): "Do you have a good rain jacket? Have you experienced walking and hiking like this before? And they (tourists) might say no. And then we told them: 'if you're walking in this kind of weather, you need a good base layer to keep you warm, a rain jacket to keep the water out, and a hat. You need those kinds of things'."

Understanding appropriate processes and responsibilities for risk communication remained a challenge in the eyes of most informants, as did overcoming a range of communication barriers. Interestingly, all informants agreed that more signage was not the answer – the region had plenty of signs – often in multiple languages – warning visitors of natural hazard risks, but these weren't particularly effective for Chinese, or many other tourist groups. In fact, some respondents felt like one of the problems was *too many* signs. A DOC informant summed up the issue raised by managers, service providers and tour guides alike:

I know a few tracks around the country, like they ended up putting safety signs and multiple languages at the start of the track ... but if you start going down that road, then it's kind of like where do we stop? Because the you end up with every sign put in different languages... then it kind of get overloaded with signage and it's never ending.

A tour guide concurred: *"I think there are too many [warning signs]... you drive down the road and you see signs, but you don't notice them any more because there are so many"*.

As well as too many signs, there was also a general consensus that many Chinese tourists – and other visitors – ignore signs. Some examples of resulting behavior have been outlined above. For some informants, this was due to tourists not noticing the signs, but other people felt that it related to differences in cultural norms or risk management processes in China compared to New Zealand. An accommodation provider explained: “*I think the Japanese are very rigid and sign oriented, and [if a sign] says stop, they won’t go. I think the Chinese are more laissez faire: ‘I will go on; let’s give it a go ... they are not bound by rules’*”, but acknowledged that the Chinese were not alone in this. An experienced Asian market specialist commented on this cultural element:

New Zealanders are very low key, very informal ... We (New Zealanders) assume that if we let tourists know the information, then we assume that they know it—however, Chinese tourists like the information in a more direct upfront way ... The current way we deal with the China market is, we would rather just give them all the information. So, we have told them everything and given them the choice to decide (what to do). But really, it should be the other way around, that they must obey once they choose to come here.

A DOC informant suggested that in China, if a walking track is risky, it would be closed and have a high fence around it to prevent access:

Whereas, in the public conservation spaces [in New Zealand], there are no fences, generally, and there is no owner. So, you can kind of do whatever you want. That’s the reason that Chinese tourists often choose to neglect these signs.

This insight was supported by a DOC service provider, who noticed that Chinese tourists appeared to assume that if a track was not manually blocked or closed, even if there are warning signs present, it is safe to enter, as she explained:

It seems to be specifically with Chinese visitors... (they) will come and ask us if a track is open. In New Zealand tracks, in general, weren’t closed. Even if it’s like, really bad weather, which is very dangerous for people. DOC will very rarely close the track, which is, I think, quite a different approach [from China]. But Chinese people seem to think if a track is open, then it’s safe for them to do that track... It’s common: ‘is this track open?’ and we’ll say ‘yes, it’s open’. As soon as they hear that, they think it must be safe to do and then we have to try to convince them not to do it... We’ll keep saying: ‘yes the track is open, but you shouldn’t be doing it because it’s dangerous’.

One solution suggested by both service providers and tour guides was to have more rangers and other personnel to ensure appropriate behavior, but it was recognized that the costs of such surveillance and ranger presence would be prohibitive. Another suggestion was to make better use of technology. This included having greater engagement with Chinese social media sites to enable tourists to prepare before they travel. As a Chinese marketer from a glacier guiding company explained: “*Each social media account of a tourism destination needs to create more posts about risk*

communication for international Chinese tourists. They all search for information on social media to prepare for their trip, especially young Chinese tourists.” Once in New Zealand, both service providers and tour guides suggested the value in developing apps specifically for this market, utilizing GPS to send advice and information direct to their phone in their own language. A tour guide explained:

So if I want to go on a trip, to and mountain, and if I go to the DOC website, maybe I can type where I am it gives me a map using GPS on my phone... Maybe it prompts you on your phone: ‘There’s a system where you register with DOC; you can get information on the track when you’re nearby.’

All stakeholder groups acknowledged that at least some of the lack of awareness of, or preparedness for, natural hazard risks amongst Chinese – and other – tourists is due to the positive destination images generally shared publically. As an i-Site manager acknowledged: “*We market the West Coast with all the positives, and the sunny, nice pictures, so when they come here, they are already committed.*” A tour guide concurred: “*I don’t think people do comprehend [the dangers], because they only see pictures, they see people on the snowy mountains... nothing looks too adventurous.*” The positive images relate not only to the official images shared by tourism operators and the regional or national tourism organization, but also to the many images posted on Chinese social media that shape the expectations of Chinese tourists. As a DOC informant explained:

That’s the Instagram shot we’ve seen. Because they don’t want to be seen with their hair that’s all messed up because of the wind. They don’t want to be seen with the five layers of coats. No, so they would take those off and ‘look at me!’ and then they put it back on.

This desire to see, and replicate, photos they have seen is one of the causes of risk taking behavior amongst tourists:

They really want to get to where they are going or to that view that they’ve seen in the marketing campaign... It doesn’t matter whether they have the gear or anything; they just want to get there, see that view, get the photo, experience it and then come back again (DOC information center supervisor).

While all informants agreed that natural hazard risk communication could, and should, be improved and would potentially result in an increased level of natural hazard awareness and preparedness among Chinese visitors, there was lack of agreement about whose responsibility it was to manage this communication, and how much to communicate. Managers and service providers suggested that tourists, tour operators and tour leaders were responsible for managing risks; an accommodation provider concluded:

If tourists are about to come to the West Coast tomorrow, the tour guide might need to tell them the basic knowledge of the West Coast. For example, the rain, the preparation, and so on; also inform them (tourists) that (rain) has built

this unique landscape ... To be a guide or leader, they must look after the group like their family, especially because of the language barrier.

By contrast, the tour guides were more likely to suggest accommodation operators as a useful source of information, particularly regarding weather conditions, with one suggesting:

I think accommodation (operators) can provide good communication because every tourist needs to stay in accommodation. If they could have information about the weather forecast... and the nearby road situation (that) would be beneficial. I understand that this information is usually available online, but if they could check them, and have a reminder in the reception that would be great.

Some service providers and tour guides thought that national and regional government agencies should take more responsibility for risk communication, as sharing too much information was not in the interests of tourism operators. As a tour guide explained: *“I think both accommodation providers and tour operators are not willing to talk about (natural hazard risk) too much to tourists because they don’t want to scare them away.”* This hesitancy to share too much information about natural hazard risks for fear of scaring away tourists was widely acknowledged by all stakeholder groups, particularly those with direct contact with tourists, as the following quotations show:

You don’t want us to be saying to a tourist: “It’s really dangerous”, you want us to say: “It’s a wonderful thing to do, just be careful OK?... As long as we wouldn’t be jeopardizing the other operator’s ability to receive the tourist (attraction operator).

I don’t see the (RTO) really talking too much about the potential of hazards or natural disasters. But I do see the general weather conditions on the website, so that informs people that if they come onto the West Coast they need a rain jacket. I think that’s important because you want to meet people’s expectations... I think it’s important to market the weather pattern, but we probably shouldn’t market for the flooding (i-site manager).

What is apparent amongst service providers and tour guides is that in some situations, particularly with group tourists, informing Chinese tourists about natural hazards to ensure they are prepared was seen as less critical than ensuring the operators themselves are prepared. A tour guide who also volunteered for Civil Defense in emergency management suggested: *“Maybe we don’t advertise [natural hazard risks] so much... [but] it’s always of the back of all of our minds to be ready to help when it does happen”*. An attraction operator echoed this sentiment:

When people come in here, we don’t tell them that there is a potential hazard... We rely on, I suppose, us doing the right thing after the event, by looking after them, and informing them, and getting them out of harm’s way, and also everything we need to do to prevent something happening in the first place.

6. Concluding discussion

This research set out to explore tourism stakeholders’ perspectives on the natural hazard risk awareness of Chinese tourists visiting a hazard-prone rural region of Aotearoa New Zealand. Study participants acknowledged that Chinese tourists generally lack natural hazard awareness and are relatively unprepared for the hazards they may face, however, they do not differ substantially from many other international tourists in this regard. There is recognition also, particularly amongst those with direct, day-to-day contact with Chinese visitors, that this market is not homogeneous, with group tourists and FITs having quite distinct characteristics, particularly around their English language skills (Prayag et al., 2015; cf. Gunawardana et al., 2022). It is interesting to note that when asked for explanations for Chinese tourists’ natural hazard awareness and preparedness levels, informants were more likely to present explanations related to contextual differences than to factors based on cultural norms and values. In this way informants generally explained a lack of natural hazard awareness and preparedness in relation to Chinese tourists’ urban lifestyles (cf. Burton et al., 1993; Smith and Espiner, 2007), lack of involvement in outdoor recreation and unfamiliarity with weather conditions, rather than to cultural norms, although these were not entirely absent from explanations. There is evidence, for example, that the vulnerability of Chinese visitors to natural hazard risk may be amplified by the different approaches to managing natural areas in New Zealand compared to China, resulting in a lack of understanding of the local management system toward hazards or natural disaster evacuation (Lindell et al., 2005; Nguyen et al., 2019). Furthermore, most informants acknowledged that Chinese tourist behavior was changing, as the proportion of FITs increased. Thus, these findings support the calls of Ooi (2019) to recognize that culture is not static, but evolves and responds to changing experience levels and contexts. As Gunawardana et al. (2022) attest “Chinese tourists demonstrate various tourist behaviors as they negotiate situational circumstances within the framework of the cultural norms, values and practices learned in their home environment” (p.3; see also Ma et al., 2021).

In the same way that Chinese tourist behavior is not homogeneous, neither are the perspectives of tourist stakeholders who interact with Chinese tourists (Sharpley, 2014; Monterrubio, 2018). Utilizing a MMARC approach to compare and contrast the ‘mental maps’ of tourism stakeholders revealed some differences in perspectives on Chinese tourists’ hazard awareness and preparedness and regarding responsibility for risk communication. In particular, those informants in service provider and tour guide roles who had regular and direct face to face contact with Chinese tourists had more nuanced perspectives of the Chinese market, compared to those managers with only indirect contact. Interestingly, when asked who should be responsible for risk communication, managers of national and regional organizations without direct contact with Chinese tourists felt that responsibility for risk communication lay with tourism providers and guides at the destination level, a perspective supported by some research (Becken and Hughey, 2013; Orchiston, 2013). Service providers and tour guides were more likely to feel that this was a responsibility of government agencies,

such as DOC and Tourism New Zealand. Such disagreements over responsibilities are frequently reported in tourism literature (Becken and Hughey, 2013; Arce et al., 2017; Bird and Gisladdottir, 2020).

A number of challenges and barriers were identified by tourism stakeholders when it came to the most appropriate tools and methods to communicate natural hazard risks to Chinese tourists. Across all three stakeholder groups there was agreement that signage alone could not be relied upon to ensure awareness of, and appropriate response to, natural hazards in West Coast tourism settings. While some informants suggested Chinese cultural norms or risk management practices in China as an explanation of this, there was general acknowledgment that Chinese tourists weren't alone in ignoring signs or barriers. The desire for a "picture perfect" photo to share on social media was often mentioned as the reason tourists ignored signage, but there was also a belief that tourists in general didn't notice signs due to their abundance and ubiquity. There were comments by informants with direct contact with Chinese tourists that the physical presence of rangers or staff was a better deterrent to risky behavior than signage alone, or greater engagement with Chinese social media sites and the development of apps to warn tourists in real time. In terms of how risk communication processes might be improved, some informants suggested that sharing natural hazard information before the tourists left home was critical for appropriate preparedness, but it was acknowledged that any natural hazard messaging (for example, the high levels of rainfall) would inevitably compete with (and potentially contradict) positive destination images.

In fact, what became apparent in interviews was a degree of ambivalence amongst service providers and tour guides about the need for Chinese tourists to be better informed about natural hazards, with fears that more hazard information might deter them from visiting the West Coast at all. This tension, between accurate hazard information and maintaining a positive destination image is a phenomenon documented in other studies, whereby tourism businesses and authorities are hesitant to increase pre-trip risk communication to international tourists in case it negatively impacts destination image (Arce et al., 2017; Bird and Gisladdottir, 2020). Instead, informants stressed the importance of having emergency management strategies in place, and risk management procedures established, to ensure natural hazards were managed for the tourists (either by tour leaders and guides, tourism companies or local government). While the rationale for this approach is clear, it does raise concerns about the extent to which tourists should be informed about potential risks they face when they embark on a tour or participate in a tourist activity; an issue that was thrown into stark relief in New Zealand in 2019 when the volcanic island of Whakaari White Island erupted, killing 22, and injuring a further 25, tourists and guides. Tourists caught up in the eruption later claimed that they had not been provided with sufficient information prior to their trip to enable them to properly evaluate the risks of taking a tour to this active volcano (March et al., 2020). Despite tourism industry concerns about the negative impact of hazard messages on tourist perceptions of the destination, previous studies show that open and transparent messages about risk are received with high trust by tourists (Ritchie,

2008). Honest messaging will also mean that tourists, including Chinese visitors, will have more realistic expectations about the conditions and experiences they might encounter, thereby potentially improving trip satisfaction (Armstrong and Ritchie, 2008; Carlsen and Hughes, 2008).

A final point of relevance is that while the growing proportion of Chinese FITs in New Zealand generally have good English language skills and are more likely to ask questions of service providers, in many ways they are more vulnerable to natural hazards than Chinese group tourists, whose limited English language sees them rely heavily on their tour leaders and guides to instruct them on what to do to avoid hazards, but also for help and instructions in the case of a natural hazard event (see also Dominey-Howes and Minos-Minopoulos, 2004; Fountain and Cradock-Henry, 2020). In the case of the independent Chinese tourists to New Zealand, any vulnerability to natural hazards seems more connected to lack of contextual knowledge – of road conditions, communication networks, weather conditions – and limited experience of outdoor recreation in unpopulated areas than to any disparate cultural norms or values.

It is an inherent feature of travel and tourism that natural (and other) hazards may be encountered en route. Hazard and risk is a growing preoccupation for tourism planners, managers and operators, and those with public responsibilities for risk communication and risk management (Espiner, 2001). This challenge is amplified in the management of visitors with backgrounds, hazard awareness and preparedness different from the host region or country. Understanding tourists' differences is particularly important considering the management of tourists in widely accessible public outdoor recreation settings, where significant natural hazard risks exist.

It is acknowledged that there are limitations with this research project. First, the number of informant interviews is relatively small ($N = 13$). This is in part a reflection of the scale and size of the tourism industry in this region, but more importantly, also reflects the timing of the study during New Zealand border closures, which meant many tourism businesses and organizations had downsized in response to the rapid decline in tourist numbers. In a similar way, the focus on supply side stakeholders – rather than the tourists themselves was a result of international border closures, meaning there were no international Chinese tourists in the country during the period of fieldwork. Despite these limitations, it is hoped that the insights from this research offer a useful starting point for further investigation into these issues.

The resumption of international tourism after 3 years' disruption due to the COVID 19 pandemic provides an opportunity for destinations to develop better natural hazard communication strategies and messages for returning tourists and to practice more 'joined up' thinking across the tourism system and between tourism providers and other sectors, including emergency management. The need for this work is increasingly urgent, with the growth of Chinese FITs and their increasing willingness to head 'off the beaten track', coupled with the increasing risks and hazards associated with natural

settings due to climate change. This paper has provided insights into critical issues in the context of New Zealand, with implications for all destinations and operators located in dynamic natural environments.

Data availability statement

The datasets presented in this article are not readily available because due to the nature of this research, participants of this study did not agree for their data to be shared publicly, so supporting data is not available.

Ethics statement

The studies involving human participants were reviewed and approved by Human Ethics Committee, Lincoln University. The participants provided their written informed consent to participate in this study.

Author contributions

JF and SE contributed to conception, design of the study, in their role as supervisors. AC undertook data collection and thematic analysis, with substantial input from JF and SE. AC wrote the first draft of the manuscript, which was substantially modified by JF. This included some re-analysis of data. All authors contributed to manuscript revision, read, and approved the submitted version.

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Conflict of interest

JF and SE declared that they were an editorial board member of *Frontiers*, at the time of submission. This had no impact on the peer review process and the final decision.

The remaining author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/frsut.2023.1192124/full#supplementary-material>

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