

**The Psychological Impacts of Major Disasters: A commentary on Bryant et al's study
of the Victorian Black Saturday Bushfires**

David M Fergusson¹

Joseph M Boden¹

¹Christchurch Health and Development Study, Department of Psychological Medicine,
University of Otago, Christchurch, PO Box 4345, Christchurch, New Zealand

Corresponding author: Professor David M. Fergusson. Christchurch Health and
Development Study. Tel +64 3 372 0406; Fax +64 3 372 0407; Email

dm.fergusson@otago.ac.nz

There is a widespread and growing perception that the rate of natural disasters including floods, fires, earthquakes and other disasters is increasing (EM-DAT, 2012; GRID-Arendal, 2012; World Bank, 2013). While these claims are contested the weight of the evidence suggests that the perceptions of increased rates of natural disaster have arisen for two reasons. First, as a result of climate change there has been an increase in the rate of hydro-meteorological events including hurricanes, typhoons and flooding (GRID-Arendal, 2012; The World Bank, 2010). This trend has been augmented by the growth of the human population which means that more people are living in areas at increased risks of natural disasters (Arnold, Dilley et al., 2005; The World Bank, 2010).

Irrespective of the reasons for the apparent rise in the rate of natural disasters, this area has become of increasing scientific interest regarding the social and psychological impacts of natural disasters on those who are exposed to and survive these disasters (for reviews, see Green, 1998; Kar, 2009; Norris, Friedman et al., 2002; Rubonis and Bickman, 1991; Schnurr and Green, 2004). More specifically, natural disasters can be seen setting in train a series of adverse life events which may span: exposure to a traumatic event; death of family members and close acquaintances; loss of property; disruption of employment; and loss of services and local infrastructure. In turn it can

be suggested that exposure to these complex series of life events is likely to lead to increased risks of both stress-related mental disorder and psychological distress. There is a growing literature in this area which suggests that while there are detectable increases in stress-related disorders such as post-traumatic stress disorder (PTSD), anxiety disorders, depression and substance misuse, there is also evidence that the majority of those exposed to disaster prove to be resilient in the face of adversity (Neria, Nandi et al., 2008; Norris et al., 2002; North and Pfefferbaum, 2013).

These findings are clearly evident in Bryant and colleagues' (Bryant, Waters et al., in press) report on the impact of the Victorian Black Saturday bushfires in February 2009, which resulted in 173 fatalities and widespread property damage. To examine the psychological impacts of the bushfires, the research group recruited respondents from 25 communities varying in the extent of exposure to the Black Saturday fires. These communities were classified into: high affected; medium affected; and low affected communities. Comparisons across these communities showed clear gradients in which increasing exposure to the bushfires was associated with increasing risks of PTSD, depression, and severe psychological distress. Despite this trend, the study also found that the majority of residents in all communities were resilient and reported no psychological distress.

While the study produces results which are highly consistent with previous research, it also illustrates the methodological challenges that research into the psychological consequences of major disasters poses. One of the most complex issues in this area of study is that of obtaining a sample that is representative of the population exposed to the disaster. Here two problems must be faced. The first is that following a disaster, a number of families will move out of the disaster area and relocate elsewhere. The second problem is that of obtaining the cooperation of those who remain in the disaster area to participate in research. Many of these families will be facing multiple issues in rebuilding and resolving post-disaster issues which may limit their enthusiasm for participating in research. These problems of sample recruitment are well illustrated by the Black Saturday bushfire research, where despite considerable efforts, the study was able to recruit only 16% of those eligible to be interviewed. Further, those who agreed to participate were disproportionately older, female and better-educated. These features raise important issues about the extent to which the conclusions of the study generalise to the wider population affected by the bushfires.

A second important issue concerns assessment of exposure to the disaster. In the Black Saturday study, the researchers used residence in a given area at the time of the

bushfires. However, within areas exposed to the bushfires, it is likely that there may have been substantial variation in the experiences of those exposed to the bushfires. These considerations suggest the importance of developing scales of disaster exposure that reflect individual variability in exposure to the disaster. It seems likely the development of such scales will reveal the presence of subgroups of individuals and families with high exposure to a disaster and elevated risks of psychiatric outcomes. These considerations suggest that studies such as the Black Saturday study, which use residence as a measure of disaster exposure, may underestimate the psychological impacts of natural disasters for those with high exposure to the adverse consequences of these disasters.

A third issue that arises in all observational studies concerns the effects of third or confounding factors on the associations between exposure to disaster and mental health outcomes. Under ideal conditions, it would be useful to have measures of pre-disaster mental health in the groups having differing exposure to disaster, to determine the extent to which individuals having different exposure to the bushfires had similar levels of mental health problems prior to the disaster.

As with all research, an important issue concerns the way in which outcomes are measured. In the bushfire studies, the authors use a series of well-validated and widely-used measures of psychiatric disorder and resilience. While these measures are informative about the mental health consequences of the bushfires, they fail to assess the extent to which the bushfires had positive benefits for those exposed to them. Major disasters can be viewed as what Rutter (1996) has described as “turning point experiences” which have the potential for both adverse and positive consequences. For these reasons, in the assessment of post-disaster reaction it may be useful to consider asking participants about the positive or beneficial consequences of their exposure to the disaster.

At this point we feel obliged to comment that many of the reflections above have arisen as a result of us being both participant-observers and researchers into the Canterbury Earthquakes. Starting in September 2010, the Canterbury Province of the South Island of New Zealand was struck by a series of over 10,000 earthquakes over approximately an 18-month period, with four major earthquakes with values on the Richter scale exceeding 6.0. The 22 February 2011 earthquake caused 185 deaths and extensive damage to the city of Christchurch, with up to 1,000 buildings requiring demolition and rebuilding (Collins, 2011). One of the features of the Canterbury

Earthquakes was that these occurred in an area in which there was an ongoing longitudinal study. This study was the Christchurch Health and Development Study (CHDS), which is a longitudinal study of 1,265 children born in 1977 who have been studied on 23 occasions to the age of 35. Of this cohort, just under 50% were resident in the Canterbury region during the earthquakes, thus providing an ideal natural experiment in which 50% of a well-studied population were exposed to a major disaster. This set of circumstances made it possible for the CHDS research team to assess the impact of the Canterbury Earthquakes on the mental health of the CHDS cohort members, taking into account both the extent of exposure to the earthquakes and pre-quake mental health. An account of the findings of this study is in press (Fergusson, Horwood et al., in press) and, in general, our findings closely mirror the findings of the Black Saturday study. This convergence of findings from different studies examining different disasters and using different research designs clearly suggests that the methodological problems of disaster research outlined above may not pose major threats to study validity.

The convergence of evidence from a growing number of studies of the effects of major disaster on mental health produces two general conclusions:

1. The first is the majority of populations exposed to major natural disasters are resilient and do not appear to experience increased risks of mental disorder following exposure to natural disaster.
2. The second is that a minority do show clear increases in disaster-related psychological outcomes including PTSD, anxiety disorders, depression and substance use.

These findings highlight the importance of post-disaster efforts to provide accessible mental health services to those experiencing disaster related mental disorders (Wang, Gao, Shinfuku et al., 2000; Wang, Gao, Zhang et al., 2000), while at the same time ensuring the resilient majority are provided with the support and infrastructure needed to address the challenges of post-disaster social, economic and physical reconstruction.

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Declaration of conflicting interests

The Authors declare that there is no conflict of interest.

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