Canterbury
District Health Board
Te Poari Hauora ō Waitaha

Wellbeing recovery after mass shootings: information for the response to the Christchurch mosque attacks 2019

Rapid literature review

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Executive summary

On Friday 15 March 2019, two mosques in Christchurch, New Zealand, were attacked by one shooter. To date, 51 people have died from their injuries. Forty-five people were hospitalised on the day of the shooting, and 118 people were treated or admitted by Canterbury DHB in relation to the incident (as at 7 May 2019). Emergency personnel from the Police and St John Ambulance attended the scene. A number of members of the public assisted in the first aid response and in transporting the injured to hospital. Almost all of the injured were taken to Christchurch Hospital.

A rapid literature review undertaken suggests that mass shootings are more intensely traumatic than other disasters, but that the majority of those affected by mass shootings will be resilient. Most people will be minimally impacted, but approximately eight percent may have moderate symptoms and two percent chronic dysfunction (Despotes et al. 2016). These prevalence figures depend on the context of the event.

An overview of the literature suggests the intensity of symptom trajectories are likely to vary over time and among groups, and depend on pre-existing risk factors (including young age, female gender, low socioeconomic status), high incident exposure (close proximity to the event or psychosocial proximity to deceased, concern they would die during attack), and differing coping strategies.

Locally those most at risk would be people highly exposed to the event, those from the targeted Muslim community, emergency responders, young, female, and potentially those with a loss of income, and concerns about residency status/ability to stay in New Zealand.

An appropriate response could be multi agency, similar to that offered in the aftermath of the Manchester Arena bombing. This should be directed in the first weeks at normalising anticipated reactions and supporting coping mechanisms and natural networks, through multiple routes including public health messaging, social marketing, the patient information website HealthInfo, primary care, and workplaces. After the initial weeks, the emphasis should shift to identifying those that need a higher level of assistance, focusing on those who have experienced greater levels of trauma, and those with previous mental health difficulties, as they may be more vulnerable. Training on 'Mental Health First Aid' may be beneficial in this context. Strategies are suggested in this document. In the longer term, the triggering nature of anniversaries of the attacks should be considered.

Evaluation of any initiatives should be incorporated into the response.

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Purpose of this rapid review

Following the 15 March 2019 mass shooting in two mosques in Christchurch, a rapid literature review was commissioned to assist the Canterbury health system with determining the evidence around:

1. The estimated volume and intensity of need for wellbeing/psychosocial recovery services. Considering intensity for groups such as directly affected people (injured, witnesses, bereaved, families), the affected Muslim community, the wider community, and first responders;
2. Across that gradient the likely different needs within groups – by age (particularly children and young people), by gender (particularly women), by ethnicity, language needs, socioeconomic status etc.;
3. Models of potential response to improve wellbeing/psychosocial recovery, e.g. trauma team, extended primary care consultations, primary and secondary mental health, public health approaches;
4. Phases of recovery/timeframes expected after an event like this, and likely requirements for these.

Background

On Friday 15 March 2019, two mosques in Christchurch, New Zealand, were attacked by one shooter. Fifty-one people died from their injuries. Forty-five people were hospitalised on the day of the shooting, and 118 people were treated or admitted by Canterbury DHB in relation to the incident (as at 7 May 2019). Emergency personnel from the Police and St John Ambulance attended the scene. A number of members of the public assisted in the first aid response and in transporting the injured to hospital. Almost all of the injured were taken to Christchurch Hospital, one child required on-transfer to Starship Children's Hospital in Auckland, and the child's injured parent was also transported alongside to Auckland Hospital.

Prior to this, a May 2018 Canterbury Wellbeing survey of 2,895 people in the region estimated that overall 93% felt safe walking around their neighbourhood during the day, 49% felt safe walking around their city or town centre at night, and 81% found it easy or very easy to be themselves in New Zealand (Nielson 2018). These responses varied by ethnicity. Feeling it was easy to be themselves, for instance, was lower among Māori (76%) and Pacific/Asian/Indian (51%) compared to those of European ethnicity (84%) (Nielson 2018).

The mass shooting came on the background of an ongoing increase in mental health need and requests for referrals in the Canterbury region, following the major earthquakes in Christchurch (2010-2011) and Kaikoura (2016). The 2018 Canterbury Wellbeing survey found 60% of respondents' dwellings had been or were currently being repaired or rebuilt, and 4% of respondents had unresolved earthquake property claims with an associated negative impact on their self-reported quality of life (Nielson 2018).

In 2018, Canterbury District Health Board (CDHB) mental health services were still receiving additional monthly referrals of approximately 700 more adults and 400 more children and adolescents, compared to pre-earthquake referral numbers (McDonald 2018).

A wellbeing approach to recovery is seen as important, from the experience of the Canterbury earthquakes. As the Prime Minister's Chief Science Advisor stated in 2011: "A comprehensive and effective psychosocial recovery programme needs firstly to support the majority of the population who need some psychosocial support within the community (such as basic listening, information and community-led interventions) to allow their innate psychological resilience and coping mechanisms to come to the fore, and secondly to address the most severely affected minority by efficient referral systems and sufficient specialised care" (Gluckman, 2011).

Caveats to this review

This review has been done in haste to inform initial planning, and is therefore not a true formal rapid review (Khanguru et al., 2012). It is pragmatic, non-systematic and has had limited peer review and consultation with experts in several fields (mental health, disaster response, Muslim culture) or the affected community (to understand what they perceive as their needs in order to plan around them). It is written in the post-event "honeymoon phase" before we can identify the longer term impacts. It should be used with caution, to avoid overemphasis or misinterpretation of findings.

The mental health effects of the terrorist attacks on the Christchurch mosques may be unique in occurring in a setting with the pre-existence of a major disaster within the last decade; the use by the perpetrator of social media to livestream the attacks; the direct targeting of Muslims by a white supremacist and the scale of violence committed; the size of the Muslim community in Christchurch relative to the number of people directly affected, and the diversity of the Muslim community; the reaction from the national and international Muslim community; and the reaction of the people and leaders of New Zealand.

Much of the literature on mass shootings and other mass killings comes from the United States (where school shootings are particularly prominent), Europe, and Scandinavia: there are sociocultural and health system differences between these and New Zealand. There is limited literature accessible through the means at the authors' disposal on mass killings in non-Western settings, or the effects of such events on Muslim populations. New Zealand has had mass shootings, notably in recent times in Aramoana in 1990 and in Raurimu in 1997, and instances of terrorism, but not on the scale and magnitude of the Christchurch attacks.

These factors may limit the applicability of the existing literature and therefore this review.

Time factors did not allow for this review to investigate the impacts of shootings or trauma on specific ethnic or religious groups (in this case, Muslims).

Further useful information on the New Zealand context of this event, including attitudes towards multiculturalism and Muslims, and experiences of being Muslim in New Zealand can be found in the Christchurch special issue of the New Zealand Journal of Psychology.

This collection of 15 relevant articles was published approximately one month after the mosque shootings, in draft form initially. (Wilson, 2019)

Results

1. The estimated volume and intensity of need for wellbeing/psychosocial recovery services. Considering intensity for groups such as those directly affected (injured, witnesses, bereaved, families), the affected Muslim community, the wider community, and emergency workers.
2. Across that gradient the likely different needs within groups – by age (particularly children and young people), by gender (particularly women), by ethnicity, language needs, socioeconomic status etc.

These questions are best answered together.

The literature suggests that even if the majority of those affected by mass shootings will be resilient, exposure to mass violence is associated with greater risk of mental health impairment than exposure to natural or other disasters. This may be because of the exceptional characteristics of mass shootings: they are perceived as purposeful and malicious, at the same time as being unpredictable. This may engender a greater sense of hopelessness and be more detrimental to the cognitive functioning of those affected, leading to greater levels of maladaptive thoughts and negative beliefs (Wilson, 2016).

Prevalence of mental health difficulties post-mass shootings vary in the literature, for reasons which may include differing timeframes of follow up in the studies, different measures and diagnostic criteria used in studies, differences in the affected populations and settings, differences in exposures. This is described well in meta-analyses such as Lowe & Galea (2017), and Schultz et al. (2014).

Post-Traumatic Stress Disorder (PTSD) after a trauma or disaster (not specifically focussed only on mass shootings) has been estimated to affect approximately 30% of children and young people during the first two years (Bonano et al., 2010 cited in Karki 2015).

A meta-analysis of PTSD after man-made mass violence by Wilson (2015) found prevalence of 1.3% to 22.0%, from 20 articles, most reporting effects of the September 11 2001 World Trade Center attacks, but still 9% at 9 years (Table 1 of Wilson 2015).

The findings of Lowe & Galea (2017) have been adapted in Table 1 below.

TABLE 1 PREVALENCE OF MENTAL HEALTH DIAGNOSES AFTER MASS SHOOTINGS (ADAPTED FROM TABLE 2, LOWE & GALEA 2017, WITH ADDITIONAL DATA)

Note: there are issues with prevalence estimates – as outlined in Lowe & Galea (2017) below, there are differences between studies in relation to:

- population demographics
- exposure to incidents
- timing of assessments (varied between 1 week to 32 months post shooting in Lowe & Galea's meta-analysis 2017)
- diagnostic criteria assessed

Abbreviations used in table
MD = Major Depression
PTSD = Post Traumatic Stress Disorder
AA = alcohol abuse
AD = alcohol dependency

Mental health conditions after a shooting or incident	Number of persons studied	Rates of conditions found short term <2 m post-event	Rates of conditions found medium term >2 and <12 m post-event	Rates of conditions found longer term >12 m post-event	Study and citation source	Evidence level
Any new psychiatric disorder	110 rescue workers & survivors			33% at 1 y *	May & North, Table 13.3, Chap 13, page 235 of Wilson, LC ed. 2016	
Post-Traumatic Stress Disorder	159 students affected	60.4%			Pynoos et al. 1987 in Lowe & Galea 2017	
	18 adults at work or meant to be at work during shooting	5.6%			North, Smith, Mccool & Shea 1989 in Lowe & Galea 2017	
	136 survivors & emergency responders	28.6%			North, Smith & Spitznagel 1994 in Lowe & Galea 2017	
	80 employees affected	5%		10% at 1 y * or 3 y post-event	Johnson, North & Smith 2002, in Lowe & Galea 2017	
	92 directly exposed & indirectly (relatives of)	38.7% at 1 w			Sewell 1996 in Lowe & Galea 2017	
	231 exposed students compared to 526 from a different school		19.2% among exposed (post-traumatic distress = 42.8%)		Suomalainen et al. 2011 in Lowe & Galea 2017	
	293 affected students	30%	23%		Littleton, Grills- Taquechel & Axsom 2009 in Lowe & Galea 2017	
	368			27% *	Littleton, Axsom & Grills-Taquechel 2011 in Lowe & Galea 2017	

Mental health conditions after a shooting or incident	Number of persons studied	Rates of conditions found short term <2 m post-event	Rates of conditions found medium term >2 and <12 m post-event	Rates of conditions found longer term >12 m post-event	Study and citation source	Evidence level
	303 women from the community (not at event)		12.6% at 6-9 months		Hough et al. 1990 in Lowe & Galea 2017	
	64 children affected 66 of their parents (130 total)		Children: 8% & 9% (using conservative criteria) to 50% & 91% (using liberal criteria) Adults: 3% & 6% (conservative criteria) 39% & 52% (liberal criteria)		Schwartz & Kowalski 1991a & 1991b both in Lowe & Galea 2017	
	124			17.7% at 1 y *	North, Smith & Spitznagel 1997 in Lowe & Galea 2017	
	136			18% at 3 y	North et al. 2002 in Lowe & Galea 2017	
	948 students & employees affected			1.8% at 18 m	Seguin et al. 2013 in Lowe & Galea 2017	
	4,639 students affected			15. 4% at 1 y *	Hughes et al. 2011 in Lowe & Galea 2017	
	284	64% at 2 w, 22% at 8 w			Vicary & Fraley 2010 in Lowe & Galea 2017	
	11 survivors compared to 11 people from affected community	36.4% at 8 w			Trapper & Friednman 1996 in Lowe & Galea 2017	
	110 rescue workers & survivors			17% *	May & North, Table 13.3, Chap 13, p 235 of Wilson, LC ed. 2016	
	325 people affected (present during shootings)		11% full PTSD and 36% partial PTSD (47% some type of PTSD)		Dyb , Jensen , Nygaard et al. 2014	
	Families of those shot: 67 parents & 36 siblings			63% parents, 72% siblings at 18 m post-traumatic stress reactions	Dyregrov, Dyregrov & Kristensen 2015	
Post-Traumatic Stress	Female students affected by shooting seen in 7 waves of a study, samples 812-559 persons			At 31 m post-shooting, 4 distinct trajectories identified for n=660 women Minimal impact (60.9%), high impact-recovery (29.1%)	Orcutt et al. 2014	

Mental health conditions after a shooting or incident	Number of persons studied	Rates of conditions found short term <2 m post-event	Rates of conditions found medium term >2 and <12 m post-event	Rates of conditions found longer term >12 m post-event	Study and citation source	Evidence level
				moderate impact-moderate symptoms (8.2%), chronic dysfunction (1.8%)		
Post-Traumatic Stress Symptoms	532		11.4%		Kumpula, Orcutt, Bardeen & Varkovitzky 2011 in Lowe & Galea 2017	Low - one study
Summary PTSD				12 m PTSD likelihood totals = 16%	Using studies with one star * which had 12 m rate	Moderate
Major Depression	80 employees	4%			Johnson, North & Smith 2002, in Lowe & Galea 2017	
	124	10.3%		4.9% at 1 y **	North et al. 1997 in Lowe & Galea 2017	
	116			10% at 3 y **	North et al. 2002 in Lowe & Galea 2017	
	948 students & employees affected			5% at 18 m	Seguin et al. 2013 in Lowe & Galea 2017	
	368	18%	22%	24% **	Littleton, Axsom & Grills-Taquechel 2011 in Lowe & Galea 2017	
	284	71% at 2 w, 30% at 8 w			Vicary & Fraley 2010 in Lowe & Galea 2017	
	11 survivors compared to 11 people from affected community	45.5% at 8 w (5/11 survivors)			Trapper & Friednman 1996 in Lowe & Galea 2017	
	110 rescue workers & survivors			5% **	May & North, Table 13.3, Chap 13, p 235 of Wilson, LC ed. 2016	
Summary Major Depression				12 month MD likelihood = 22%	Using studies with two stars ** which had 12 month rate	Moderate
Alcohol abuse or dependency	124			5.7% (AA/AD) ***	North, Smith & Spitznagel 1997 in Lowe & Galea 2017	
	80 employees affected	9%			Johnson, North & Smith 2002 in Lowe & Galea 2017	
	948 students & employees affected			5% at 18 m	Seguin et al. 2013 in Lowe & Galea 2017	

Mental health conditions after a shooting or incident	Number of persons studied	Rates of conditions found short term <2 m post-event	Rates of conditions found medium term >2 and <12 m post-event	Rates of conditions found longer term >12 m post-event	Study and citation source	Evidence level
	110 rescue workers & survivors			15% but new disorders rare ***	May & North, Table 13.3, Chap 13, p 235 of Wilson, LC ed. 2016	
Summary Alcohol				12 month alcohol abuse likelihood = 10%	Using studies with three stars *** which had 12 m rate, but noting that new alcohol disorders were rare in May & North in Wilson, LC ed. 2016	Very low
Social phobia	948 students & employees affected			3% at 18 m	Seguin et al. 2013 in Lowe & Galea 2017	Very low - one study

The impact on individuals can be considered in terms of groups:

Rescue workers: The effect of mass shootings was considered in a meta-analysis by May & North (2016). They analysed data from two mass shootings in the US, at a cafeteria and a courthouse. Civilian and rescue workers were surveyed in both, a total of 22 rescue workers, 18 police, four security or Emergency Medical Service responders, and 66 civilians who were present. They were surveyed at baseline (6-8 weeks after the disaster) and again at approximately one year post-disaster. Experiences of the event differed, as most rescue workers were not endangered during the shootings, only three felt they might die, compared to 38 (60%) of the civilians. Outcomes are shown in the table below.

TABLE 2: PSYCHIATRIC DISORDERS AT BASELINE AND ONE YEAR POST SHOOTINGS (TABLE 13.3 FROM MAY & NORTH (2016))

Table 13.3 Psychiatric disorders at baseline.

	Rescue workers (n = *22*) % (n)	*Police* (n = *18*) % (n)	*Security/ EMS* (n = *4*) % (n)	*Civilians* (n = *66*) % (n)
PTSD				
Lifetime predisaster prevalence	14 (3)	18 (3)	0 (0)	3 (2)
Disaster-related prevalence	14 (3)	11 (2)	25 (1)	18 (12)
Incidence	14 (3)	11 (2)	25 (1)	18 (12)
Major depression				
Lifetime predisaster prevalence	9 (2)	11 (2)	0 (0)	2 (1)
Postdisaster prevalence	9 (2)	6 (1)	25 (1)	3 (2)
Incidence	9 (2)	6 (1)	25 (1)	2 (1)
Alcohol use disorder				
Lifetime predisaster prevalence	33 (7)	18 (3)*	100 (4)*	44 (29)
Postdisaster prevalence	10 (2)	0 (0)	50 (2)	17 (11)
Incidence	0 (0)	0 (0)	0 (0)	3 (2)
Drug use disorder				
Lifetime predisaster prevalence	10 (2)	6 (1)	25 (1)	13 (8)
Postdisaster prevalence	0 (0)	0 (0)	0 (0)	0 (0)
Incidence	0 (0)	0 (0)	0 (0)	0 (0)

Note: Compared to civilians, *$p \leq .05$.

Media/journalists covering a mass shooting: Backholm (2016) reported on two meta-analyses Aoki et al. 2013 (11 studies), 0-33% PTSD, and Smith et al. 4.3-35% (15 studies) but this included war correspondents. The Norwegian terrorist attacks of 2011 had surveyed 375 journalists, 9% had PTSD (Idas & Backholm, 2016, cited in Backholm, 2016).

Families of those involved in the shootings: at 18 months after the Utoya shootings in Norway, parents and siblings of those who died were surveyed, 82% (of 67 parents), and 75% (of 36 siblings) had complicated grief reactions; their rates of Post-Traumatic Stress reactions were also 63% and 72% (Dyregrov, Dyregrov & Kristensen, 2015).

Affected community: Of 303 women from an affected community (who were not directly involved in a shooting), 12.6% had developed PTSD of at 6-9 months after the event (Hough et al. 1990 cited in Lowe & Galea, 2017).

Closely-associated communities: Hansen, Dinesen & Østergaard (2017) found a 16% increase in the incidence of trauma and stressor-related disorders in Denmark 1.5 years after the Norway attacks of 2011 (compared to 4% increase after the 9/11 attacks), with the increase potentially related to mass media coverage of the trial of the attacker. This may be consistent with the typical pattern of responses to a disaster reported by Gluckman (2011) and in Britt et al. (2012) who described heroic/honeymoon phases in the months following an event, followed by a disillusionment phase and then a reconstruction phase.

FIGURE 1: PHASES OF COMMUNITY RESPONSE AFTER A DISASTER (FIGURE 6 FROM BRITT ET AL. (2012))

This pattern was consistent with findings reported by Pledger, McDonald & Cumming (2019) who looked at indicators of health status following the 2011 earthquake in the Canterbury population, albeit over a longer timeframe and with ongoing intermittent triggers.

Some groups are more vulnerable to poor mental health post shooting, these appear to include (Lowe & Galea (2017), and Schultz et al. (2014)):

- Being wounded in the shooting – combination of physical injury and psychological trauma associated with poor mental health (PTS, depression, anxiety); injury-related distress; involvement in eventual judicial action
- Demographic characteristics – female gender, identification with a non-majority ethnicity, low socioeconomic status
- Pre-existing psychological status and resources – poor pre-incident psychological functioning, prior trauma, poor social supports, 'fewer psychosocial resources'

- Exposure – greater proximity to the shooting, fear of losing own life during event, closer acquaintance with those killed or injured. The dose-response relationship is debated, but in a meta-analysis Wilson (2014) found a small to medium effect size, suggesting that the level of exposure to a mass shooting is important in predicting risk of PTS but needs to be considered along with pre-, peri- and post-trauma factors. Exposure intensity ranges from those injured in the shooting, to those not shot but in the line of fire, to those who were present and saw people being shot or the immediate aftermath, to those who were on the premises but hiding or escaping but may have seen the perpetrator or heard gunfire. Emergency personnel can also be strongly affected. Outside the premises of the attacks are those in the community associated with those targeted and the adjacent surrounding community, and then the rest of the population, some of whom may only have witnessed the attacks through social media and other media exposure.

Despotes et al. (2016) discuss symptom trajectories after shooting events (particularly a 2008 shooting event at Northern Illinois University, USA) that included:

- Minimal impact-resilience (65%) – lower levels of exposure, less pre-existing trauma, more adaptive emotional regulation
- High impact-recovery (25%) – minimal pre-existing symptoms, moderate post-event symptoms, recovering to minimal symptoms in the medium term
- Moderate impact-moderate symptoms (8%) – moderate pre-existing symptoms, high post-event symptoms, recovering to moderate symptoms in the medium term
- Chronic dysfunction (2%) – high symptom levels pre- and post-event.

Resiliency 'resources', which have been quantified as 'hope, optimism, and social support' can modify the effects of trauma on survivors, as outlined by Weinberg et al. (2016). In addition, there can be a 'bidirectional' relationship between survivors and spouses (Weinberg et al., 2016).

Identifying those at risk of mental health or wellbeing impacts

Identifying those at risk of adverse impacts from the Christchurch mosque shootings requires consideration. Population level mass screening could result in over or under diagnosis of problems, and would be resource intensive and impractical. Assessing potential impacts on patients who have self-presented to health practitioners or those identified as requiring assistance by support services, would be seem the most appropriate way forward.

Possible approaches for impact assessments on affected individuals may include using either pre-existing/previously evaluated/ validated patient questionnaires (such as for children, the CRIES 8 https://www.corc.uk.net/media/1268/cries_selfreported.pdf, and for adults the IES-R Impact of Events Scale – Revised https://www.aerztenetz-grafschaft.de/download/IES-R-englisch-5-stufig.pdf) or developing a new specific screening questionnaire in response to the Christchurch mosque shooting situation (such as the Brief Trauma Screening Interview Tool proposed by Dorahy & Blampied, 2019). These three questionnaires are shown in Appendix 2.

3. Models of potential response to improve wellbeing/psychosocial recovery, e.g. trauma team, extended primary care consultations, primary and secondary mental health, public health approaches
4. Phases of recovery/timeframes expected after an event like this, and likely requirements for these.

Elements of both these questions are answered below.

Therapies for PTSD were reviewed in Gallagher et al. (2016) and are summarised below:

- The strongest evidence was for Cognitive Behavioural Therapy (CBT) variants, Prolonged Exposure Therapy (PE) and Cognitive Processing Therapy (CPT).
    - The most evidence-based therapy is PE. A number of randomised controlled trials have shown a benefit in PTSD reduction. Sessions are usually 90 minutes (10-15 sessions).
    - The next most evidence-based intervention is CPT. It also has randomised controlled trial level evidence. It is delivered in individual or group settings, usually 12 therapy sessions of 50-60 mins, or in groups for 90 minutes.
    - Both of these forms of CBT are recommended for PTSD treatment by organisations including the American Psychological Association (APA).
- Eye Movement Desensitisation and Reprocessing (EMDR) has shown some promise, but to date studies have been small and the number of sessions used can vary, making meta-analyses difficult. The therapy has eight phases.
- Medication: Selective Serotonin Reuptake Inhibitors (SSRIs) have been shown beneficial in some randomised controlled trials, producing remission in 30% in some studies, however other studies have not shown a benefit and there are concerns the benefits may not last after the medications are discontinued.

Social solidarity may be associated with less mental health effects, but psychological proximity to the victims, strong in a small community/country, may be more important to development of post-traumatic stress than geographical proximity (Shultz et al. 2014).

Psychological First Aid (PFA) is a generic set of eight actions designed around disaster/trauma responses, as outlined by Ruzek et al. (2007). These are shown below:

TABLE 3: PSYCHOLOGICAL FIRST AID CORE ACTIONS AND GOALS (TABLE 1 FROM RUZEK ET AL. (2007))

Table 1. Core Actions and Goals of Psychological First Aid

1. Contact and Engagement
   Goal: Respond to contacts initiated by affected persons, or initiate contacts in a non-intrusive, compassionate, and helpful manner.

2. Safety and Comfort
   Goal: Enhance immediate and ongoing safety, and provide physical and emotional comfort.

3. Stabilization (if necessary)
   Goal: To calm and orient emotionally-overwhelmed/distraught survivors.

4. Information Gathering: Current Needs and Concerns
   Goal: Identify immediate needs and concerns, gather additional information, and tailor PFA interventions.

5. Practical Assistance
   Goal: To offer practical help to the survivor in addressing immediate needs and concerns.

6. Connection with Social Supports
   Goal: To reduce distress by helping structure opportunities for brief or ongoing contacts with primary support persons or other sources of support., including family members, friends, and community helping resources.

7. Information on Coping Support
   Goal: To provide the individual with information (including education about stress reactions and coping) that may help them deal with the event and its aftermath.

8. Linkage with Collaborative Services
   Goal: To link survivors with needed services, and inform them about available services that may be needed in the future.

Turunen et al. (2014) emphasise the importance of enhancing natural networks – family, relatives, friends – after the Kauhajoki school shooting in Finland supplemented by professional care, particularly targeting the most trauma-affected.

Early and proactive outreach to highly exposed / high risk people and reducing barriers to mental health help-seeking is identified as important (Shultz et al. 2014).

Barriers and enablers identified in the literature (Smith et al. 2016) include intra-individual factors: psychopathology (such as PTSD), mental health literacy, and attitudinal factors such as stigma; and interpersonal factors: informal networks that promote support structures that naturally occur in communities; and a positive feedback loop between informal support-seeking that reinforces formal mental health service seeking and back again to increased informal network support.

Increased listening to users of services is emphasised as important to align their needs and wishes with the models that are developed. (Dyegrov et al. 2016). Key interventions covered in the medium term follow up to the Utøya attacks in 2011 of relevance to the Christchurch attacks include (Dyegrov et al. 2016):

- A proactive model of psychosocial follow up – this intended to secure contact, continuity and assessment between the bereaved and health and social support, with a coordinator with a health or social background assigned to each family that offered contact on a regular basis. Users accessed mental health services, primary care, police, schools, and need-related help. It was positively perceived by users and lasted at least a year post event
- Visits to the site
- Periodic gatherings – aimed at increasing recognition, understanding and normalisation of grief reactions, and adapted where appropriate for age (e.g. arts and sports for children)
- Development for education staff.

Turunen & Punamäki (2014), discussing the aftercare in response to a shooting in Kauhajoki in Finland in 2008, describe:

- an immediate phase of 24 hours
- an acute phase of two weeks, involving psychosocial group work
- a five-month empowerment and normalisation phase, emphasising getting back to normal in a safe place with systematic screening and referral for symptoms of traumatic stress, particularly for the most exposed
- a habituation phase until the end of one year, involving returning to the site of the shooting, and care around the first anniversary
- a follow-up phase until the end of after care at two years, involving upskilling of staff about trauma, to prevent and identify new cases.

Despotes et al. (2016) discuss resilience and post-traumatic growth post shooting events. They note that trauma reactions are complex and may include positive aspects which can be encouraged by de-pathologising responses to trauma (recognising the natural recovery to pre-existing symptom levels over months for a majority of affected individuals), and encouraging resilience in individuals and communities (by, for example, facilitating connections between survivors and natural social supports), and fostering safety and calmness, efficacy, hope, and connectedness.

They discuss post-traumatic growth as a “potential positive psychological outcome of trauma that is profound and transcends pre-trauma functioning”, characterised by a deeper appreciation for life, recognition of enhanced relationships and reconstruction of a belief system that was damaged by trauma. This may be related to optimism, various forms of coping (particularly religious and positive appraisal coping), social support, spirituality, and possibly deliberate rumination (repetitive thoughts directed at problem-solving or sense-making). They state: “Recovery for some may involve changing important personal beliefs. This process may involve religious and social communities, and include actions that foster social, political, and cultural change. Dialogue in public forums may reflect some individuals’ attempts to cope with, recover from, and grow after the shooting event, and has the potential to affect the recovery of others.”

Hobfoll et al. (2007) identified five key principles, based on the advice of a panel of experts on support for those exposed to disaster and mass violence, which should be used to guide and inform intervention and prevention efforts at the early to mid-term stages post-event. These are promoting:

- a sense of safety
- calming
- a sense of self- and community efficacy
- connectedness
- hope.

For children, the potential channels of exposure include direct exposure and injury, witnessing the impact of the shooting on others, knowing someone who was a victim, and witnessing the event via media. Around 30-40% of children and young people exposed to a life-threatening event will suffer mental health effects, with level of exposure, emotional sensitivity, lack of expressive ability, female gender, immigrant status, and poor family and social supports contributing to the risk. In the context of school shootings, children experience the loss of a sense of safety, fragility and vulnerability. They experience stress responses characterised by mood, anxiety, and behavioural symptoms, fear, helplessness and somatic complaints. The manifestation of these is modulated by the child's stage of cognitive development and coping abilities, and the reactions of those around them. Grief reactions are stimulated in children who have suffered loss of family, friends, or other significant adults and the loss of innocence, perceived safety, and the sense of continuity in their daily lives (Shultz et al. 2014).

Authorities in Greater Manchester, after the Manchester Arena bombing of May 2017, offered a layered response for adults (GMCA & NHSGM, 2017a), and children and young people (GMCA & NHSGM, 2017b), involving a universal offer of advice, a targeted offer of help, and a specialist offer to respond to higher psychological needs, combined with monitoring for risk of self-harm.

Rowhani-Rahbar, Zatzick & Rivara (2019) highlight the potentially long-lasting consequences with three recent deaths by suicide in survivors of mass shootings and their families in recent weeks in USA. The father of one victim at Sandy Hook elementary School died seven years after the event, and two survivors of the February 2018 Marjory Stoneman Douglas High School shooting died just over a year after the shooting. They recommend a stepped model of care, including collaborative primary care to identify ongoing issues, and intensive interventions for any affected individuals.

The evidence for Critical Incident Stress Debriefing shows it does not reduce long term trauma, as summarised in Ruzek et al. (2007).

A local example of a successful social marketing campaign to improve wellbeing after a disaster is the All Right? Initiative, which was set up after the Canterbury earthquakes of 2010-11. A Wellbeing survey of 2,895 Canterbury residents found 50% were aware of the campaign, and 73% had a favourable or very favourable opinion of it (Nielson 2018). Respondents to an All Right? Facebook page survey (n=212) indicated 98% considered the

Facebook site was helpful and 85% had done activities as a result of the website (Calder et al. 2019).

Discussion

Mass shootings carry greater risk of negative mental health outcomes in those exposed to them than other disasters because of their malicious and purposeful but unpredictable nature. In the Christchurch attacks, Muslims were specifically targeted, potentially adding to this phenomenon. Additionally, they were targeted in mosques, a venue that the Muslim community would normally associate with peace and security. The livestreaming of the attacks and subsequent distribution of its recording is a particular feature of the attacks. The possible effects on Muslims in Canterbury should be noted as the recording has meant people who were not physically present during the attacks may have become witnesses to relatives and friends dying violent deaths, in graphic detail.

The aftermath of the shooting also had distressing features, including that people were prevented from entering or re-entering the mosque (presumably because of safety concerns – the possibility of bombs or additional attackers) when they felt they could have saved or helped the injured. In addition, there has been distress related to the delay for families to receive the bodies of those killed – there were delays in bodies being retrieved from the mosque and then in being released from the morgue. This is particularly important when rapid preparation of bodies for burial is integral to Muslim funerals. The timing of the attacks not long before Ramadan and the discouragement of people coming together in groups (such as for communal feasts/Iftar) may be particularly disrupting for the Muslim community. However, when people do come together during Ramadan and for Eid al-Fitr (marking the end of Ramadan) the absence of loved ones will be especially felt.

These factors may be balanced to an extent by the understanding that those killed were at prayer and therefore in a pure state, and were shahid/martyrs and sent directly to heaven.

The Muslim community in Canterbury is small, making up around 3,000 people in 2013 (Statistics NZ, 2013), or around 0.6% of the Canterbury population (at the 2013 Census). As a small community, individuals and families may be highly proximal to each other – witnessing relatives and friends in the community being injured or killed, either in person or in the video made by the attacker, adds to the potential level and specificity of the distress.

The Muslim community exists within the Canterbury community, and Canterbury within the whole country. Even within the Muslim community, there is substantial diversity, consisting of more than 40 ethnicities nationally, originating from the Middle East, Africa, Europe, Central Asia, the Indian subcontinent, South East Asia, the Pacific, and New Zealand (Shepard, 2006). Indeed, this diversity makes it difficult to find relevant evidence or to generalise about a Muslim experience of recovery from traumatic events.

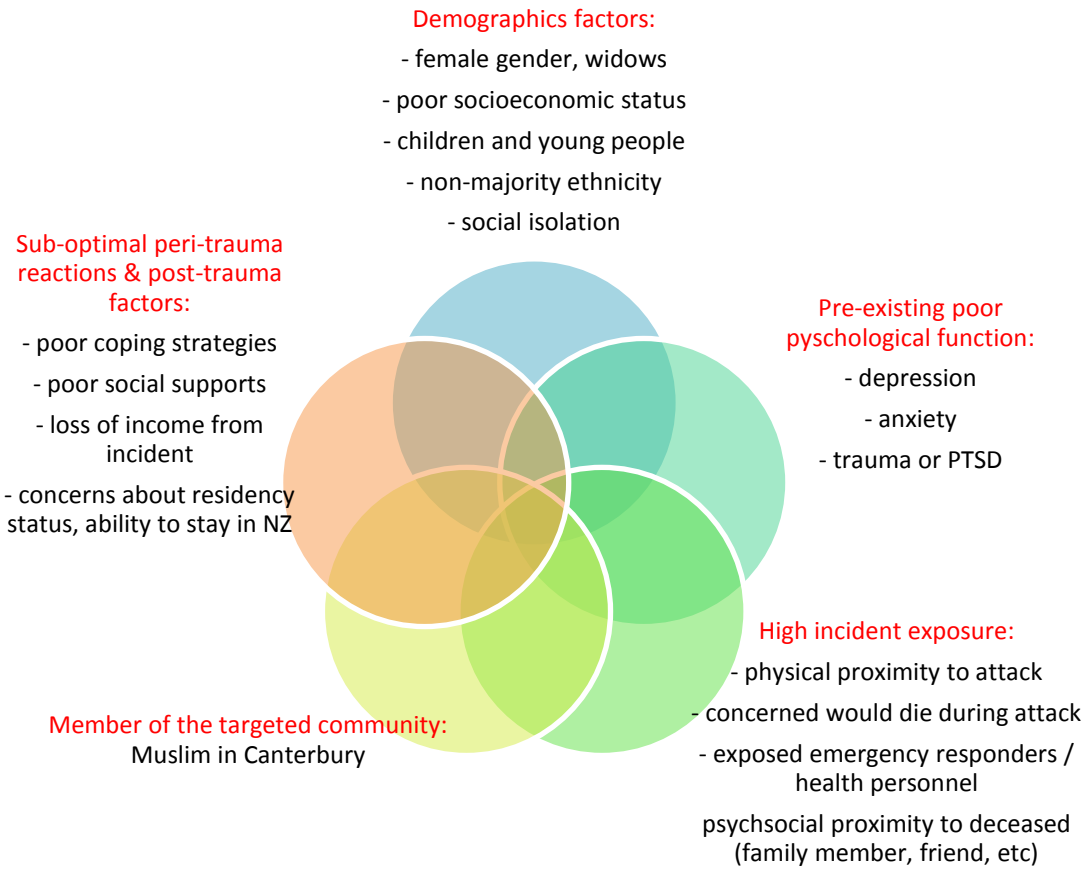
Some Muslims in Canterbury are former refugees and would have experienced previous trauma in their journey to asylum and refuge in New Zealand, and are among the affected people. There may be added distress for some, in the shattering of their expectation of New Zealand being a safe place (Emhail, 2019). Indeed, some Muslim immigrants to New Zealand

may have chosen to come here specifically because they considered it as one of the safest places in the world – there being no safer alternative place to go. Feelings related to the lack of safety in their country of origin and asylum may trigger negative reactions.

On the other hand, the same previous experience of trauma may have engendered a higher level of resilience, and there may be cultural factors that are protective for Muslims, such as shared beliefs and practices. The prohibition on drinking alcohol in Muslim culture may reduce the prevalence of post-event alcohol use disorders.

A way to conceptualise the risk to wellbeing and mental health as a result of the attacks is to consider different dimensions of risk as they overlap and interact, as shown below.

FIGURE 2: PROPOSED RISK FACTORS FOR MENTAL HEALTH IMPACTS AFTER MASS SHOOTINGS IN CANTERBURY



Prevalence estimates vary, and there are enough specific elements of the Christchurch mosque attacks to make calculation a rough estimate at best. However, with that in mind, in the short term the prevalence of mental health need is likely to be related to risk outlined in Figure 2, and potentially accumulate across the various aspects.

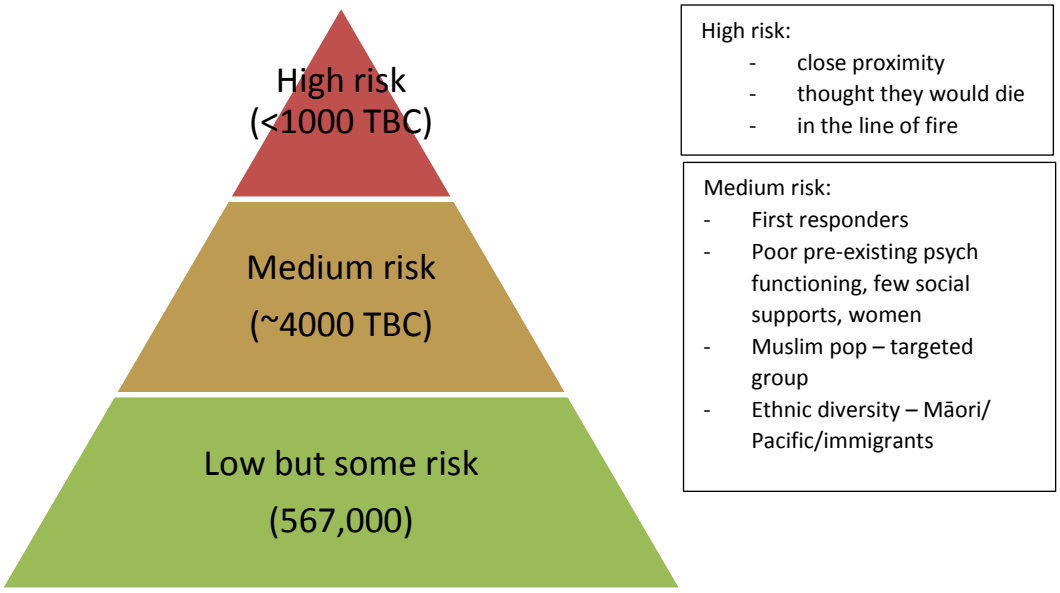
TABLE 4: RISK MODELLING FOR CANTERBURY MENTAL HEALTH IMPACTS OF THE SHOOTINGS

Groups	Population size	Predicted prevalence from literature (using Table 1)	Predicted affected population
Highly exposed to event	Approx. 500-1000 Including bereaved: 33 spouses, 90 children, 100+ siblings (Mitchell & Forrester 2019) As at 30 April 2019, 977 people were registered with Victim Support (Stuff.co.nz, 30 April 2019)	At 12 months PTSD 10-27% MD 4.9-24%	50-270
Emergency personnel & first responders (ambulance, police, hospital staff)	Approx. 200	At 12 months PTSD 17% MD 5%	34 PTSD 10 MD
Canterbury Muslim community	Approx. 3-4,000	12.6% at 6-9 months using one study (Hough et al. 1990 in Lowe & Galea 2017)	440 at 6-9 months (using 3500 pop)
Canterbury population totals	567,870 *	16% using one study of Denmark after Utoya, Norway shooting (Hansen, Dinesen & Østergaard 2017)	90,860

*source of population estimate: https://www.health.govt.nz/new-zealand-health-system/my-dhb/canterbury-dhb/population-canterbury-dhb

A tiered approach to wellbeing considerations and the intensity of aftercare needed may beneficial, focussing on those most requiring support.

FIGURE 3: TIERED APPROACH OF THOSE POTENTIALLY REQUIRING SUPPORT IN CANTERBURY



Social solidarity and natural networks are likely to be strong within the small Muslim community in Canterbury, but by the same token so is psychological proximity, potentially

aggregating the level of exposure. The 'otherness' of Muslims in Christchurch / New Zealand may modulate the sense of social solidarity that Muslims might feel from the surrounding community.

The Muslim community in New Zealand and internationally have rallied support for the Muslim community in Christchurch, which includes clerical visits, and practical and psychological support to families of those affected by the attacks. The government and leaders of many communities in Christchurch and across New Zealand, including particularly the Prime Minister, have indicated their rejection of the ideology behind the attacks and their sense of unity with the Muslim community. This may generate a sense of hope and connectedness to the community that is protective against some negative mental health outcomes. Political will and action to change gun laws may instil a greater sense of safety. The recasting of Muslims in the context of the Christchurch attacks as 'victims' rather than as 'terrorists', as has been a feature of recent times, is important, as is the feeling of solidarity with and love towards them.

Muslim leaders have been generous and magnanimous in their call for forgiveness of the attacker, and their thanks to the rest of community for support. This may help ameliorate some of the effects of the attacks in the Muslim and wider community. However the possibility should not be ignored for some in the Muslim community to feel ongoing anger and estrangement from their faith community (and presumably there are Muslims for whom faith is less central to their lives), and from the wider community, potentially leading to isolation.

In the Muslim community in Christchurch, reducing some barriers to care, particularly cultural ones, may be limited by the small number of health workers (particularly mental health workers) from the affected community and the existing levels of cultural competency in the rest of the health workforce. The gender of health workers and their ability to work with Muslims of the opposite gender is an important consideration.

In the wider community, there will be varying levels of exposure to the attacks. Some people, particularly young people, were exposed to potentially distressing events such as viewing the livestream video. Others may have intensively followed media after the attacks. Children may have experienced prolonged lockdown with limited access to information and facilities such as toilets.

In the aftermath of the attacks: primary care, if cost (co-payments/fees have been waived for general practice visits and primary mental health interventions for the Muslim community in Canterbury (Ministry of Health, 2019)) and other barriers can be overcome; schools; and specific workplaces are logical places to offer support, identify higher levels of need, and organise care when needed. Muslim and community mental health organisations in Canterbury can play an important role in supporting individuals living with mental illnesses and encouraging them to seek help.

Proactively contacting those most affected by the shootings, to offer any practical assistance and supports as needed, would be appropriate responses and in line with Psychological First Aid recommendations.

Consideration should also be given, and appropriate supports put in place, around potentially upsetting triggering times, such as Eid al-Fitr, the anniversaries of the attacks, and for witnesses the re-traumatising effects of being witnesses for the prosecution in the trial of the attacker.

Recommendations

Canterbury has an integrated health system, and a wealth of experience in dealing with disasters and responding intersectorally. It will be important for a whole of system approach to respond to the mosque attacks, and for access to services to be carefully considered for those seeking help. Using existing alliances, workstreams, and guideline and information systems (such as HealthPathways, HealthInfo, and Leading Lights for schools) would be appropriate.

To address the needs of the Muslim community:

Taking opportunities to listen to the Muslim community and users of services to align their needs and wishes with the models that are developed. Facilitation of a dialogue between Muslim community and DHB, local and central government agencies (as much as intersectoral work is possible). Encompass consideration of the diversity of the Muslim population and the need for adapted responses for women and men.

Encouragement of normal processes for grieving and solidarity through natural networks. Engagement with Muslim faith leaders and social networks, which may require temporary assistance from outside Canterbury as the Muslim community in Christchurch begins and continues recovery. Refer to those killed as shahid/martyrs and those injured as survivors, rather than victims, as this carries a connotation of pride rather than being defined by the perpetrator of the attacks.

Consider prioritising social marketing messages to Muslims in Canterbury. Consider group education sessions for relatives and affected members of the Muslim community in a variety of languages that focuses on trauma and distress, normal grieving processes, how grieving can affect peoples' reactions. These should be delivered by Canterbury DHB mental health staff as the relevant and trusted health 'authority', rather than people working on the ground with families, as they need to maintain close relationships with families. They should be delivered several times to allow word to spread among the Muslim community, and cover distinctly men, women and children, and how grief may affect people together as a family.

Proactive model of psychosocial follow up, with assigned navigation for each family (as was developed e.g. after the attacks in Utøya, Norway) for most affected group and their families, with sensitive screening for traumatic stress, and referral for trauma-informed care in the community/primary care in the first instance, would seem appropriate (this is also in line with Psychological First Aid principles).

Counselling for families should be culturally competent, cognisant of specific features of Muslim culture, such as the structure of families, the place of parents to be respected

elders, and that mothers may have to be taking on the role of both mother and father if their husband has been killed. Particular consideration should be given to widows as according to aspects of Muslim culture they should live with males of their own family, which may not be possible if those male relatives are not able to be in New Zealand.

Augmentation of the workforce:

- Recruitment of Muslim workers, especially with mental health experience, to work with/alongside the existing mental health and social work workforce in the community, primary and secondary care. Recruiting workers from diverse cultural and linguistic backgrounds. Observing the fit of a Muslim mental health-focused workforce in Kāhui Tū Kaha, a Ngāti Whātua organisation from Auckland, who came to Christchurch after the attacks, raises the potential of iwi or kaupapa Māori organisations (would also align with Mana Ake kaimahi) hosting these workers, alongside other natural homes such as Canterbury Resettlement Services and primary mental health teams.
- Development of the existing workforce to be more culturally competent (e.g. understanding what is important to the Muslim community) and culturally responsive (e.g. being able to engage and have an understanding of mental illness from a Muslim perspective).

Urgent work (finishing that which is currently ongoing) to ensure full availability of a professional interpreter service across the health system (and possibly beyond, such as for other social service agencies/providers) according to need.

Support needs to be planned for the long term, to allay worries in the Muslim community about the future, and expressions of solidarity and hope need to continue so as not to be perceived as temporary.

For the wider community:

Among the wider community, support similar to that offered in the aftermath of the Manchester Arena incident could be offered. This should be directed in the first weeks at normalising anticipated reactions and supporting coping mechanisms and natural networks, through multiple routes, including through public health messaging, social marketing, HealthInfo, primary care, and workplaces. After the initial weeks, the emphasis should shift to identifying those who need a higher level of assistance, focusing on those who have experienced greater levels of trauma, and those with previous mental health difficulties, as they may be more vulnerable. Training on ‘Mental Health First Aid’ may be beneficial in this context, to assist in the identification of those whose mental health may be deteriorating.

Particular attention should be given to:

- emergency and health personnel, and those who assisted at the scene or getting people to hospital as they have been exposed to dead bodies and traumatically injured survivors, and have the potential for vicarious trauma (monitoring may be appropriate for these people);
- people exposed in the vicinity of the attacks or to the livestream;

- children who experienced prolonged lockdown in unpleasant conditions, and who may have feared for their safety.

Following the Greater Manchester (GMCA & NHSGM 2017a & 2017b) example this could involve phased, tiered offers, based on a multiagency stepped model providing a holistic continuum of care, graduating up from four weeks post-event onwards, particularly 12 weeks onwards. For adults:

- Universal offer/Getting Advice – good advice aimed at normalising, potentially through a dedicated website, text or call 1737, and/or HealthInfo
- Targeted offer/Getting Help – monitoring from four weeks for those at greater risk, with screening with a brief PTSD screening instrument, such as the screening instrument for assessing psychological distress following disasters adapted for the Christchurch mosque shootings by Dorahy & Blampied (2019)
- Specialist offer/Getting More Help – higher risk individuals where symptoms (e.g. anxiety, depression, sleep difficulties) are present from four to 12 weeks, offering trauma-focused CBT for PTSD within the first three months (longer 90 minute sessions, 10 to 15 sessions), potentially EMDR.

For children and young people:

- Universal offer/Getting Advice – to get good advice aimed at normalising, potentially through schools (through Leading Lights), 1737 and HealthInfo (through parents/caregivers)
- Targeted offer/Getting Help – getting help (community monitoring and targeted community support) particularly for those not responding to the universal offer, where there was co-existing mental health needs or continuing experience of secondary stressors, those with family affected by the events. Identification by education, primary care, and community services personnel of children and young people who would benefit from ongoing monitoring, targeted higher support and specialist assessment; and by self-referral through a help-line. Approaches include enhanced psychosocial support, promotion of a sense of safety, calming, self-efficacy, and specialist phone consultation
- Specialist offer/Getting More Help– for children and young people experiencing moderate to severe needs and additional risk factors. Identification through specialist consultation, offering trauma-focused CBT adapted to suit the developmental stage and circumstances, and involving co-working with parents, schools and others; potentially EMDR and family-focused approaches where more than one family member is affected.

For all:

- Multi-agency/Staying Safe approach – monitoring for risk of harm to self or others.
- Consider the triggering nature of anniversaries of the attacks, and put appropriate supports in place.
- Consider evaluation of any initiatives, over the longer term.

If time permits, a further investigation on literature of trauma impacts on ethnic or religious communities (in particular, Muslim communities) could be undertaken.

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Appendix 1: Methods

National and local experts were contacted regarding their contacts and literature they held. Librarians at the University of Otago, Christchurch, provided a formal Medline literature review for evidence.

Sources of information searched on 27/3/2019:

Database:	**Searched by:**	**Comments:**
CINAHL	Rebecca Phibbs	*Nursing and Allied Health Database*
EMBASE (1947 to present)	Carol Davison	*Medical database – a European equivalent to Medline*
MEDLINE (1996 to March 25 2019)	Carol Davison	*Medical database, produced in the U.S.*
PsycINFO	Rebecca Phibbs	*Premier psych database*
Web of Science	Carol Davison	*Useful for tracking citations from a specific research article.* • *Preliminary search carried out on the Shultz article* • *Subsequent author search on both Shultz and Thorsen*
Other sources:	**Searched by:**	**Comments:**
Cochrane Ovid EBM Reviews Proquest dissertations Library Catalogue (Primo) Google Scholar World Health Organisation APA (American Psychological Association) website Various guidelines sites – *most didn't yield anything* Various theses websites – *most didn't yield anything*	Marg Walker	Cochrane via https://www.cochranelibrary.com/ Search Terms Used Systematic review(s) Review Terror Terrorism psychological first aid PSA early intervention guidelines mental health following disasters mental health first responders children women survivors post disaster community disasters Mass trauma

Date range & general comments or observations:

Searcher	**Comments**
Carol	**Date range:** The bulk of the references selected and retrieved from the MEDLINE and EMBASE searches were published within the last 12 years. As a result (and as a rough guide only as these numbers may change as we collate all the references together) there were • 94 references = 2008-2019

	A smaller number of the references selected were published before 2008 • 26 references = 2000-2017 • 4 references = 1994-1998 **General comments:** • One of the limits applied to all references has been English language, which has excluded a small number of non-English articles from the selection process. • The focus has been on journal references / articles-other types of information aren't included. • Where possible when articles are described and identified as 'meta-analysis', 'reviews' or 'systematic reviews' with the databases, the relevant articles have been selected. • Unfortunately, in the databases many of the articles are simply described as 'journal articles', which means their evidence may not be strong. Despite this, these references have been selected and included here, with a final decision on relevance to be made by Matt or Melissa. • Counting up the number of references that made up the 5-6 individual search results in these two databases, around 1300 references were actively scanned.
Rebecca	**Date range:** Most material selected is from 2013 onwards, although I have included some older material. **General comments:** • I have included some book material, from PsycINFO. • Some material may not be relevant; the final decision as to whether or not to include will of course be made by Melissa and Matt.
Marg	**Date range:** Most material selected is from 2013 onwards just a few earlier papers that have been fairly highly cited. **General comments:** • I have included some book material from the library catalogue and from Google Scholar. • Placed some emphasis on guidelines and reviews • Retrieved 11 references of which 43 looked most useful. • One New Zealand doc – thought might be good to reference: Crawshaw J, Blanch C. (2016). Framework for Psychosocial Support in Emergencies (New Zealand). Ministry of Health. https://www.health.govt.nz/system/files/documents/publications/framework-psychosocial-support-emergencies-dec16-v2.pdf

Search strategies

The search strategies used in the major database searches are shown below. As these searches were carried out by Carol and Rebecca, there is some variation in approach and terms used. This information may be useful for an overview of the search strategy and if required, an analysis may identify gaps or other avenues for further investigation.

1. gunshot injury/
2. (gun* or hangun* or wound).tw.
3. firearm/
4. gun violen*.tw.

5. 1 or 2 or 3 or 4
6. mass shoot*.tw.
7. shoot*.tw.
8. mass disaster/
9. mass casual*.tw.
10. terrorism/
11. terrorism.tw.
12. 6 or 7 or 8 or 9 or 10 or 11
13. survivor/
14. survivor*.tw.
15. victim/
16. victim*.tw.
17. 13 or 14 or 15 or 16
18. exposure to violence/
19. 17 or 18
20. 5 and 12 and 19
21. limit 20 to (english language and “systematic review”)
22. limit 20 to (english language and meta analysis)
23. from 20 keep …
24. family/
25. exp spouse/
26. 24 or 25
27. 5 and 12 and 26
28. from 27 keep …
29. rescue personnel/
30. first responder*.tw.
31. paramedical personnel/
32. allied health personnel.tw.
33. nursing staff/
34. medical staff/
35. police/
36. 29 or 30 or 31 or 32 or 33 or 34 or 35
37. 5 and 12 and 36
38. limit 37 to english language
39. 38 not (20 or 27)
40. limit 39 to journal
41. psychological resilience/
42. resilience.tw.
43. coping behavior/
44. mental health/
45. psychological well-being/
46. community mental health.
47. self concept
48. self efficacy.tw.
49. attitude/

50. psychological adjustment/
51. emotional agjustment.tw.
52. social adaptation/
53. psychological adaptation.
54. social environment/
55. socioeconomics/
56. risk factor/
57. 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56
58. 5 and 12 and 57
59. limit 58 to (english language and journal)
60. 59 not (20 or 27 or 38)
61. from 60 keep …

Appendix 2: Potential Brief Screening Tools

i. Screening tool for adults

Impacts of Events Scale – Revised, downloaded from https://www.aerztenetz-grafschaft.de/download/IES-R-englisch-5-stufig.pdf on 2 May 2019.

IMPACT OF EVENTS SCALE-Revised (IES-R)

INSTRUCTIONS: Below is a list of difficulties people sometimes have after stressful life events. Please read each item, and then indicate how distressing each difficulty has been for you DURING THE PAST SEVEN DAYS with respect to _____ (event) that occurred on _____ (date). How much have you been distressed or bothered by these difficulties?

	Not at all	A little bit	Moderately	Quite a bit	Extremely
1. Any reminder brought back feelings about it	0	1	2	3	4
2. I had trouble staying asleep	0	1	2	3	4
3. Other things kept making me think about it.	0	1	2	3	4
4. I felt irritable and angry	0	1	2	3	4
5. I avoided letting myself get upset when I thought about it or was reminded of it	0	1	2	3	4
6. I thought about it when I didn't mean to	0	1	2	3	4
7. I felt as if it hadn't happened or wasn't real.	0	1	2	3	4
8. I stayed away from reminders of it.	0	1	2	3	4
9. Pictures about it popped into my mind.	0	1	2	3	4
10. I was jumpy and easily startled.	0	1	2	3	4
11. I tried not to think about it.	0	1	2	3	4
12. I was aware that I still had a lot of feelings about it, but I didn't deal with them.	0	1	2	3	4
13. My feelings about it were kind of numb.	0	1	2	3	4
14. I found myself acting or feeling like I was back at that time.	0	1	2	3	4
15. I had trouble falling asleep.	0	1	2	3	4
16. I had waves of strong feelings about it.	0	1	2	3	4
17. I tried to remove it from my memory.	0	1	2	3	4
18. I had trouble concentrating.	0	1	2	3	4
19. Reminders of it caused me to have physical reactions, such as sweating, trouble breathing, nausea, or a pounding heart.	0	1	2	3	4
20. I had dreams about it.	0	1	2	3	4
21. I felt watchful and on-guard.	0	1	2	3	4
22. I tried not to talk about it.	0	1	2	3	4

Total IES-R Score: _____

INT: 1, 2, 3, 6, 9, 14, 16, 20
AVD: 5, 7, 8, 11, 12, 13, 17, 22
HYP: 4, 10, 15, 18, 19, 21

Weiss, D.S. (2007). The Impact of Event Scale-Revised. In J.P. Wilson, & T.M. Keane (Eds.) *Assessing psychological trauma and PTSD: a practitioner's handbook* (2nd ed., pp. 168-189). New York: Guilford Press.

AETR2N 22 1/13/2012

Revised Impact of Event Scale (22 questions):

The revised version of the Impact of Event Scale (IES-r) has seven additional questions and a scoring range of 0 to 88.

On this test, scores that exceed 24 can be quite meaningful. High scores have the following associations.

Score (IES-r)	**Consequence**
24 or more	PTSD is a clinical concern.[6] Those with scores this high who do not have full PTSD will have partial PTSD or at least some of the symptoms.
33 and above	This represents the best cutoff for a probable diagnosis of PTSD.[7]
37 or more	**This is high enough to suppress your immune system's functioning** (even 10 years after an impact event).[8]

The IES-R is very helpful in measuring the affect of routine life stress, everyday traumas and acute stress

References:

1. Horowitz, M. Wilner, N. & Alvarez, W. (1979). Impact of Event Scale: A measure of subjective stress. Psychosomatic Medicine, 41, 209-218.
2. Weiss, D.S., & Marmar, C.R. (1997). The Impact of Event Scale-Revised. In J.P. Wilson & T.M. Keane (Eds.), Assessing Psychological Trauma and PTSD (pp.399-411). New York: Guilford.
3. Hutchins, E. & Devilly, G.J. (2005). Impact of Events Scale. Victim's Web Site. http://www.swin.edu.au/victims/resources/assessment/ptsd/ies.html
4. Coffey, S.F. & Berglind, G. (2006). Screening for PTSD in motor vehicle accident survivors using PSS-SR and IES. Journal of Traumatic Stress. 19 (1): 119-128.
5. Neal, L.A., Walter, B., Rollins, J., et al. (1994). Convergent Validity of Measures of Post-Traumatic Stress Disorder in a Mixed Military and Civilian Population. Journal of Traumatic Stress. 7 (3): 447-455.
6. Asukai, N. Kato, H. et al. (2002). Reliability and validity of the Japanese-language version of the Impact of event scale-revised (IES-R-J). Journal of Nervous and Mental Disease. 190 (3): 175-182.
7. Creamer, M. Bell, R. & Falilla, S. (2002). Psychometric properties of the Impact of Event Scale-Revised. Behaviour Research and Therapy. 41: 1489-1496.
8. Kawamura, N. Yoshiharu, K. & Nozomu, A. (2001) Suppression of Cellular Immunity in Men with a Past History of Post Traumatic Stress Disorder. American Journal of Psychiatry. 158: 484-486

ii. Screening tool for children

CRIES 8, downloaded from https://www.corc.uk.net/media/1268/cries_selfreported.pdf on 2 May 2019

CRIES–8

Date: ☐☐/☐☐/20☐☐ Time: ☐☐h☐☐m

Below is a list of comments made by people after stressful life events. Please mark each item showing how frequently these comments were true for you during the past seven days. If they did not occur during that time please mark the 'not at all' box.

	Frequency during the last week:	0	1	3	5
1	Do you think about it even when you don't mean to?	Not at all	Rarely	Sometimes	Often
2	Do you try to remove it from your memory?	Not at all	Rarely	Sometimes	Often
3	Do you have waves of strong feelings about it?	Not at all	Rarely	Sometimes	Often
4	Do you stay away from reminders of it (e.g. places or situations)?	Not at all	Rarely	Sometimes	Often
5	Do you try not to talk about it?	Not at all	Rarely	Sometimes	Often
6	Do pictures about it pop into your mind?	Not at all	Rarely	Sometimes	Often
7	Do other things keep making you think about it?	Not at all	Rarely	Sometimes	Often
8	Do you try not to think about it?	Not at all	Rarely	Sometimes	Often

NHS ID: .....

Service allocated case ID .....

Intrusion subscale total
QUESTIONS: 1,3,6,7

Avoidance subscale total
QUESTIONS: 2,4,5,8

CRIES–8 — *Child/Young Person*

iii. Screening instrument for assessing psychological distress following disasters

Dorahy MJ, Blampied NM. (2019). A screening instrument for assessing psychological distress following disasters: Adaptation for the March 15th, 2019 mass shootings in Christchurch, New Zealand. New Zealand Journal of Psychology, 47(1): 23-28. Available at (accessed 30 April 2019): https://www.psychology.org.nz/wp-content/uploads/NZJP-Vol-48-No-1-DRAFT-v2-1.pdf. (screening instrument on pages 26-28).

BRIEF TRAUMA SCREENING INTERVIEW

IDENTIFICATION CODE (Persons first & last initials & day & month of birth-eg. mb1308) _____

AGE _____ GENDER _____

PHONE _____ EMAIL _____

TODAY'S DATE _____ TIMES ASSESSED WITH THIS MEASURE: 1 2 3 4 5

DO YOU CONSENT TO BEING CONTACTED IN THE FUTURE TO CHECK YOUR PROGRESS? YES NO

The following questions are designed to be asked by a GP, clinician or health professional of people who may be distressed by the March 15th 2019 mass shootings in Christchurch. The questions are designed to help understand people's responses and reactions and identify those who might require more psychological support.

- I am going to ask you some questions about reactions that people sometimes have after an event such as the recent shootings in Christchurch.
- My questions are concerned with your personal reactions to the March 15th 2019 events.
- Can you indicate whether or not you have experienced the following AT LEAST TWICE IN THE PAST WEEK
- If answer is YES, please rate: 0=A little bit; 1=Moderately; 2=Quite a lot; 3=Very much; 4=Extremely

	(At least TWICE in the past week) YES	NO	Rating 0-4
1. Upsetting thoughts or memories about the event that have come into your mind without your intention			
2. Upsetting dreams about the event			
3. Acting or feeling as though the event were happening again			
4. Feeling upset by reminders of the event			
5. Bodily reactions (such as fast heartbeat, stomach churning, sweatiness, dizziness) when reminded of the event			
6. Difficulty falling or staying asleep			
7. Irritability or outbursts of anger			
8. Difficulty concentrating			
9. Heightened awareness of potential dangers to yourself and others			
10. Being jumpy or being startled at something unexpected			

A. Total score on items 1-10 ≥ 6: NO YES

As a result of the attacks, how often have you been bothered in the past week by the following problems?	Not at all	Several days	More than half the days	Nearly every day	Every-day
11. Feeling nervous, anxious or on edge	0	1	2	3	4
12. Not being able to stop or control worrying	0	1	2	3	4
13. Feeling afraid as if something awful might happen	0	1	2	3	4
14. Feeling down, depressed, or hopeless	0	1	2	3	4
15. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3	4

B. Mean score on items 11-15 ≥ 1.5: NO YES

As a result of the attacks, how much in the last week has the following happened?	Not at all	Slightly	Some-what	Very	Extrem-ely
16. Feeling like you were walking around in a dream or a movie.	0	1	2	3	4
17. Things not feeling completely real.	0	1	2	3	4
18. Going around in a daze, not noticing things.	0	1	2	3	4
19. Times when you felt separate from your body.	0	1	2	3	4

C. Mean score on items 16-19 ≥ 2: NO YES

Since the attacks, to what degree have you:

20. Felt people around you have understood and supported your spiritual and religious beliefs, and culture?

0 (Constantly) 1 (often) 2 (sometimes) 3 (occasionally) 4 (Not at all)

D. Score on item 20 ≥ 3: NO YES

21. Has this event reactivated painful feelings of the Canterbury Earthquakes or other distressing events?	YES	NO

E. Score "Yes' on 21: NO YES

22. Have you got people around that you can talk to openly about what you have experienced during and since the attack?

0 (Not at all) 1 (occasionally) 2 (sometimes) 3 (often) 4 (Constantly)

F. Score on items 21 ≤ 1: NO YES

Please add the number of 'YES' responses for A-F:

- **If 2 or less, psychological first aid, education. No further action unless requested.**
- **If 3 or 4, education, support, watchful wait. Invite further contact if no change in a week**
- **If > 4, continue ongoing psychological support or referral to appropriate person/service**

Brief Screening Scoring Key

1a: Scoring in the 2 months following the disaster

Add up items for each section (A-F) to determine if YES (criterion met) or NO (criterion not met):

A: Sum total of items 1-10 = 6 or above
B: Mean of items 11-15 = 1.5 or above
C: Mean of items 16-20 = 2 or above
D: Item 20 = 2 or above
E: Item 21 = YES
F: Items 22 = above 3

1b: Decision making in the 2 months following the disaster

Green (no further immediate action), orange (watch and wait – invite to contact again if no improvement), red (continue psychological support, assessment, & move into therapy)

- **If 2 or less, psychological first aid, education. No further action unless requested.**
- **If 3 or 4, education, support, watchful wait. Invite further contact if no change in a fortnight**
- **If > 4, continue ongoing psychological support with specific treatment of symptoms or the person, or referral to appropriate person/service**

2a: Scoring beyond 2 months following the disaster

The same as scoring above.

2b: Decision making in the 2 months following the disaster

Green (no further immediate action), orange (watch and wait – invite to contact again if no improvement), red (continue psychological support, assessment, & move into therapy)

- **If 0, Invite further contact if any difficulties arise**
- **If 1 or 2, education, support, watchful wait. Invite further contact if no change in a fortnight**
- **If > 2, continue ongoing psychological support with specific treatment of symptoms or the person, or referral to appropriate person/service**