Increasing the resilience of the Deaf Community in NSW to natural hazards

Milestones 2 & 3 - Deaf Community Experience, Knowledge & Needs (Final Results Report)

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Deaf Community Experience, Knowledge & Needs Assessment

Final Results Report - Milestones 2 & 3

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List of Acronyms

ABC	Australian Broadcast Corporation
ABS	Australian Bureau of Statistics
ACCAN	Australian Communications Consumer Action Network
Auslan	Australian Sign Language
CALD	Culturally and Linguistically Diverse (Community)
DECCW	Department of Environment, Climate Change and Water
Displan	State Disaster Plan
EMQ	Emergency Management Queensland
FR NSW	Fire and Rescue New South Wales
IP-relay	Internet Protocol Relay
NGO	Non-government Organisation
NRS	National Relay Service
NSW RFS	New South Wales Rural Fire Service
NSW SES	NSW State Emergency Services
NSW	New South Wales
PTSD	Post-traumatic Stress Disorder
QLD	Queensland
RA	Research Assistant
TTYs	Teletypewriters
VRS	Video Relay Service

Key terms and concepts

Auslan: Australian Sign Language

Combat Agency: The agency identified in Displan as the agency primarily responsible for controlling the response to a particular emergency. (Source: SERM Act).

Australian Government Disaster Response Plan (COMDISPLAN): The COMDISPLAN outlines the coordination arrangements for the provision of Australian Government physical assistance to states or territories or offshore territories in the event of a disaster (Australian Government Attorney's-General Department, 2011).

Community: In *Communicating with people with a disability - National Guide for Emergency Managers (Attorney General's Department, 2013),*four types of *communities* are identified: (i) geographic communities (bounded by space or location), (ii) communities of interest (shared interests/characteristics/attributes), (iii) virtual communities (connected online), and (iv) communities of circumstance (shared issue or disaster experience). In this project, we align ourselves most closely with 'communities of interest' i.e. groups of people who interact with each other based on shared interests,attributes, social networks, modes of expression and identity.

Crisis: A distinct yet unexpected and non-routine event (or series of events) that threatens the lives of stakeholders and the viability of the affected organisation or population, thereby creating spheres of uncertainty and unknown outcomes (Caywood & Stocker, 1993; Seeger, Sellnow, & Ulmer, 1998). In doing so, crisis events demand urgent changes whilst simultaneously opening up opportunities for transformation (Farazmand, 2001).

Cued speech: a visual mode of communication that uses hand-shapes and placements in combination with the mouth movements of speech to make the phonemes of a spoken language look different from each other (National Cued Speech Association, 2013).

deaf: Someone who is deaf (denoted by a small 'd') is physically deaf but does not use Auslan or identify with the Deaf Community(Schembri, 2010).

Deaf: Someone who is Deaf (with a capital 'D') belongs to the Deaf Community and uses Auslan as their main language. They consider themselves to be 'normal' and not 'impaired' by their inability to hear - their identity is drawn from their shared culture and language and not from their inability to hear. Deaf people rely mainly on their vision (Auslan and text) to communicate and cannot usually hear speech even when amplified by a hearing aid (Schembri, 2010).

Deaf Community: The Deaf Community is a network of people who share a language, a culture, and a history of common experiences – similar to an ethnic community. The Deaf Community is well organised with national, state and local networks of sporting, recreation, social, special interest and advocacy groups(Schembri, 2010).

Disaster: A disaster is a complex, place-oriented product of a hazardous event and the historical outcomes of socio-political and economic forces (distinct from environmental forces) that have shaped societal structures and society's capacity to respond effectively to the hazard (Wisner, Blaikie, Cannon, & Davis, 2004). Disasters occur when a significant number of vulnerable people experience a hazard (or series of hazards) that cause severe damage to livelihoods and overwhelm the system, making recovery improbable without external aid (Wisner et al., 2004).

The State Disaster Plan (Displan): The NSW Displan details emergency preparedness, response and recovery arrangements for New South Wales to ensure the coordinated response to emergencies by all agencies having responsibilities and functions in emergencies (Ministry of Police and Emergency Services, 2011).

Emergency: An event, actual or imminent, which endangers or threatens to endanger life, property or the environment, and which requires a significant and coordinated response(Emergency Management Australia, 2004).

Emergency management: A range of measures to manage risks to communities and the environment (Emergency Management Australia, 2004).

Emergency service organisation: Government agencies in New South Wales that are charged (under the New South Wales State Disaster Plan) with the responsibility for managing or controlling an accredited rescue unit. These agencies include: the NSW Police, Fire and Rescue NSW, NSW Rural Fire Service, Ambulance Service, NSW State Emergency Service, and NSW Volunteer Rescue Association (State Emergency and Rescue Management Act 1989 No 165).

Fingerspelling: a form of sign language in which individual latters are formed by the fingers to spell out words(Oxford Dictionaries, 2013).

Hard-of-hearing: Those who define themselves as being hard-of-hearing or hearing-impaired see themselves as 'hearing' people with a hearing impairment or medical problem. This group of people usually prefer to use speech, listening (with the help of hearing aids) and lipreading to communicate over Auslan and do not identify with the Deaf Community(Macready, 2009; Schembri, 2010).

Hazard: A threat to humans and their welfare with the potential to cause loss (K. Smith, 1995).

Mitigation: In the context of disaster management, mitigation refers to structural and non-structural measures undertaken to limit the adverse impact of natural hazards (IFRC, 2012).

Natural hazard: Natural process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage (UNISDR, 2007).

Preparedness: The process of ensuring that an individual, population or organisation (1) has complied with preventive measures, (2) is in a state of readiness to contain the effects of a forecasted disastrous event to minimize loss of life, injury, and damage to property, (3) can provide rescue, relief, rehabilitation, and other services in the aftermath of the disaster, and (4) has the capability and resources to continue to sustain its essential functions without being overwhelmed by the demand placed on them(BusinessDictionary.com, 2012).

Home signs: A private sign system that is developed and used within a single family. For instance, when hearing parents with no sign language skills have a deaf child, an informal system of signs will naturally develop, unless repressed by the parents. Terms used to describe these mini-languages are home sign (most common term), private sign or kitchen sign (Disabled World, 2013).

Recovery: Decisions and actions taken after a disaster with a view to restoring or improving the pre-disaster living conditions of the affected community or population, while facilitating necessary adjustments to reduce disaster risk to future events (IFRC, 2012).

Resilience: The capacity of a system, population or household to absorb disturbance and reorganise throughoutvolatile periods of change whilst retaining function, structure and identity (see Folke, 2006; Walker & Meyers, 2004).

Risk: The calculated likelihood of an event or change taking place and negatively impactingan exposure unit (individual, household or population) resulting from a decision or course of action (D. M. Smith, 2000).

Signed English: a sign language dialect, which matches each spoken word of English. It is mostly used for language development, allowing a teacher to reinforce the spoken word with its equivalent sign (Sign.com.au, 2013).

Vulnerability: The degree to which an exposure unit [human groups, ecosystems andcommunities] is susceptible to harm due to exposure to a perturbation or stress, and theability (or lack thereof) of the exposure unit to cope, recover, or fundamentally adapt(Kasperson & Kasperson, 2001).

Executive Summary

The purpose of this report is to present the findings of the Deaf Community Needs Assessment, which aims toidentify what resources deaf people need to enable them to effectively prepare for, respond to, and recover from natural hazards and the challenges they face in accessing them. Specifically it:

1. Examines Deaf cultural traits and identifies preferred communication mediums and support networks Deaf people use in daily life and in times of need;
2. Identifieslevels of knowledge Deaf people have of hazards, natural hazard risk and people's current understanding of what the roles and responsibilities of emergency services are in supporting people;
3. Explores the actions Deaf people have taken before, during, and after past hazard events to better understand how deaf people respond to natural hazards, the resources they needed, and charts the challenges they face in getting access to these needed resources; and
4. Investigates the resources and strategies Deaf people in NSW believe will increase their risk awareness and help them better prepare and respond to natural hazards in the future.

In providing answers to these questions, it also fulfills the requirements of Milestones 2 and 3 of the project as detailed in the original project work plan approved for funding.

THE DEAF COMMUNITY, THEIR CULTURE, AND THEIR UNDERSTANDING OF RISK

Reducing natural hazard risk levels and bolstering preparedness begins with identifying *who*are at risk and the nature of that risk (*to what*). But the identification of *who* is more than the listing of demographics; it involves understanding how people identify themselves, how they operate in their daily lives and interact with each other, what drives their choices and actions in the face of risk, and how this risk is perceived. These characteristics and behavioural tendencies are hooks that disaster and emergency managers can use to build effective disaster management strategies that capitalise on the strengths of a population and provide support where needed.

The Deaf Community in NSW is a smallbut diverse group of people (estimated numbers range between 1,484 and 4,130) who are united by a shared language (Auslan), culture and common experiences. It is very important for Deaf people to feel like they are a part of the Deaf culture and community. It incites a sense of belonging and creates a sphere of inclusion, acceptance, trust, and equality. However, levels of social cohesion and connectedness varied greatly across the six regions. Residents in both the Northern NSW and Illawarra generally felt that they belonged to a strong cultural community. Responses from residents in Sydney, New England and the Central Coast were mixed, whilst Central West residents overwhelmingly felt that their community was weak and lacked strong social networks. This has implications for emergency and natural hazard management - those areas that have higher levels of social cohesion have larger support networks to draw upon in times of need. The existence of stronger networks also provides emergency services with natural entry points for community engagement.

The most favoured means through which to access risk information is family and friends, followed by television, text messages (largely received from family and friends), the Internet and Social media. Deaf people's knowledge of basic terms often used in disaster and emergency preparedness information material (crisis, emergency, disaster, hazard, and natural hazard) was low as were risk perceptions of natural hazards in NSW (generally) and more specifically in areas where people live. People cannot plan or effectively respond to risks that they don't know about or to event processes that they don't fully understand. Deaf people are also largely unaware of the roles and responsibilities of the NSW State Emergency Services, the NSW Rural Fire Service and Fire and Rescue NSW in relation to supporting community members before, during or after a natural hazard has occurred. Being unclear of the roles and responsibilities of the emergency services and asubsequent reliance on assistance that 'may never come' leaves people extremely underprepared and more vulnerable to natural hazards.

LESSONS LEARNT FROM PAST HAZARD EXPERIENCES

A key component of the Deaf Community Needs Assessment was to gain insights into how Deaf people have prepared for, responded to, and recovered from natural hazards in the past and to explore the possible challenges they faced. Our findings suggest that Deaf people's ability to anticipate and plan for the hazard events they faced was curtailed by a limited knowledge of the risks. The majority of the 15 people (out of a total 39 interview participants) we spoke to had no prior experience with hazards before the event that affected them. Consequently, they had no idea about what to do when they were confronted with the hazard event in question. Those that had experienced more than one natural hazard in their lifetime were better prepared and more likely to have an emergency response plan in place that the family followed.

Most had not received any warnings prior to the event. The consequences of not receiving any warnings (limited access to human capital) included: confusion, helplessness, panic for themselves and their children, and a complete state of unpreparedness.During the hazard event, communication was found to be the biggest issue Deaf people faced when responding to natural hazards. There was a lack of information on how to respond effectively during the hazard events people experienced (including what to do, where to go, who to contact, and how to access basic resources like food, shelter, money, and clothes) and a lack of appropriate communication mediums through which to obtain this information. The most common communication mediums used to access information on the changing nature of the hazard and what to do as the event unfolded were: face-to-face contact with other people including members of the public via the written word; SMS; the Internet and email; and television.

Access to strong social networks proved instrumental in helping people cope with and respond to the hazards they faced. Deaf people often turned to trusted social networks - family, friends, neighbours (Deaf and hearing), school teachers, trusted employers, and Deaf support organisations - for emotional and logistical support and informationduring and after the hazard events they experienced.

In many cases, support offered by the government was seen to fall short of meeting the needs of Deaf people causing frustration and mistrust in the government's understanding of their needs and subsequent ability to support them. People's experiences with the emergency services were also largely negative. Some people did receive support from the emergency services at some stage during the hazard events but it was felt that assistance often came too late. The main issues Deaf people had when interacting with emergency services personnel and first responders include:

- Emergency services personnel and first line responders exhibiting discomfort with having to communicate with Deaf people directly. Instead, personnel regularly chose to converse with any hearing individuals (even if the hearing individuals present were children);
- Communication methods used to disseminate evacuation warning and instructions (door-knocks undertaken by hearing people and audio loudspeakers) were largely ineffective causing Deaf people to be left stranded for hours, not knowing what to do and where to go;
- First responders not having enough patience to communicate with Deaf people via pen and paper and not offering to organise Auslan interpreters; and
- The language used by emergency services personnel and first line responders is too advanced for some Deaf people to understand.

This outcome is detrimental to future preparedness levels. Frustration and apathy felt by Deaf Communitymembers leads to a growing disconnect between communities and government support structures (in this case the emergency services and first line responders). This may not only deter community members from seeking help from these same organisations in the future (thereby removing a needed support structure and increasing their vulnerability to future events) but it also erodes the effectiveness of governance structures and processes put in place to help the very people they are alienating.

Lessons taken from these past experiences do, however, suggest that Deaf/deaf support organisations are well placed to help facilitate greater access to the resources Deaf people need to cope with the impacts of the experienced events and recover afterwards. They also help create spheres of safety and trust, and provide effective support for deaf people in emergency situations. Consequently they are a natural facilitating link between Deaf/deaf individuals, the emergency services, and the resources Deaf/deaf people need to effectively cope and respond to natural hazards.

KEY CHALLENGES DEAF PEOPLE FACE WHEN RESPONDING TO HAZARDS

The challenges identified from Deaf people's past hazard experiences correspond to those identified by the wider Deaf Community. This assessment has confirmed that language barriers and not having access to information in accessible forms greatly undermines Deaf people's response capabilities. However, the findings also indicate that not all of the identified challenges are related to communication. Cultural differences, education, mismatched expectations, and

social cohesion also play a role in influencing Deaf response capabilities. The key challenges are summarised below.

Communication barriers - the biggest challenge

- Language barriers - Auslan is the preferred language for most, with English often being the second language Deaf people learn;
- Risk and response information is often not available in accessible forms;
- Deaf people have limited options for contacting emergency services during a hazard event; and
- There is a shortage of Auslan interpreters in some parts of NSW (generally), making it particularly difficult for Deaf people to access them during emergency events.

Socio-cultural challenges to Deaf preparedness

- There is a lack of Deaf awareness amongst emergency services and the hearing public, which hinders their ability to effectively help Deaf people;
- There is a mismatch between what Deaf people expect emergency services to do for them in an emergency situation and the responsibilities emergency services are mandated to provide under the *NSW Disaster Plan* (Displan);
- Strength of community and social support networks varies across NSW, which leaves some people (particularly those in country areas) without adequate support and feeling isolated in a disaster or emergency event;
- Passivity versus activism and empowerment - some Deaf Community members believe that Deaf people are too passive in asking for the resources they need and rely too heavily on hearing people to help them and make decisions for them.

PREPAREDNESS SOLUTIONS TO INCREASE DEAF'S PEOPLES RESILIENCE TO HAZARDS

Deaf Community members recognise the need to take full advantage of a wide range of communication and telecommunication options/mediums to effectively disseminate information about natural hazard risk levels, warnings, and instructions on what to do. They also recognise the important role social networks play in assisting them in times of need and the need to capitalise on existing strengths to further improve these linkages within and across communities. In light of these challenges and identified needs, Deaf people in NSW have therefore identified a wide range of strategies and action points that they believe will increase their risk awareness and help them better prepare and respond to future natural hazards. These strategies and desired tools are grouped into the following four categories and are explained in detail in Section 6 of the report:

- Improving access to information;
- Telecommunication needs and solutions - covering mobile and landline solutions and those involving the Internet, TV, TTY, and Fax;
- Capacity building and educational actions; and
- Strategies for strengthening social capital within communities and building strong institutional linkages.

1 Introduction

New South Wales (NSW) (Figure 1) is affected by a range of natural hazards that take human life, cause injuries, and destroy private property and infrastructure. Risk management seeks to simultaneously increase the resilience and reduce the vulnerability of individuals and communities to the negative effects of natural hazards and their associated disasters. To achieve this, communities work together with local government authorities and emergency service organisations, but having the information needed to respond effectively before, during, and after an emergency or disaster event is crucial in determining a positive outcome.

During the January 2011 floods and Cyclone Yasi (February 2011) Queensland Premier Anna Bligh and Emergency Management Queensland (EMQ) used Australian Sign Language (Auslan) interpreters to communicate with the Deaf Community during live television conferences for the first time. This initiative was commendable but the power failed in relevant communities, causing TV broadcasts, Internet and telephone services to fail. This left the Deaf Community members with fewer means to receive emergency response information, leaving them vulnerable to ongoing events. In NSW there is currently no state emergency strategy or process to effectively assess the needs of the Deaf Community in a disaster setting and provide them with the assistance they need prior, during, or after a hazardous event. To redress this oversight, this project aims to:

1. Increase the resilience of the Deaf Community to future natural hazards and disasters via improved access to and provision of emergency management information; and
2. Increase the effective resources of NSW emergency service organisations enabling them to deliver their core business (to the Deaf Community) and to improve the deaf awareness ofstaff and professional officers within those organisations.

The objectives used to fulfil each aim are to:

1. Undertake consultation workshops and to conduct face-to-face interviews with representative members (and stakeholders) of the Deaf Community to:
   a. Determine current awareness of the Deaf Communityofnatural hazard and disaster risk in NSW;
   b. Identify the current sources of information used by the Deaf Community to help prepare for emergencies and to respond appropriately in hazard/disaster situations;
   c. Investigate the preferred forms of communication that will meet the needs of the Deaf Community during live emergency situations in the future; and
   d. Analyse existing capabilities of the NSW emergency service organisations (specifically, the NSW State Emergency Services, the NSW Rural Fire Services and Fire and Rescue NSW) to deliver risk information and warning messages to deaf people across NSW.

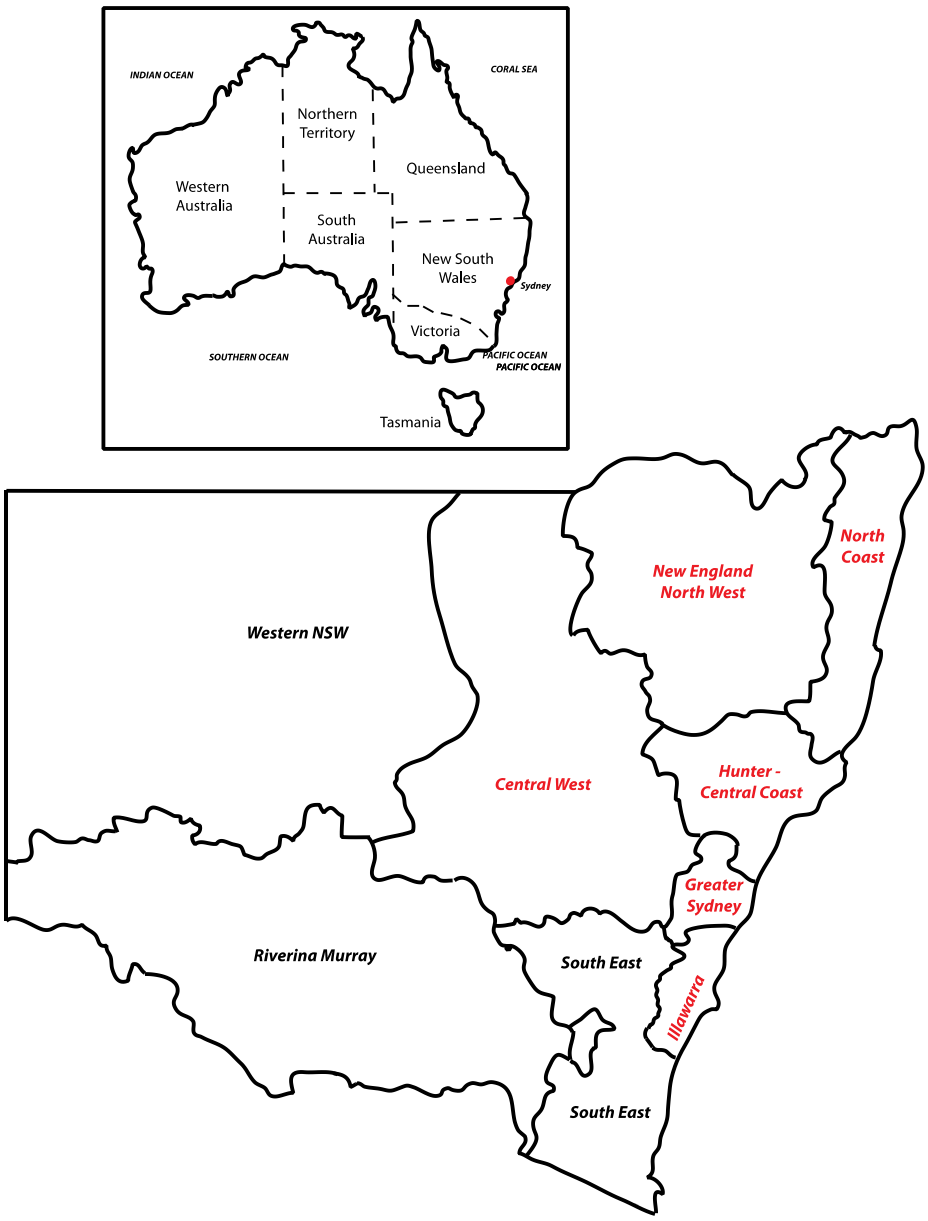

Figure 1: Location of New South Wales, Australia and its regions[1]

[1] Regions included in the study marked in red

2. Use the results generated from Objective 1 to devise a range of information communication sources/materials and strategies to meet the needs of deaf people in NSW;
3. Trial and test various communication and information sources for selected (high probability) hazard scenarios in NSW (determined by the NSW SES) with deaf people in NSW; and
4. Assist the NSW State Emergency Services, the NSW Rural Fire Services and Fire and Rescue NSW devise and implement a communication strategy to specifically cater for the needs of deaf people in NSW.

Therefore, to fulfill the aims of this project, a four-pronged approach was needed. This approach is detailed in Figure 2. This report presents the findings of the Deaf Community Needs Assessment. In doing so, it fulfills the requirements of Milestones 2 and 3 of the project. Milestone 2 represents the production of a series of focus group discussion and one-on-one interview questions and these are detailed in Appendix A, B and C. The results of the consultation with the NSW Deaf Community represent the bulk of this report and as such, achieve Milestone 3.

Figure 2: Four-step approach to strengthening disaster preparedness for deaf people

The remainder of the report is divided up into six sections. Section 2 outlines the aims of the Deaf Community Needs Assessment, the methods employed to conduct the assessment, and gives a brief overview of the challenges of undertaking the research. Section 3 examines the Deaf Community of NSW in the context of risk: the community's cultural attributes, levels of social cohesion and the support systems they use; and the preferred communication mediums and information sources Deaf people use to inform themselves of risk and appropriate preparedness strategies. Section 3 concludes with an examination of Deaf people's perceptions of natural hazards and risk, levels of emergency planning, and people's understanding of the roles and responsibilities of the emergency services. Drawing upon the personal experiences of Deaf residents in NSW, Section 4 explores how Deaf people have prepared for, responded to, and recovered fromnatural hazard events in the past and identifies the challenges they faced in getting access to the resources they needed at each stage of the disaster cycle.Section 5 details the key hazard response challenges Deaf people face. These include the communication barriers that inhibit their access to the information and resources they need to effectively plan and respond to hazardous events and wider socio-cultural issues that hinder people's response capabilities. Reflecting on these challenges, Section 6 presents a wide range of strategies Deaf people in NSW believe will increase their risk awareness and help them better prepare and respond to future natural hazards. The strategies and desired tools are grouped into four categories: improving access to information; telecommunication needs; capacity building and educational actions; and strategies for building social and institutional capital. The conclusions of the Deaf Community Needs Assessment are then detailed in the final section (Section 7).

2 Aims and methods

The main aim of the Deaf Community Needs Assessment (hereafter referred to as *the Assessment*) is to identify what resources Deaf people need to enable them to effectively prepare for, respond to, and recover from natural hazards and the challenges they face in accessing them. Arguably, the most fundamental resource needed to enable effective responses is knowledge - about risk, how best to respond, the type of resources and support people might need to respond, and how to get access to those - and access to that knowledge. In this Assessment, we therefore place much focus on identifying levels of risk knowledge and best ways to effectively communicate preparedness knowledge to deaf and hard-of-hearing people. We also have very limited information on: the actions Deaf people take during a hazard event; the sources and type of information they rely on for directives; the networks (personal or community-based) they turn to for assistance when their individual coping capacities are overwhelmed; the resources they need to help them respond effectively, and the challenges they may face in accessing these resources. Taking a holistic and highly contextual approach to disaster management (Calgaro, Lloyd, & Dominey-Howes, in press; Wisner et al., 2004), the objectives of this Assessment are to:

A. Ascertain levels of knowledge Deaf people have of hazards, natural hazard risk and available support systems (including the role of emergency services in supporting people);
B. Identify the communication mediums and support networks Deaf and hard-of-hearing community members use in daily life and in times of need;
C. Identify the current sources of information used by the Deaf Community to help prepare for emergencies and to respond appropriately in hazard/disaster situations;
D. Investigate the preferred forms ofcommunication that will best meet the needs of deaf people during live emergency situations in the future;
E. Explore the actions deaf people have taken before, during, and after past hazard events to better understand how Deaf people respond to natural hazards, the resources they needed, and chart the challenges they faced in getting access to these needed resources; and
F. Investigate other types of support and resources people would like or need to better prepare them for future natural hazard events.

Fulfilling these objectives will provide the foundational knowledge needed to inform the design of preparedness strategies and actions and communication protocols that effectively support the needs of Deaf people and increase their resilience to future natural hazard events.

2.1 Overview of methods

Three complimentary methods were used to fulfil the aims and objectives of the Assessment: focus group discussions (FGDs), open-ended interviews, and field observation. These are ‘standard research methods’ used in human and policy relevant research (Bird, Gisladottir, & Dominey-Howes, 2009; Hay, 2005; Hoggert, Lees, & Davies, 2002). A summary of the methods

used, the information obtained through the application of each method, the sources (participants) used, and how each method was deployed are provided in Table 1.

The research focussed on six regions in NSW, encompassing both country and city areas where most Deaf people live: the North Coast, New England, the Central Coast, Central West NSW, Sydney, and Illawarra (highlighted in red in Figure 1). There were three reasons for choosing to include these regions in the research:

a. Statistics from the Australian Bureau of Statistics suggest that these are the areas in NSW where Deaf populations are highest (ABS, 2012a);
b. The Deaf Society of NSW, our project partner and gatekeeping institution, has offices in each of these regions, making it easier for us to access Deaf Community members; and
c. These regions span both country and city areas, which enables us to get the perspectives of people with very different lifestyles and explore differences in the abilities that country residents had to access the resources they needed compared to those living in urban areas.

The research was undertaken in two phases. Phase 1 comprised of FGDs and semi-structured interviews. These were conducted over a total period of 3.5 months (late August - mid December 2012). Phase 2 comprised of a second round of FGDs that were undertaken over a 4-week period in April and May 2013. The FGDs and interviews were undertaken in Auslan, the preferred language of most Deaf people. Field observations were undertaken throughout the two research phases and used to supplement and corroborate findings gained from the FGDs and interviews, the two main methods used to collect the data. Wanting to be as inclusionary as possible, all efforts were made to recruit a broad spectrum of people in terms of age (excluding those under 18), gender, and location. Given the Deaf-focussed (culturally Deaf) mandate of the project and our stronger links to the Deaf Community (via the Deaf Society of NSW), our sample was skewed toward culturally Deaf people. However, deaf (nonAuslan users) along with some hard-of-hearing and hearing individuals chose to attend some of the FGDs also.

A total of 31 FGDs were undertaken across NSW: 15 in Phase 1 and 16 in Phase 2. In total, 278 people attended the FGDs. Every effort was made to recruit a wide cross-section of participants that was representative of NSW's Deaf population (see Appendix A for more detail). The FGDs conducted in Phase 2 took place once the data from Phase 1 had been analysed and preliminary results produced. Returning to the communities in a second phase was considered crucial on 3 grounds.

Table 1: Deaf Community Needs Assessment Research Methods Summary

Method	Purpose (informational needs)	Participants and Deployment	References
Focus group discussions	**PHASE 1:** ▪ Ascertain levels of knowledge Deaf people have of hazards, natural hazard risk and available support systems (including the role of emergency services in supporting people) (Objective A) ▪ Identify the communication mediums and support networks Deaf and hard-of-hearing community members use in daily life and in times of need (Objective B) ▪ Identify current sources of information used by the Deaf Community to help prepare and respond effectively to hazard/disaster situations (Objective C) ▪ Investigate the preferred forms of communication that Deaf people use on a daily basis and those communication mediums that meet the needs of Deaf people during live emergency situations in the future (Objective D) ▪ Explore the actions Deaf people have taken (or plan to take) before, during, and after past hazard events to better understand how Deaf people respond to natural hazards (Objective E) ▪ Investigate other types of support people would like or need to better prepare them for future natural hazard events (Objective F) **PHASE 2:** ▪ Present the preliminary results of the research to the community, giving them feedback on what we have learnt so far from the wider Deaf Community(feedback mechanism to encourage inclusiveness) ▪ Provide an opportunity for the community to give the researchers feedback on what we may have missed in terms of the needs and wants that the community have (Objective D and F) ▪ Further investigate the preferred forms of communication and devise communication strategies (with community input) that will meet the needs of Deaf and hard-of-hearing people during future live emergencies (Objective D) ▪ Deepen community discussions on needs-based actions and strategies (begun in Phase 1) with the community that will help Deaf and hard-of hearing community members respond better to future emergency and disaster situations (Objective D and F)	**PARTICIPANTS:** ▪ A broad spectrum of NSW residents participated in the FGDs. They spanned all ages (above 18), professions, living arrangements and marital status, gender, and location (city and country residents were well-represented) ▪ Whilst the sample was dominated by culturally Deaf individuals (in line with the project's mandate), deaf people as well as some hard-of-hearing and hearing individuals also attended some of the sessions **DEPLOYMENT:** ▪ Participants of the Phase 1 FGDs were recruited via: the networks of the Deaf Society of NSW and Deaf Society staff; personal and professional referrals; professional and social networks (both formal and informal) operating within the NSW Deaf Community; fliers posted on the Deaf Society's Facebook and Internet pages; adverts in the *Deaf* Herald; and snowballing techniques ▪ Two additional recruitment methods were used to enlist participants in Phase 2. Direct invites were sent to Phase 1 FGDs participants via email or SMS. A short Auslan video advertising the Phase 2 FGDs was also created and posted on the Deaf Society's Facebook and Internet pages	Cameron (2005); Goss and Leinbach(1996); Hesse-Biber and Leavy(2006); Kitzinger(1994).
Semi-structured interviews	**PHASE 1:** ▪ Ascertain how Deaf and hard-of-hearing community members identify themselves and their communities (related to Objective A) ▪ Identify the communication mediums and support networks Deaf and hard-of-hearing community members use in daily life and in times of need (Objective B) ▪ Gage levels of risk awareness and preparedness including how much community members know about the role of emergency services in the disaster cycle (Objective A) ▪ Gain insights into how Deaf and hard-of-hearing community members have coped with and responded to past emergency and natural hazard disasters and the challenges they have faced in gaining access to the resources they needed (Objective E) ▪ Ascertain what type of support community members need or want to help them better prepare and respond to future natural disasters and emergency situations (Objectives D and F)	**PARTICIPANTS:** ▪ 38 of the 39 interviews conducted were undertaken with Deaf or hard-of-hearing participants. Despite the small sample size, the research was designed to be as representative as possible. Therefore, every attempt was made to speak to a wide range of community members in terms of age, gender, geographical location, and past hazard experiences ▪ One of the 39 participants was a hearing Auslan interpreter who had intimate knowledge of Deaf communications issues and had witnessed first hand the challenges Deaf people faced when responding to 2 natural hazard events - the January 2011 floods and Cyclone Yasi (February 2011) **DEPLOYMENT:** ▪ Participants were recruited from the Phase 1 FGDs, personal referrals, social networks operating within the NSW Deaf Community, and snowballing techniques	Brockington and Sullivan (2003); Cresswell(2009); Dunn (2005); May (2001); Valentine (1997); Winchester (2005).
Field observation	**PHASE 1 & PHASE 2:** ▪ To reflect upon and record the issues being discussed in the interviews and FGDs and identify common or evolving themes as they emerge from the data collecting process ▪ To observe and better understand social dynamics - levels of group cohesion and inclusions (or exclusion) and the quality and nature of social relationships (including power dynamics) between key stakeholders	**SOURCES:** ▪ Observations undertaken in the six regions of NSW included in the research **DEPLOYMENT:** ▪ Observations were carried out throughout the fieldwork period during semi-structured interviews and focus group discussions ▪ Observations were recorded on a daily basis in fieldwork diaries and in photographs	Corti(1993); Kearns (2000); Kitchin and Tate (2000); Wolcott (1995).

First, our choice to return and report our findings demonstrated our commitment to 'giving back to the community' and helped us build rapport and trust levels. Second, this reporting exercise enabled the research team to: (i) present the preliminary findings to the community members and give them feedback on what had been learnt so far; (ii) to check the validity of our preliminary findings and give the community the opportunity to add things that had either been missed or overlooked in the first round of data collection; and (iii) it gave the researchers the opportunity to work closely with the community to refine and rank the identified preparedness strategies and actions. Third, it ensured that the research process was inclusionary - community members were included in the co-production of knowledge and took an active role in creating, refining and ranking preparedness strategies and actions that they felt would best meet their needs.

A total of 39 participants were interviewed across NSW in Phase 1 of the data collection. This small sample and the information derived from the participants is by no means representative. Rather, it provides a snapshot of the NSW Deaf population. Despite the highly opportunistic nature of the recruiting process, every attempt was made to speak to a wide range of community members. Particular emphasis was placed on talking to those who had experienced natural hazard events in the past - 15 of the 39 interview participants had prior hazard experiences. Thirty-eight of the 39 participants were Deaf or hard-of-hearing. The final interview was undertaken with a hearing Auslan interpreter. The advantages of including this individual in the sample were that: (i) his close working relationship with Deaf Community members gave him intimate insights into their needs and communication frustrations; and (ii) he had helped to support Deaf Community members during the January 2011 floods and Cyclone Yasi (February 2011) that affected both Queensland and Northern NSW residents and therefore saw first hand the challenges Deaf people faced when responding to live natural disasters (see Appendix B for more detail).

2.2 Research team

The research team was a cross-cultural team comprising of five core members. Dr Emma Calgaro (a hearing Research Fellow at UNSW) oversaw the design and implementation of the Assessment. Dr Calgaro worked in close partnership with four Deaf Research Assistants (RAs). Nick Craig and Julia Allen led the FGDs and the interviews. They were supported by Sherrie Beaver (Phase 1) and Leilani Craig (Phase 1 and 2). All RAs helped to refine the research design and method tools throughout different stages of the fieldwork, helped in the recruiting of participants, collected and prepared the data ready for analysis, and gave feedback throughout the analysis phase. Additional support was provided by Associate Professor Dale Dominey-Howes (Principle Investigator of the project at The University of Sydney (originally the University of New South Wales)) and Kate Matairavula (Deaf Society of NSW). Mrs Matairavula gave substantial input into the design of the methods (from the Deaf perspective) and helped operationalise the Deaf Society networks to aid with participant recruitment.

There were three crucial advantages of including Deaf assistants on the research team. First, they used their cultural knowledge to help refine the research methods and tools throughout different stages of the fieldwork to ensure that our approach and methods were 'Deaf-friendly' and culturally appropriate. Second, they used their contacts and insider knowledge of their community's social networks to recruit participants. Third, and most importantly, their presence in the FGDs and interviews fostered mutual trust and understanding between the researchers and participants. A hearing person who is not part of the Deaf culture cannot easily emulate this shared cultural understanding and trust.

2.3 Research analysis

Given that Auslandoes not have a written form that is used in everyday use[†], has no written form, the data was largely paraphrased and written up in English. Material deemed of particular relevance or importance to the analysis was, however, translated directly into English. Pseudonyms were used to protect the identity of participants (Dunn, 2005). Letters A to EE are used throughout the report to denote information obtained from each of the FGDs as outlined in Appendix A (Tables A1 and A2).Each interview participant was given a pseudonym in the form of a number between 1 and 39 to ensure anonymity (listed inTable B1 in Appendix B). Again these numbers are used throughout the report to denote the source of the corresponding information.

The data set was analysed using NVivo, a qualitative analysis software package.Nvivowas used in two ways. First, Nvivo was used to help group the data under pre-determined headings or 'nodes', which enabled usto retrieve all relevant data quickly, ready for manual analysis (see Dunn, 2005; Weitzman, 2000). These 'nodes' matched the main informational categories used in the semi-structured interview schedule. Second, NVivowas used to undertake text searches to help locate specific information and the participant sources for that information (QSR International, 2006). These spot-checks were most useful in the final stages of the analysis when informational gaps appeared and needed filling.

2.4 Research challenges

The implementation of the research design and methods was successful and the feedback was very positive. Many people were excited to be given the opportunity to learn about natural hazard risk (an unintended but positive outcome), inform government about the communication challenges they face, share their experiences with the research team and with others, and help design solutions. However, the process of working in a cross-cultural setting did present the research team with unique challenges that affected the type and amount of participants recruited in different locations and the quality of the data we collected from groups and individuals.

[†]Auslan does have a written form. However, this form is only used by linguists for research purposes

2.4.1 Recruitment issues

1. Every attempt was made to obtain a representative sample of the Deaf population in NSW. Deaf people respond best to information and requests that come from people or networks that they know intimately and are wary of people (particularly hearing people) that they do not know. Word-of-mouth is an extremely important (and trusted) information medium. Therefore, our recruitment strategy largely involved tapping into established networks (both formal and informal) to access participants. However, being reliant on established networks (informal and formal) meant that our sample was skewed to reflect the types of people that were already well-connected to established networks. These established networks that the research team knew of and had access to (including the Deaf Society's clients) are generally white. This meant that our sample was skewed somewhat toward a white demographic that may not reflect the diverse ethnic make-up of the NSW Deaf population. This reliance on established networks also meant that those people who are socially isolated (and in some instances geographically isolated) were possibly left out of the research process. This could have been an opportunity for these people to meet others and become more connected. Instead, they are arguably more vulnerable. This problem was acknowledged throughout the research process but no clear paths into solving it were found.

2. Attendance and interest was uneven across locations. This can be attributed in part to population numbers. There were, for example, more participants in Sydney than in regional areas. However, this does not fully explain the disparities between different areas. Deaf Society staff members advised that FGD attendance numbers in a given location was not necessarily reflective of the size of the estimated Deaf population. One reason given for this finding was the closeness of the communities in each area and the power of word-of-mouth. For example, Illawarra's community is very close and attendance was spurred on by good relationships Deaf people have with one another and the close relationship the Deaf Community have with the Deaf Society Illawarra officer.

3. There was difficulty in managing the numbers of the FGDs due to people not regularly confirming their planned attendance at scheduled events despite continuous reminders. This resulted in very large numbers in some FGDs, most notably in the Central Coast events (Phase 2). FGDs larger than 12 people are extremely hard to manage. Consequently, the facilitators found it very hard to successfully run the FGDs. The facilitators were therefore forced to turn some people away or redirect them to other events where possible.

2.4.2 Cultural issues

1. Due to the cross-cultural nature of the research, mismatches between English (the written word) and Auslan (a visual language) made it challenging for the Deaf Research Assistants to translate some of the interview questions into Auslan and explain some of the concepts to Deaf people. This caused frustration in some interview participants who thought they were being asked the same questions; the questions were different but tenses or slight nuances of questions were often misunderstood. The questions were continuously reworked to help alleviate these issues without changing the meaning. When misunderstandings arose, participants asked for examples to help them understand. Using examples to communicate meaning is a common practice in Auslan. The Research Assistants therefore had to balance the need to facilitate better understanding through the use of examples whist trying to avoid 'leading' the participants or distorting their natural answers.

2. There were marked differences in literacy levels, understanding and feedback between country and city people. Whilst there were very active individuals in all areas, city residents tended to be quicker to understand what was being asked of them and were quicker to give their opinions and respond to questions. In contrast, people from the country needed multiple explanations of the tasks and example answers to understand and participate effectively. City residents also proffered more ideas than their country counterparts. Country residents were more likely to rely on others to give them the answer (usually a hearing person if one was present) than give their own opinion. Furthermore, the RAs felt that FGD participants were often waiting to be presented with information (passive exercise with them as recipients of information) instead of generating knowledge. This mismatch of expectations left some participants feeling confused and others disappointed and frustrated. One reason for this is differences in literacy levels and access to education - people in the country generally have lower literacy levels than those in the cities. Another possible culturally-embedded reason for this is related to learnt dependencies. Many Deaf people have not be given the opportunity to voice their opinions on matters that concern them, causing them to accept (and expect) others to speak for them. It is hoped that this project will help give Deaf people a platform for sharing ideas and gaining confidence and conviction through the process.

3 Deaf culture, communication and risk

Reducing natural hazard risk levels and bolstering preparedness begins with identifying *who*are at risk and the nature of that risk (*to what*). But the identification of *who* is more than the listing of demographics; it involves understanding how people identify themselves, how they operate in their daily lives and interact with each other, what drives their choices and actions in the face of risk, and how this risk is perceived. These characteristics and behavioural tendencies are hooks that disaster and emergency managers can use to build effective disaster management strategies that capitalise on the strengths of a population and provide support where needed. Reflecting the project's emphasis on knowledge and effectively communicating that knowledge, the presentation of the report's findings begins by identifying the cultural traits of NSW's Deaf Community (as defined by them) including language use, levels of connectedness within the community and support systems people use in times of need. The discussion then moves on to focus on the preferred communication mediums deaf people use to receive knowledge and communicate in everyday situations, and the sources deaf people use to access risk and preparedness information. Finally, this section examines the community's perceptions of hazards and natural hazard risk in the areas where they live, levels of emergency planning, and people's current awareness of the roles and responsibilities of emergency service organisations.

3.1 Language usage

The Deaf Community of NSW is a small[‡] but diverse group of people who share a language (Australian Sign Language or Auslan), a culture, beliefs and practices that derive from a history of common experiences that are transmitted across generations (Padden & Humphries, 1988; Schembri, 2010). They are also a linguistic minority, with Auslan being used as the dominant language and communication (Table 2). The Deaf Community can therefore be classified as Culturally and Linguistically Diverse (CALD). However, not all deaf people are members of the Deaf Community[§]. Reasons Deaf people gave for learning Auslan are related to culture, identity and communication (Table 3). Other dominant linguistic communication mediums include spoken English, Signed English[**], and written English. The diversity of linguistic mediums used in the Deaf Community can make communication between members a challenge[33]. For example, some community members who don't know Signed English find it hard to understand Deaf people who use Signed English[37]. Furthermore, education levels differ vastly in this small but diverse community[9]. The variety of language and educational backgrounds found within the Deaf Community can make it hard for some to find others that are at the same level, inhibiting connectedness and causing frustration[9,21,39].

[‡]Data on how many Deaf people live in NSW is patchy and unreliable due to the ambiguous questions that the Australian Bureau of Statistics (ABS) use to collect the Census data. ABS 2006 Census data estimates the Auslan speaking population to be 1,484 people (ABS, 2012b) whilst Hyde and Power (1991) purport the number to be 4,130).

[§]see Key Terms and Concepts on pages vi-viii for definitions for *deaf* and *Deaf* people.

[**] See Key Terms and Concepts on pages vi-viii for definition of signed English.

Table 2: Language usage

Communication methods used	Percentage of participants
Auslan	100
Spoken English	50
Signed English	37
Written English	16
Other sign languages	13
Fingerspelling[††]	13
Cued speech[**]	13
Home signs[**]	5
Lipreading	3
Braille	3

Table 3: Reasons for using Auslan

Reasons for using Auslan	Source (interview participants)
Wanted a visual language due to problems in understanding or keeping up with oral communication	1,2,6
The participant grew up in a Deaf household	10
To better communicate with Deaf family members, and other deaf people	1,4,5,7,14,15,18,19,21,22,26,27,28,29,30,31,32,33,36,37,38,39
Learnt sign language at school	8,11,12,16,17,18,25,33
Participant cannot talk	35
Found sign language interesting	34
Auslan was considered an integral part of the participant's identity - "Because of my identity as a Deaf person"	23
Peer pressure to conform to cultural norms - one community member was harassed for using Signed English over Auslan	6

[††] See Key Terms and Concepts on pages vi-viii for a definition of *signed English,fingerspelling* and *cued speech,* and *home signs.*

3.2 Deaf culture

"Deaf people know how I feel, what my frustrations are and my feelings, hearing people do not know or will ever understand that. It doesn't matter if a hearing person has a deaf family, this person will still never fully understand 100% of what it's like to be a Deaf person"[21].

The majority of those interviewed (77%) considered themselves to be Deaf and part of the Deaf culture (Figure 3). Many grew up in the Deaf Community and culture[10,11]whilst others joined the community later as adults[36]. Only 8% of people characterized themselves as being deaf but not part of the Deaf culture, whilst the remaining 15% identified with both cultures. Other cultures people identified with include: Deaf-blindcommunity[33]; Jewish culture[10]; Italian culture[3]; Aboriginal culture[26]; Roman Catholic[15,18,20]; and Church of England[25].

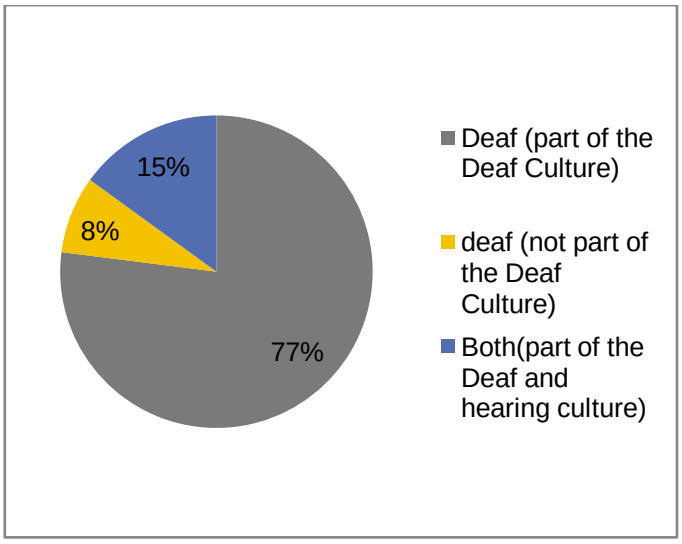

Figure 3: Dominant cultural identities

Characteristics that define the Deaf Community include:

- Common interests (44%);
- Shared language enabling clear and in-depth communication (85%)
- Common experiences (41%);
- Minority language cultural group with a common identity and values (49%).

Deaf people see numerous advantages in belonging to the Deaf Community, most quoted being the ability to effectively communicate with others, the opportunity to meet and socialise with others in Auslan, and feeling included and accepted (Table 4). There are, however, some disadvantages in belonging to this community, many of which are symptomatic of the small size of the community (Table 4).

3.3 Level of connectedness and support systems

Social capital - encompassing kinship networks, group membership, relationships, social cohesion, and levels of trust and reciprocity - is instrumental in helping people access the resources they need throughout their lives and promoting reassurance and stability in times of need(DFID, 1999; Munasinghe, 2007).Figure 4 shows that the majority (87%) of those interviewed stated it was very important to them to belong to the cultural groups they identified with. As noted in Table 4, being part of the Deaf Community and culture incites a sense of belonging and creates a sphere of inclusion, acceptance, trust, and equality[1,3,15,16,19,21,23,27,30,33,36,37,39]. It also helps people get access to resources they need on a daily basis[38]. Only 31% of those interviewed had experienced feelings of social exclusion at some stage in their lives[2,17,20,25,27,28,30,37,39]. However, when participants were asked if they felt that they were part of a strong community, the responses across NSW were mixed (Figure 5).

Residents in both the Northern NSW and Illawarra generally felt that they belonged to a strong cultural community. One Northern Rivers resident felt that the community was growing in strength due to the growth in the Deaf population caused by more and more people moving into the area[15]. Responses from residents in Sydney, New England and the Central Coast were mixed, whilst Central West residents overwhelmingly felt that their cultural community was weak.

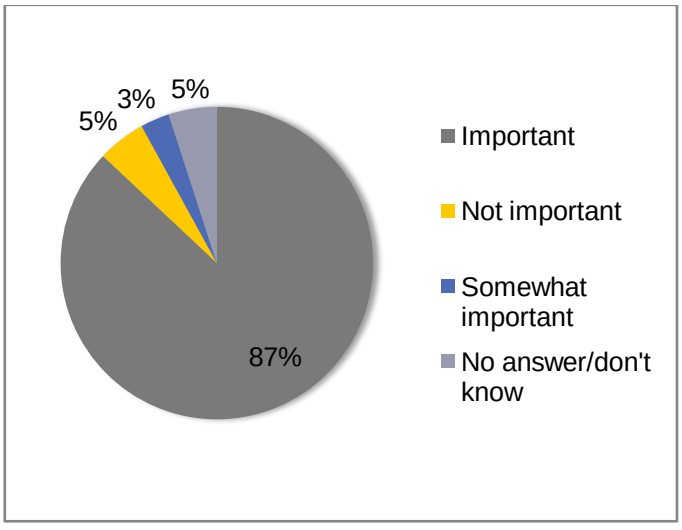

Figure 4: Importance of belonging to cultural groups

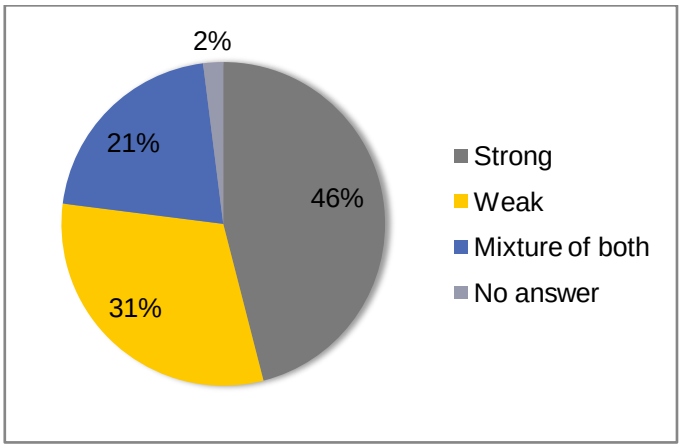

Figure 5: Perceptions of community strength and cohesiveness

Perceived weaknesses in community cohesiveness were largely attributed to location and the small size of communities[4,5,9,10,20,37,39]. Together, these attributes have left people with limited access to support services (Central West[37]andfar North Coast[20]) and feeling isolated from social events (noted in New England[22] and far North Coast[20]) and others with similar interests (Central West[37,39] and Central Coast[10]). General feelings of isolation amongst county people has prompted calls for more support to enhance connectivity:

> *"Contacting people who live far in the country is very difficult. It's very sad. This is something that needs to be improved. I want to see the Deaf Society make efforts to contact and include deaf people in the country. How?...I think the Deaf Society needs to find a way to work with schools that have deaf students to share and exchange information"[9].*

Members of theDeaf-blind community (a smaller sub-group of the Deaf Community who are deaf and blind but primarily identify themselves as being Deaf) feel particularly isolated due to a lack of access to social servicesand the inability to effectively converse with other Deaf Community members due to their lack of sight[33]. There is also a belief that the strength of communities (social cohesiveness) has decreased over time due to the wide usage of telecommunications technology, which allows people to keep in touch via mobile phone (particularly SMS), the Internet, and fax[5,8,9,27]. This development has caused social clubs to close down and face-to-face contact to diminish over time[5,8,9]:

> *"I remember when I was young, I used to go to Deaf Clubs every week to socialize and meet people. I used to see older Deaf seniors as role models for the younger generation where we learnt about their history, stories, etc., something that we can pass on to our next generation of Deaf people. The concept of a collective community like Deaf Clubs no longer means anything to the younger generation and they're missing out a lot on what could have been an opportunity to meet and learn about their own Deaf Culture and history. It's really sad. I personally believe that we should continue to have Deaf Clubs for all Deaf people"[9].*

Table 4: Advantages and disadvantages of belonging to the Deaf Community[‡‡]

Advantages	Disadvantages
▪ Opportunity to communicate, understand, and share/exchange information in Auslan without having to worry about misunderstandings and misinformation ▪ Opportunities to meet other deaf people, make other Deaf friends, and socialise in Auslan ▪ Feeling of inclusion and acceptance - feeling the same as everyone else, having a sense of belonging, and not feeling left out or lonely ▪ Great social options (café gatherings, seniors group, sporting events) with people that share a cultural heritage and experiences ▪ Having a support system for both existing members and those who are new to the Deaf Community ▪ Identifying and feeling like an equal to others - this feeling is missing when deaf people are around hearing people ▪ The small size of the community makes it easy to meet a wide variety of people, keep in touch and socialise regularly ▪ Having access to deaf support organisations such as the Deaf Society of NSW who can help deaf people share information and experiences (social learning) through workshops and social events ▪ Well-educated Deaf people often socialise and inspire those who lack quality education to improve their knowledge through socialising and communication ▪ Socialising with other Deaf people creates networking opportunities ▪ A source for receiving assistance in getting access to the resources Deaf people need every day ▪ Opportunity to meet and travel (overseas) with other Deaf people	▪ Whilst social events are very popular, for some community members in regional areas, getting access to these social events is difficult due to distance ▪ Too much gossip, rumours, and backstabbing ▪ Too little support generally, particularly in regional areas ▪ Deaf people often have lower education levels, which has a negative impact on attitudes and behaviour ▪ The small size of the community ▪ Not enough Auslan interpreters available ▪ Having to rely on hearing individuals (which in some cases are children) to communicate with others for basic services ▪ The community can be very narrow-minded ▪ Social events are too infrequent for some ▪ Some Deaf people are rude and arrogant

[‡‡]Listed in order of times quoted in the data

Furthermore, older members of the Deaf Community feel that there is currently too much of a reliance on them to organise events and advocate for their respective communities. They would like to see younger members of the community take the initiative and become more active in community affairs[15]. Despite these geographical, demographic, and technological issues, levels of connectivity are also a function of human agency - the choices individuals make. It is also recognised that some people actively chose not to be part of the Deaf Community, causing them to feel that their links to the community are weaker than others who choose to be more involved[31,32].

These regional place-based differences in levels of community cohesiveness have implications for the design of effective resilience building strategies. Communities with high levels of cohesiveness - Illawarra and Northern NSW - also benefit from strong support structures (formal or informal). Emergency services and support organisations can capitalise on these existing structures and use them to entice collective participation in and support for hazard reduction strategies. Existing social connectivity in Sydney, New England and the Central Coast can be used to build stronger networks. However, low levels of social connectivity recorded in the Central West means that foundational work is needed to strengthen social connectivity, build effective networks, and in doing so, increase resilience levels.

However, when the focus is shifted from the community to the household level, it is evident that access to social capital ismore widespread and evenly distributed across the state.The main support systems Deaf people turn for assistance in times of need are overwhelmingly kin networks (85%) and friends (54%) followed by Deaf support organisations (31%) and interpreters (31%) (Table 5). SMS is a common medium used by Deaf people to contact their chosen support structures[9,39]. There are also numerous support organisations or informal groups Deaf people actively use to connect with other Deaf or hard-of-hearing people and help them get access to resources they need in their daily lives. These are listed in Table 6.

A third of those interviewed were not aware of any support organisation in NSW whilst another 8% of participants had knowledge of them but did not use them. Of these participants (16 people or 38% of the sample group), 57% identified themselves as culturally Deaf, 12.5% identified themselves as being deaf, and another 12.5% identified as being both deaf and Deaf. Geography was cited as a reason for the lack of awareness of and engagement with deaf or hard-of-hearing support organisations[11,12,23]. All but three participants in this group were from regional areas. Most of the support organisations are based in the larger cities like Sydney and Brisbane, which made it more difficult for regional people to use them. Unfortunately, this has left some regional residents feeling “cut off from the services we need”[23]. However, some Deaf people are very proud of their ability to operate independently of support structures and made this very clear: “I am very capable of supporting myself and doing things on my own”[7].

Table 5: Support systems used by deaf people in times of need

Sources for assistance	Source (interview respondents)	Percentage of respondents
Family (Deaf & hearing)	1,2,3,4,5,6,7,8,9,10,11,12,15,16,17,19,20,21, 22,23,24,25,26,27,28,29,30,31,32,33,34,35,36	85
Friends	2,4,10,15,16,17,18,19,20,24,25,26,27,28,30,32,35,36,37, 38,39	54
Neighbours	1,11,12,18	10
Interpreters	1,3,5,6,9,14,19,20,21,24,26,29	31
Deaf support organisations[§§]	1,2,3,6,7,14,19,25,27,28,30,31	31
Work colleagues	34,35	0.5
Church/religious organisations	39	0.25
Governmental departments[***]	14,18,25,30	10
Emergency services[†††]	3,29,32	8
Other[‡‡‡]	6	0.25

Deaf people do not see the government as a trustworthy or effective support system. Opinions of the government (local and state level) and its capacity to serve the needs of Deaf Community members were mixed and largely negative. Many felt that the government tried to assist where they couldbut this often wasn't enough[2,10,11,12,14,34,35,38]. Three possible reasons were given for why this might be the case. First, the government is seen as not having the knowledge or skills necessary to effectively serve Deaf people[3,5,8,9,19,27,30,33,36,39] - "No, they absolutely lack understanding and support of Deaf, Deaf with disabilities, and Deaf-blind communities"[33]. Second, people think that the government do not see deaf people as a priority, and therefore place the needs of hearing people above those with hearing difficulties[8,29]. Finally, some felt that the government was untrustworthy, primarily interested in pursuing votes, and therefore continuously failed to effectively help the community they are supposed to serve[4,7,9,18,23,32,37] - "No they always talk but never keep their promises. Waste of my time"[9].

[§§] Deaf organisations mentioned include: Deaf Society of NSW, National Relay Service, Challenge Disabilities Services (CDS)

[***] Governmental departments include: Centrelink

[†††] For the participants, emergency services include: SES, Police, Ambulance, Fire services

[‡‡‡] Other includes: Breast Cancer Clinic.

Table 6: Deaf support organisations or groups actively used by Deaf people

Deaf support organisations	Source (interview participants)	Percentage of respondents
Australian Communication Exchange (incl. NRS & VRS)	2,6,14,19,27,28,30,31,	21
Deaf Australia	15,23,28	8
Deaf Australia (NSW)	23,26	5
Deaf Society of NSW	2,3,6,9,10,14,19,22,23,25,26,27,28,30,31,33,39	44
Disability Services	33	3
Vision Australia	33	3
National Auslan Interpreter Booking and Payment Service	3,6,9,19,23,27,30,31,37,39	26
Australian Hearing	2,3,6,21,38	13
Ephpheta Centre	3,15,23,31	10
Parents of Deaf Children	3	3
Royal Institute for Deaf and Blind Children	28	3
Kids of Deaf Adults (KODA)	3,30,31	8
Deaf Employment Services (Nova Employment)	5	3
Deaf Sports Australia	5	3
Community colleges	21	3
South Coast Deaf Coffee Group	2	3
Gold Coast Deaf Club	14	3
Deaf Services QLD	14	3

There were some exceptions to this dominant negative view. Some people praised local councillors (in the Blue Mountains and Tamworth) for their interest in deaf issues and supporting the Deaf Community[21,25,31]. There was also praise of the actions of the Bligh QLD government and the government's decision to collaborate with the Deaf Services Queensland to better support deaf people during and after the 2011 Queensland floods[18]. People would like to see the NSW government emulate the actions of the Queensland government and include Auslan interpreters in emergency announcements and instructions[18].

3.4 Communication mediums used

Advances in communication mediums have given Deaf people greater autonomy in accessing information[1,2,17]. The main communication breakthroughs listed by those interviewed were the introduction of teletypewriters (TTYs), fax machines, internet access (including instant chat programs like Skype and MSN messenger), mobile phones with SMS facilities, and most recently, smartphones[3,7,8,9,11,12,18,28,37]. The results show a shift away from deaf people accessing information second-hand from hearing individuals to them accessing information directly via

personal telecommunication devices such as mobile phones and smartphones[7]. This shift is summed up by a Central Coast resident:

> *Of course, technology has helped a lot in how we communicate. We have SMS that we can use to text, making communication easier, the Internet allows us to check emails to see what's happening instead of having to rely on a radio for information[10].*

However, the speed at which technology is developing and the complexity of new systems is making it harder for some deaf people to use it effectively:

> *Technology continues to advance over time andit has become difficult to keep up. Now, the latest is SMS. Many young people are experts in navigating through their smartphones. I'm not. I'm old but I'm still always learning… I remember when I worked with machines in the old days; everything was manual and simple to follow and fix. Later, technology changed to digital and then now, everything's computerized. Complicated![9]*

Smartphone usage was widespread amongst the research participants. Sixty-five percent of FGD participants and 55% of interview participants had a smartphone, whilst a further 34% of interview participants had mobile phones without Internet access. However, the higher costs of having a smartphone is a hindrance for some who would like one but cannot afford one[1,7,P].

Communication mediums used on a daily basis to obtain general information on things that interest them and what is happening around them and their ranking in terms of preference are listed in Table 7. Television is the favoured method followed by the internet and newspapers. The types of sources people favour to access specific information on risk differs slightly (Table 8). The most favoured means through which to access risk information is family and friends, followed by television, text messages (largely received from family and friends), the Internet and Social media.

Table 7: Everyday communication mediums used

Communication medium used	Rank
Television with captions	1
Internet & email	2
Newspaper	3
SMS alerts	=4
Word-of-mouth	=4
Newsletters/pamphlets	6
Hearing family/friends	7
Social media (Facebook)	8
Teletext	9
Fax	10

3.5 Knowledge and perceptions of hazards and risk

Knowledge of risk (a form of human capital) is not the only factor that determines risk perception and subsequent action or inaction (see Bird, Gisladottir, & Dominey-Howes, 2010; Paul et al., 2009; Rippl, 2002). However, a lack of risk awareness - due, in part, to limited access to information and no prior exposure or experiences with hazard events -does rob people of the choice to increase their preparedness to those possible risks(US-IOTWS, 2007). This, in turn, curtails their ability to cope and effectively respond and recover from hazards (US-IOTWS, 2007). Knowledge of basic terms often used in disaster and emergency preparedness information material was generally low. Interview participants were asked to define the following five terms: *crisis, emergency, disaster, hazard, and natural hazard*. As shown in Table 9, only two terms - *emergency* and *natural hazards* - was correctly defined by more than half of those interviewed. The term *emergency* was best understood (59%) whilst disaster was the worst understood (74%).

This demonstrates a strong need for education on disaster preparedness terminology, the types of risk that people are exposed to in NSW and in regions where people live, and what types of actions people need to take, before, during, and after a natural hazard.

Table 8: Sources used by Deaf people to access risk information

Sources of risk information that Deaf people use	Times cited in FGDs & interviews	Ranking
Family/friends/neighbours/colleagues/doctors/carers (hearing & non-hearing)	62	1
TV with captions/interpreters	44	2
SMS (family/friends/ESs)	33	3
Internet (generally on PCs & smartphones)	23	=4
Social media (Facebook/Twitter/Instagram)	23	=4
RFS/SES/police via door knocks/websites/phone apps/TTY calls/NRS calls/direct visits to police station	19	=6
Community newsletter/brochures/noticeboard/neighbourhood office	19	=6
Word-of-mouth	14	8
Newspapers (but not always up-to-date)	13	9
Email (generally)	9	10
Radio via hearing person	7	=11
Have never received any hazard information	7	=11
Animal warnings/dog barking	4	=13
Visual prompts (no cars on highways/flowers on highways/see ES vehicles with sirens on/fire ban signs on major thoroughfares)	4	=13
Email registry with councils/ESs	3	=15
Disaster/emergency workshops	3	=15
Apps (Silent tweets, WhatsApp)	3	=15
Deaf Support Organisations	2	=18
Fax	2	=18
Warning signs in public areas	2	=18
Deaf Society of NSW	2	=18
Phone (via hearing people)	2	=18
Pager	1	=19
Skype	1	=19
BOM website	1	=19
Government agencies	1	=19
Following the actions of hearing people	1	=19
TTY	1	=19
First Aid certified individuals	1	=19

Table 9: Knowledge of key disaster and emergency planning terms

Term	Yes (correct)	No (incorrect)	Don't know	No answer	Total
Crisis	18%	44%	31%	7%	100%
Emergency	59%	36%	5%	5%	100%
Disaster	3%	74%	21%	2%	100%
Hazard	31%	51%	16%	3%	100%
Natural Hazard	50%	26%	23%	8%	100%

3.5.1 An overview of natural hazard risk perceptions and climate change in NSW

Knowledge levels and perceptions of natural hazard risk amongst Deaf Community members were low. Risk perceptions that Deaf people have of natural hazards that affect NSW (generally) and the place in which they live also differs greatly from natural hazard occurrences and risk levels identified by scientific evidence. Comparisons between Table 10 and Table 11 demonstrate the disparity between the hazards Deaf people think affect NSW (some of which are not natural hazards) and those that the Department of Environment, Climate Change and Water (DECCW) identify.

The majority of those interviewed had some understanding of climate change (Table 12). Of those interviewed, 64% thought that climate change would affect them in some way (Table 13). The perceived effects of climate change include:

- Shorter winters and hotter summers[1];
- The weather will get hotter, drier and be harder for people to endure[2,10,14,17,31,33,34];
- Unpredictable weather changes and patterns[3,4,7,8,9,11,12,17,18,19,20,24,30,31];
- Heavy rains[15];
- Stronger and more frequent hazard events[3,4,9,29];
- More droughts, low dam levels, and water restrictions[10,27].

The following sections provide a regional breakdown of Deaf people's risk perceptions beginning with Sydney.

Table 10: Natural hazards in NSW - community perceptions

Hazard	FGD votes
Bushfires	16
Cyclone	14
Hail storms	14
Wind storms	14
Dust storms	13
Earthquake	13
Floods	13
Lightening	11
Storms	11
Tsunami	10
Landslide	7
Tornados	6
Thunder storms	5
Black-outs*	5
Sand storms	4
Mudslide	4
Snow storm	4
Heatwaves	3
Blizzards	3
Tidal surge	2
Train collision*	2
Road accident*	2

Hazard	FGD votes
Sand-slide	1
Riverine floods	1
Dam overflows	1
Droughts	1
Fog	1
Volcanos	1
Black ice	1
Beach rips	1
Avalanche	1
Flash waterfall	1
Rough seas	1
Rock erosion	1
Gas explosion*	1
War coming*	1
Terrorists*	1
House fires*	1
Drowning*	1
Bridge collapse*	1
Car accident*	1
UFOs*	1

* Not technically natural hazards

Table 11: Natural hazards in NSW based on governmental risk data

Natural hazards in NSW
Bush fires
Wind storms
Hail storms
Lightening
Flash flooding
Riverine flooding
Heatwaves
Coastal erosion and inundation

Source: DECCW (2010b).

Table 12: Knowledge of climate change

Understanding of climate change	%
Yes	62
No	13
Unsure	26

Table 13: Perceptions of climate change impacts

Will climate change affect you?	%
Yes	64
No	26
Unsure	10

3.5.2 Risk profile in Sydney

Hazard awareness and risk perceptions are influenced by several factors, one of which is peoples' direct and indirect experiences (Pidgeon, Kasperson, & Slovic, 2003; Sjöberg, 2000). The types of hazards that Deaf people living in Sydney have experienced throughout their lifetimes include:

- Hailstorms
- Heatwaves
- Droughts
- Bushfires
- Dust storms
- Riverine flooding
- Coastal erosion and inundation
- Flash flooding
- Wind storms
- Lightening
- Earthquakes

Table 14 compares (i) community natural hazard risk perceptions in Sydney (which hazards affect Sydney the most) *with* (ii) the natural hazards that the Department of Environment, Climate Change and Water (DECCW) identify as occurring in Sydney and the expected impact climate change will have on the frequency of these events.

Table 14: Comparison of hazards identified by community versus DECCW - Sydney

Community hazard perceptions	Ranking
Bushfires	=1
Hail storms	=1
Lightning	3
Flash Floods	4
Wind storms	5
Heatwaves	6
Heavy Rain	7
Dust storm	8
Riverine flooding	9
Earthquake	10
Thunder storm	11
Tsunami	12
Erosion	13
Cyclone	14
Locusts	15
Landslide	16

Source: data from Phase 1 FGDs in Sydney

VS

Natural hazards in Sydney identified by DECCW	Climate change impact
Bush fires	↑ Projected increase
Wind storms	≈ Uncertain impact
Hail storms	≈ Uncertain impact
Severe hail storms	≈ Uncertain impact
Severe thunder storms	≈ Uncertain impact
Lightning	≈ Uncertain impact
Flash flooding	↑ May increase
Riverine flooding	↑ Likely increase
Heatwaves	↑ Projected increase
Coastal erosion & inundation	↑ Projected increase
Tsunami related inundation	↑ May increase

Source: DECCW (2010c)

3.5.3 Risk profile of North Coast

The types of hazards that Deaf people living on the North Coast have experienced throughout their lifetimes include:

- Hailstorms
- Tropical cyclones
- Droughts
- Bushfires
- Dust storms
- Riverine flooding
- Coastal erosion and inundation
- Flash flooding
- Wind storms
- Lightening
- Earthquakes

Table 15 compares (i) community natural hazard risk perceptions on the North Coast (which hazards affect the North Coast the most) *with* (ii) the natural hazards that the Department of Environment, Climate Change and Water (DECCW) identify as occurring on the North Coast and the expected impact climate change will have on the frequency of these events.

Table 15: Comparison of hazards identified by community versus DECCW - North Coast

Community hazard perceptions	Ranking
Bushfires	1
Hail storms	=2
Flash Floods	=2
Thunder storm	4
Wind storms	5
Heatwaves	=6
Dust storm	=6
Erosion	=6
Riverine flooding	=9
Lightning	=9
Cyclone	11

Source: Phase 1 North Coast FGD data

VS

Natural hazards in North Coastidentified by DECCW	Climate change impact
Bush fires	↑ Projected increase
Wind storms	≈ Uncertain impact
Hail storms	≈ Uncertain impact
Severe thunder storms	≈ Uncertain impact
Lightning	≈ Uncertain impact
Flash flooding	↑ May increase
Riverine flooding	↑ Likely increase
Heatwaves	↑ Projected increase
Coastal erosion & inundation	↑ Projected increase
Tsunami related inundation	↑ May increase

Source: DECCW (2010a)

3.5.4 Risk profile of New England

The types of hazards that Deaf people living in the New England region have experienced throughout their lifetimes include:

- Hail storms
- Grass fires
- Dust storms
- Bush fires
- Earthquakes
- Riverine flooding
- Heatwaves
- Coastal erosion and inundation
- Flash flooding
- Wind storms
- Lightening
- Severe storms
- Snow storm

Table 16 compares (i) community natural hazard risk perceptions in the New England (which hazards affect New Englandthe most) *with* (ii) the natural hazards that the Department of Environment, Climate Change and Water (DECCW) identify as occurring in New Englandand the expected impact climate change will have on the frequency of these events.

Table 16: Comparison of hazards identified by community versus DECCW - New England

Community hazard perceptions	Ranking	VS	Natural hazards in New Englandidentified by DECCW	Climate change impact
Lightning	1		Bush fires	↑ Likely increase
Wind storms	2		Wind storms	≈ Uncertain impact
Hail storms	=3		Hail storms	≈ Uncertain impact
Flash Floods	=3		Severe thunder storms	≈ Uncertain impact
Bushfires	5		Lightning	≈ Uncertain impact
Riverine flooding	6		Flash flooding	↑ May increase
Heatwaves	7		Riverine flooding	↑ Likely increase
Heavy Rain	8		Heatwaves	↑ Projected increase
Grass fires	9			
Cyclone	10			
Dust storms	11			
Earthquake	12			

Source: Phase 1 New England FGD data

Source: DECCW (2010b)

3.5.5 Risk Profile of Central Coast

The types of hazards that Deaf people living on the Central Coast have experienced throughout their lifetimes include:

- Hail storms
- Heatwaves
- Dust storms
- Bush fires
- Earthquakes
- Riverine flooding
- Drought
- Mudslides
- Wind storms
- Lightening
- Severe storms

Table 17compares (i) community natural hazard risk perceptions on the Central Coast (which hazards affect the Central Coastthe most) *with* (ii) the natural hazards that the Department of Environment, Climate Change and Water (DECCW) identify as occurring on the Central Coastand the expected impact climate change will have on the frequency of these events.

Table 17: Comparison of hazards identified by community versus DECCW - Central Coast

Community hazard perceptions	Ranking	VS	Natural hazards on the Central Coastidentified by DECCW	Climate change impact
Bushfires	1		Bush fires	↑ Projected increase
Wind storms	2		Wind storms	≈ Uncertain impact
Riverine flooding	3		Hail storms	≈ Uncertain impact
Hail storms	4		Severe hail storms	≈ Uncertain impact
Thunder storm	5		Severe thunder storms	≈ Uncertain impact
Lightning	=6		Lightning	≈ Uncertain impact
Dust storm	=6		Flash flooding	↑ May increase
Drought	=8		Heatwaves	↑ Projected increase
Earthquake	=8		Coastal erosion & inundation	↑ Projected increase
Heavy Rain	=8		Tsunami related inundation	↑ May increase
Sea surge	11			
Heatwaves	12			

Source: Phase 1 Central Coast FGD data

Source: DECCW (2010c)

3.5.6 Risk profile of Illawarra

The types of hazards that Deaf people living in the Illawarra region have experienced throughout their lifetimes include:

- Hail storms
- Heatwaves
- Dust storms
- Bush fires
- Earthquakes
- Riverine flooding
- Drought
- Mudslides
- Wind storms
- Lightening
- Severe storms
- Flash flooding

Table 18 compares (i) community natural hazard risk perceptions in the Illawarra (which hazards affect the Illawarra the most) *with* (ii) the natural hazards that the Department of Environment, Climate Change and Water (DECCW) identify as occurring in the Illawarra and the expected impact climate change will have on the frequency of these events.

Table 18: Comparison of hazards identified by community versus DECCW - Illawarra

Community hazard perceptions	Ranking
Wind storms	1
Flash flooding	=1
Sea surge	3
Heavy Rain	4
Bushfires	5
Hail storms	6
Lightning	7

Source: Phase 1 Illawarra FGD data

VS

Natural hazards in the Illawarraidentified by DECCW	Climate change impact
Bush fires	↑ Likely increase
Wind storms	≈ Uncertain impact
Severe wind storms	≈ Uncertain impact
Hail storms	≈ Uncertain impact
Severe thunder storms	≈ Uncertain impact
Lightning	≈ Uncertain impact
Flash flooding	↑ May increase
Riverine flooding	↑ Likely increase
Heatwaves	↑ Projected increase
Coastal erosion & inundation	↑ Projected increase
Tsunami related inundation	↑ May increase

Source: DECCW (2010a)

3.5.7 Risk profile for Central West

The types of hazards that Deaf people living in the Central West have experienced throughout their lifetimes include:

- Hail storms
- Heatwaves
- Bush fires
- Flash flooding
- Riverine flooding
- Drought
- Wind storms
- Lightening
- Severe storms

Table 19 compares (i) community natural hazard risk perceptions in the Central West (which hazards affect the Central West the most) *with* (ii) the natural hazards that the Department of Environment, Climate Change and Water (DECCW) identify as occurring in the Central West and the expected impact climate change will have on the frequency of these events.

Table 19: Comparison of hazards identified by community versus DECCW - Central West

Community hazard perceptions	Ranking	VS	Natural hazards in the Central Westidentified by DECCW	Climate change impact
Black Ice	1		Bush fires	↑ Projected increase
Bushfires	2		Wind storms	≈ Uncertain impact
Storm	3		Hail storms	≈ Uncertain impact
Flash flooding	4		Severe thunder storms	≈ Uncertain impact
Lightning	5		Lightning	≈ Uncertain impact
Heavy Rain	6		Flash flooding	↑ May increase
Snow	7		Riverine flooding	↑ Likely increase
Hail storms	8		Heatwaves	↑ Projected increase
Thunder storm	9			
Dust storm	10			
Wind storms	11			
Frost	12			
Earthquake	13			
Drought	14			

Source: Phase 1 Central West FGD data

Source: DECCW (2010d)

3.6 Levels of emergency planning

"I hope nothing happens!"[5]

The vast majority of people (79%) did not have an emergency plan (Table 20). Reasons people gave for not having an emergency plan include:

- People did not have the time and were too busy[7];
- People haven't had an prior experiences with natural hazards and therefore little knowledge of the risks[3,5,11,12,31,33,39] - "We should...The problem is we have no experience with this"[11];
- Others who had no prior experience with hazards, saw no need for one because they did not foresee any future threats [2,5,9,19,21,22,26] - "I don't have a plan because I feel safe so didn't think I needed a plan"[9];
- Some were unaware that they needed one because they have never received information on the need and/or what an emergency plan should entail[20,33]; and
- Others just had not thought about the need before[3,4,17,24,28,35,36,37].

This finding - low levels of emergency and hazard preparedness coupled with the reasons given for inaction - correlate strongly with wider vulnerability and disaster management research on risk. Research suggests that risk reduction and preparedness (in)action is shaped by the contextualised interplay of access to risk information, measured probability of events, past experiences of similar events and expected time-frames for future events, personal attributes, and the social context within which people live (Bird et al., 2010; Pidgeon et al., 2003; Sjöberg, 2000; Slovic, 2000).

Some people were used to having to respond to hazards that affected them on a regular basis, demonstrating a level of risk normalisation (Scolobig, De Marchi, & Borga, 2012). Accordingly, they felt they were well-prepared due to experience and therefore did not feel the need for a specific plan[10,18]. Of the 10% of people that did have a plan, the types of plans used include:

- Having emergency kits that have been prepared by an external source - Bushfire Prevention kit supplied from the local council[29];
- Having emergency kits made up by themselves or family members, which include items like a torch, spare batteries, food, spare clothing, water, and tablets[18,25,38];
- Plan to take photos and family pieces that cannot be replaced but nothing else[32]

Table 20: Levels of emergency planning in the Deaf Community

Level of planning	No. of participants (%)
Emergency plan	10
Somewhat prepared/partial plan	8
No emergency plan	79
No answer	3
Total	100

3.7 Awareness of emergency services roles

> *I am not clear on why we have so many different emergency services and feel that all are not very seamless when responding during emergency situations. Sometimes RFS would respond and say this is their responsibility while Fire and Rescue NSW may say it's theirs too. What about Police? Are they part of responding to emergencies too?*[9]

There is much confusion amongst Deaf people about what the emergency service organisations in NSW do and who is responsible for assisting them in the event of a natural hazard. Being unclear of the roles and responsibilities that emergency services have in supporting the general public may lead to unrealistic expectations in terms of the type of assistance that is available. A reliance on assistance that 'may never come' leaves people underprepared and more vulnerable to natural hazards.

Table 21 presents a list of emergency services that participants identified as being available to assist them when natural hazards occur. The wide range of 'emergency services' identified by participants suggests that Deaf people do not necessarily make a distinction between emergency service organisations that officially have lead roles in emergency response and other organisations, institutions, groups, individuals (family, friends, neighbours) or information sources that they feel can help them in the event of an emergency.

Specific knowledge on what the SES, NSW RFS & Fire and Rescue NSW do and what their responsibilities are is low. Only 38% of those interviewed correctly identified what the RFS NSW do, with the figure falling to 28% for the SES. However, knowledge of the role and responsibility of Fire and Rescue NSW was the lowest (15%) with one Sydney resident adding: "I have not heard of this Fire and Rescue NSW before. It's news to me"[27].

When asked who was responsible for assisting them during a natural hazard event, nearly half of the interview participants (46%) named the emergency services as having responsibility (Table 22). Another 43% either refrained from answering or didn't know. Only one person (3%) identified himself as having some responsibility for his wellbeing and actions[30]. This indicates

that Deaf residents are unclear or unaware of emergency management procedures in NSW. According to the State Disaster Plan (Displan), the initial responsibility for hazard preparedness and response lies with the individuals who are affected. It is only when the capacity of that individual to respond is overwhelmed that the emergency services step into to assist (beginning at the local level before moving to the district, state, and national levels when need be).

Together, these findings suggest that there is a need to better educate Deaf people on the roles and responsibilities of different agencies and how the emergency management system works so that they can better understand what happens in an emergency and what to expect.

Table 21: Emergency services available to offer assistance when natural hazards occur

Service	Times cited
NSW SES	25
Police	25
Ambulance	16
Fire services[§§§]	15
NSW RFS	12
Family/friends	10
Fire and Rescue NSW	9
Army	8
Hospital/medical services	8
Coast guard/life savers	8
Community services	7
Neighbours	6
Red Cross	6
Local government	5
Salvation Army	5
106 TTY service	5
VRS/NRS services	5
Other government agencies	4
Rangers	4
RSPCA/vet services	4
Interpreters	4
Phone/SMS	4
TV	4
Churches	4
Deaf Society of NSW	3

Service cont.	Times cited
Internet	3
NRMA/tow trucks	3
Facebook	3
Navy	2
Rotary Club	2
Wires	2
St John Ambulance/First aid	2
St Vincent's de Paul	2
"000" service	2
Security firms	2
Children (relying on children)	2
Royal Flying Doctors	1
Country Energy	1
State government	1
Emergency strobe lights	1
Lifeline	1
School teachers	1
Air force	1
Food bank	1
Vitacall (aged care service)	1
NABS[****]	1
Newspaper	1
Electrician	1
Local clubs	1
Charities (general)	1

[§§§] General descriptor used when no one organisation was specified

[****] National Auslan Booking Service

Table 22: Responsibility for assistance during natural hazard events

Responsibility	No. of participants (%)
Emergency services (SES, RFS, Fire & Rescue NSW)	46
Family/friends/neighbours/carers	13
Other support organisations (police, government)	21
Themselves	3
Don't know	8
No answer	35

4 Lessons from past experiences

A key component of the Deaf Community Needs Assessment was to gain insights into how Deaf people have prepared for, responded to, and recovered from natural hazards in the past and to explore the possible challenges they faced. These different stages of the disaster cycle are shown in Figure 6. The documentation and assessment of people's past experiences in dealing with natural hazards provides valuable insights into how people actually act in emergency and hazard situations as opposed to how people predict they will act(Bubeck, Botzen, & Aerts, 2012; Grotthman & Reusswig, 2006; Scolobig et al., 2012; Slovic, 2000).

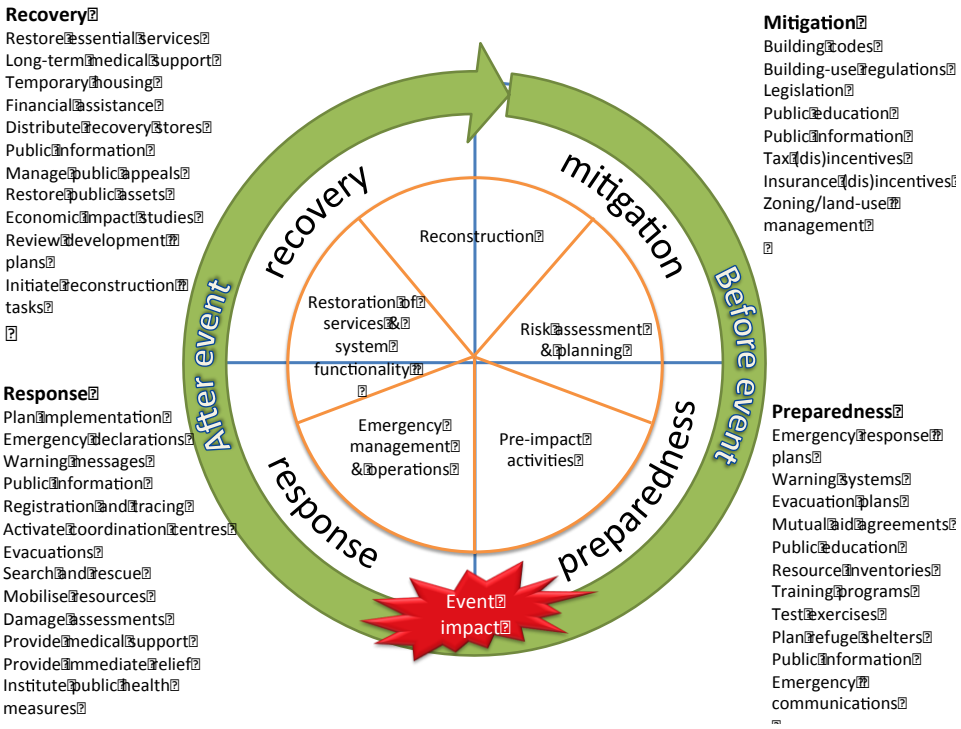

Figure 6: The disaster cycle and actions taken during each stage

Fifteen of the 39 participants we interviewed had experiences with natural hazards in the past (see Table B1 in Appendix B). Fourteen of these were Deaf people, whilst one was an Auslan interpreter that had experienced and helped Deaf people throughout the January 2011 floods in Queensland. The types of hazards experienced by these Deaf Community members are detailed in Table 23.

Research on natural hazards and people's ability to recover from different hazards reveals that an individual's or group's ability to anticipate, withstand, and recover from shocks over time is intrinsically linked to access and entitlements to socio-political, economic, and environmental resources (or capital)(Adger & Kelly, 1999; Pelling, 2003). Therefore, the following sections analyse the experiences of 15 Deaf Community members in dealing with different types of hazards. We examine the types of successes and challenges people had in anticipating, coping with and effectively responding to natural hazards. This involves an assessment of the resources people were able to access to help them prepare before the hazard event, respond during the event, and recover after the event.

Table 23: Types of hazards experienced by region

Region	No. of participants	Hazard type
Sydney	3	Bushfires
Central Coast	1	Bushfires
	1	Earthquakes
	1	Floods
Illawarra	1	Bushfires
	1	Floods
North Coast	2	Bushfires
	2	Hailstorms
	2	Earthquakes°
	1	Severe Storms
		Cyclones
		Floods
New England	1	Bushfires°
	1	Floods
Central West	1	Bushfires
	1	Floods

4.1 Pre-event hazard awareness and actions

As argued in Section 3.5, a lack of risk awareness robs people of the choice to increase their preparedness to those possible risks and can curtail their ability to cope and effectively respond and recover from hazards(US-IOTWS, 2007). The findings from this study largely support this view. Nine of the 15 interviewed have only experienced one hazard in their lifetime and therefore had no prior hazard experiences. Consequently, they had no idea about what to do when they were confronted with the hazard event they experienced[6,15,17,19,20,21,22,30,31]. Five of the participants had experienced more than one natural hazard event in their lifetime[5,10,18,27,37].

Having prior experiences with hazards did increase the preparedness levels of three of the five participants interviewed. Each of these three participants took positive steps to better prepare

° Denotes hazards that were not experienced in the same regions where the interviewee now resides

themselves and their families for future hazards. Their prior experiences influenced their preparedness strategies and their subsequent ability to effectively respond to those hazards and access the support they needed. The types of actions they took included:

- Moving to an area that was judged to be less exposed to vegetation that could fuel bushfires[10];
- Regularly clearing property of fire fuel[10];
- Registering their address and contact details with the local emergency services[19];
- Having an emergency kit or essential supplies prepared and ready to use in the event of future hazards[10,19];
- Regularly checking with neighbours, newspapers, radio reports (via hearing children and husband), weather reports, and the NSW RFS website (since its inception) to keep informed of fire and flood risk levels[10];
- Back-burning around the house and having hoses ready in the event of a fire[30];
- Regular checks of the water levels of creeks near their property[10]; and
- Establishing a hazard action plan for the whole family[10].

One North Coast resident had previous experiences with floods but not for bushfires and earthquakes[18]. Her previous experience with floods influenced her preparedness for future flood events. Her recurrent experiences taught her that floods could affect her area even if it had not rained in her immediate area - the water flows down from Queensland. She has adopted a two-step plan to prepare herself: (i) to stay up during the night if there were heavy rains in Queensland to monitor the water levels; and (ii) have her hearing father stay with her as she could not hear the flow of water. Her actions are, therefore, hazard specific and the pattern of action she has developed for this recurrent hazard has increased her resilience to this particular hazard.

Another Central Coast resident also demonstrated a heightened resilience to recurrent flood events by developing and following the same plan of action; if the bridge that connects their home to the main road floods, the family stays at home and waits for the flood waters to subside as the waters have never come close to the house[10]. This same family was, however, hindered in their flood preparedness planning by not being able to access information about the flood risk to their property from their local council. Their local council told them that flood risk reports and maps could not be found for their area[10]. This, however, is not a Deaf-specific problem. It is a wider information access issue that is found in NSW and across Australia. Only 56.8% of councils in NSW provide flood information to residents (Box, Thomalla, van den Honert, & McAneney, 2012). Whilst this inability to access information on flood risk (knowledge as a form of human capital) did lessen their ability to make appropriate preparedness decisions, the family circumvented this issue by turning to alternate information sources.

Four other positive preparedness outcomes that came from having prior hazard experiences included[10,18,19,37]:

- An increase in risk awareness;
- The ability to mentally prepare for the onset of hazards (therefore avoiding states of panic);
- Having the capacity to help others mentally cope with the stress of natural hazards and inform others on what actions they needed to take; and
- Having the opportunity to decide on the best actions to take and save what was deemed most important to them.

Only one of the 15 participants received prior warning of the bushfire hazard he faced[30]. This Sydney resident was alerted by the emergency services who helped him prepare for fire threat near his home. They advised him what actions he needed to take if the fire came closer to his house:

> *"One of the firefighters asked me why I wanted to get through the blockage and I told her that I wanted to go home, which was nearby. I showed her my drivers' license with my address on it. The firefighter then explained the situation to me that they are now back burning against the big bushfire that was approaching the area. I asked them what should I do and what if I needed help. They explained what I should do and that the situation was not serious yet. They warned that there will be heavy smoke and to be careful"[30].*

Those who had not received any warnings used multiple communication mediums and information sources to access information on risk levels as the hazard events unfolded. These included: the Internet[10], weather reports[10], radio updates accessed through hearing partners, family members or hearing neighbours[10,18], warnings received from partners via SMS[5], personally delivered warnings from hearing neighbours[10] and members of the public[18], and visual or physical cues[10,17,18,19,21,22,27,30,31,37]. Visual or physical cues were a common source of hazard threat information: "I always play everything by 'eyes' (ears, for hearing people)"[10].

The types of visual cues used to gage hazard threats included:

- Regular checks of water levels in nearby creeks to ascertain possible flood threats[10];
- Seeing smoke, floating fire embers and fires, seeing fire trucks parked on the side of the road, and fireballs for bushfire threats[18,22,27,30,37];
- Trains stopping due to fire threats further up the line[5];
- Seeing roadblocks to indicate both flood and fire threats[30,31,37];
- Experiencing the physical sensation of shaking to indicate an earthquake event[18,19];
- Seeing rapid changes in the shape and colour of the clouds to indicate the onset of a severe hail storm[17];
- Observing the actions of hearing people for storms and bushfires[17,27];
- Seeing lightening strikes to indicate the onset of a severe electrical storm[18]; and
- Experiencing heavy rain (but this did not indicate how serious the floods wouldbe)[21].

This finding broadly correlates with those methods that Deaf people generally identified as being their favoured mediums for accessing risk information (Table 8 in Section 3.4). The top five mediums were family and friends, followed by television, text messages (largely received from family and friends), the Internet and social media.

Despite making every effort to access information on hazard threats through multiple channels, one Central Coast resident affirmed that floods and bushfires in her area were still hard to predict: "We never know when it'll come, no matter how much we check through the internet, weather reports, or ask our neighbours"[10]. Her inability to access pre-event warnings, however, was not seen as a 'Deaf' problem. Instead, it was seen as a widespread problem that affected her and her hearing neighbours in the area[10].

The lack of flood warnings greatly limited one Wellington resident's ability to effectively respond. As a teacher she is required to drive long distances in country areas to reach her students. On several occasions roads have been closed due to flooding and she had no way of knowing this until she reached the roadblocks. This led to her having to take 2-hour long detours to get home[37]. Another North Coast resident was unable to hear the onset of a severe hailstorm and was left panicked and unprepared as trees fell around her house[17]. The only warning she had about the onset of a severe storm was from her young hearing children who came running inside from playing, frightened by the sound of the hail and the trees falling around them[17].

The consequences of not receiving any warnings (limited access to human capital) included: confusion[5,6,19,27],helplessness[27], panic for themselves and their children[17], and a complete state of unpreparedness[5,17,27]. One Sydney resident explained her feeling of helplessness and confusion when her train journey was halted by nearby bushfires[27]. Everyone was leaving the train but she could not understand why because she did not hear the announcement:

> *"I was wandering around not knowing what to do so I waited in the station area for an hour…I had no way of contacting anyone"[27].*

The actions people take in response to a perceived or realised threat, including non-action, are influenced by multiple factors. Human agency and personality traits (risk averse vs. risk seeking), along with the way people interpret risk knowledge in the context of experiences, heuristics, beliefs and cultural norms, people's weighted preferences on what is most important to them in a given time and space, and future expectations (including the social amplification of risk) that evolve within a socio-cultural, economic and political context, greatly affects action and inaction (Bird et al., 2010; Fischhoff, Slovic, & Lichtenstein, 2000; Johnson & Covello, 1987; Kasperson, Kasperson, Pidgeon, & Slovic, 2003a; Paton, 2007; Rippl, 2002; Scolobig et al., 2012; Slovic, 2000). There is, therefore, no guarantee that knowledge and acceptance of risk will spur risk-reduction actions before, during, or after an event (Scolobig et al., 2012; Thomalla, 2008; Thomalla & Schmuck, 2004). The evidence from this assessment confirms this.

One participant living in Canberra at the time of the 2003 bushfires saw the fires as she and her brother drove out of town to Wagga Wagga for a party. However, despite having some concerns about the impact the fires may have on her house (given the wind direction), she still chose to continue on her journey instead of turning back[22]. The risk was not deemed large enough for her to turn around and go back[22]. Her house was completely destroyed in her absence.

During the Newcastle earthquake event that took place on 28 December 1989, a Central Coast resident was asked by the office-building warden (who was also her colleague) to leave the building and follow her other colleagues to the nearby park so a roll call could be done. However, she ignored these instructions as she was concerned about the safety of her son and wanted to go and collect him from school. The welfare of her son was of utmost importance to her in that moment. She had no means of contacting her family and emergency services, as she did not have access to a TTY and mobile phones were not widely available[6].

4.2 Actions taken and challenges faced during hazard events

The first phase of *change* that directly follows the onset of the natural hazard (or shock) is the response phase (Figure 6,) involving the immediate impact and coping responses that are designed to stabilise the human-environment system. This stage is reactive in nature and draws upon all the resources that a population and its governing bodies have at hand in the very moment that the shock occurs(Calgaro, Lloyd, et al., in press). Finding out who has been affected and to what extent is part of this immediate reaction. The first priority of most people when faced with the hazard threat was contacting loved ones to either get more information on the unfolding situation, inform them of where they were and what was happening, or a combination of some or all of these[5,6,10,19,30]. Once this is done, attention turns to getting access to socio-political, economic, physical and environmental resources needed to help people cope with the impacts and recover from the shock(Adger & Kelly, 1999; Pelling, 2003). The following sections explore the experiences people had in getting access to the resources they needed during and immediately after the event and the challenges that hindered their success. This includes their success in accessingknowledge and information (human capital), basic resources (access to emergency money, food and basic clothing), institutional support and functioninginfrastructure (physical capital).

4.2.1 Communication and access to information (human capital) during the event

Communication was found to be the biggest issue Deaf people faced when responding to natural hazards[5,6,10,18,20,21,22,27,37]. There was a lack of information on how to respond effectively during the hazard events people experienced and a lack of appropriate communication mediums through which to obtain this information[6,22]:

> *"I had no means of contacting the emergency services[6]. I was unable to get in touch with the emergency services because I did not have access to a TTY, and mobile phones were not widely available at the time, and radio was not an optionfor me- I cannot hear it. I was unable to get into contact with my parents and sister. I wanted to know if it was safe to drive, and if so, which*

roads were safe to take. At the same time, I had no idea who the emergency services were, although I thought I should try to contact them somehow so I could find out what was happening[6]".

The most common communication challenges people faced include:

- Emergency and hazard information (including warnings pre-event, updates and evacuation orders during the event) being disseminated via communication mediums inappropriate for them such as radio, loudspeakers, and direct door-knocks[5,6,22,27,37];
- Limited or no mobile phone reception[19,37];
- Not being able to effectively communicate with hearing people (via writing, lipreading, bodily gestures or a combination of all) when seeking help or assistance meaning that people either received no help or information or full details on what was happening and response actions were often missing[5,18,22,27];
- The inability to contact emergency services personnel via SMS or a communication medium that is more suited to the communication needs of Deaf people[5,17,18,19,20,21,27,37];
- Emergency services personnel and first line responders being unresponsive to assistance requests[10,] (seeSection 4.2.4);
- The process of applying for assistance and basic resources needed after the event was too complex for some Deaf people to understand properly and too time-consuming which curtailed their ability to access these resources in a timely manner[22,27].

The most common communication mediums used to access information on the changing nature of the hazard and what to do as the event unfolded were:

- Face-to-face contact with other people including members of the public via the written word[5,18], hearing neighbours (many of whom got their information from the radio)[10,18], hearing family members[10,18],and hearing work colleagues and employers[5,18];
- SMS through mobile phones[5,19,21,22,30];
- Mobile phone with access to Telstra's *Blue Tick* system (very reliable in rural and remote areas)[18];
- The Internet and email[10,19];
- Television[19]; and
- Emergency Services personnel[10].

Again, the use of these sources broadly correlates with those methods that Deaf people generally identified as being their favoured mediums for accessing risk information, the most popular being family and friends, TV, text messages (largely received from hearing and non-hearing family and friends), the Internet and social media (see Table 8 in Section 3.4). However, whilst hearing people were a common source of information, some Deaf people felt that hearing people could not be relied upon to help them[5,37]. One Illawarra resident was stuck on a train for approximately four hours due to flooding on the tracks further up the line. When he asked hearing people around him what the problem was, the reaction from other passengers was mixed. Some tried to help him by explaining the situation but others refused to help him[5]. Another resident from the Central West believed that a reliance on hearing people was not a

reliable source of assistance because hearing people may not be available to help[37]. She therefore concluded that "there is no point in relying on hearing people as my experience has proved this"[37].

The ramifications of not having access to information on what to do to prepare, respond and recover from natural hazard events included:

- People not being able to understand what was happening around them - they could not access the information that their hearing colleagues or members of the general public were verbally sharing with each other around them[5,6,27];
- People could not access audio information and instructions that were broadcast over loudspeakers in public places and on public transport[5,27];
- People had no way of knowing if an evacuation call had been put out[10,22];
- Deaf people were, therefore, prohibited from knowing what response options were available to them and making informed choices about which actions would be best for ensuring their safety and the well-being of their loved ones[6,18,27];
- People were forced to follow the actions of others in order to be safe, which further increased Deaf people's dependency on hearing people (thereby contravening the UN Convention on the Rights of Persons with Disabilities) and, in turn their vulnerability to hazard events[5,6];
- People had limited knowledge of and subsequent limited access to assistance, support and basic resources (food, shelter, money, clothes) that they needed to effectively respond during and recover after the natural hazard event they faced[6,18,22,27,30,37]; and
- People not knowing where evacuation centres were or what other accommodation options were available to them[18,22,31,37], causing some to flee to public parks and clearings with basic belongings (and animals) to escape from the bushfire threat they faced. This left them with no access to basic resources (including food and information) for a few days until the threat had passed[37].

4.2.2 General response challenges

Whilst communication and access to information were the greatest challenges that Deaf people faced, they also faced other infrastructural challenges (physical capital) due to damages that the hazard events caused. For instance:

- Power failures that limited communication options[17,18,19]. Power failures caused by an earthquake event in New Zealand meant that many communication options were unavailable to a North Coast resident who was living in New Zealand at the time[19]. SMS was still available, but there was no direct emergency SMS number that she could use. Consequently, she could only receive SMS messages but not send any[19]. Another North Coast resident also experienced power failures following the 1989 Newcastle earthquake[18];
- Water supply failures[18,19];

- Telephone lines and networks being down, making all telephone contact impossible during and in the days immediately after the event[17];
- Road blockages, which not only stopped or delayed people from reaching their own homes but it also made it difficult for emergency services and other support networks (including interpreters) from being able to assist those trapped in their homes[10,22,30,31,37].

4.2.3 Access to social capital

As argued in Section 3.3, social capital is instrumental in helping people access the resources they need throughout their lives (in good times and bad) and promoting reassurance, and stability in times of need(Calgaro, Dominey-Howes, & Lloyd, in press; DFID, 1999; Munasinghe, 2007). The importance of social capital and social connectedness in helping Deaf people get access to the resources they need to effectively respond was clearly evident from the natural hazard experiences that people had. Deaf people often turned to trusted social networks - family, friends, neighbours (Deaf and hearing), school teachers, trusted employers, and Deaf support organisations - for emotional and logistical support and information[5,6,10,17,18,19,20,37]:

- People relied on their partners (hearing and Deaf), family, friends, neighbours, and work colleagues to get information on what was happening and get instructions and/or exchange ideas on what actions they should take in response to the unfolding hazard[5,6,10,18,19,22,27];
- People turned to their hearing neighbours to access information on what actions they were supposed to take throughout the hazard event[10,19];
- People asked neighbours or family to contact the emergency services and insurance companies on their behalf to get assistance after severe storms because they did not know of any other way to contact them[17,20];
- Children and adults turned to family, neighbours and personal Deaf networks for comfort, reassurance, and help in responding to the hazards they faced[18,19,21,27,37];
- People also turned to their family, friends and colleagues for shelter, food and clothing during and immediately after the hazard event[5,6,17,18,19,20,27,31]; and
- Social networks (including interpreters, Deaf support organisations, family and friends) were used to get information on where they could access resources (for example, from charities and government departments for example) needed to rebuild after the hazard event[17,19,22].

Family and friends were often a crucial resource for Deaf people and helped them cope during and after hazard events[19]. These trusted social connections provided information to affected participants when they couldn't access information directly and made people feel safe (emotional support)[19]. This was achieved through the process of sharing their experiences with their friends[19]. Friends and family also helped people access basic supplies (including food and shelter) in the immediate aftermath, providing the support needed to help stabilise the affected parties until they were able to move on to the recovery process[19].

Others became a main source of support for their Deaf friends. One North Coast resident had access to friends who knew a RFS officer[18]. This RFS officer provided her with informal training on what to do in the event of a fire. She then passed this knowledge and advice onto her Deaf flatmates[18]. Here again linkages with friends (social capital) and knowledge (human capital) were important facilitators of preparedness and effective action:

> *"Then I remembered that a Deaf friend of mine has a partner who also works for the RFS and fortunately he told my Deaf friend about what she should do in case there were a bushfire and then she shared that information with me so I remembered what she told me. She said if there was a bushfire we should put on overalls and boots to as that will help prevent us from getting burnt and luckily that I had them so I quickly put on my overalls and boots…She was grateful for the training she received from her friend's boyfriend who worked for Rural Fire Services and she was well prepared for the bushfires"[18].*

There were, however, place-based differences in the strength of social networks. Social networks were found to be stronger in some areas than others. One Central Coast resident was part of and greatly benefitted from a strong neighbourhood network where people looked out for each other[10]:

> *"In Berowra, we had great neighbours because we created and exchanged a list with our names, emergency contacts, phone numbers, email addresses, etc. as a way to communicate each other on evacuation plans, emergency warnings, where to go and when to come back during and future emergencies. That concept was lovely…but here in Ourimbahit is different…Here, in Ourimbah, no one bothers to check or share any updates with us"[10].*

This demonstrates good social cohesion and connectedness that boost preparedness and resilience. This example also demonstrates that these linkages can be determined, in part, by the characteristics of a place-based population. Some are more connected than others. This is evident when comparing the strength and connectedness of the Illawarra and the Central West regions (Bathurst and Orange) (noted in Section 3.3).

4.2.4 Support from the emergency services and government institutions

The level of support received from emergency personnel by those interviewed was mixed[10,17,20,37]. Some people did receive support from the emergency services at some stage during the hazard events[10,18,30]. NSW RFS personnel informed a Sydney resident of the threat levels that a nearby bushfire posed to his house, what he needed to do to protect himself and his home from the bushfire (and the airborne embers and smoke) as it got closer to his house[30]. Another North Coast resident called upon a neighbour (who was a NSW RFS volunteer) for assistance[18]. The neighbour immediately mobilised the RFS in the area, who in turn put the fire out. This again reaffirms the effectiveness of using social networks to get access to the resources one needs in the event of a natural hazard. However, some residents felt that the timing of the support provided by the emergency services often came too late for Deaf people to feel like they had the opportunity to effectively respond[10,20].

Others attest to feeling completely ignored by first line responders and emergency personnel during and after hazard events[18]. After the 1989 Newcastle earthquake, a North Coast resident recalls the constant presence of emergency services personnel in her area for six weeks after the event. However, during this time not one emergency services officer approached her and her Deaf friends or offered to help them. This left them with no access to information on how best to respond during the event or what to do afterwards when the threat had passed[18]. Another resident living in Canberra at the time of the 2003 Canberra bushfires recalled being refused help or given inadequate assistance on several occasions throughout the bushfire event. The multiple challenges that this participant and her family faced, demonstrates the breadth of challenges Deaf people face in effectively responding to and recovering from a natural hazard event[22]:

a. Evacuation warnings were provided over a loudspeaker which no one in the participant's family could hear because all were Deaf except for her 10 year old nephew *(no access to human capital - information not disseminated in an appropriate form)*;
b. Evacuation orders were disseminated via door-knocks. Instead of communicating with the Deaf family members through writing as requested, emergency services personnel insisted on communicating through the young nephew despite repeated requests by the Deaf adults present to communicate directly with them via writing *(limited access to information in an accessible and appropriate form)*;
c. Emergency personnel instructed people to evacuate to the houses of family and friends via loudspeaker. Again the Deaf family didn't hear the instructions causing them to be left stranded for hours and not knowing what to do *(no access to human capital - information not disseminated in an appropriate form)*;
d. After waiting numerous hours for help and having no family in the area to go to *(limited access to localised social networks)*, the SES personnel finally realised the problem and relocated the family to a motel free of charge *(delayed access to institutional support)*;
e. On returning to her burnt-out home from her trip to Wagga Wagga, the participant asked a nearby policeman where her family had been relocated. The policeman refused to answer her questions and referred her to the local police station *(limited access to institutional support)*;
f. Officers at the police station were unable to assist her locate her family due to communication problems. Communication was difficult due to noAuslan interpreters being available - interpreters couldn't get through due to road closures *(no access to human capital - language assistance)*;
g. Writing, as a form of communication between herself and the police proved ineffective because the language the police used was unfamiliar to the participant and she didn't understand them *(limited access human capital - appropriate skills)*;
h. The police advised the participant to approach others for help but the participant did not know anyone else outside her family circle in Canberra because their extended family and friends were in Tamworth where they were from *(limited access to localised social networks)*.

The negative consequences of this experience were two-fold. First, the emergency services preference of communicating through a minor hearing individual was highly inappropriate and caused undue trauma and stress on the 10 year old boy who eventually collapsed from fatigue and distress and refused to talk to anyone[22]. This experience correlates with those reported in the US after 9/11. The trauma of deaf individuals (adults) who experienced the 9/11 event was compounded when they were asked to assist in counselling other deaf people. They had not received counselling themselves due to a shortage of sign language interpreters (National Council on Disability, 2005). Second, the inability (and in some cases unwillingness) of first line responders and emergency services personnel to provide the needed support caused the participant to lose faith and trust in the emergency services.

This outcome is detrimental to future preparedness levels. Frustration and apathy felt by Deaf Communitymembers leads to a growing disconnect between communities and government support structures (in this case the emergency services and first line responders). This may not only deter community members from seeking help from these same organisations in the future (thereby removing a needed support structure and increasing their vulnerability to future events) but it also erodes the effectiveness of governance structures and processes put in place to help the very people they are alienating. This is a wider issue that affects both Deaf people[10,17,18,22]and hearing people. For example, apathy and disillusionment in the ability (and willingness) of governmental institutions to effectively assist community members was observed in Thailand after the 2004 tsunami (Calgaro, Naruchaikusol, & Pongponrat, 2009).

Communication barriers (*human capital*) again feature as a major reason for people not being able to get the information (*human capital*) and support (*social capital*) they needed from the emergency services, leaving people feeling dissatisfied and frustrated:

1. *A lack of awareness on who to contact and how:* Some people refrained from contacting the emergency services for support during natural hazard events for two reasons. First, they were unaware of who they specifically needed to contact and second, they had no means of contacting the emergency services due to them not being able to talk to emergency services on the phone[6,27]and not having an emergency services SMS number to use[18,21,22,37]. To overcome this barrier, some approached the local fire stations only to find that they were unattended at that time[27]. Other NSW residents asked neighbours or family to contact the SES on their behalf to get assistance after severe storms because they did not know of any other way to contact them[20];
2. *A perceived organisational preference to speak to people directly:* there is a feeling amongst some that their inability to hear negatively influenced the way emergency response personnel responded to them when they asked for help[10]. A Central Coast resident often visits the website of the NSW SES for flood information and flood updates. She has also tried on numerous occasions to contact the NSW SES via email or through the NRS but both communication mediums proved ineffective. This was particularly the case when using email. No one ever responded to the emails she sent. Accordingly, she

asked her hearing husband to call them and had him pass on the information to her[10]. One possible reason put forward by community members was a lack of Deaf awareness amongst staff who are largely volunteers[10];

3. *The propensity of emergency services personnel and first line respondents to prefer talking to any hearing person rather than try to communicate with Deaf people:* Following a severe storm, a North Coast resident was left feeling frustrated when SES personnel repeatedly chose to speak to her son so he could interpret for her instead of trying to communicate directly[17];
4. *Time constraints:* Communicating with Deaf people takes more time and effort than communicating with hearing people. Accordingly, there is a feeling that emergency services personnel may not have or want to spend time trying to communicate with deaf people when they are responding to an emergency situation or live event[18]; and
5. *A reluctance to provide Deaf people with appropriate emergency service numbers to call:* After years of lobbying emergency services personnel and police, one North Coast resident was successful in getting access to a private police number that she could send SMSs in an emergency situation (natural hazard or otherwise) but she was asked not to give this to others[18].The reason given by the police for limiting access was that they did not have the authority to allow public access to this number. This raises questions as to why public access to this number was barred and the nature of the regulations behind a policy that limits much needed access to support services. This finding again highlights the (possibly unintended) negative implications policies can have on the type of support emergency services and first line responders can offer Deaf people. Limiting access to appropriate emergency services personnel benefits a few who are willing to fight for access over others who do not. Access should be equal[18].

Some people received access to basic resources (access to emergency money, food and basic clothing) and support from government institutions (for example, Centrelink) after the event[17,22]. However, the level of support was thought to be too low to properly support them in the days after the event[22]. These types of experiences may help to explain why Deaf people do not see government as trusted resources for obtaining the level of assistance they need (see Section 3.3). When support from emergency service and governmental personnel was missing or their needs were not sufficiently met, Deaf people again turned to family, friends, neighbours (Deaf and hearing), and Deaf/deaf support organisations for support and information[18,22].

4.3 Post-event actions

Once the immediate needs of the affected population are met and rapid short-term reorganisation responses designed to stabilise the human-environment system are completed, the disaster cycle moves from the response to the recovery phase (Figure 6).Attention turns to longer-term adjustments and rebuilding efforts, the consequences of which continue to feed back into the system and begin to shape future preparedness and response capabilities (Calgaro, Lloyd, et al., in press). Only seven of the 15 participants interviewed had their property

damaged and were left to rebuild after the event had passed[6,17,18,19,20,22]. One participant had her house completely destroyed in the 2003 Canberra bushfires and her repairs took six months to complete[22].

The actions people took in the aftermath of the hazard events they faced varied. Not knowing what to do after an earthquake event, one participant turned to her family for help[6]. Her sister inspected the house for damage and her sister and parents organised her insurance claim and the subsequent repairs[6]. Those with rental properties left the organisation of household repairs to landlords[17,18]. Three people made successful insurance claims to have property (damaged houses, home contents, and cars) fixed and/or replaced[17,20,22], whilst others were left with the task of cleaning and clearing away debris spread from fire[37] and flood events. The following sections outline the recovery process and the resources people used to recover, and the challenges they faced.

4.3.1 The role of social capital in aiding recovery

Social networks once again became a key source for assistance and support in the aftermath of the various hazard events, demonstrating the positive role social capital plays in improving coping and recovery capabilities. Assistance came from many sources includingfamily, friends, neighbours and employers. Family members and friends provided participants with immediate emergency assistance (food, shelter)[19,20], logistical support (help in organising the rebuilding process)[6] and emotional support[19]. Neighbours helped keep people informed on developments as the hazard event unfolded and where and how to access food and assistance from emergency services[17,18].

Some people noted an improvement in relationships with neighbours and a stronger feeling of community rapport following the joint experience of hazard events[6,19,27]. One Sydney resident observed that neighbours that had kept their distance prior to the hazard eventjoined together to assist each other in cleaning out gutters and filling any receptacle (including gutters) with water to help protect people's houses from fires[27]. Following the 2011 Christchurch earthquake, one resident noticed a strong sense of community, with neighbours constantly visiting each other to check if people were okay and had everything they needed[19]. However, there were instances when this stronger feeling of connectedness faded over time as conditions returned to their pre-event state[27]. Others reported no change in levels of connectedness[18,20,30,37], with some admitting that they never talk to their neighbours nor offered to help others in their area[37]. In some areas, the hazard event further compounded ingrained feelings of social isolation. One resident witnessed the improvement of neighbourly connectedness among her hearing neighbours but she and her family were excluded from these interactions[22]. This lack of social connectedness leaves people feeling more isolated[22] and vulnerable to shocks and stressors.

Established informal Deaf networks also helped support people after hazard events. Following the 2011 Christchurch earthquake, the house of one Deaf resident became the refuge for other Deaf Community members who were too scared to stay in their own homes due to constant aftershocks[19]. Deaf Community members also used established Deaf social networks to get help for other Deaf residents (particularly the elderly) who were stranded in their own homes, had no family and friends to turn to for help and no knowledge of community organisations like Deaf Aotearoa (New Zealand's principal Deaf/deaf advocacy and support organisation)[19]. Long-standing relationships with Auslan interpreters also proved useful in helping a Canberra resident get access to clothing and food (from local charities) and temporary governmental housing following the Canberra 2003bushfires[22]. The Deaf resident had no idea how to get assistance until the interpreter told her what to do and accompanied her to the relevant governmental offices[22].

Employers were another source of help. The employer of one participant gave her a week off to allow her to make the necessary arrangements for her house to be rebuilt after the 2003 Canberra bushfires[22]. Following the 1989 Newcastle earthquake, the employer of a Central Coast resident organised counselling for all staff to help them emotionally recover[6].

4.3.2 Access to health services and emotional support

Most of those interviewed did not require medical attention or suffer from long-term health problems[10,17,18,20,21,27,30,31]. Those that did were able to access counselling and support through a range of established social networks, namely friends[19], employers[6], Deaf support organisations[19], and schools[22]. Following the Christchurch 2011 earthquake, Deaf friends who were suffering from anxiety turned to each other for mutual support and understanding, whilst Deaf Aotearoa organised counselling for Deaf Communitymembers[19]. A victim of the 2003 Canberra bushfires suffered from Post-traumatic Stress Disorder (PTSD) for six months after the event but did not seek sustained treatment as she did not feel the need[22]. However, she did seek treatment for her children (supplied through their local school) who also suffered from PTSD[22]. One Central Coast resident was grateful to receive counselling that was provided by her employer. However, the counselling sessions were not as effective as the participant had hoped due to there not being any interpreters available to aid in communication, a common problem at that time[6]. This again highlights the issue of communication and the shortage of interpreters (human capital) during and after emergency and disaster events. Getting access to counsellors was not the problem. Being able to communicate effectively and having the resources available to do that was.

4.3.3 Institutional support

Four of those interviewed did not receive any financial or logistical assistance from government authorities, charities, or community services[10,17,18,37]. They did not know what type of assistance was available and how to access it demonstrating a lack of knowledge (*human capital*) on the availability of post-event resources[10,18,37]. Others simply did not need it[20,21,27,30,31]. Governmental financial assistance was deemed inadequate to cover the cost of emergency provisions, thereby reinforcing the view among Deaf people that the government is not a reliable source of support[22] (noted in Section 3.3).

Many of those interviewed did not receive assistance from Deaf/deaf advocacy and support organisations[6,10,17,18,37]and the explanations given for this fell into three categories. Some people did not seek assistance simply because they did not need it[21]. Some did not seek assistance because they were unaware that these organisations could or had the capacity to assist them (*limited knowledge about possible support avenues - human capital*)[6,10,37,17]. Others, however, said that they did not receive support because Deaf support organisations failed to contact them or offer them support[18,20,22,27,30]. This reasoning infers that it was the responsibility of the Deaf support organisations to contact them and not theirs to inform and prepare themselves. Disaster victims, for example, are never simply passive victims; they are also survivors and active agents who make choices based on multiple factors including risk perceptions, expectations, personal experiences, and cultural norms(Fordham, 1999; McLaughlin & Dietz, 2008). This is a passive positioning that is at odds with Australia's emergency management approach, which places responsibility for emergency response on the individual in the first instance (NSW State Emergency Management Committee, 2003). The mismatch between people's expectations for others to come to their aid in times of crisis and the mandated roles of community service organisations (most notably emergency services), not only causes misplaced frustration but also leaves community members more vulnerable to shocks and stressors. They will be waiting for assistance that might never come.

There were, however, some instances where community and support organisations were instrumental in providing financial and social support during the emergency and short-term recovery phases of different hazard events[19,22]. Following the 2003 Canberra bushfires, the ACT Deafness Resource Centre provided emergency funds (monetary donations) and information on how to access basic supplies (clothing, bedding, and furniture) to help people recover and rebuild[22]. They also provided information on who to approach for the provision of temporary housing and sent interpreters to accompany Deaf people to the relevant institutions[22]. This service not only enabled effective communication between the two parties but also provided Deaf people with emotional support.

Deaf Aotearoa proved to be an invaluable source of social support following the 2011 Christchurch earthquake. They[19]:

- Established a list of deaf people in the affected areas and contacted these people on a regular basis to ensure that they were okay;
- Organised counselling for Deaf Community members;
- Scheduled specific consultation times (via SMS) when deaf people could speak to emergency services personnel via a team of Deaf Aotearoa interpreters about the state of and availability of basic services (water, sewage), where the emergency centres were located, and what to do in the event of aftershocks and how to prepare for future events; and
- Partnered with the emergency services in providing deaf people with constant updates as the event unfolded (including the supply of interpreters in media broadcasts) and during the initial stages of the recovery process.

These actions demonstrate the important role Deaf/deaf advocacy and support organisations can have in creating spheres of safety, trust and providing effective support for deaf people in emergency situations. They possess intimate knowledge of the Deaf culture, deaf people's needs, and often have access to established Deaf and hearing networks and organisations that can help source social, human, and financial resources that people need to cope and recover. Consequently they are a natural facilitating link between deaf individuals and the services (deaf-specific or general) and resources that deaf people need to effectively cope and respond to natural hazards. The actions of Deaf Aotearoa could be used as a model for NSW Deaf/deaf advocacy and support organisations to follow. Other humanitarian NGOs like the Red Cross also distributed donations and emergency provisions in the immediate aftermath of the disaster[19].

4.3.4 Risk perception changes post-event

Risk perceptions and acceptability of risk is shaped by multiple factors including the type of event that is experienced, past experiences of similar events and expected time-frames for future events, personal attributes, heuristics and the social context within which people live (Hansson, 2010; Kasperson, Kasperson, Pidgeon, & Slovic, 2003b; Roeser, 2010; Slovic, 2000). However, as argued in Section 4.1,there is no guarantee that knowledge and acceptance of risk will spur risk-reduction actions before, during, or after an event (Scolobig et al., 2012; Thomalla, 2008; Thomalla & Schmuck, 2004).

Nine of the 15 interviewed (60%) did report increased levels of risk awareness following their own personal experiences with natural hazards[6,17,18,19,20,22,27,30,37]. Alterations in risk perceptions and actions following the experienced events include:

- Elevated concerns of climatic change and the negative impact this will have on the frequency and intensity of future hydro-meteorological natural hazards[6];
- Greater awareness of changing weather patterns[17];
- Greater desire to learn more about actions to take before, during and after a natural disaster[6,20,27];
- Having important documents ready and understanding the importance of knowing where emergency shelters and/or alternative accommodationare[37];
- Having garden hoses connected to the tap[30] and keeping property clear of excess vegetation and debris that is flammable to better prepare for bushfires[18,30];
- Constantly having their mobile phone on and with them at all times just in case of an emergency[30];
- Having an emergency kit[20]; and
- The decision to move to a different location altogether - one participant moved to an area with fewer trees[22] after a bushfire event whilst another made the more extreme move from Christchurch to Australia due to fears of future earthquakes in New Zealand in the full knowledge that Australia also has earthquakes[19].

Some people haven't taken any additional action or made specific preparedness plans because they still don't know the levels of risk they face and how best to respond before, during and after specific hazards[22,27].

Three people (20%) reported no change in their risk awareness levels or preparedness strategies. These people felt that they were already aware of the main types of hazards and associated risks that affect their local area and the events that they had experienced merely reinforced this view[10,15].Nonetheless, they are still keen to learnmore about how best to respond and interact with emergency services[15].

The participants were asked what they thought were appropriate hazard response actions in light of their experiences. The answers to this question revealed that some people still feel that it is the responsibility of others (emergency services, support organisations) to contact them and tell them what they need to do and where they need to go:

> *"They should let me know early that the fire is coming to my area and to be ready to evacuate if needed. And tell us what we should take like important documents etc and tell us where we should go, where the evacuation centre/safe place are[37]".*

This again suggests a belief that it is the responsibility of others to help them in the first instance and not for them to help themselves.There is therefore a clear mismatch between some people's expectations of who is ultimately responsible for their wellbeing in the event of a

natural disaster or emergency situation and the responsibilities stipulated in the State's Disaster Plan (Displan). Not only is this approach to risk preparedness out of step with emergency management approaches in Australia (where the onus of responsibility is placed on the individual in the first instance until that person's capacity is exhausted or overwhelmed), it also infers a passive mindset, whereby 'others' are expected to take care of their well-being. The reasons for this inferred mindset are unclear. It could be related to cultural norms, knowledge and education levels and/or personality traits (see Section 5.2.4) but this belief is potentially dangerous from a disaster preparedness perspective and increases their vulnerability to future hazard events.

5 Key hazard response challenges for deaf people

Deaf people in NSW feel greatly disadvantaged in disaster and emergency situations due to their inability to access the information they need to effectively plan and respond to hazardous events[G,H,N,O,R]. The community's frustration with feeling disconnected and marginalised is summed up by one group of Sydney participants who state "we always come last"[H]. Some of those interviewed state that they do not know what actions they need to take, who to contact in the event of an emergency or natural hazard, or where to go if they needed to evacuate[20,C]. Others attest to there not being enough information on what to do in the event of a natural hazard[28]. Consequently, many follow the preparedness plans and response actions of their families and other hearing people[25,A,N].

Deaf Community members have identified 18 challenges that they believe are hindering their ability to anticipate, prepare, respond and recover from natural hazards. These are summarised and ranked in terms of importance in Table 24. However, the findings of this Assessment indicate that not all of these challenges are related to communication. Cultural differences, education, mismatched expectations, and social cohesion also play a role in influencing Deaf response capabilities. Here we further explain the key challenges.

5.1 Communication - the biggest challenge

"We are always the last ones to know"[Z]

Deaf people feel that communication is the biggest challenge that hinders their ability to anticipate, prepare for, respond to and recover from natural hazards. The main communication barriers are: language barriers; response information not being available in accessible forms; limited options for contacting emergency services during a hazard event and accessing Auslan interpreters.

Table 24: Hazard response challenges identified by the Deaf Community

Rank	Challenges[††††]
1	Language/communication barriers
2	Information not in accessible form including no direct access to emergency services
3	Interpreter accessibility issues
4	Awareness of Deaf needs is low amongst emergency services & the general public
5	Poor education levels among Deaf people
6	Passivity of Deaf population (weak confidence, scared of asking questions, non-action)
7	Emergency services don't know where deaf people live
8	Power outage concerns - what's the back up?
9	Deaf/Blind issue- no way of knowing (seeing or hearing) whether an emergency is occurring without assistance
10	Emergency services don't share information with other services (e.g. SES and Police)
11	No SMS emergency contact for roadside help and in rural areas
=12	Concerns about having access to the correct technological tools to access information
=12	Mobile phone reception weak all over Australia
=12	Emergency Service won't accept Deaf people to work or volunteer
=12	Information dissemination via word-of-mouth difficult due to isolation in the country
=16	Affordability - can people afford mobile/TV services (particularly smartphone technology)
=16	SMS, VRS, TTY- worries about long waiting periods
18	Emergency information on the Internet not deaf-friendly and does not meet Deaf needs

5.1.1 Language barriers

Language barriers are the most common communication challenge deaf people face, which affects their ability to interact with the dominant hearing/English-speaking population on a day-to-day basis. Auslan is the preferred language for many deaf people, with English often being their second language. Not all deaf people lip-read,many are unable to speak clearly, and education and literacy levels are low in some areas (particularly in regional areas). This makes it difficult for deaf people to communicate with hearing people via common communication mediums including written text[E,H,K]. Those that are less literate also avoid asking hearing people for help because they are embarrassed[H]. Consequently, Deaf people are often left to rely on second-hand information that is passed down from others who can hear[E,K,M,O]. Information access is even more limited for deaf-blind individuals[F]. Deaf/Blind individuals have no way of knowing whether an emergency is happening around their homes unless they smell smoke (in the event of a fire)[S]. Worse yet, they find it very difficult to ask for help if they are alone in the

[††††]Challenges marked in black are based on the data from Phase 1 of the research that was reaffirmed in the Phase 2 FGDs. Those listed in red are additional challenges that community members added in the Phase 2 FGDs

house. Asking strangers with little experience of interactions with Deaf/Blind people is also extremely difficult[S].

5.1.2 Preparedness and response information is often not in accessible forms

The main barrier to accessing risk and hazard response information during the disaster cycle is that it is often not available in accessible forms[5,6,17,18,19,20,21,22,27,37A,C,E,G,I,L,O,W,X,Z]. Information dissemination mediums are largely audio-based - radio, phone, TV broadcasts without captions, messages broadcast over loudspeakers in public places - and therefore inaccessible to deaf people[C,G,H,I,J,K,L,M,N,O,Z]. The negative consequences of deaf people not being able to hear audio messages, is clearly evident from those who have experienced natural hazards in the past. As outlined in Sections 4.2 and 4.2.1, two people with prior bushfire hazard experiences were left feeling very confused (and in one case, frightened) when their respective trains were stopped by a fire threat further up the line[5,27]. Unlike their fellow hearing passengers, they were unable to hear the loudspeaker messages telling passengers what the issues was and what to do. Accordingly, they did not know what was going on or how to act because they have no idea of the nature of the threat or how serious the threat was[5,27]. Another North Coast resident was unable to hear the onset of a severe hailstorm and was left panicked and unprepared as trees fell around her house[17].

Auslan interpreters are not systematically included in television broadcasts[G,K,M,O]. However, on occasion, interpreters been cut out of the picture when cameras are zoomed in for close-up footage[G]. Other broadcast-related issues include:

i. Incomplete, or unreliable caption services that are often too fast for people to read or are jumbled[G,J,K,L,M]; and
ii. Bad lighting on broadcasts hindering the ability of deaf people to lipread.

Furthermore, Australia's leading commercial video-on-demand and catch-up TV content providers (Foxtel On Demand, Telstra BigPond, Quickflix and Fetch TV) are failing to provide captions for deaf/hard of hearing or vision impaired consumers. Even when content has been broadcast on TV with the appropriate captioning, Australia's online video players, along with the free-to-air TV networks, fail to provide the same captions for online viewers (ACCAN, 2013).

Consequently, information about disaster/emergency preparedness and response strategies and appropriate actions is delayed, or in some cases, completely missing[4,5,7,A,C,H,I,M,N]. The receipt of no information or information that is incomplete, delayed (and possibly redundant) or incorrect causes deaf people to feel left out at best and panicked at worst[A,E,F,J,L].

Newspapers do not have enough detail and the information is often too old to make it a reliable source for swift action[L,M]. The Internet is a popular source of information for both hearing and deaf people and is used extensively by the NSW SES, NSW RFS and FR NSW to disseminate preparedness information. However, information on the Internet (including that found on the

emergency services websites) is often difficult to find. The language used in the text is also too advanced for some Deaf people to understand, prompting calls for more information to be made available via Auslanvidoes[Q]. Another problem is that website information is not always up-to-date[J].

Many Deaf people feel that they are "always the last ones to know", which is a source of great frustration[Z]. In the absence of easily-accessible information, the most common set of actions Deaf people take to access information on natural hazard risk and response strategies are[A,F,H,I,L,O]:

- Contact family and friends (hearing and deaf) via SMS to ensure they receive the correct information and can prepare;
- Check with neighbours and sources online;
- If people are still unsure of what to do, some will try to visit the local police station in person;
- If all else fails, deaf people will approach strangers on the street.

5.1.3 Telecommunication challenges

Deaf people find it difficult to contact emergency services and ask for help during hazard situations because there are a limited range of telecommunication options that they can use, which often forces them to rely on hearing people for help[E,L,R].

On 1st July 2013, a new emergency contact system was introduced which gives Deaf people more options. Under this system, Deaf people have four ways to contact emergency services when faced with a life-threatening situation (Conroy, 2013; National Relay Service, 2013a, 2013b):

i. TTY by dialling 106;
ii. Via two-way Internet relay where users ask for Triple Zero (000);
iii. By SMS relay by texting 0423 677 767;
iv. Via video relay (VRS) using Skype (available between 7am and 6pm on business days).

The most important component of this new system was the addition of the SMS relay option that enables deaf people or people with speech impairments to contact triple-0 via SMS. This is a first for Australia (Conroy, 2013). However, the new system does have some detractors:

- All these options depend on the National Relay Service (NRS);
- Deaf people cannot send SMS messages directly to emergency services;
- There are also concerns that the effectiveness of the new SMS and VRS system will be undermined if there are not enough staff and resources available to support a fast service[Q,CC]. Delays in accessing assistance from the emergency services (due to resource shortages) could lessen the reliability of this service[Q];
- The TTY technology is out-dated, too slow and time-consuming[39,A,E,H,L,Q]. Some are completely unaware of the TTY option, whilst others have found it quicker to SMS

their hearing children and ask them to call '000'[A,E,L]. It is therefore viewed as a good back-up system in the event of internet and mobile connection failures[A].

Other telecommunication-related issues and questions that have been raised by Deaf people include:

- The variable reliability of mobile reception across Australia. Mobile phone reception can be weak in some areas, particularly in the country. What if an emergency happens and there's no mobile reception? How will they get help? These are big issues for many deaf people[Q];
- Accessibility to and affordability of the correct technological devices and applications needed to access emergency and disaster preparedness information e.g. mobile phones and services (particularly smartphones given the direction that mass communication is taking), the right app or video program on mobile phones, subtitled TV, access to natural disaster warning systems[P]; and
- There are questions relating to the government's ability and willingness to invest in the necessary systems and initiatives to meet the needs of Deaf people. Does the government have money to afford this given there's budget cuts happening everywhere?[P]

The possibility of telecommunication network failures is a growing concern among deaf people who now rely heavily upon this technology (SMS and Internet particularly) for every-day communication[A,C,D,E,H,I].Deaf people rely heavily on telephone systems (predominantly mobiles) to communicate with others and receive information as they cannot access radio updates. Some have already experienced telecommunication network failures. During the Queensland floods in 2011, for example, the National Relay Service was unable to operate leaving deaf people with no access to the '106' TTY service[A]. One North Coast resident faced this challenge during a hailstorm[17].

Power outages are another concern.A common question many Deaf people asked was 'what happens when the power goes out?'[Q]. Power outages would affect peoples ability to charge and use their mobile phones[17,Q]. When asked what they would do if the networks failed and the power went out, many had no idea as to what they would do[23,39,A]. One resident exclaimed: *"I really don't know. I would simply take my dog with me and find a way out of the disaster"*[23]. Another noted: *"If [the] power is out and [the] phone battery is dead, we are left to fend for ourselves and that's where the communication barrier happens between us and emergency services"*[39]. People therefore felt the need to have a back-up plan[Q]. In most cases, the back-up plan involved them seeking assistance from hearing people (friends, family, neighbours, and strangers if need be) who had access to radio services[9,10,20,21,25,30].

5.1.4 Interpreter-related issues

There is a shortage of Auslaninterpreters in NSW, particularly in regional areas. The difficulty in accessing interpreters inhibits emergency preparedness and response capabilities in two ways. First, Deaf people find it difficult to attend community meetings or workshops on emergency/disaster preparedness simply because they cannot hear what is being said[H,L]. Nor can they attend emergency drills for the same reason[A]. Second, interpreters are also hard to get access to during emergencies, leaving Deaf people with no effective way to communicate with emergency services personnel as the disaster situation unfolds[22,H,S,W].

5.2 Socio-cultural challenges to Deaf preparedness

Having information provided in accessible forms is paramount to effective action. However, emergency and disaster preparedness is also shaped by deeper socio-cultural factors including levels of social cohesion, knowledge and education levels, personal experiences and expectations, cultural norms, and cultural interpretations of daily life (Bankoff, 2003; Calgaro, Lloyd, et al., in press; Cannon, Twigg, & Rowell, 2003; Thomalla, 2008; Thomalla & Schmuck, 2004; Wisner et al., 2004). This holds true in relation to Deaf people's experiences in dealing with emergencies and hazards.

5.2.1 Lack of deaf awareness amongst emergency services and the hearing public

Deaf Community members believe there is a larger problem hindering the provision of accessible emergency preparedness information and appropriate communication mediums. Most hearing people have little exposure to deaf people. Accordingly, hearing people have little understanding of Deaf culture and deaf people's needs (a lack of Deaf awareness), making it difficult for them to know how best to help deaf people in times of need[F,I,J,L,O]. Members of Australia's dominant 'hearing' culture (which includes the institutions who create and implement emergency management policy and strategies) are yet to come to terms with the 'otherness' of Deaf people - the way they see themselves, their culture, and the different way they navigate through the world(Macready, 2009). The inability of the dominant 'hearing culture' to appreciate this alternate 'world view' and very different experience of life (non-hearing versus hearing) has resulted in the design of inappropriate emergency management tools and strategies. People cannot find answers to problems that they don't fully understand or acknowledge.

5.2.2 Balancing Deaf Community expectations with the capacity of emergency services

As argued in Sections 4.3.3 and 4.3.4, there is a potentially dangerous mismatch between what Deaf people expect emergency services to do for them in an emergency situation and the roles responsibilities emergency services are mandated to provide under the *NSW Disaster Plan* (Displan) and related national protocols (most notably the *Australian Emergency Management Arrangements* and the"*Disaster Response Plan or COMDISPLAN*). Many Deaf people expect

emergency services personnel to attend individual houses to provide information via a door-knock exercise and help them evacuate in an emergency. This is particularly the case amongst older Deaf people who are used to (and most comfortable with) receiving information face-to-face. Another concern is that, emergency services do not check on Deaf people who live alone[C]. However, this strategy is not always possible (particularly in high-density areas) due to hazard conditions and limited man-power. As argued in Section 3.7, being unclear of the roles and responsibilities of the emergency services and asubsequent reliance on assistance that 'may never come' leaves people extremely underprepared and more vulnerable to natural hazards.

5.2.3 Strength of community & social support networks vary greatly across NSW communities

As argued in Section 3.3, access to social support networks and high levels of social cohesion promote reassurance and stability in times of need (DFID, 1999; Munasinghe, 2007). The strength of community and social support networks vary greatly across NSW communities. Some Deaf Communities (e.g. Illawarra and North Coast) are very close and well-organized, creating strong support structures that emergency services can tap into. Others aren't. This leaves some people (particularly those in country areas) without adequate support and feeling isolated in a disaster or emergency event. Increases in resilience and well-being can be achieved through building stronger social relations and improving cooperation and equal representation (Jäger et al., 2007).

5.2.4 Passivity versus activism and empowerment

Deaf people want to have access to the same opportunities, resources, and services as hearing citizens[19,R,S,W,X,Z,CC,DD,EE]. However, some Deaf Community members feel that there is one cultural barrier that is inhibiting their access to the resources and support that Deaf people need. Some believe that Deaf Community members are too passive and rely too heavily on hearing people for assistance[7,8,21,D]. Instead, more active community members want to see Deaf people being more aggressive in advocating for the support and resources they need[7,8]. This is a contentious cultural issue. Limited educational opportunities, coupled with wider societal beliefs that deaf people need to be taken care of, have caused many Deaf people to rely on hearing people to make decisions for them[21,D]:

> *"Lots of the country people are afraid to speak up [about] how they feel. Many times at a meeting, for example, a leader would sign and those people would just nod their heads pretending to understand until at the end [when] they would ask what the meeting was about or what the leader was talking about. They are not assertive and will not put their hands up to say that they don't understand[21"].*

Some older Deaf people attribute this passivity to their limited exposure to and experience with advocating for themselves and their rights in a hearing world[Z]. Deaf people (particularly older

ones) have spent many years accepting what they were given ("what more can the government do for us"), and thinking whatever they get is "better than nothing"[Z]. Those that are less literate also avoid asking hearing people for help because they are embarrassed[H]. This tendency towards passivity is not a universal condition. There are many Deaf people who feel empowered and see themselves as independent and active members of the community. For example, the Lismore community felt very confident in expressing their views and advocating for issues important to them[AA]. This is attributed, in part, to their positive relationship with their local MP who is a former teacher for the Deaf and fully aware of Deaf people's needs[AA]. There are great advantages in having links to sympathetic, resourceful and politically connected community leaders. Not only do they give people confidence in their own ability to positively shape social processes, they also provide effective platforms for social mobilisation and accessing resources when natural hazards occur (Calgaro, Dominey-Howes, et al., in press; Tan-Mullins, Rigg, Law, & Grundy-Warr, 2007).

6 Preparedness solutions to increase the resilience of deaf people

Effective risk communication and disaster preparedness strategies are inclusionary, decision-relevant, two-way, and they foster trust, awareness, understanding, and motivation to act (Atman, Bostrom, Fischhoff, & Morgan, 1994; Council, 1989; Kasperson et al., 2003a; Ng & Hamby, 1997). To increase inclusiveness and relevance to a wide spectrum of people, it is imperative that communication methods match the preferences of the receiving population and use multiple platforms for disseminating the information (voice, fax, email, SMS, TV, and centralised emergency websites) to maximise coverage (Malizia, Astorga, Onorati, Díaz, & Aedo, 2008; McGinley, Turk, & Bennett, 2006). Many Deaf Community participants recognise the need to take full advantage of a wide range of communication and telecommunication options mediums to effectively disseminate information aboutnatural hazard risk levels, warnings, and instructions on what to do[1,2,4,6,7,8,10,16,19,20,22,23,24,26,27,28,29,30,31,34,36,37,38,39]. They also recognize the important role social networks play in assisting them in times of need and the need to capitalize on existing strengths to further improve these linkages within and across communities.

This section details the wide range of strategies Deaf people in NSW believe will increase their risk awareness and help them better prepare and respond to future natural hazards. The strategies and desired tools are grouped into four categories: improving access to information; telecommunication needs; capacity building and educational actions; and strategies for building social and institutional capital. That said, some Deaf Community members would prefer to continue to rely on friends, family and neighbours[16,20,38,D,F,P,] interpreters and note-takers for obtaining information[16], thereby reinforcing the continued importance of existing social networks in supporting preparedness and resilience in the Deaf Community.

6.1 Improving access to information

Deaf Community members have identified 11 actions and strategies that they believe will improve their ability to access information needed to anticipate, prepare for, respond to and recover from natural hazards. These are summarised and ranked in terms of importance in Table 25. The main actions and strategies are explained in more detail below. Where relevant, more than one action/strategy are combined and discussed together as they refer to related issues.

Table 25: Solutions to improve access to information identified by deaf people

Rank	Improving access to information[‡‡‡‡]
1	More visual hazard warning signs in public areas
2	Central register system administered by emergency services/local councils for all those with disabilities to register their needs and contact details
3	More interpreters (Auslan& Deaf/Blind) during emergencies
4	Door-to-door updates by the emergency services or Deaf Liaison Officers during hazard events
5	Access to GPS system that tracks weather conditions, road blocks and provides alerts on approaching natural disasters
6	Need for plain text with pictures for written material
7	Car radio services with scrolling hazard captions
8	Regular newsletters and pamphlets on natural hazard risk, preparedness, and response from councils/emergency services or Centrelink
9	Deaf support organisations to disseminate natural hazard and emergency information
10	Laser lights of updates for Hazards shown on wind-screens in cars
11	Visual hazard signs that states "if you see a bushfire or floods, please call this #", would like the same in SMS format

1. Provision of more visual hazard warning signs along roads & in public places

Deaf people want to see more visual warning signs and announcements indicating imminent risks of natural hazards used in public places and along roads[3,5,27,37,I,K,M,O,P]. The range of visual warning signs that were might be used include:

- Visible announcements on public transportation[5,O];
- Flashing warning signs on highways to alert drivers of natural hazard events that are close-by. Deaf people cannot hear warning sirens while driving and are only made aware of emergency service vehicles when they see the flashing lights[3];
- People would also like to see the common roadside signs saying *"If you see a bushfire or floods, please call this #..."* adapted to include an SMS contact deaf people can use. Having anaccessible number would allow deaf people to be of service to emergency services and the wider community by informing them of any bushfires or floods that deaf people might see as they drive along[P,T,EE];
- An emergency flashing light system installed in public places and in people's homes that emergency services can activate when natural hazards take place[18,C,I,J,K,Y].One North Coast resident has seen this type of public system work in Queensland and would therefore like to see a similar system introduced in NSW[18].

2. Introduction of a central register that all people with disabilities can use to register their details and specific needs

This could be run by the emergency services (preferred option for many), Deaf support organisations, Centrelink or local councils. People with disabilities can use this register to advise emergency services of their location, contact information and their specific needs so that

[‡‡‡‡]Challenges marked in black are based on the data from Phase 1 of the research that was reaffirmed in the Phase 2 FGDs. Those listed in red are additional challenges that community members added in the Phase 2 FGDs.

emergency services and first line responders can organise best ways to communicate with deaf or deaf/blind people in advance and assist them effectively in emergency situations[1,7,10,17,29,33,C,D,F,G,H,I,J,K,L,M,N,O,T,DD]. Warnings and preparedness advice could also be disseminated via email[1,7,10,16,19,23,26,28,36,37] (or fax[7,D]) to deaf people that are registered [31,33,F,K,M,N,P]. If the telecommunication networks go down, this register could also be used to contact people directly (visits by emergency services personnel)[33]. We acknowledge that this type of system might prove very difficult to manage but it is extremely popular among Deaf people.

3. **Provision of more interpreters (Auslan and Deaf/Blind) during emergencies**

More Auslan and Deaf/Blind interpreters are needed during emergencies to help Deaf people communicate with emergency services personnel and volunteers [8,16,17,23,25,27,S,T,DD,EE]. This need is particularly acute in the country (and some regional areas like the Central Coast) where there is a lack of Auslan interpreters [6,22,25,27,M,O,EE]. Community members suggest that this could be achieved in partnership with Deaf support organisations or through Centrelink but they need to be provided in a timely manner[22,27]. Deaf Community members would also like to see the introduction of an emergency 24/7 'stand-by system' for interpreters who would remain on call for a specified period, to make it easier for emergency services and Deaf people to get access to interpreters in a timely fashion[DD,EE].

4. **Provision of door-to-door updates by emergency services or Deaf Liaison Officers during hazard events**

Some community members would like to have preparedness and response updates disseminated in person via door-knocks[19,25,26,27,O,P]. This face-to-face contact is very important for some community members[25]. This could be done by emergency services personnel or aDeaf Liaison Officer - a trained officer responsible for reaching out to Deaf Community members during emergencies[5,28,G,J].

5. **Access to GPS system that tracks weather conditions, road blocks, and provides live alerts on approaching and unfolding natural hazard events**

Many Deaf people own GPS systems and use them for both work and holidays, making it a useful medium for natural hazard alerts[3,4,Z,CC,DD]. The GPS warnings could also include alternate route suggestions[3].The tracking of weather systems is currently available through the Bureau of Meterology website where users can find out localised news by postcode. However, the voicing of the need for an expanded version infers that Deaf people need to be better informed of its existence and all the sources of information that are available to them. For those without a GPS system, another variation could be a car radio service that provides scrolling hazard captions via the visual display (ranked 7th in Table 25)[O].

6. The use of plain text with pictures in written forms of communication

Deaf people are very visual, particularly those who are less literate.Combining plain text with simple text in written forms of communication istherefore much easier for Deaf people to understand[G,H,I,O].

7. Regular newsletters and pamphlets on natural hazard risk, preparedness, and response

Regular Deaf-friendly newsletters and pamphlets detailingnatural hazard risk levels, preparedness and response instructions could be disseminated via mail by councils, emergency services, Deaf support organisations/groups (Deaf Society of NSW or Ephepheta Centre) or Centrelink Offices (given that many deaf people go to the Centrelink offices to collect a disability pensions)[10,D]. An alternative idea is for the emergency services to produce and disseminate updated information packs to deaf people advising them what to do in the event of each type of hazard event that affects a particular area[10.] These could be supplied in paper form via mail and in the offices of local councils, emergency service local branches or Centrelink and/or email[D,EE]. This communication medium suits those who do not have access (or reliable access) to online services or are not confident in using this medium[2,24,29,39,C,H,K,L]. Having information accessible at the local council would also give deaf members an opportunity to ask for additional information[39]. However, emergency/disaster preparedness brochures and literature need to include an SMS number for deaf people to contact for further information[M].Newspapers are another medium that deaf people could turn to for warning if other mediums are unavailable[30].

8. Deaf support organisations to act as a source of emergency information and support

The Deaf Society of NSW, as the main support organisation for Deaf people in NSW, is a prominent source of information and assistance for the community it serves. Community members therefore feel that it (like other Deaf support organisations) is well-placed to be a source for preparedness information - Deaf people already naturally turn to them for help[C,P,Z]. The Deaf Society could email material to those on its existing client lists[EE]. The request to have existing social support organisations as a source of preparedness information again demonstrated the importance Deaf people place on having access to and usingestablished and trusted networks (social capital). Deaf people's reliance of strong community organisations is very much evident in smaller communities like the Illawarra and Coffs Harbour communities, which are close-knit. But the success of a strategy based on strong Deaf support organisations may need to be place-specific; they may not work in other areas where similar connections do not exist or are not as effective. This observation reiterates the need to consider place-based differences (and context) when designing hazards preparedness and response strategies.

6.2 Telecommunication needs and solutions

Telecommunication needs and solutions identified by the NSW Deaf Community members fall into two broad categories: (i) mobile and landline telecommunication solutions; and (ii) those involving the Internet, TV, TTY, and Fax.

6.2.1 Improvements in mobile and landline telephone services

As noted in Section 4.7.1, mobile phones (both smartphones and more basic devices) and the texting function are the most popular and effective way for deaf people to communicate with others both in their everyday lives and during hazard events. The favoured options for improving deaf people's resilience are subsequently heavily skewed towards mobile-orientated solutions. A summary of the mobile and landline telecommunication solutions suggested by the NSW Deaf Community and their rankings are presented in Table 26.

However, there are risks in relying too heavily on this method of communication. Information dissemination can be patchy and therefore unreliable when used in isolation(Hans & Mohanty, 2006). This is particularly the case when some parts of the telecommunications networks (such as cellular phone towers and transmitters) and supporting power infrastructure are damaged and the network subsequently fails due to the onset of the hazardous event(Hans & Mohanty, 2006). The evidence suggests that some Deaf people do not believe that the telecommunication networks would fail and as such are not looking to other mediums for information[32]. This dependence on the mobile phone as their sole tool for receiving natural hazard warnings is cause for concern and reaffirms how reliantDeaf Community members have become on mobile phone technology.

Table 26: Mobile and landline telecommunication solutions to current needs

Rank	Mobile and landline telecommunication solutions §§§§
1	Establish a direct SMS "000" emergency contact number (no 3rd party - NRS or VRS)
2	Receive SMS Emergency Warning Alerts from NSW Emergency Services
3	Video Relay Service (VRS) to contact Emergency Services
4	Access to SMS severe weather updates from weather bureaus
5	Smartphone apps like Silent Tweets, RFS NSW app
6	Improve reception for mobiles especially in rural areas
7	SMS "000" two way conversation contact number, not one way
8	Government to subsidise or provide smartphones
9	Improve affordability of better mobile and landline services (Telstra)
10	Faster responses from NRS and VRS
11	Training on use of smartphone and apps
12	Alert icon App that knows where you are if emergency situations
13	24/7 VRS
=14	13500 # for SMS
=14	"Chat" sms app to emergency '000' service like MSN
=14	Bush telegraph via SMS
17	Special information line # via SMS

§§§§• Challenges marked in black are based on the data from Phase 1 of the research that was reaffirmed in the Phase 2 FGDs. Those listed in red are additional challenges that community members added in the Phase 2 FGDs

1. Establish a direct SMS '000' emergency contact number

"SMS is a must"[24].

The establishment of a direct SMS "000" emergency contact number is emphatically deemed the *most important* action needed to improve deaf people's access to reliable information andtimely assistance[1,2,3,4,5,7,8,9,10,15,16,17,18,19,20,21,22,23,24,25,26,27,28,30,31,32,34,36,37,38,39,C,D,E,F,G,H,I,J,K,L,M,N,O,P,DD]. The new '000' SMS service introduced on 1st July 2013 is an indirect service as it runs through a 'third party' - the NRS. There are three problems with having an indirect service. First, it can make response times longer. Having a direct line to the emergency services saves time and makes deaf people less reliant on hearing people for help[5,18,20,21,37,Z]. Second, this system could still pose problems for people who cannot read and write[21].

Queensland's *Policelink*is a model that deaf people in NSW would like to see emulated[15,25,E]. Under the Policelink system, deaf people can either send an SMS or an email to the Queensland Police. On receipt, the police arrange for an appropriate response - they may send a message back to gather further information to assist, arrange for a Police Officer to attend, or request that contact be made to Policelink via the National Relay Service on telephone(Queensland Police, 2013). Third, there would be no alternative for deaf people if the NRS was placed out of action due to a natural hazard event. This occurred in the 2010-2011 Queensland floods when the Brisbane-based NRS office flooded and were temporarily shut. During this period, the Deaf Society of NSW posted updates on their website on the NRS's behalf. The attributes that Deaf people would like to see included as part of this SMS system include:

- Direct "000" SMS emergency contact to have two-way conversation capabilities rather than one-way, as is the case when hearing people dial '000'[S,W,X,Z,CC,DD,EE]. One way to enable a direct two-way conversation to take place between deaf people and emergency services personnel (see option 1 above) is to introduce a chat-based SMS app (similar to "Whatsapp") that is linked to the '000' service through Skype or MSN[CC,DD]. This access allows them to have the same level of access as their hearing counterparts[S].
- Have an email option, similar to the Queensland's *Policelink*.

2. Automatic SMS Emergency Warning Alerts from NSW Emergency Services

SMS updates to be sent to Deaf people from a central emergency services system as most people have their mobile phones with them at all times. A special alert message system that pops up on smartphone screens (that differentiates it from normal SMS messages) would also be beneficial[8]. Deaf people who receive these alerts could then forward them onto to other Deaf Community members (word-of-mouth)[25,I], thereby taking full advantage of existing social networks to improve preparedness at a community level. This is an extension of how some Deaf people currently access information in the absence of a dedicated SMS service:

> *"I believe the best way to get everyone in the Deaf Community to get together and be informed is through SMS. That's what I do every time any natural emergency happens here in Tamworth-my sister listens for updates through the radio and SMS's me. I then share the SMS with other Deaf people in the area so they are aware. Deaf people like me cannot hear or understand the radio so we have to rely on hearing people like my sister who have access to that and pass on the information to others[25]."*

An extension of this SMS hazard alert system is to have a system that sends automatic SMS/email alerts to registered parties when new bulletins break on TV news in Auslan/captions[DD]. The premise is based on hearing people having automatic access to radio anywhere, be it in their car or at a public place. Deaf cannot hear this but they do have their phones with them at all times.These alerts could advise people to watch the news about an emergency that will or is currently affecting their area(s)[DD]. This system would help deaf people access the same information that hearing people get but through their phones.

This type of system does exist. *Emergency Alert*(http://www.emergencyalert.gov.au/) is the national automated telephone warning system that is used by emergency services in all states to send voice messages to landlines and text messages to mobile phones within a defined area, about likely or actual emergencies such as fire, flood, or extreme weather events. People do not sign up, nor can they opt-out. Emergency Alert has been set up so all landlines and mobile phones are automatically registered, regardless of carrier. Mobile phone information is based on the billing address, landlines are based on the location of the handset. For the mobile version, the system automatically sends a text message to all mobiles (using Telstra, Optus and Vodafone) with a registered service address within the warning area.Since December 2012, the system has the capability to send a text message to mobile phones active on Telstra's networks with a last known location within the warning area.From November 2013, this service will be available for mobile phones on Optus and Vodafone networks from November 2013(Ministry of Police and Emergency Services, 2012).

This system, however, is not well-known within the Deaf Community, flagging a need for it to better publicised within the Deaf Community.

3. **Smartphone applications** (free *apps*preferably) like *OpenMiSilent Tweets* with up-to-date 'live' hazards information and preparedness advice[3,39,G,I,J,K,L,M,N,O].

4. Improve reception for mobiles (especially in rural areas)

This is an extension of the previous point on increasing affordability to reliable mobile services (Telstra). Telstra generally offers the best quality reception speed but their services are also costly which hindersDeaf people's access to this service[V]. Optus and Vodaphone's reception services aren't as strong as Telstra's, especially out in the country. Many people in rural areas have long commutes to work, so if there is an emergency or natural hazard in areas where there isno reception, Deaf people are likely to be the last to know and the last to get access to assistance from the emergency services or the public[Y]. Accordingly, if the government is looking

to increase Deaf people's access to hazard preparedness information and the services of the emergency services via mobile and Internet services there needs to be investment in improving mobile reception across all parts of NSW and Australiaand the delivery speeds offered by telecommunicationcompanies[P,S,V,W,X,Y,Z,DD,EE]. If they don't, any investment in the types of solutions they support will be futile in the long run[P].

5. Government to subsidise or provide free smartphones for deaf people

The ongoing shift toward communication strategies that use smartphone technology relies on access to devices that not all people have or can afford. Some Deaf people cannot afford this technology (due to many being on disability pensions), whilst others have simpler devices without Internet access[R]. If the government and emergency services choose to design their communication strategies around smartphone and Internet technology then it is felt that the government will need to help fund Deaf people's access to this technology via rebates, subsidies or supplying Deaf people with smartphones for free[D,R,T,U,V,X,Y,CC,EE]. There are three reasons for this thinking. First, not having access to this technology will place people at a disadvantage with regard to accessing risk and preparedness information and instructions[R,U]. Having access to a smartphone is thought to be most important in country areas where people are already more isolated and rely heavily on mobile phones to communicate out of geographical necessity[U]. Second, people remember when the government provided TTY technology to deaf people for free at the time TTY technology was released and therefore cannot see why this same gesture cannot be applied to smartphones[CC,EE]. Finally, the effectiveness of smartphone and Internet related communication tools designed to increase Deaf people's preparedness to hazards will be undermined if people do not have the access to the devices resulting in a waste of resources[T].

6. Improve affordability of landline and mobile services

Telstra offers the best reception across the state but their service is very expensive compared to other providers like Vodaphone or Optus[X,W,Y,EE]. Having weaker reception places them at more risk but many feel they have no choice due to price[V,W,X,Y]. Many Deaf people also live on government money (disability pensions). Therefore Deaf people would also like to have access to cheaper landline plans to increase access to TV, TTY, or Fax[W]. Suggested ways of reducing the cost of access to Telstra's services (particularly mobile services) include:

- Telstra to offer discounted mobile plans (half-price if possible) that exclude the voice function and offer text and data options only. Other countries offer discounted phone plans specifically designed for the Deaf (Canada, UK, and USA) that exclude voice and people would like to see this option offered here in Australia[EE]; or
- Introduce governmental subsidy schemes that help reduce the cost of reliable mobile phone services (Telstra)[P].

Telstra are aware of this need and has been working closely with Australian Communications Exchange, Deaf Australia, the Deaf Society of NSW and Australian Communications Consumer Action Network (ACCAN) to develop affordable phone plans for deaf people that will exclude

the voice/mobile minutes (B. Ciavarra, Manager of Telstra's Disability Programs, *pers. comm.,* 14 August 2013). Telstra already have phone plans that allow consumers to use the minutes for any of the following: voice, data, and SMS. Consumers can pick any plan and elect to use any of those three for "x" number of minutes (B. Ciavarra, Manager of Telstra's Disability Programs, *pers. comm.,* 14 August 2013). However,this still means thatone or more of the available services will be wasted due to lack of usage.

7. Improve the response times of the National Relay Service (NRS) and Video Relay Service (VRS)

The ability to contact emergency services via Video Relay Service (VRS) will soon be possible under the new '000' system, thereby fulfilling this identified need (ranked 3rd in Table 26). However, the new VRS service is still in the trial stage - the service only operatesMonday-Friday from 7am-6pmAEST and is supported by six VRS interpreters. At this point, the VRS cannot yet handle any emergency calls. This will change once the service is expanded to operate on a 24/7 basis. However, questions about its ability to deliver fast results remain. People have experienced delays in the past when using both services due to a shortage of NRS operators and VRS interpreters and the hours provided for VRS are currently limited. Therefore, people feel that an expansion of this system to include the emergency function will require the employment of more operators and the times for both services need to be extended to 24/7[X,P,Q,CC]. These services need to be available at all times to cater for the erratic timing of hazard events - they do not just take place during business hours[X].

8. Alert icon App that can be used to locate people in emergency situations

This request is for an app version of personal emergency alert systems (activated by a device that some senior people wear around their necks)that people can use if they need urgent assistance[T]. Seniors would like an app that they can use to alert emergency services of their whereabouts during hazard events to get access to immediate help. This type of technology already exists and could be adapted by the emergency services to fulfil this need.

The app *Find My Friends* allows users to geographically track the whereabouts of other users who have the app and have shared their location through the app. A person's location is determined using GPS in the iOS device when Location Services are turned on. Notifications appear when a user requests another user to see where they are. The feature can also be turned on and off at any time (Apple Inc., 2013). Red Button Technologies (www.redbutton.com.au) also has an emergency alert app (for iPhone, Android, and older phones) that allows users to manage their personal health, work safety and security risk. The emergency button simultaneously connects with the designated group of contacts and also provides conferencing between the caller, recipient and '000' operators. The app connects to the Cloud-based Priority Group Connectivity Server (PGC) through public phone networks. This then connects with their program called 'Friendlies' that contains selected contacts for emergencies. During an emergency, the person in need of assistance clicks on their *Redbutton*app and it automatically sends out to all of their Friendlies via call and SMS alerts. The

first respondent takes the call and assists. If further emergency assistance is needed, either the person in need of assistance or the responding Friendly can seamlessly conference call 000 through a 0 key. The 000 linked into the conversation will then automatically connect with both the person in need of assistance and the Friendly. Both of these applications provide emergency services with foundational ideas that can be adapted to better fulfil Deaf people's needs.

9. Bush telegraph system via SMS

The 'Bush-telegraph' is a 'word of mouth' system commonly used in the country for emergency events. Whilst this seems ideal, the problem is that this system is still inaccessible to deaf people as it requires someone to verbally initiate the news. This could be made more accessible to Deaf people by using SMS as the medium instead of verbal communication[AA].

6.2.2 Internet, TV, TTY, and Fax

Table 27 presents other telecommunication solutions that Deaf people feel will increase their access to hazard and emergency preparedness and response information. The main solutions are explained in more detail below.

1. TV reports to include Auslan interpreters and standardised& reliable captioning

Deaf people want to see all television reports and newsflashes includeAuslaninterpreters[1,7,20,25,29,C,E,G,H,I,J,K,L,M,N,O,P] (shown in a larger frame to help people see them clearly)and standardized and reliable captioning[1,19,26,27,31,D,E,G,K,N,P]. The Australian Communications Consumer

Action Network (ACCAN) also supports this call. Following the identification of numerous communication issues that occurred during the Queensland 2011 floods, ACCAN calls for introduction of standardised and reliable open-captioning on free-to-air TV, the ABC and the SBS and the routine inclusion of Auslan interpretations in all emergencybroadcasts (ACCAN, 2011).The Illawarra community was particularly enthusiastic about having Auslan interpreters alongside government and emergency services personnel as seen on broadcasts following the Queensland floods in 2011[P]. These two requests were the most important changes deaf people would like to see to emergency-related broadcasts. Related solutions include: (i) the addition of standardised captions and Auslan interpretations on Foxtel news services[T,X]; and (ii) having all TV news accessible online in Auslan and with captions[R].

Table 27: Internet, TV, TTY, and Fax solutions

Rank	Internet, TV, TTY, and Fax solutions[*****]
1	All live TV news reports to have Auslan interpreting (that show full view of interpreter)
2	TV reports to have standardised & reliable captioning
3	Central website providing emergency information for all disasters and hazards (in simple, plain English)
4	Increase access to emergency Information through the Internet (Auslan videos, captioned videos)
5	One central government emergency service website for people with disabilities
6	Use of social media through Internet (Facebook, Twitter)
7	Have direct emergency numbers for TTY and/or fax as an alternative to phone and internet services
8	24/7 specific TV channel with constant captions and Auslan interpreters for Deaf (good for people who do not have TTY, fax, or mobile phones)
9	"Google" glasses to be used for relaying emergency information
10	Free or cheaper Internet Plans for Deaf People (half price discount)
11	Foxtel to have newsflashes with captions and Auslan
12	Compulsory captioning on all public TV and public transportation screens (such as electronic screens in train stations)
13	Improve internet speeds in rural areas
14	State based digital emergency notices through Tele-text and TV (such as Channel 46 NSW) and twitter feeds
15	Improve TV reception in rural areas for clearer picture on TV
16	All TV news accessible online in Auslan and captions, etc.
17	Information 13500 line in pre-recorded video format to be made available online

2. Central website providing emergency information for all disasters and hazards for people with disabilities

Deaf people would like to have acentral website (one consolidated source) for people with disabilities that is dedicated to providing risk and preparedness information for all hazards, which includes 'live' updates[28,K]. This would make it easier for people to get access to information that is specifically tailored to their needs, alleviating the need for them to navigate their way through multiple and often confusing webpages (a key challenge identified in the Emergency Service Capacity Assessment). However, information would need to be presented in forms that are accessible to deaf people i.e. the use of visual cues (pictures, symbols, numbered text boxes or pictorial sequences) paired with simple, plain English, and Auslan videos with captions.Deaf people have also expressed an interest in having this website send out SMS emergency updates to them informing them of the risk levels of different hazards and localised instructions on what to do. This facility is already covered in part by the new nation-wide *Emergency Alert System*but this system in not well-known in Deaf circles.

[*****] Challenges marked in black are based on the data from Phase 1 of the research that was reaffirmed in the Phase 2 FGDs. Those listed in red are additional challenges that community members added in the Phase 2 FGDs

3. Increase access to emergency Information through the Internet

Related to the point above, there is a call to increase the accessibility of hazard preparedness information by including Auslan videos with captions on emergency services websites[5,6,16,24,27,31,34,E,G,H,I,J,P]. Recognising this need, the NSW SES has already taken positive steps to provide flood-related hazard preparedness and response information on their floodsafe website in Auslan (http://www.floodsafe.com.au/what-floodsafe-means-for-you/dea-and-hearing-impaired).

4. Use of social media (Facebook & Twitter) to disseminate information

Social media is an increasingly popular communication tool among Deaf people (particularly younger people). Consequently, social media tools (Facebook and Twitter) are seen as an effective way to disseminate risk, preparedness response information and instructions on what Deaf people should do before, during, and after a natural hazard event[4,20,28,30,C,D,G,J,K,P].

5. 24/7 Specific TV channel on emergency broadcasts in Auslan for Deaf people

Most people have access to TV[P]. Therefore, there is a call for a specific 24/7 TV channel that shows emergency broadcasts inAuslan with reliable captioning[P,DD,EE]. This would be especially beneficial for those who do not have a TTY, fax, or mobile phone and/or have limited to no English reading skills. Therefore, people would like to have a separate channel for the Deaf with Auslan interpreters and reliable captioning to meet the needs of Deaf Auslan users and those that rely on English text[DD].

The Australian Broadcast Corporation's (ABC) News 24 already provides live captioning for all emergency broadcasts. However, it does not yet include Auslaninterpreters in these broadcasts. This is a step towards meeting the needs of Deaf people but more is needed to increase Deaf people's accessibility to risk and hazard information and instructions.

6. 24/7 TV channel for Deaf people with captions and Auslan interpreters for all news programs

An extension of the above solution is to have a TV channel that offers full, reliable captions and Auslaninterpreters for all news programs[Y]. This would save all stations having to provide emergency information in Deaf-accessible forms. Channel 2 (ABC) was seen as the logical choice to have this facility. Another option is to have standardized emergency notices disseminated via Teletext or Austext on one designated channel (a service which was discontinued)[S].

7. Subsidised or free internet plans for Deaf people

Affordability of both mobile phone and Internet services can be difficult for some Deaf people, particularly for those on disability pensions[W,Z]. Therefore, Deaf people would also like to receive rebates or subsidies for internet plans. This would help people to afford access to emergency management information websites, email services, and the VRS[W]. A related need is the improvement of Internet download speeds, particularly in country areas where people are more

isolated and therefore more dependent on reliable telecommunication services to communicate[P,Z,DD].

8. Compulsory captioning on all public TV and public transportation screens

Most TVs and information screens in public places (such as community clubs, shopping centres, and electronic screens train stations) do not have captioning or subtitles. Deaf people are concerned about what would happen if the news pops up with an emergency announcement and there's no captioning? This would leave Deaf peopleat a disadvantage because they would not know what the emergency or warning is about[S]. Therefore people would like this facility routinely introduced in all public places[R,S].

9. Information 131500 line in pre-recorded video format to be made available online

Deaf people want the same access that hearing people have to the 131500 information number. Hearing people who call this line, get pre-recorded messages or a live person to talk to about public transport services - if any delays are occurring and if there are issues due to natural hazards. To get this same level of access, some Deaf people would like to have access to pre-recorded videos (in Auslan and with captions) online[R].

6.3 Capacity building and educational actions

"I also would like to see a deaf person work or be involved with the SES. I would if given a chance" [37].

Deaf Community members have identified eight actions and strategies that they believe will help improve Deaf people's preparedness levels to natural hazards and increase the capacity of support organisations (including the emergency services) to better support them before, during and after hazard events. These are summarised and ranked in terms of importance in Table 28. The main actions and strategies are explained in more detail below.

1. Deaf awareness training

The most pressing capacity building exercise put forward was Deaf awareness training [3,6,7,17,18,20,22,27,39,H,J,L,M,O,P,T,W]. This is seen as a fundamental requirement for improving levels of support Deaf people receive before, during and after a hazard event. As argued in Section 5.2.1, Deaf people believe that a lack of Deaf awareness among the hearing populace makes it very difficult for hearing people to (i) understand Deaf people's needs and (ii) subsequently provide appropriate support. Accordingly, regular Deaf awareness training (not one-offs that is then forgotten or not received by new staff) is recommended for emergency services personnel, first-responders and volunteers working on the ground during a hazard event, government officers with emergency management response responsibilities, and the general public[7,39,H,J,L,M,O,W]. There is also a push to include the Prime Minister, strategically placed chief executive officers and TV news crews in this list[P]. It was thought that if people in higher and well-respected

Table 28: Capacity building and educational needs and actions

Rank	Capacity building and educational needs[†††††]
1	Deaf Awareness Training for emergency services & public
2	Regular hazard workshops for Deaf people
3	Train emergency services on how to receive NRS calls from Deaf consumers
4	Emergency Services to train Deaf people to work as 'Deaf Liaison Officers'
5	Deaf Awareness Training for PM, CEO's and Politicans, TV news presenters
6	Improve interpreter skills (via training) for emergency situations
7	Provide training for deaf people (particularly seniors) on how to access information on the Internet
8	Deaf Society of NSW needs more staff and provide 24/7 emergency support
9	Train older generations on how to use smartphones and apps

positionswere made aware of Deaf needs and took an interest, they were best placed to heighten awareness and bring about action and positive change[P].

Specific points that Deaf people want incorporated into the training include:

- The communication needs of deaf people, which includes having patience when communicating with pen and paper[3,7,20,W];
- Instructions on the diverse nature of the Deaf Community, the types of groups that make up the Deaf Community and differences in their needs. This is a particularly important action point for Ushers and Deaf-blind people who feel that their needs are least understood[T]. Ushers and Deaf-blind people also feel that Auslan interpreters need training on the differences between Ushers and Deaf-blindpeople[T].

2. Regular workshops on natural hazard risk, preparedness & response strategies

Regular natural hazard workshops for Deaf people (presented in Auslan)were seen as the best way to increase both risk awareness and people's capacity to prepare for, respond to and recover from events[2,3,4,6,7,10,11,14,16,18,19,20,21,22,23,24,25,27,29,30,31,36,37,38,39,H,J,L,M,O,P,T,W]. Details on who should run them and what should be included are outlined below.

Facilitators: There was a preference for these to be provided throughout NSW by emergency services (NSW RFS, NSW SES, FR NSW) with support from Deaf support organisations and Deaf Liaison Officers (see point 3 below). There were three reasons for this[Q,T]:

i. Emergency services could provide "hands on" workshops through their local branchesso deaf people could see how the emergency services work and responses to emergencies;
ii. Emergency services taking the lead in this initiative would demonstrate their commitment to working in partnership with Deaf Community members and meeting their needs; and

[†††††] Challenges marked in black are based on the data from Phase 1 of the research that was reaffirmed in the Phase 2 FGDs. Those listed in red are additional challenges that community members added in the Phase 2 FGDs

iii. Increased interaction between emergency services and deaf people would help facilitate mutual understanding between both parties.

Clarity would be best achieved by using an Auslanpresenter to facilitate the workshops. However, if this is not possible, having an Auslan interpreter present would also work well[2,30,36,37].

How often: Suggested annual timeframes vary - every three, four, six, or 12 months. There is also support for regular workshops to be held before bushfire or flood season i.e. for the timing of the workshops to be seasonal[29,30,32]. A seasonal approach may also work best with current emergency services community awareness programs.

Advertising techniques of upcoming events: The best way to notify people of upcoming events would be via email (using Deaf support organisation client lists), through websites (postings on emergency services websites and those of established Deaf/deaf support organisations) and social media outlets (e.g. Deaf Society of NSW's Facebook page).

Style and contents: Some deaf people, particularly those in country areas, have lower literacy levels meaning that workshops would need to be undertaken in simple English and at a slower pace to ensure that all people understand[21]. The workshops also need to be very visual[K]. To ensure that workshop material is pitched at the correct level, we recommend that emergency services work closely with the Deaf Society of NSW when finalising the material. Things people want to be informed about include (for example):

- The difference between hazards anddisasters;
- Types of hazards that affect people in their place of residence and risk levels (thought to be especially important for those who are new to an area);
- The role of emergency services (SES, RFS NSW, FR NSW), how they operate during emergency and hazard situations;
- Training on emergency plans i.e. What to do before, during (including what to pack and take with you), and after a disaster or emergency;
- Where people can get information on natural hazard risks in their area;
- Who deaf people should contact in a disaster situation;
- Information on what to do when telecommunication networks fail and alternate deaf-accessible means people can use to get reliable and up-to-date information;
- Where evacuation shelters are in their local area;
- How best to assist and support other people in their community;
- Organisations people can approach for assistance before, during, and after a disaster event;
- Emergency rescues strategies and options for pets and livestock (particularly important for people living in country areas);
- First aid; and
- Where to get counseling and emotional support after a natural hazard.

There are some individuals who would like to receive information in one-on-one meetings with emergency services to be informed about the potential risks[2]. However, this may not be practical.

3. Emergency Services to train Deaf people to work as 'Deaf Liaison Officers'

Deaf people want the emergency services to employ 'Deaf Liaison Officers' that are trained in disaster preparedness who can work directly with both the Deaf Community and emergency services to improve community preparedness and awareness[6,16,28,37,N,EE].

These 'Deaf Liaison Officers'would act a trusted and culturally sensitive liaison between the Deaf Community and the emergency services[28,37,N].Roles of the Deaf Liaison Officer could include:

- Facilitating (or helping to set up and run) the disaster awareness and preparedness workshops[G];
- Help in the making and distribution of Deaf accessible natural hazard/disaster preparedness videos;
- Being the contact person for any Deaf Community enquiries regarding preparedness strategies and processes;
- Disseminatingpreparedness and response plans, strategies, information,updates and response instructions provided by emergency services to the wider Deaf Community before, during and after hazard events;
- Undertaking door-knocks to advise deaf people of preparedness and response updates, particularly during events[5,28,G,J.] This person could also be a good source of information if telecommunication networks fail[3]; and
- Monitor various emergency information points and distribute information.

This position could be for a shared officer either between NSW RFS, NSW SES and FR NSW only or between all three ESOs and the Deaf Society of NSW. Given that the Deaf Society of NSW already has an on-going project with FR NSW (NSW Smoke Alarm Subsidy Scheme - SASS), this person may be a natural link between on-going projects and improving emergency and disaster preparedness generally to multiple natural hazards.

The NSW SES, NSW RFS and FR NSW are open to and encouraging of Deaf people taking on volunteer roles in the respective organisations. However, there is some doubt amongst Deaf Community members as to whether they would be accepted and given the proper support to effectively work for or with the emergency services in some capacity. They would like to see this happen but "seeing is believing"[R]. The willingness is clearly there on both sides - Deaf people just need to know how to get involved and be reassured that they will be welcome and that their communications needs will be catered for.

4. Further training needs

Other training needs identified by the community include:

- Training for emergency services call centre staff on how to respond to National Relay Service calls[H,R];
- Basic Auslan training for emergency services personnel and on-the-ground responders including police volunteers[20,39,C,I,L,M];
- Improve interpreter skills for emergency situations - if Auslan interpreters are routinely included on live TV news broadcasts (as done during the recent hazard events in Queensland), then there is a need for specific training for interpreters on how to best interpret information in this context[EE];
- Provide training to Deaf support organisations on how best to support deaf people in times of emergencies and disasters so they can be a knowledgeable resource for deaf people[27];
- Provide training for trauma counsellors on how to work with interpreters and how best to assist Deaf people in emergency and disaster situations - having counsellors that are fluent in Auslan is preferred[27];
- Provide training for segments of the Deaf Community on how to use the Internet - some seniors do not have access to the Internet and are therefore not adept at navigating their way through websites. They would like to see training offered on how to use the Internet and how to obtain natural hazard and emergency response information; and
- Provide training (particularly needed for seniors) on how to use smartphones, how to keep abreast of new technological development, and how to get access to and use smartphone apps that can benefit and assist deaf people during emergencies (such as 000 SMS emergency contact, using VRS, downloading and using the current NSW RFS *Fire Near Me NSW*app etc.)[S,X].

6.4 Strategies for building social and institutional capital

As argued in Section 3.3, social capital promotes reassurance, and stability in times of need (DFID, 1999; Munasinghe, 2007). Investing in the building of strong networks and improving social cohesion not only lowers vulnerability levels to natural hazards but also improves general well-being (Jäger et al., 2007). With this in mind, the Deaf Community have proposed a set of actions they feel will strengthen social networks, improve community cohesion, and increase institutional cooperation.

6.4.1 Strengthening social capital within communities

Box 1 outlines nine actions that Deaf Community members believe will strengthen social networks, improve community cohesion and increase the quality of support offered by Deaf support organisations.

Box 1: Nine actions to Improve community cohesion and institutional support

1. Organise a mentoring program within Deaf communities, whereby older community members such as former teachers and professional workers share their experiences with younger community members. These same mentors could also provide Deaf Awareness workshops for hard-of-hearing and hearing people[23].
2. Support organisations and communities groups to arrange more social activities in areas thought to have weaker community linkages to further increase social cohesion and strengthen networks. This is seen as particularly important in the Central West of NSW.
3. Increase the presence and services of the Deaf Society of NSW in the Central West[37]. Holding a series of workshops with community members in the area is suggested as a good way to ascertain what types of services Deaf Community members in the greater area would like to have[37].
4. This idea of having workshops to gage the types of support community want is emulated by residents in the Illawarra[3]. It is thought that having these activities regularly would also benefit deaf people who have recently moved to an area because they would help inform people about what services are available[1,3].
5. Calls for the Deaf Society of NSW to emulate the support Queensland Deaf Services offered its community after the 2011 floods and Cyclone Yasi i.e. by helping raise funds to assist deaf victims in flooded and cyclone-impacted areas[N].
6. The Deaf Society of NSW to allocate more hours to Deaf-Blind services and provide guides for activities that Deaf-Blind people would like to be involved in[33].
7. Increase government funding for the Deaf Society of NSW to enable them to offer better services and support to the Deaf Community[9], particularly for those living in rural areas where support is most lacking[21].
8. Increase institutional learning among Deaf support organisations through a collective forum that is run on a regular basis. This forum would enable support organisations to learn from each others successes[30].
9. Create a Deaf advisory committee to work with the government so they can better support the Deaf Community[2].

6.4.2 Building strong institutional links

There are also calls for strengthening institutional linkages and cooperation between the emergency services and Deaf support organisations (particularly the Deaf Society of NSW)[19]. Cooperation between Deaf Aotearoa (main Deaf support organisation in New Zealand) and emergency services in the aftermath of the Christchurch earthquakes has been suggested as a model of institutional cooperation. Following the Christchurch earthquakes, Deaf Aotearoa took the following actions in cooperation with emergency services to ensure deaf people received the support they needed:

- Established a list of deaf people in the affected areas and contacted these people on a regular basis to ensure that they were okay;
- Organised counselling for Deaf Community members;
- Scheduled specific consultation times (via SMS) when Deaf people could communicate with emergency services personnel via a team of Deaf Aotearoa interpreters about the state of and availability of basic services (water, sewage), where the emergency centres were located, and what to do in the event of aftershocks and how to prepare for future events; and
- Partnered with the emergency services in providing Deaf people with constant updates as the event unfolded (including the supply of interpreters in media broadcasts) and during the initial stages of the recovery process. This ensured people could receive information updates and instructions on what to do and how to better prepare themselves.

7 Conclusions

The Queensland floods in 2011 and Cyclone Yasi alerted NSW emergency services to the special needs that Deaf people have when faced with natural hazards. From the outset, communication difficulties were flagged as the biggest barrier Deaf people experienced in accessing hazard information and effectively planning for and responding to natural hazard events. This issue was the premise for the project's inception. We also had very limited information on the actions Deaf people take during hazard events; the sources and type of information they rely on for directives; the networks (personal or community-based) they turn to for assistance when their individual coping capacities are overwhelmed; the resources they need to help them respond effectively, and the challenges they may face in accessing these resources. This Assessment has helped us answer these fundamental questions and in doing so provides the foundational knowledge needed to redress Deaf people's vulnerability to natural hazard risk and design effective resilience building strategies. This is a first for NSW.

This assessment has confirmed that language barriers and not having access to information in accessible forms greatly undermines Deaf people's response capabilities. However, a deeper analysis of Deaf culture traits, levels of natural hazard risk awareness and Deaf people's understanding of the roles and responsibilities of emergency services have with regard to supporting people enables a more complete understanding of the drivers that contribute to lower levels of preparedness to natural hazards.

Knowledge of basic terms often used in disaster and emergency preparedness information material (crisis, emergency, disaster, hazard, and natural hazard) was low as were risk perceptions of natural hazard risk in NSW (generally) and more specifically in areas where people live. People cannot plan or effectively respond to risks that they don't know about or to event processes that they don't fully understand. Another factor that is hindering Deaf people's hazard response capabilities is a potentially dangerous mismatch between what Deaf people expect emergency services to do for them in an emergency situation and the responsibilities emergency services are mandated to provide under the *NSW Disaster Plan* (Displan) and related national protocols (most notably the *Australian Emergency Management Arrangements* and the*Disaster Response Plan or COMDISPLAN*). Some Deaf people believe that it is the responsibility of emergency services to ensure their safety and attend to them personally in the event of a natural hazard. Australian emergency management protocols stipulate the opposite. In the first instance, the onus of responsibility in dealing with an emergency or hazard event falls to the individual. Emergency services only step in to assist members of the public when it becomes clear that they cannot reasonably cope on their own (Emergency Management Australia, 2009). Being unclear of the roles and responsibilities of the emergency services and asubsequent reliance on assistance that 'may never come' leaves people extremely underprepared and more vulnerable.

These findings can be largely attributed to difficulties Deaf people have in accessing natural hazard risk and preparedness information due to language barriers and low levels of literacy in some areas (most prominently in country or regional locations). However, there is another culturally-laden factor that is influencing this positioning and lowering the preparedness of some. Some Deaf Community members believe that Deaf people are too passive in asking for the resources they need and rely too heavily on hearing people to help them and make decisions for them. This is attributed to: (i) limited educational opportunities;(ii) Deaf people having limited exposure to and experience with advocating for themselves and their rights in a hearing world; and(iii) wider societal beliefs that Deaf people are 'disabled' and need to be taken care of.

That said, people affected by hazards or disasters are not passive victims.They are also survivors and active agents who make choices based on multiple factors including risk perceptions, expectations, personal experiences, and cultural norms(Fordham, 1999; McLaughlin & Dietz, 2008). This assessment has identified cultural traits and common social practices that boost Deaf people's ability to cope and effectively respond to adversity, including natural hazard events. Deaf people have access to and rely heavily on strong personal relationships and established social networks to help them in times of stress. The availability and use of this type of support (social capital) was evident across all six regions included in the research and proved instrumental in assisting those people who had prior experiences with natural hazards. Deaf people often turned to trusted social networks - family, friends, neighbours (Deaf and hearing), school teachers, trusted employers, and Deaf support organisations - for emotional and logistical support and informationduring and after the hazard events they experienced. During the hazard event, people relied on their partners (hearing and Deaf), family, friends, neighbours, and work colleagues to get information on what was happening and get instructions and/or exchange ideas on what actions they should take in response to the unfolding event. Neighbours and family members helped people contact emergency services for assistance and provided much needed comfort and reassurance. After the natural hazard event had passed, family members and friends provided Deaf people with immediate emergency assistance (food, shelter), logistical support (help in organising the rebuilding process)and emotional support. Neighbours helped keep Deaf people informed on developments as the hazard event unfolded and where and how to access food and assistance from emergency services.

In many cases, support offered by the government was seen to fall short of meeting the needs of Deaf people causing frustration and mistrust in the government's understanding of their needs and subsequent ability to support them. However, lessons taken from these past experiences suggest that Deaf/deaf support organisations are well placed to help facilitate greater access to the resources Deaf people need to cope with the impacts of the events and recover afterwards. For example, following the 2011 Christchurch earthquakes, Deaf Aotearoa worked in partnership with emergency services to provide trauma support, kept in regular contact with Deaf people to makes sure they were okay and had the resources they needed (including up-to-date information as the disaster unfolded), and scheduled specific times for

Deaf people to speak to emergency services with the assistance of interpreters. These actions demonstrate the important role Deaf advocacy and support organisations can have in creating spheres of safety, trust and providing effective support for deaf people in emergency situations. They also have access to established Deaf and hearing networks and organisations that can help source social, human, and financial resources that people need to cope and recover. Consequently they are a natural facilitating link between deaf individuals and the resources deaf people need to effectively cope with and respond to natural hazards.

Having a deeper contextual understanding of Deaf people, their culture, and those factors that either strengthen or hinder their hazard response capabilities not only allows for the design of appropriate hazard preparedness and resilience building strategies and tools, it also opens up broader opportunities for positive social change that boosts peoples' well-being. This assessment reveals that whilst social connectedness and the need to feel a sense of belonging is very important to Deaf people, reported levels of social cohesion and the strength of social networks differed greatly across NSW Deaf communities. Recognising the importance of social cohesion and having strong networks, Deaf people have identified specific strategies aimed at increasing social cohesion in areas where current weaknesses exist.

In light of these findings, Deaf Community members in NSW have identified a wide range of strategies and actions that would meet their specific needs and would help to increase their ability to anticipate risk and better respond to future natural hazards. Deaf Community members recognise the need to take full advantage of a wide range of communication and telecommunication options to effectively disseminate information about natural hazard risk levels, warnings, and instructions on what to do. They also recognise the advantages of having access to strong social networks in times of need. Accordingly, the actions and strategies Deaf people have identified include: (i) specific strategies that they feel will improve their access to information on natural hazard risk, and preparedness actions and hazard response; (ii) capacity building and educational actions that will both increase their awareness of natural hazard risk and ability to effectively respond and boost hearing people's (including emergency services and the general public's) understanding of Deaf people's needs and their subsequent ability to assist Deaf people; and strategies for building social and institutional capital within the Deaf Community.

The emphasis placed on having Deaf people list, review and rank their needs and identify suitable hazard preparedness strategies for themselves has two distinct advantages. First, the co-creation of knowledge on shared needs and matching solutions increases the likelihood that their needs will be met. Second, and most importantly, it gives Deaf people the platform to advocate for their needs and, in doing so, increases 'ownership' of those solutions and promotes self-empowerment and creates a greater sense of equity and well-being, all of which increase resilience levels to future events.

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Appendix A: Focus Group Discussions

1 Overview

Focus Group Discussions (FGDs) are a valuable tool for exploring and formulating simultaneous insights and understanding for both researchers and participants during the research process (Goss & Leinbach, 1996: 116-117). This transforms knowledge through social learning, promotes empowerment among the 'researched', heightens participant participation throughout the research process and creates opportunities for social transformation (Cameron, 2005).

The use of this method in understanding natural hazard risks, and people's capacity to prepare and respond to future hazards is advantageous for two reasons. First, the encouraged interaction between group members provides an opportunity for participants to explore different points of view, reconsider their own views and understands, and formulate new opinions (Cameron, 2005). For Kitzinger(1994: 113), "participants do not just agree with each other. They also misunderstand one another, question one another, try to persuade each other of the justice of their own point of view and sometimes they vehemently disagree". The process of social learning is important for building unity and common understandings within and across community groups and sub-groups, a process that is an integral component of successful resilience building strategies. Second, the creation of small community forums provides the researcher with an opportunity to report back on initial findings ascertained from other data, verify results and gain answers to outstanding queries. In doing so, this gives the participants an opportunity to directly influence the output.

2 Objectives of the FGDs

Two sets of FGDs were undertaken. The objectives of the first round of FGDs were to:

- Ascertain levels of knowledge deaf people have of hazards, natural hazard risk and available support systems (including the role of emergency services in supporting people) (fulfilling Objective A);
- Identify the communication mediums and support networks Deaf and hard-of-hearing community members use in daily life and in times of need (Objective B);
- Identify current sources of information used by the Deaf Community to help prepare and respond effectively to hazard/disaster situations (Objective C);
- Investigate the preferred forms of 'communication' that deaf people use on a daily basis and those communication mediums that meet the needs of deaf people during live emergency situations in the future (Objective D);
- Explore the actions deaf people have taken (or plan to take) before, during, and after past hazard events to better understand how deaf people respond to natural hazards (Objective E);

- Investigate other types of support people would like or need to better prepare them for future natural hazard events (Objective F).

The second round of FGDs were undertaken in Phase 2 of the community assessment. Phase 2 aimed to present the preliminary findings of Phase 1 to the community and further discussions on suitable emergency/disaster preparedness strategies that fulfil the needs identified in Phase 1. The objectives of Round 2 were to:

- Present the preliminary results of the research to the community, giving them feedback on what we have learnt so far from the wider Deaf Community (feedback mechanism to encourage inclusiveness)
- Provide an opportunity for the community to give the researchers feedback on what we may have missed in terms of the needs and wants that the community have (Objective D and F)
- Further investigate the preferred forms of communication and devise communication strategies (with community input) that will meet the needs of deaf and hard-of-hearing people during future live emergencies (Objectives D)
- Deepen community discussions on needs-based actions and strategies (begun in Phase 1) with the community that will help deaf and hard-of hearing community members respond better to future emergency and disasters situations (Objective D and F)

3 Sampling design and deployment

A total of 15 FGDs were undertaken in the first phase of the community assessment that ran between late August to mid-November 2012. A further 16 FGDs were undertaken in Phase 2 (mid April - mid May 2013) once the data from Phase 1 had been analysed and preliminary results produced. A summary of FGD details and group participants for Phase 1 and Phase 2 are presented in Tables A1 and A2 respectively. As shown in Table A2, the locations of the Phase 2 FGDs did alter slightly from Phase 1. The following NSW locations were added in answer to a rise in interest shown from these areas: Glenn Innes (New England); Coffs Harbour (Northern NSW); Dubbo (Central NSW). The original FGD held in Orange (Central West) was switched to Bathurst at the request of Bathurst residents who are also serviced by the Orange-Based Deaf Society office. Given that the first FGD was conducted in Orange, it seemed fair to alternate the location and move the second FGD to Bathurst. A FGD was also undertaken in Canberra in response to a specific request we received from Canberra residents who had heard about the project and were keen to learn more. Given the inclusionary nature of our project, we agreed to include them despite them not being located in NSW.

The Deaf Society of NSW, one of the project's four partners and the main advocacy organisation for the Deaf Community of NSW, took the role of gatekeeper. The Deaf Society of NSW assisted in gaining access to willing participants through their extensive social networks that reach most Deaf Community sub-groups (youth, elderly groups, business networks, and parents groups to name a few). This network covers much of NSW and is coordinated through the Parramatta

Head office in conjunction with 6 regional offices in the Illawarra, Central West, Central Coast, North Coast, and New England. Gaining access to participants via the Deaf Society's networks has 2 other advantages. First, it provides a platform for introducing the project and our aims, which in turn, helps facilitate trust between the Research Assistants and Deaf Community members. Second, it kept intrusion to a minimum.

Participants for the regional FGDs were recruited primarily through the Deaf Society of NSW regional offices. Fliers were made to advertise each FGD (see Figure A1) and were distributed by the Deaf Society regional officers via their networks. These same fliers were also posted on the Deaf Society of NSW's Facebook page and website. Other recruitment methods included personal referrals, informal social networks operating within the NSW Deaf Community, and snowballing techniques. Participants for the Sydney-based FGDs were recruited via: the networks of the Deaf Society of NSW and Deaf Society staff (our project partner and gatekeeper organisation); personal and professional referrals from Deaf research team members; professional and social networks (both formal and informal) operating within the NSW Deaf Community; fliers posted on the Deaf Society's Facebook page and website;adverts in the *Deaf* Herald; and snowballing techniques. Prospective participants were contacted via email, and in some instances SMS. The use of written mediums is most important for those that are deaf or hard-of-hearingas they cannot receive information through mainstream audio mediums.

Two additional recruitment methods were used to enlist participants in Phase 2. The participants of the Phase 1 FGDs were contacted via email and SMS and personally invited to the Phase 2 FGDs to ensure that the research process remained inclusionary. This courtesy also enabled us to fulfil the promise we made them in Phase 1 - to return and tell them what we had found. A short Auslan video advertising the Phase 2 FGDs was also created and posted on the Deaf Society's Facebook and Internet pages.

In compliance with university ethics regulations, permission to use the data collected from the FGDs was formally secured through the participants' completion of an information and consent form(see below). The information and consent forms were written in English and outlined the following:

- The purpose of the study;
- A description of the partner institutes involved;
- A brief introduction to the lead researchers;
- The expected duration of each interview and recording methods;
- An outline of the rights of the participant i.e. to withdraw at any time, to have their identities protected and confidentiality assured; and
- Information on how the results would be presented.

The average size of each FGD group was between 4 to 12 participants to facilitate a good in-depth discussion where all participants have ample chance to voice and discuss issues. However, due to high levels of interest in some areas and time-slots, numbers in some FGDs

exceeded this limit. The average duration of the FGDs was approximately 2 hours and were facilitated by Nick Craig, and Julia Allen with the support of Sherrie Beaver and Leilani Craig. An overview of the main tasks that were undertaken in Phase 1 and Phase 2 are detailed in Sections 4 and 5 respectively.

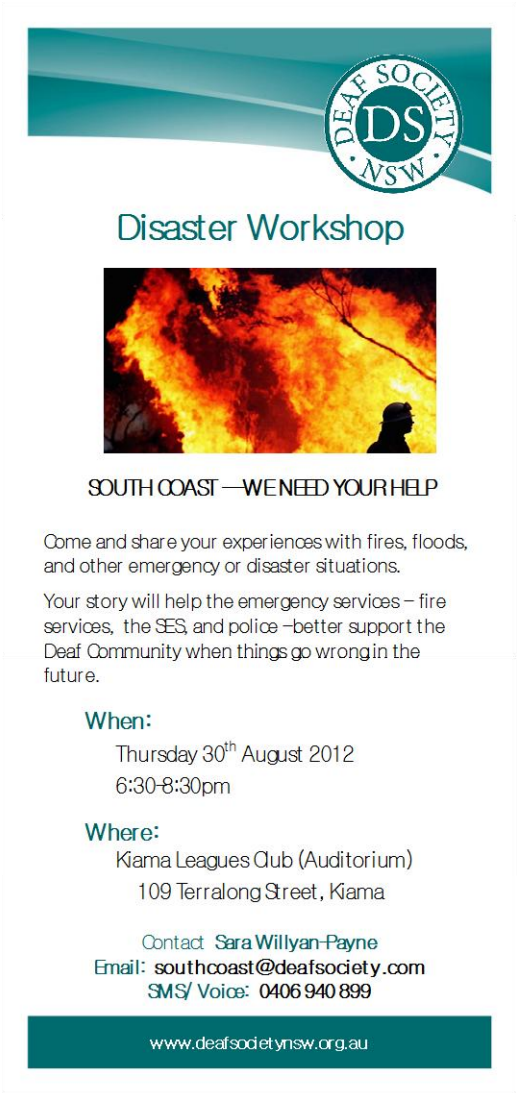
Table A1: Focus Discussion Summary - Phase 1

	Location	Group	Date (dd.mm.yy)	Time	No. of participants
A	Kiama	Deaf people	30-08-12	6-8PM	14
B	Newcastle	Deaf seniors	12-09-12	1-3PM	14
C	Lismore	Deaf people	19-09-12	10-12noon	12
D	Lismore	Deaf people	19-09-12	2-4PM	4
E	Tweed Heads	Deaf people	20-09-12	2-4PM	4
F	Sydney	Deaf people	02-10-12	2-4PM	4
G	Sydney	Deaf professionals	02-10-12	6-8PM	9
H	Sydney	Deaf seniors	04-10-12	2-4PM	7
I	Sydney	Deaf professionals	04-10-12	6-8PM	17
J	Sydney	Deaf youth	05-10-12	6-8PM	13
K	Central Coast	Deaf people	09-10-12	6-8PM	5
L	Sydney	Deaf seniors (Ephpheta Centre)	17-10-12	10-12noon	8
M	Orange	Deaf people	19-10-12	6-8PM	8
N	Newcastle	Deaf people	14-11-12	6-8PM	7
O	Tamworth	Deaf people	19-11-12	6-8PM	12

Table A2: Focus Group Discussion Summary - Phase 2

	Location	Group	Date (dd.mm.yy)	Time	No. of participants
P	Sydney	Deaf people	15-04-13	6-8PM	10
Q	Sydney	Deaf people	16-04-13	6-8PM	5
R	Sydney	Deaf people	17-04-13	6-8PM	6
S	Sydney	Deaf people	18-04-13	6-8PM	5
T	Sydney	Deaf/Blind people	19-04-13	1030-1230	3
U	Kiama	Deaf people	19-04-13	6-8PM	16
V	Bathurst	Deaf people	22-04-13	6-8PM	3
W	Dubbo	Deaf people	23-04-13	6-8PM	3
X	Canberra	Deaf people	24-04-13	6-8PM	11
Y	Tamworth	Deaf people	29-04-13	6-8PM	10
Z	Glen Innes	Deaf people	30-04-13	6-8PM	4
AA	Coffs Harbour	Deaf people	01-05-13	6-8PM	10
BB	Lismore	Deaf people	02-05-13	6-8PM	9
CC	Tweed Heads	Deaf people	03-05-13	6-8PM	6
DD	Gosford	Deaf people	06-05-13	6-8PM	15
EE	Newcastle	Deaf people	07-05-13	6-8PM	24

Figure A1: Sample flier used to recruit FGD participants for Phase 1



Ethics Approval # 08/2012/13

The University of New South Wales in partnership with Deaf Society of New South Wales, NSW State Emergency Services, Fire and Rescue NSW, and Rural Fire Services NSW

PARTICIPANT INFORMATION STATEMENT AND CONSENT FORM

Increasing the resilience of the Deaf Community in NSW to natural hazards and disasters

Purpose of study and participant selection
You are invited to participate in a study aimed at assessing and improving the capacity of the Deaf Community to effectively respond to natural hazards and emergency situations in NSW. We hope to learn about the extent of the Deaf Community's awareness of different hazards and determine the best ways to communicate with and support the Deaf Community before, during, and after live emergencies. You were selected as a possible participant in this study because you are a member of the Deaf Community in NSW.

Description of study and risks
If you decide to participate, we would like you to attend a Focus Group Discussion that is estimated to take 2 hours. The Focus Group Discussions are designed to:

- Identify the types of natural hazards that affect or may affect you and the risks that you are most worried about;
- Explore ways in which participants have (drawing on past experiences) or would respond to different types of hazards (scenarios);
- Identify the different sources of information you have access to and use to help you prepare and respond effectively to hazard/disaster situations.

There is a chance that recollections of past emergency events may trigger distress or episodes of Post Traumatic Stress Disorder. If this does occur, the investigator will (i) immediately stop the discussion and give you the opportunity to discontinue your participation and (ii) if need be, refer you to medical professionals located in your area that can assist you in treating your distress.

Your decision to participate (or not) in the discussion will not jeopardize any other contribution you have made to this study.

Confidentiality and disclosure of information
Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will only be disclosed with your permission, except as required by law. If you give us your permission by signing this document, we plan to use the information gathered to help the emergency services in NSW design and implement emergency response plans and communication strategies that cater to the particular needs of the Deaf Community in NSW. We also intend to publish the results in academic geographic journals to help foster a

wider understanding of the needs of the Deaf Community in an emergency situation and how best to respond to these needs. In any publication, information will be provided in such a way that you cannot be identified.

Feedback to participants
Feedback on the results from the data collected and the outcomes of the project will be made available to all participants through a series of forums. Invitations to these forums will be circulated to all willing participants via email (where possible) and through existing social networks.

Your consent
Your decision whether or not to participate will not prejudice your future relations with the University of New South Wales or the Deaf Society of NSW. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without prejudice.

Inquiries
If you have any questions or concerns following your participation, please do not hesitate to contact Dr Emma Calgaro on 9385 9433 or e.calgaro@unsw.edu.auwho will be happy to address them.

Complaints may be directed to the Ethics Secretariat, The University of New South Wales, SYDNEY 2052 AUSTRALIA (phone 9385 4234, fax 9385 6648, email ethics.sec@unsw.edu.au). Any complaint you make will be investigated promptly and you will be informed out the outcome.

Please keep this information sheet and one copy of the Participant Consent Form. The investigator will keep the other signed copy. Both copies should be signed by you and the investigator

You will be given a copy of this form to keep.

The University of New South Wales in partnership with Deaf Society of New South Wales, NSW State Emergency Services, Fire and Rescue NSW, and Rural Fire Services NSW

PARTICIPANT INFORMATION STATEMENT AND CONSENT FORM (continued)

Increasing the resilience of the Deaf Community in NSW to natural hazards and disasters

You are making a decision whether or not to participate. Your signature indicates that, having read the information provided above, you have decided to participate.

Signature of Research Participant | Signature of Witness

……
…….
(Please PRINT name) | (Please PRINT name)

……
……..
Date | Nature of Witness

REVOCATION OF CONSENT

Increasing the resilience of the Deaf Community in NSW to natural hazards and disasters

I hereby wish to **WITHDRAW** my consent to participate in the research proposal described above and understand that such withdrawal **WILL NOT** jeopardise any treatment or my relationship with the University of New South Wales, Deaf Society of New South Wales, NSW State Emergency Services, Fire and Rescue NSW, or Rural Fire Services.

…….
Signature | Date

……
Please PRINT Name

The section for Revocation of Consent should be forwarded to Dr Emma Calgaro, 9385 9433, e.calgaro@unsw.edu.au).

4 FGD tasks - Phase 1

Equipment needed:
- Flip-chart
- Enough thick pens for all participants to use
- A3 sticky post-its for people to write on whilst in their groups
- A2 sticky post-its for the group discussions
- A4 paper
- coloured paper
- sticky tape
- Thick string
-white board pens

Welcome
Facilitator to introduce the project and the purpose of the focus group, the types of exercises that will be undertaken, and the general rules for the session. The facilitator also needs to introduce the Information and Consent Forms. The participants do have the option to sign these at the end of the session if they feel more comfortable.

Ground rules:
First, has everyone turned off their mobile phones?

My job today, as the facilitator, is to ensure that everyone has the possibility to share and discuss their views. There are no right or wrong answers. We expect that there will be differing point of view and these are most welcome. If recording the session it is because we want to make sure none of their comments are missed. No names will be included in any reports and your comments are confidential.

Purpose of focus group:
The purpose of today's discussion is to:

a. Identify the types of natural hazards that affect or may affect you and the risks that you are most worried about;
b. Explore ways in which participants have (drawing on past experiences) or would respond to different types of hazards (scenarios);
c. Identify the different sources of information you have access to and use to help you prepare and respond effectively to hazard/disaster situations.

This will be done by way of three exercises.

A guide to the timing of activities

Risk Perceptions: 45 minutes

a. Hazards in NSW (5 minutes)
b. Hazards in local area (30 minutes)
c. Exploring changes in hazard and weather patterns over time (20 minutes)

Hazard Scenarios: 45 minutes
Sources of information: 30 minutes
Total time allocation = 2hrs 10 minutes.

4.1 Risk perceptions - hazard identification and ranking

Objective

To identify:

a. The types of natural hazards that have affected participants and their communities;
b. The hazards that participants perceive to be the greatest risk to them; and
c. If the types of hazards and weather patterns that people experienced or are aware of have changed throughout their lifetime in terms of frequency, intensity, trends, and impacts.

Lead questions

- What type of hazards do participants think affect NSW?
- What types of hazards affect the participants in their area?
- Which hazards do participants believe they are most at risk from (list & ranking)?
- Have people noticed a change in the types and nature of hazards (types of hazards, their frequency, and intensity) that they have been affected by throughout their lifetime? If so, what changes have they noticed?
- Do people believe that climate change has any bearing on the frequency and intensity of natural hazards?

Organisation

Tasks 1 and 2 will involve participants splitting up into groups of 3-4 people to discuss the questions given to them before coming together as a group to discuss them with the wider group to get consensus and to rank the hazards they are most worried about.

Whilst groups are discussing each of the questions asked of them, both the facilitator and scribe/helper move around the groups to make sure they understand what the task is asking of them and to help them if they get stuck.

Task 1: Identifying people's knowledge about hazards in NSW (5 min. warm-up)
Facilitator to advise the group that the first main exercise involved talking about natural hazards - such as bushfires, floods, storms - and how they affect people. Make sure the group is clear about what natural hazards are - naturally occurring events (bushfires, floods etc) that may cause harm to people and their environment.

The facilitator asks the group to split into smaller groups of 3-4 people and to identify the types of natural hazards that they think affect NSW. Participants are to write these on post-it notes (1 hazards per post-it) provided **(2 mins).**

Once the 2 minutes is up, the scribe/helper collects the pile of post-its from each group. The facilitator presents the findings to the whole group by grouping the findings from each group together, finding commonalities (fire with fire, floods with floods etc) and sticking the post-its onto a larger board/wall. Ask participants to validate the list and ask them if they have any more to add **(3 mins).**

Task 2: Identifying people's knowledge about hazards in their area (30 mins)
The facilitator asks the group to split into their smaller groups to **(10 mins)**:

a. Identify the types of natural hazards that occur or have occurred in their town/city. Participants to write them on post-it notes as per Task 1 - 1 hazard per post-it **(5 mins).**
b. Decide which hazards they are most at risk from (which hazards pose a threat to them and their property) and give each hazard a score from 1 -20 (1 being very low risk and 20 being very high risk). Ask participants to order the post-its from the highest to lowest risks and stick them on the A4 paper provided to form a list**(5 mins).**

- After **10 minutes**, the facilitator brings the wider group together again.
- The scribe/helper will collect each 'list' from the small groups and give them to the facilitator.
- The facilitator uses the below framework to chart all the groups ranked hazards (using post-its provided by each group).
- Facilitator to add up the total amounts scored for each hazard and record the score in *overall assessment* box.
- Facilitator to ask people if they agree or disagree with the scores
- Facilitator to get the group to collectively rank the hazards - 1 being the least risky to xx being the most risky to them and their community.

Framework:

Hazards	Scoring (20 points)				Final Ranking of risk
	Group A	Group B	Group C	Overall score for each hazard	
Hazard 1					
Hazard 2					
Hazard …					
Hazard…					

Task 3: Exploring changes in hazard and weather patterns over time (20 mins)

- A long piece of string or other material is stretched across the meeting areato represent the passage of time**(but who holds the string??)**
- The facilitator asks the participants as a group to think back throughout their life to the earliest hazard events that they remember
- Starting with the earliest hazard event anyone can remember, a timeline of the last 30-50 years is developed to identify large hazard events
- Participants can stand on the line at the appropriate place and describe the event with input from other group members
- Facilitator guides the participants through a discussion of the event - impacts on them and their family, community reaction, and support they and their family received.
- The scribe/helper records the events andtrends and explanations on a whiteboard or post-it flip chart paper.
- Paper can also be put along the length of the line and all the details recorded in different colours.
- Facilitator asks the participants to also note any changes or trends in weather ie, hotter summers, colder winters, more storms, less storms.
- Facilitator asks the participants to chart other big social and political events that have influenced their communities throughout this time.

4.2 Resources and hazards responses - hazard scenarios

Objective

To explore ways in which participants have (drawing on past experiences) or would respond to different types of hazards (scenarios).

Organisation (45 mins)

- The facilitator splits the group up into 2 groups
- The facilitator takes a pre-determined hazard scenario (e.g. Sydney bushfires) or one identified in the hazard timeline and presents the scenario to the participants.
- The facilitator would present key things they are expected to thinks about - plans, actions, information sources, family/networks they would contact, what resources would they need to survive, where would they go, transport etc**(5 mins).**
- Once the scenario has been given, the facilitator asks the group to discuss and write down on separate pieces of paper (A3 or butchers paper provided) what they would do during each phase of the emergency - before, during, after **(30 mins).**
- The facilitator and scribe/helper would sit with one group each and prompt and challenge the group using the list of questions that accompany the scenario
- After **30 minutes**, the 2 groups are brought together to list their main actions/considerations
- The facilitator helps the groups summarise the main actions from both to create summary whilst the scribe would write the main actions on flip chart/white board **(10 mins)**.

Hazard scenario example - bush fires in Sydney

For the facilitator's information only - this can be revealed to the participants later:

This scenario is based on the Black Christmasbushfires were bushfires that burnt for almost three weeks from 25 December 2001 across New South Wales, Australia. It was the longest continuous bushfire emergency in NSW history.

The event:

- Its December, the height of Sydney's summer, and its hot.
- Temperatures have been in the mid to high 30s and going as high as 45º C
- Recent lightening storms have helped cause the outbreak of fires
- There are more than 100 fires burning across NSW and ACT.
- Fires surround Sydney - the biggest fires are found in Lane Cove National Park, the Royal National Park&Blue Mountains National Park.
- One fire is burning on a 25 kilometre front with flames 30 metres high, travelling at 20 kilometres an hour.
- Strong westerly winds are fuelling the flames making it very difficult for fire fighters to fight the fires
- The fires have jumped the Nepean River in Penrith - something that was not thought likely to happen
- The fires have reached suburban areas and 26 emergency declarations have been made across the state
- Many of these declarations were for areas in Sydney - Blue Mountains Wyong, Hawkesbury, Shoalhaven, Tallaganda, Gosford, Penrith, Fairfield, Blacktown, Liverpool, Sutherland, Wollondilly, Campbelltown, Wingecarribee, Wollongong, Kiama, Shellharbour, Baulkham Hills, Hornsby, Ku-ring-gai, Ryde, Lane Cove, Warringah, Pittwater
- Major roads and highways were closed to traffic, stranding motorists and throwing the travel plans of thousands of holidaymakers into chaos
- Sydney is covered in a blanket of thick smoke, creating the worst air pollution that Sydney has ever experienced.

Scenario 1

- Its 2am in the morning
- Your door bell rings. A fireman is at the door. Behind him you see flashing lights, people fleeing in their cars
- You can smell the smoke - the smoke stings your throat and eyes
- What do you do?

Scenario 2

- Its 11am on a week day and you are at work
- Your partner/family member contacts you and tells you that your house is at risk?
- What do you do?

Things to think about:

- Plan: Did you have a pre-determined plan? If so, do you follow it?
- Knowledge: about the risks prior to the event?
- Where do you get your information from about the hazard, prior, during, and as it progresses?
- Response: to stay and defend or to evacuate

If you choose to evacuate:

Family and networks:

- Who do you contact?
- Family members being home alone?
- Dependents? Where are they and how can you get to them?
- What about pets? What do you do with them?

Supplies

- What will you take? Emergency kits, clothes, toys, medication, personal effects
- How much will you take? How long will your supplies last?

Shelter

- The ability to leave your home safely? What do you do if you cannot leave (Plan B)?
- Where do you go (family, evacuation shelters)?
- How do you know if the evacuation shelters have what you need? What do you do if the shelter is full or cannot accommodate your needs (Plan B)?

Transport

- How will you get there? Which routes will you take? Are you familiar with alternate routes?
- Where do you go if you cannot get to your planned destination?

Communication options

- Where do you get information updates as the event unfolds?
- What happens if the telecommunications networks go down?

After the event - your property has been damaged

- Can you get home? What do you do if the roads are not clear?
- If you cannot go home, where do you stay?
- Do you have insurance/adequate insurance?
- Do you have access to your insurance papers?
- What do you do if your insurance company won't pay up immediately?
- Who do you turn to for help to help clean up and undertake repairs?
- Do you have enough money for repairs?

If you choose to stay:

Family and networks:

- Who do you contact?
- Family members being home alone at your house or another location?
- Dependents? Where are they and how can you get to them?
- What about pets? What do you do with them?

Supplies

- Do you have enough food, water, medication, emergency kits?
- How long will your supplies last?

Shelter

- Loss of water or power?
- What actions do you take to protect your home before the fire arrives, from flying embers, when the fire arrives?

Communication options

- Where do you get information updates as the event unfolds?
- What happens if the telecommunications networks go down?
- How can you the contact people for help?

Plan B - you have to evacuate

- The ability to leave your home safely? What do you do if you cannot leave?
- Where do you go (family, evacuation shelters)?
- How do you know if the evacuation shelters have what you need?
- How will you get there? Which routes will you take? Are you familiar with alternate routes?
- Where do you go if you cannot get to your planned destination?
- What do you do if the shelter is full or cannot accommodate your needs (Plan C)?

After the event - your property has been damaged

- Can you get home? What do you do if the roads are not clear?
- If you cannot go home, where do you stay?
- Do you have insurance/adequate insurance?
- Do you have access to your insurance papers?
- What do you do if your insurance company won't pay up immediately?
- Who do you turn to for help to help clean up and undertake repairs?
- Do you have enough money for repairs?

4.3 Sources of information

Objective

To identify the different sources of information the Deaf Community has access to and use to help them prepare and respond effectively to hazard/disaster situations.

Organisation (30 mins)

- The facilitator writes each of the questions up on board or flip chart paper (1 question per flip chart page)
- The facilitator asks the group to split into their smaller groups of 3-4 people.
- Participants are asked to discuss the following 4 questions and write their answers on post-it notes provided.
- Groups to be given **5 minutes** to discuss and record answers for each question
- Once the time is up for each question (or people are finished), the scribe collects the post-its for each question and the facilitator asks the groups to move on to the next question
- This process is repeated for each of the 4 questions.
- Once **20 minutes** has passed (or people are finished discussing all 4 questions), the facilitator goes through the results with the whole group to reach consensus.

Questions:

a. What emergency services are you aware of that can help you when a natural hazard strikes?**Record on post-its**
b. How do you receive information on possible risks and best ways to respond to natural hazards and emergencies (internet, sms, community notices in mail etcetc) and who provides this information?**Post-its**
c. Are there any barriers for you in accessing information?**(post-its or A4 paper)**
d. What are the preferred forms of communication and information sharing that meet your needs during future emergency situations?

5 FGD tasks - Phase 2

Equipment needed:
- Flip-chart
- Enough thick pens for all participants to use
- sticky post-its for people to write on whilst in their groups
- A4 paper
- white board pens

Welcome
Facilitator to introduce the project and the purpose of the focus group, the types of exercises that will be undertaken, and the general rules for the session. The facilitator also needs to introduce the Information and Consent Forms. The participants do have the option to sign these at the end of the session if they feel more comfortable.

Ground rules:
First, has everyone turned off their mobile phones?

My job today, as the facilitator, is to ensure that everyone has the possibility to share and discuss their views. There are no right or wrong answers. We expect that there will be differing point of view and these are most welcome. If recording the session it is because we want to make sure none of their comments are missed. No names will be included in any reports and your comments are confidential.

Purpose of focus group:
The purpose of today's discussion is to:

a. Present the preliminary results from the workshops and interviews undertaken last year, thereby giving you feedback on what we have learnt so far from the wider Deaf Community;
b. Provide an opportunity you as community members to tell us if we have got it right or if are things we may have missed in terms of the needs and wants that the community have;
c. Further investigate the preferred forms of 'communication' and devise communication strategies that will meet the needs of the Deaf Community during future live emergencies; and
d. To refine the needs-based strategies (identified by the community in Phase 1) that the community members feel will help deaf and hard-of-hearing people better respond to future emergency and disasters situations.

This will be done by way of three exercises. The first exercise (task 1) is a presentation of the differences between risk perceptions that the community have and those risks identified by the government. Tasks 2 and 3 will involve participants splitting up into groups of 3-4 people to discuss the issues/questions given to them before coming together as a group to discuss them with the wider group to get consensus and to rank the issues and solutions they think are most important.

Whilst groups are discussing each of the questions asked of them, both the facilitator and scribe/helper move around the groups to make sure they understand what the task is asking of them and to help them if they get stuck.

A guide to the timing of activities

- Review of risk perceptions for the state and regional areas: 10 minutes
- Review and prioritisation of current challenges deaf and hard-of-hearing people face: 45 minutes
- Review and prioritisation of solutions/future strategies: 60 minutes

Total time allocation = 2 hours

5.1 Risk perceptions - review of hazard identification and rankings

Task 1 objective
To compare the natural hazard risks that the community have identified for NSW and their regional area and those identified by the NSW Department of Environment, Climate Change and Water (DECCW). This task is more **to inform** people of the difference between their risk perceptions and the types of hazards that have been identified by the government in their state and region.

Task 1 organisation (10 minutes maximum)

This task is to be done with the whole group using Powerpoint.

- Facilitator begins by defining what natural hazards are so everyone is clear: “a natural hazard is a naturally occurring event (bushfires, floods, severe storms, dust stormsetc) that may cause harm to people and their environment”
- Facilitator to present the hazards that the community identified for NSW to the group using Powerpoint
- Facilitator then compares this list to those identified by the NSW Department of Environment, Climate Change and Water (DECCW)
- The process is repeated for hazards affecting each of the regions

- The facilitator presents hazards that the community identified for the region where the FGD is taking place
- Facilitator then compares this list to those identified by the NSW Department of Environment, Climate Change and Water (DECCW)

Facilitator will also present a PowerPoint slide detailing how many people (%) have an emergency plan.

5.2 Main challenges in responding to hazards

Task 2 objectives

- To gain feedback and validation of preliminary findings from the first round of focus group discussions and open-ended interviews;
- To finalise current community challenges; and
- To rank those challenges that are most urgent or need most attention

Questions

- Do the participants agree with the challengesidentified so far?
- Are there any additional issues that we have missed and that are important?
- How are these challenges ranked in terms of importance to community members?
- Significant issues to be considered:
- Language barriers
- Information not in accessible forms
- Shortage of interpreters, particularly in regional areas
- Low literacy levels
- Passivity of deaf population
- Low understanding amongst hearing people of deaf needs and challenges

Task 2 organisation (30 minutes)

- The facilitator presents the preliminary findings from the Phase 1 FGDs to the participants verbally, guided by points listed on the Powerpoint presentation **(10 mins)**.
- The facilitator asks participants to discuss (agree/not agree) the presented issues in groups of 3-4 and to write down on the paper provided (A4 or A3 paper) which issues need changing and/or adding.Facilitator gives them **5 minutes** for this task.
- Participants discuss the issues amongst themselves and clarify or add any outstanding issues not already raised.
- Whilst this is occurring, all three research assistants walk around to each group (or focus on one group each if numbers are smaller) to help participants and make sure that people are answering the question correctly.
- Once each group is finished (or **after 5 minutes**), the scribe/helper collects each 'list' from the small groups and gives them to the facilitator.

- The facilitator uses the below framework (presented either on the poster or Powerpoint) to add the additional issues/challenges to the original list
- The facilitator brings the wider group together to agree on the issues and identify those that need changing or adding.
- Once the list is completed, the facilitator asks participants to split into their smaller groups again. The facilitator asks each group to rank each of the listed issues using a scale between 1-20 (1 being the most important challenge and 20 being the least important) and to write these rankings down on the paper provided (A4 or A3). Facilitator gives them **5 minutes** for this task.
- After **5 minutes**, the helper/scribe collects the rankings from each group.
- The facilitator brings the whole group together once again
- Facilitator adds up the total amounts scored for each issue and records the score in *overall assessment* box.
- Facilitator to ask the group if they agree or disagree with the scores
- Facilitator to get the group to collectively rank the identified issues/challenges - 1 being the most urgent to xx being the least urgent or important to them and their community.

Issues Framework

Issues/Challenges	Scoring (20 points)				Final Ranking
	Group A	Group B	Group C	Overall Assessment	

5.3 Solutions for improving preparedness and response levels for deaf people

Task 3 objectives

- To gain feedback and validation of preliminary findings from the first round of focus group discussions and open-ended interviews;
- To further investigate community-led solutions designed to improve deaf peoples capacity to prepare, respond and recover from future natural hazards; and
- To prioritise identified solutions.

Questions

- Are there any solutions that we have missed so far that people would like to see added?
- How are these solutions ranked in terms of support and feasibility for community members?

Significant issues to be considered:

- Dissemination of information via telecommunication mediums (mobile phones; internet; social media; TV);
- Other information channels (central register; visual warnings in public places; written mediums such as pamphlets, newsletters and newspapers; face-to-face contact with emergency services; enough interpreters; 'Deaf Police' or 'Deaf Liason Officer'; increased role of Deaf Support Organisations).

Disaster preparedness educational needs:

- Hazard awareness training for deaf people but we need to know how often, who should be involved, what do people want to learn; and
- Deaf awareness training for the emergency services and the general public.

Task 3 organisation (60 minutes)

- The facilitator presents the preliminary findings on needs and solutions from the Phase 1 FGDs to the participants verbally, guided by points listed on the Powerpoint presentation **(15 mins)**.
- The facilitator asks participants to discuss (agree/not agree) the presented needs/solutions in groups of 3-4 and to write down on the paper provided (A4 or A3 paper) which needs/solutions need changing and/or adding.Facilitator gives them **10 minutes** for this task.
- Participants discuss the needs/solutions amongst themselves and clarify or add any outstanding issues not already raised.
- Whilst this is occurring, all three research assistants walk around to each group (or focus on one group each if numbers are smaller) to help participants and make sure that people are answering the question correctly.
- Once each group is finished (or **after 10 minutes**), the scribe/helper collects each 'list' from the small groups and gives them to the facilitator.
- The facilitator uses the below framework (presented either on the poster or Powerpoint) to add the additional needs/solutions to the original list
- The facilitator brings the wider group together to agree on the needs/solutions and identify those that need changing or adding.
- Once the list is completed, the facilitator asks participants to split into their smaller groups again. The facilitator asks each group to rank each of the listed issues using a scale between 1-20 (1 being the most important needs/solutions and 20 being the least important) and to write these rankings down on the paper provided (A4 or A3). Facilitator gives them **10 minutes** for this task.
- After **10 minutes**, the helper/scribe collects the rankings from each group.
- The facilitator brings the whole group together once again
- Facilitator adds up the total amounts scored for each issue and records the score in *overall assessment* box.
- Facilitator to ask the group if they agree or disagree with the scores

- Facilitator to get the group to collectively rank the identified needs/solutions - 1 being the most urgent to xx being the least urgent or important to them and their community.

Solutions Framework

Solutions	Scoring (20 points)				Ranking
	Group A	Group B	Group C	Overall Assessment	

Appendix B: Semi-structured interviews

1 Overview and rationale of use

Semi-structured interviews were chosen as one of the main methods of data collection because they enable the researcher to quickly gain insights into the complexities of social phenomena through the subjective eyes of social actors that form part of the social tapestry (Valentine, 1997; Winchester, 2005). Valuing the subjectivity of data collection, interviews reveal how individuals make sense of their social world, how they identify themselves within this social tapestry, and how they act within it (May, 2001). This includes how they interact with other community members (including those within their immediate community and those in greater society), the social networks and processes they use to help them ascertain the resources they need to function in daily life, as well as the challenges they face in accessing these resources (including problems with communication). The particular advantages of using semi-structured interviews to explore community characteristics along with their risk awareness and preparedness levels and needs are twofold. First, they promote a two-way dialogue between the researcher and participant, whereby information is exchanged, reflected upon and preconceptions on both sides verified and/or challenged (Dunn, 2005). Second, semi-structured interviews create opportunities for participants to voice what is most relevant and important to them (Dunn, 2005), while providing a structure for comparability (May, 2001) between community groups and across regional case study sites (Sydney, Illawarra, Central Coast, North Coast, New England, and Central West NSW).

2 Objectives

The semi-structured interviews were designed to:

- Ascertain how Deaf and hard-of-hearing community members identify themselves and their communities (related to fulfilling Objective A);
- Identify the communication mediums and support networks Deaf and hard-of-hearing community members use in daily life and in times of need (Objective B);
- Gage levels of risk awareness and preparedness including how much community members know about the role of emergency services in the disaster cycle (Objective A);
- Gain insights into how Deaf and hard-of-hearing community members have coped with and responded to past emergency and natural hazard disasters and the challenges they have faced in gaining access to the resources they needed (Objective E);
- Ascertain what type of support community members need and want to help them better prepare and respond to future natural hazards (Objective D and F).

3 Sampling design and deployment

A total of 39 participants were interviewed across NSW. The interviews were undertaken between late-September and mid-December 2012 by two Deaf Research Assistants (Nick Craig and Julia Allen). This small sample and the information derived from the participants is by no means representative. Rather, it provides a snapshot of the NSW deaf population. Thirty-eight of the 39 participants were Deaf or hard-of-hearing. One of the 39 participants was a hearing interpreter. The advantages of including this individual were that: (i) they worked extremely close with Deaf Community members and as an interpreter understood their communication related frustrations; and (ii) they helped support Deaf Community members during the January 2011 floods and Cyclone Yasi (February 2011) that affected both QLD and Northern NSW residents and therefore saw first hand the challenges Deaf people faced when responding to live natural disasters. Despite the small sample size, the research was designed to be as representative as possible. Therefore, every attempt was made to speak to a wide range of community members in terms of age, gender, geographical location, and past hazard experiences. The only people that were exempt from the sample were those who were under the age of 18. This was done to comply with UNSW ethics restrictions (Ethics Approval # 08/2012/13).

The recruiting process was highly opportunistic. Participants were recruited from the Round 1 FGDs, personal referrals, social networks operating within the NSW Deaf Community, our presence at the 2012 Deaf Festival and the Deaf Society's 2012 Open Day(both held (held in Parramatta in October 2012); and snowballing techniques. Despite the highly opportunistic nature of the recruitment process, the Research Assistants (RAs) endeavoured to interview a wide range of community members (in terms of age, gender, geographical location, and past hazard experiences). A summary of the interview participants is detailed in Table B1.

The number of interviews was determined by time and budgetary constraints. Participants were contacted via phone (SMS), email or in person. Each interview was carried out in a location suggested by the participant and lasted (on average) between 1 to 2 hours. The familiarity of the interviewee's surroundings both added to their comfort levels and awarded them some control over the interview process.

In compliance with university ethics regulations, permission to use the data collected from the interviews was formally secured through the participant's completion of an information and consent form(see below).The form was written in English and outlined the following:

- The purpose of the study and a description of the partners involved;
- A brief introduction to the lead researchers;
- The expected duration of each interview and recording methods;
- An outline of the rights of the participant
- Information on how the results would be presented.

The interviews were undertaken in Auslan. Answers were recorded in two ways. To make it easier for the RAs to record information quickly, the format of the interview question sheet (List B1) was changed in places to replicate a survey format. The Deaf RAs and staff at the Deaf Society of NSW deemed this partial survey format necessary for cultural reasons: Deaf individuals in NSW like to have examples to help them understand meaning and context due to them being more visual than literal. Including boxes to tick enabled them to get a feel for the context and gave them examples to help them better understand what we were asking. Answers to the multiple-choice type questions were therefore noted on paper and longer, more in-depth answers were captured on film using an iPad. The filming of the entire interviewwas the most effective way to capture the detail of the participant's experiences. The identities of the participants were also kept confidential using pseudonyms.

The interview design remained dynamic throughout the research process. Questions derived from the literature and document analysis were reviewed and reworded throughout the fieldwork process to adapt the wording to Auslan translations to further clarify the meaning of the questions and make it easier for the RAs to communicate and the participants to understand.

TableB1: Open-ended interview participants in NSW

Interview	Date of interview	Participant	Past event experiences
ILLAWARRA			
1	24.09.12 (JA)	Female resident WARILLIA	-
2	24.09.12 (JA)	Male resident WARILLIA	-
3	08.10.12 (JA)	Female resident WOLLONGONG	-
4	7.12.12 (JA)	Female resident ALBION PARK	-
5	7.12.12 (NC)	Male resident ALBION PARK	Floods Bushfires
CENTRAL COAST			
6	09.10.12 (NC)	Female resident BELMONT SOUTH	□ □ □ □ □ □
7	11.10.12 (NC)	Female resident MAYFIELD	-
8	15.11.12 (JA)	Female resident TERRIGAL	-
9	15.11.12 (NC)	Male resident TERRIGAL	-
10	15.11.12 (NC)	Female resident OURIMBAH	Floods Bushfires
11	16.11.12 (JA)	Female resident KINCUMBER	-
12	16.11.12 (JA)	Male resident KINCUMBER	-

NORTH COAST			
13	19.10.12	Male informant TWEED HEADS	✓
14	23.10.12 (NC)	Male resident TWEED HEADS SOUTH	-
15	23.10.12 (JA)	Male resident TWEED HEADS SOUTH	Bushfire
16	24.10.12 (JA)	Female resident LISMORE NORTH	-
17	24.10.12 (JA)	Female resident CASINO	Hailstorm
18	25.10.12 (JA)	Female resident MALLANGANEE	Earthquake Severe Storm Bushfire
19	25.10.12 (NC)	Female resident GOONELLABAH	Earthquake
20	26.10.12 (JA)	Female resident BANORA POINT	Hailstorm
TAMWORTH			
21	20.11.12 (NC)	Female resident MANILLA	Flood
22	20.11.12 (NC)	Female resident MANILLA	Bushfire
23	21.11.12 (JA)	Female resident TAMWORTH	-
24	21.11.12 (NC)	Female resident TAMWORTH	-
25	21.11.12 (JA)	Female resident TAMWORTH	-
26	21.11.12 (NC)	Female resident TAMWORTH	-

Interview	Date of interview	Participant	Past event experiences
SYDNEY			
27	7.11.12 (NC)	Female resident VALLEY HEIGHTS	Bushfire
28	8.11.12 (JA)	Male resident NORTH ROCKS	-
29	9.11.12 (JA)	Female resident WARRIEWOOD	-
30	9.11.12 (NC)	Male resident LAPSTONE	Bushfire
31	9.11.12 (NC)	Female resident LAPSTONE	Bushfire
32	9.11.12 (J)	Male resident KENTHURST	-
33	3.12.12 (NC)	Female resident QUAKERS HILL	-
CENTRAL WEST			
34	11.12.12 (NC)	Female resident BATHURST	-
35	11.12.12 (JA)	Female resident BATHURST	-
36	12.12.12 (NC)	Female resident WELLINGTON	-
37	12.12.12 (NC)	Female resident WELLINGTON	Bushfire Floods
38	12.12.12 (JA)	Female resident BATHURST	-
39	13.12.12 (JA)	Female resident BATHURST	-

Research Team

1. Emma Calgaro (co-ordinator)
2. Julia Allen (JA)
3. Nick Craig (NC)

Ethics Approval # 08/2012/13

The University of New South Wales in partnership with Deaf Society of New South Wales, NSW State Emergency Services, Fire and Rescue NSW, and Rural Fire Services NSW

PARTICIPANT INFORMATION STATEMENT AND CONSENT FORM

Increasing the resilience of the Deaf Community in NSW to natural hazards and disasters

Purpose of study and participant selection

You are invited to participate in a study aimed at assessing and improving the capacity of the Deaf Community to effectively respond to natural hazards and emergency situations in NSW. We hope to learn about the extent of the Deaf Community's awareness of different hazards and determine the best ways to communicate with and support the Deaf Community before, during, and after live emergencies. You were selected as a possible participant in this study because you are a member of the Deaf Community in NSW.

Description of study and risks

If you decide to participate, we request that you take part in an in-depth interview that is expected to take between 1-2 hours. The interviews are designed to:

- Gain deeper insights into the every-day life of a Deaf Community member;
- Identify the networks and support systems that members of the Deaf Community are apart of and the benefits of belonging to these support systems;
- Discuss any previous experiences in dealing with emergency situations or explore responses to possible future events;
- Further explore the most effective and innovative ways to communicate with and support the Deaf Community in an emergency situation.

There is a chance that recollections of past emergency events may trigger distress or episodes of Post Traumatic Stress Disorder. If this does occur, the investigator will (i) immediately stop the discussion and give you the opportunity to discontinue your participation and (ii) if need be, refer you to medical professionals located in your area that can assist you in treating your distress.

Your decision to participate (or not) in the interview will not jeopardize any other contribution you have made to this study, nor are you under any obligation to complete both the survey and interview.

Confidentiality and disclosure of information

Your consent will be sought to record any discussions and transcribe them for analysis. Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will only be disclosed with your permission, except as required by law. If you give us your permission by signing this document, we plan to use the information gathered to help the emergency services in NSW design and implement emergency response plans and communication strategies that cater to the particular needs of the Deaf Community in NSW. We also intend to publish the results in academic geographic journals to help foster a wider understanding of the needs of the Deaf Community in an emergency situation and how best to respond to these needs. In any publication, information will be provided in such a way that you cannot be identified.

Feedback to participants

Feedback on the results from the data collected and the outcomes of the project will be made available to all participants through a series of forums. You will be asked to indicate your interest in attending these forums at the time of the survey or interview by ticking a box on the survey. Invitations to these forums will be circulated to all willing participants via email (where possible) and through existing social networks.

Your consent

Your decision whether or not to participate will not prejudice your future relations with The University of New South Wales. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without prejudice.

Inquiries

If you have any questions or concerns following your participation, please do not hesitate to contact Dr Emma Calgaro on 9385 9433 or e.calgaro@unsw.edu.auwho will be happy to address them.

Complaints may be directed to the Ethics Secretariat, The University of New South Wales, SYDNEY 2052 AUSTRALIA (phone 9385 4234, fax 9385 6648, email ethics.sec@unsw.edu.au). Any complaint you make will be investigated promptly and you will be informed out the outcome.

Please keep this information sheet and one copy of the Participant Consent Form. The investigator will keep the other signed copy. Both copies should be signed by you and the investigator. You will be given a copy of this form to keep.

The University of New South Wales in partnership with Deaf Society of New South Wales, NSW State Emergency Services, Fire and Rescue NSW, and Rural Fire Services NSW

PARTICIPANT INFORMATION STATEMENT AND CONSENT FORM (continued)

Increasing the resilience of the Deaf Community in NSW to natural hazards and disasters

You are making a decision whether or not to participate. Your signature indicates that, having read the information provided above, you have decided to participate.

Signature of Research Participant | Signature of Witness

……
…….
(Please PRINT name) | (Please PRINT name)

……
…….
Date | Nature of Witness

REVOCATION OF CONSENT

Increasing the resilience of the Deaf Community in NSW to natural hazards and disasters

I hereby wish to **WITHDRAW** my consent to participate in the research proposal described above and understand that such withdrawal **WILL NOT** jeopardise any treatment or my relationship with the University of New South Wales, Deaf Society of New South Wales, NSW State Emergency Services, Fire and Rescue NSW, or Rural Fire Services.

…….
Signature | Date

……
Please PRINT Name

The section for Revocation of Consent should be forwarded to Dr Emma Calgaro, 9385 9433, e.calgaro@unsw.edu.au).

List B1: Semi-structured interview questions

Date:

Time:

Participant:

1. Demographics and personal circumstances

1. Age

☐18-25 ☐26-35 ☐36-45 ☐46-55 ☐56-65 ☐66-75 ☐76+

2. Gender: ☐ Male ☐ Female

3. What is your normal occupation?
4. Where do you live?
5. How long have you lived in this suburb?
6. Why did you choose this area?
7. What do you like about living in this area (attractions/qualities)?
8. What do you dislike about living here?
9. Do you live:

☐alone

☐with others that are (tick all that apply)

- ☐all deaf
- ☐deaf adults
- ☐deaf children
- ☐hearing adults
- ☐hearing children
- ☐adults that need special assistance

10. What is your religious background?
11. Are you an active participant in that religion or any other religion?
12. Do you know what level of hearing you have from a medical perspective?

☐No

☐Yes What can you hear?

- ☐Total deafness in better ear (above 120db)
- ☐Profoundly deaf in better ear (91-120db)
- ☐Severely deaf in better ear (71-90db)
- ☐Moderately deaf in better ear (41-70db)
- ☐Mildly deaf in better ear (26-40db)

13. At what stage in life did you lose your hearing/did your hearing begin to deteriorate?

14. Highest level of education?

☐ Primary school

☐ High school ☐ Year 10 ☐ Year 12 (incl. HSC done at TAFE)

☐ TAFE/College

☐ Bachelor Degree/Honours

☐ Post-graduate studies ☐ Masters ☐ PhD

15. Type of school:

☐ deaf primary school ☐ mainstream primary school with deaf unit

☐ deaf high school ☐ mainstream primary school without deaf unit

☐ mainstream high school with deaf unit

☐ mainstream high school without deaf unit

16. If you attended a mainstream school, what additional support was available for you to help you learn (teachers aid, deaf teacher, notetaker, interpreter)?
17. What languages do you use at home?
18. Do you use more than one language at home?

☐ No

☐ Yes If so, what are they?

19. If you learnt sign language:

a. Which sign language(s) do you use? (tick all that apply)

☐ Auslan

☐ another sign language

☐ signed English

☐ cued speech

☐ Others (please specify

b. At what stage in life did you learn sign language?
c. Why did you learn sign language?

d. If signing is used, what style of signing is used now (rank from 1 [most preferred communication method] to 5+ [least preferred] if more than one is used)?

☐ ___Visual

☐ ___One that closely follows English

☐ ___One that involves lots of finger spelling

☐ ___One that involves private signs invented/used within family or friend networks

☐ ___Any other styles (please specify)

2. Deaf culture and community

20. Do you believe yourself to be (question relating to how people classify/identify themselves):

☐ deaf and part of the Deaf Community (Deaf)

☐ deaf but not part of the Deaf Community (no regular use of AusLan)

☐ hard-of-hearing/hearing impaired and part of the Deaf Community

☐ hard-of-hearing/hearing impaired and **not** part of the Deaf Community

☐ other (please specify and explain why you classify yourself in this way)

21. If you do believe yourself to be a member of the Deaf Community:
    a. What characteristics define this community?
        - Common interests
        - Common language
        - Common experiences
        - Minority language cultural group
    b. What are the benefits of belonging to this community?
    c. What are the disadvantages of belonging to this community?

22. Do you consider yourself to be a member of any other sub-cultures within the wider community (religious culture, ethnic cultures stemming from ethnicity)?

☐ No

☐ Yes If so, which ones?

23. Do you consider yourself a fully integrated member of these communities?
24. What are the benefits of belonging to this community?
25. What are the disadvantages of belonging to this community?

26. Is it important for you to feel that you belong to the Deaf Community/any other sub-cultures you mentioned?

☐ No If not, why not?

☐ Yes If so, why?

27. Do you feel that you are a part of a strong community?

☐ No If not, why not? ☐ Yes If so, why?

3. Support systems

28. Who do you approach when you need help or have found yourself with troubles that you could not cope with alone (tick all that apply)? Can you please rank from 1 [most used support systems] to 5+ [least used] if more than one is used.

☐ Family

☐ Friends

☐ Interpreters

☐ Deaf support organisations (please list which ones)

☐ governmental departments or institutions (please list which ones)

☐ Any others (please list)

29. What is your opinion of your local, state, and federal government?
    a. Do you trust their actions and what they say?
    b. What do you think of their capacity to help the communities they serve?
    c. Do you think your local/state governmental members and officials have the skills needed to best serve your and your community's needs?

30. Are you aware of any support services/organisations that exist to help Deaf Community members/those with hearing loss?

☐ No

☐ Yes If so, which ones and which do you use (to get information from/to access services)?

Know of	Use
☐	☐ Australian Communication Exchange (incl. NRS & VRS)
☐	☐ Deaf Australia
☐	☐ Deaf Australia NSW
☐	☐ Deaf Society of NSW
☐	☐ Deaf Healf
☐	☐ Deafness Forum
☐	☐ Australian Deaf/Blind Council
☐	☐ National AuslanInterpeterBooking and Payment Service
☐	☐ Australian Hearing
☐	☐ Ephpheta Centre
☐	☐ Parent of Deaf Children
☐	☐ Royal Institute for Deaf and Blind Children (RIDBC)
☐	☐ Better Hearing Australia
☐	☐ Shhh
☐	☐ Aussie Deaf Kids
☐	☐ Parents of Deaf Children
☐	☐ Australian Communications Consumer Action Network (ACCAN)
☐	☐ Any others (please list)

a. Of those that you have had contact with, how have they helped you?

31. Do you have any suggestions on how to help Deaf Community members/hearing impaired people can become more integrated into and better supported by support organisations?
32. Have you ever felt excluded from activities/organisations in your lifetime?

☐ No

☐ Yes

a. If so, when and what happened?
b. Was the exclusion your choice or someone else's choice? ie. did you actively choose to interact with other Deaf Community members or work in certain environments or did you feel uncomfortable (or unwelcome) interacting with different groups?

4. Awareness and perceptions of hazards (risk perception)

33. Can you tell me what the following terms mean to you:
    - Crisis
    - Emergency
    - Disaster
    - Hazard
    - Natural hazard

34. Based on your knowledge, which of these events do you think affect the place where you live generally (tick all that apply)?

☐ Bush fires
☐ Wind storms
☐ Hail storms
☐ Lightening
☐ Flash flooding
☐ Riverine flooding
☐ Heatwaves
☐ Coastal erosion and inundation
☐ others
☐ don't know

35. For you, how likely is it for the following hazards to affect you (personally, your property, your job)?

Rank the hazards from the most likely ('1' being the most likely) to the least likely (8+) of occurring. List any others not mentioned and include them in your ranking

___ Bush fires

___ Wind storms

___ Hail storms

___ Lightening

___ Flash flooding

___ Riverine flooding

___ Heatwaves

___ Coastal erosion and inundation

36. What is your understanding of climate change?

37. Do you think that climate change will affect you in any way?

☐ No

☐ Yes If so, how?

38. In the past, what types of hazards have affected the place where you live (public spaces, private property, people and their jobs) (tick all those that apply)?

☐ Bush fires
☐ Wind storms
☐ Hail storms
☐ Lightening
☐ Flash flooding
☐ Riverine flooding
☐ Heatwaves
☐ Coastal erosion and inundation
☐ Any others (please list)

39. What hazard events have you personally been affected by (tick all those that apply)?

☐ Bush fires
☐ Wind storms
☐ Hail storms
☐ Lightening
☐ Flash flooding
☐ Riverine flooding
☐ Heatwaves
☐ Coastal erosion and inundation
☐ Any others (please list)

40. What effects could your top 4 ranked hazards have on you, your family, job or business (if you have one)?

41. Do you currently have a plan in place to help you and your family prepare for an emergency or hazardous event?

☐ No If not, why not?

☐ Yes If so, can you tell what it is and what steps you would take in the event of an emergency?

42. Do you consider yourself to be a happy person?
43. Do you consider yourself to be a cautious person?
44. What excites you about your future?
45. What worries you about your future?

5. Communication and risk

46. How do you normally receive news and information that is of importance to you (tick all that apply)? Which ones of these communication mediums do you use or favour the most. Please rank these - 1 being most favoured to 5+ being your least favoured

☐___ Television
☐___Newsletters
☐___SMS alerts
☐___Internet
☐___Newspaper
☐___Any others (please list)

47. How have communication methods changed throughout your lifetime? If so, how?
48. Do you have a mobile phone?

☐No If not, what type of communication device do you use to keep in contact with people?

☐Yes

a. If so, what type do you have (smartphone or one with no internet access)?
b. Do you have reliable network coverage in the areas where you spend most of your time (work, home, shopping, education institutions)?

49. Do you receive information on possible risks and best ways to respond to natural hazards and emergencies?

☐No If not, who would you approach to get this type of information?

☐Yes

a. If so, where from?
b. Do you find this information useful in helping you plan and respond better to future hazards or emergencies?
c. If, so how does it help you?

50. Do you receive education or have you attended any information seminars on possible risks and best ways to respond?

☐No

a. If not, would you like to?
b. If you would like to learn more about different types of risks, how would you like to receive this information (seminars made available through social groups or clubs etc) and how often (every 6 months, every year)?

☐Yes

a. If so, where from?
b. Do you find this education and information useful in helping you plan and respond better to future hazards or emergencies?

c. If, so how does it help you/ what have you learnt?

51. What do you want to know more about hazards and disasters?
    - what types of hazards might affect you in your area
    - what the differences are between hazards and disasters
    - training on emergency plans ie. What to do before, during, and after a disaster or emergency
    - where people can get information on natural hazard risk in their area and emergency response plans
    - who Deaf people should contact in a disaster situation
    - the steps they should take when a future event occurs
    - where evacuation shelters are
    - what to do after a disaster has occurred
    - the organisations people can approach for assistance before, during, and after a disaster event

52. How have you received information or news about hazard warnings, disasters, and appropriate responses in the past?
53. What do you think the best way is for people generally in the Deaf Community to receive information about future hazards and disasters?
54. What do you think the best way is for you personally to receive information about future hazards and disasters?

6. Community understanding of the role of emergency response agencies

55. Can you tell me what you think the following organisations do and what their responsibilities are?
    - State Emergency Services (SES)
    - Rural Fire Services NSW (RFS)
    - Fire and Rescue NSW
56. Who is responsible for assisting you in a natural hazard event?
    a. What do you think these organisations should do for you?
    b. What do you think your main needs would be if you were affected by a natural hazard event?
    c. How do you think the emergency services can best meet these needs?

7. Risk behaviour - past experiences with hazards

7.1 The event

1. Have you had any past experiences with emergencies or disasters that were caused by natural hazards?

☐No

[Thank you for your time]

☐Yes

a. If so, can you tell me what happened?
b. How did you become aware of the emergency or hazardous situation?
c. Did you feel your life was in danger at any stage?
d. Did you suffer any physical injuries?
e. Were any of your family members or friends seriously injured or killed?

7.2 Preparation prior to the event

2. Did you have time or the opportunity before the event to prepare your home/move any of your belongings?

☐No

☐Yes

a. If so, what preparations did you make?
b. Did you receive adequate information or advice about the event as it was developing?
c. Did you receive any help in preparing your home?

☐No

☐Yes

i. If so, from who?
ii. Did you request this help or was it offered?
iii. Did the help you received meet your needs at the time?

3. Had you ever been affected by that type of hazard before/or another type of hazard before?

☐No If not, did you still know what to do?

☐Yes

a. If so, did your response to this past situation influence your actions in preparing and responding to this one?
b. If so, how did it influence you?

7.3 During the event

4. How did you respond to this situation as it unfolded?
    a. What steps did you take?
    b. Did you contact anyone for help?
    c. If so, who and why did you choose these people/organisations?
    d. How did you contact these people/organisations for help?
5. If you **did not contact** any of the emergency response organisations,
    a. Why not?
6. If you **did contact** any one of the emergency response organisations:
    a. How did you contact them?
    b. How long did it take for the emergency response organisation to respond to your needs?
    c. Did you feel comfortable in your interactions with them?
    d. Were these organisations helpful and in what way?

☐No

i. If these organisations were not helpful or there were problems, what were the issues?
ii. Was there any assistance that you needed that you didn't receive?
iii. Did you have trouble gaining help when you needed it?
iv. Did you resolve these issues with the organisation and if so how?
v. If the issues were not resolved, why not?

☐Yes

i. If so, how did they help you/meet your needs?
ii. Was there any assistance that you needed that you didn't receive?

e. How would you rate the contacted organisation in terms of their effectiveness in helping you?

☐Excellent ☐Good ☐Satisfactory ☐Poor

f. Do you think your inability to hear/hear well influenced the way emergency response personnel responded to you?

7. Did you have to leave your home before or during the event?

☐ No

[Go to Q8]

☐ Yes Did you go to an emergency shelter during or immediately after the event?

☐ No

a. If not, where did you go?
b. Why did you stay there?
c. How did you find that accommodation?
d. What was your experience like in finding somewhere to stay (easy or hard)?
e. How long did you stay there?
f. Who were you with?
g. Tell me about your experiences of living away from your home.

☐ Yes

a. Where was it?
b. How long did you stay there?
c. Who were you with?
d. Tell me about your experiences there.
a. How did the staff respond to you and your family?
b. Do you think your inability to hear/hear well influenced the way people responded to you?
e. Did you feel comfortable in your interactions with them?

8. Did you have access to all the information and communication resources you needed to cope in this situation (in temporary accommodation **OR** in an emergency shelter)?

☐ No If not, what was lacking?

☐ Yes If so, was there anything that would have improved your experience?

9. Did you receive immediate support (emergency provisions) such as money, food or clothing from (tick all that apply):

☐ family

☐ government

☐ charity

10. Was it difficult or hard to get access to these resources?

☐ difficult

a. Why was it difficult?
   - You didn't know who to approach or where to go (lack of information)
   - The process in applying for the resources needed was unclear/difficult to understand/too time-consuming

- Any other reasons?

☐easy

a. Why was it easy?

11. Did this immediate support (emergency provisions) meet your immediate needs?

☐No

a. If not, what was missing and what else did you need?
b. What could be improved to better meet your needs (and those of your family and friends) in future situations?

☐Yes

a. If so, is there anything that could be improved to meet your needs (and those of your family and friends) in future situations?

7.4 After the event

12. Tell me about the days immediately after the hazard event?
13. Did your home and/or personal effects sustain any damage?

☐No

a. Tell me about your experiences in returning home.

☐Yes

a. Tell me about your experiences in returning and rebuilding your home.
    i. Was your home liveable?
    ii. Were you able to salvage your belongings?
b. How long did it take for you to recover?
c. What types of resources did you need to help you recover?
    - People's help (social capital)
    - Information to know where to get the help you needed (social capital)
    - Access to money to help rebuild (economic capital)
    - Materials to rebuild with (physical capital)
d. How did you get access to these resources and what difficulties (if any) did you face in getting access to these resources?

14. Did you make an insurance claim as a result of the event?
    a. Were you successful in your claim?
    b. Tell me about that process.
    c. Do you think your inability to hear/hear well influenced the quality or ease of this process?
        i. If so, in what way?

15. Did you receive any assistance (financial, logistical) from governmental authorities, charity or community services?

☐No

a. If not, what was the reason for this?
b. Do you think that your inability to hear/hear well influenced your interactions (if any) with these support organisations?
    i. If so, in what way?

☐Yes

a. If so, did you feel comfortable in your interactions with them?
b. What assistance did they provide?
c. Did this assistance meet your needs at that time?
d. What could be done differently in the future to better meet your needs?

16. How do you think this event specifically affected the Deaf Community/hard-of-hearing community?
17. Do you think government agencies or other organisations involved in either the immediate response to the event or the recovery process adequately met the needs of the Deaf Community/hard-of-hearing population?

☐No

a. If not, what could be done differently in the future to better meet your needs?

☐Yes

18. Was your workplace affected by the event?
    a. At what stage after the event were you able to return to work?
19. Tell me about interactions with your neighbours in the days after the event
    a. Did you feel a sense of community or shared experience?
    b. If so, was this sense of community stronger, weaker, or the same as it was before the event?
    c. Were you able to assist each other in the clean-up?
20. Did you receive assistance from, or provide assistance to others in the Deaf Community/others that cannot hear well?

☐No

☐Yes If so, what type of assistance?

21. Did any deaf/hard-of-hearing support organisations assist you or supported you in your recovery after the event?

☐No

a. If not, why not?

b. Can you suggest ways that they may be able to better support you in the future?

☐Yes

a. If so, which organisations assisted you?

b. What type of assistance did your or your family receive?

c. What aspects of this assistance were most beneficial?

d. What aspects of this assistance was least beneficial?

e. Can you suggest ways that they may be able to better support you in the future?

22. Was there any form of assistance that you felt you needed but did not get?
23. After the event, had your perception of your personal risk to natural hazards changed?

☐Increased ☐Decreased ☐Stayed the same

a. Can you explain why?
b. If your perception has changed, have you taken any actions to safeguard yourself (and your family if applicable) from future risks?
    i. What actions have been taken and why?
c. If you haven't changed your actions and personal plan, why is this the case?
d. In light of your experiences, what do you see as appropriate actions to prepare for natural hazards?

24. Have you experienced any long-term health problems – either physical or mental – as a result of these past events?

☐No Go to Q25

☐Yes If so, what were they and how did you cope and recover?

25. Did you feel you needed access to healthcare support in the recovery process?

☐No If not, why not? **Go to Q27**

☐Yes

a. Were you able to access healthcare support in the recovery process?
b. If so, what type of assistance did you get and from who?
    - deaf/hard-of-hearing support services
    - emergency services

- counselling services (government funded, self-funded, charity or religious based service, local deaf/hard-of hearing support organisations, other???)
- medical services?

c. If so, describe the process of obtaining healthcare assistance following this event.
d. Do you feel that having limited/no hearing has ever been an issue in obtaining treatment or support?
e. Did you find this support useful and if so what was most useful?

26. Based on your experiences, what type of counselling support do you think would benefit you and/or your community most for future events?

27. Did other people in your community that you know of experience extreme anxiety, disorientation, and panic in during and/or after the hazard event?

☐ No **Go to Q28**

☐ Yes

a. If so, how did they cope and recover?
b. Did they receive any assistance from deaf/hard-of-hearing support services, emergency services, counselling services (either those especially set up to support disaster victims OR private), and/or medical services?

☐ No

i. If not, why not (if they don't know then move on to **Q28)**?

☐ Yes

i. If so, what type of assistance did they receive and from who?
ii. Do you know if it was useful to them and if so what was most useful?

28. Where there any aspects of the emergency response process that could have been improved to better help you prepare and respond?

☐ No **Go to Q29**

☐ Yes If so, what would you like to see included in the emergency response to better help you (pre-event, during the event, and after the event)?

29. What would help Deaf Community members to respond more effectively to future warnings and the dangers of natural hazards events?

Appendix C: Field observation

Field observations were used tocompliment the data collected from the FGDs and interviews. This participatory method allows researchers to reflect upon and record the issues being discussed in the interviews and FGDs and identify common or evolving themes as they emerge from the data collecting process (Kearns, 2000). It also enables researchers to observe and better understand social dynamics - levels of group cohesion and inclusions (or exclusion) and the quality and nature of social relationships (including power dynamics) between key stakeholders (Kitchin & Tate, 2000; Wolcott, 1995).

The types of things that were of interest include:

a. Observations on the main issues and themes that come out of the FGDs and interviews i.e. what the researcher thinks the main outcomes from each focus group discussion were, what community members are most interested in, issues that community members are most passionate about, what community members would like to see happen in the future, and challenges community members have in getting help; and
b. Observations on how community members interact with each other in the FDGs i.e. do they share opinions or are they divided as a group, do they interact with each other well, do they seem to respect and trust each other, do some people dominate more than others and if so does the researcher have insights into why that might be the case.

Observations and insights gained though those observations were written up daily with a time and date recorded for each entry enabling easy referencing when using the data (Corti, 1993).