

# Secondary Stressors and Extreme Events and Disasters: A Systematic Review of Primary Research from 2010-2011

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## Abstract

### Introduction

Extreme events and disasters, such as earthquakes and floods, cause distress and are associated with some people developing mental disorders. Primary stressors inherent in many disasters can include injuries sustained or watching someone die. The literature recognises the distress which primary stressors cause and their association with mental disorders. Secondary stressors such as a lack of financial assistance, the gruelling process of submitting an insurance claim, parents' worries about their children, and continued lack of infrastructure can manifest their effects shortly after a disaster and persist for extended periods of time. Secondary stressors, and their roles in affecting people's longer-term mental health, should not be overlooked. We draw attention in this review to the nature of secondary stressors that are commonly identified in the literature, assess how they are measured, and develop a typology of these stressors that often affect people after extreme events.

### Methods

We searched for relevant papers from 2010 and 2011 using MEDLINE®, Embase and PsycINFO®. We selected primary research papers that evaluated the associations between secondary stressors and distress or mental disorders following extreme events, and were published in English. We extracted information on which secondary stressors were assessed, and used thematic analysis to group the secondary stressors into a typology.

### Results

Thirty-two relevant articles published in 2010 and 2011 were identified. Many secondary stressors were poorly defined and difficult to differentiate from primary stressors or other life events. We identified 11 categories of secondary stressors, though some extend over more than one category. The categories include: economic stressors such as problems with compensation, recovery of and rebuilding homes; loss of physical possessions and resources; health-related stressors; stress relating to education and schooling; stress arising from media reporting; family and social stressors; stress arising from loss of leisure and recreation; and stress related to changes in people's views of the world or themselves. Limitations in this review include its focus on studies published in 2010 and 2011, which may have led to some secondary stressors being excluded. Assumptions have been made about whether certain items are secondary stressors, if unclear definitions made it difficult to differentiate them from primary stressors.

### Conclusions

This is the first review, to our knowledge, that has developed a typology of secondary stressors that occur following extreme events. We discuss the differing natures of these stressors and the criteria that should be used to differentiate primary and secondary stressors. Some secondary stressors, for example, are entities in themselves, while others are persisting primary stressors that exert their effects through failure of societal responses to disasters to mitigate their immediate impacts. Future research should aim to define secondary stressors and investigate the interactions between stressors. This is essential if we are to identify which secondary stressors are amenable to interventions which might reduce their impacts on the psychosocial resilience and mental health of people who are affected by disasters.

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## Introduction

Rapid and extensive changes occur in people's lives and the worlds in which they live when they are exposed to extreme events and disasters. These can cause great stress to people, families and communities because of their inherent effects, such as causing short-term fear of death and exposure to traumatic events, and because of the chain of events they set in motion. Effective psychosocial recovery after disasters and other extreme events is characterised by adaptation to changed circumstances. In some situations, the personal and social meanings that people derive from their experiences of an extreme event have more influence on its psychosocial impact than the event itself. People's abilities to re-build, recover, and adapt following a disaster are determined by their own physical, psychological and social characteristics, as well as the characteristics of, and support they receive from their families and the communities in which they live<sup>1</sup>.

The Department of Health in England (DH)<sup>2</sup> and NATO/EAPC<sup>3</sup> clearly differentiate between distress and mental disorders following a disaster. Most people experience distress after their exposure to an extreme event. In the case of people with good psychosocial resilience and access to social support, their distress may be relatively transient as people call on a set of inner capabilities and supporting relationships to spring back and begin the processes of adaptation. Mental disorders occur often, but less commonly than distress, and in some cases they may require intensive and long term continuing interventions and treatment. The threshold between what might be considered a common or anticipated response of distress, and what is indicative of a person developing a mental disorder, are difficult to define and the pathways are complex. There are a number of factors that make it more likely for people to develop mental disorders such as pre-existing mental ill health and personal factors such as gender, age or income, but particularly important factors are whether or not they receive adequate social support and whether or not they perceive that they receive this. As the timescale and dysfunctional impact of distress grows, the possibility of people passing from an anticipated, distressed psychosocial response, to developing mental disorder also increases<sup>3</sup>.

Furthermore, the psychosocial effects of extreme events have commonly been viewed as resulting from a complex array of primary and secondary stressors. Primary stressors have been defined as stress that is *'inherent in particular major incidents, disasters and emergencies and arising directly from those events'*<sup>2</sup>. They encompass experiences that are related directly to, or consequent on, people's involvement in a disaster such as watching someone being killed, or fearing for one's life and the safety of others.

Secondary stressors, by contrast, are circumstances, events or policies that are indirectly related or *'non-inherent and consequential'*<sup>2</sup> to the index extreme event. Typically, the term is used to describe situations that persist for longer than the events. Some secondary stressors are entities in themselves, whereas others are unresolved and persisting primary stressors. They can include problems such as infrastructure failure and challenges to returning to normality and repairing structures. They may also include the impacts of policies and plans made prior to events that inadvertently limit people's recovery or adaptation.

Much of the focus of previous research has been to identify primary stressors and provide evidence and strategies to tackle these problems and minimise their impact<sup>2,3</sup>. However, recent initiatives have resulted in increasing awareness of the importance of secondary stressors and their potential to lengthen the impact and distress caused by a disaster<sup>2,3,4</sup>. There is plentiful evidence that the likelihood of people developing distress or going on to develop a mental disorder is increased in line with the intensity and persistence of both primary and secondary stressors. Despite this, however, there is a lack of a clear typology to describe these secondary stressors. We believe that it is important to be able to group the secondary stressors that occur after an extreme event. This should enable improved application of past experience with a view to recognising potentially important secondary stressors earlier, and, preferably, even before a disaster occurs.

In this review we aimed to: determine if secondary stressors that affect people exposed to extreme events and disasters are commonly recognised in the literature; identify how they are measured; and produce a typology of secondary stressors. In particular, we sought to identify the secondary stressors that contribute to prolonging or intensifying people's distress and those which may also increase the risks of survivors developing mental disorders following extreme events.

## Methods

We identified and analysed the content of primary research papers. We limited our search to research papers published in 2010 and 2011 because the disaster literature has grown rapidly in the last few years. Our intention is to use analysis of these papers to provide an indication of how secondary stressors are described in the current literature.

In order to be included in our review, papers had to report an evaluation of the association between a secondary stressor and an impact on people's distress or mental health after an extreme event. Initially, we defined secondary stressors as *'continuing or chronic problems that occur as a consequence of a disaster and impact on people's emotional, cognitive, social and physical functioning; and thereby may prolong the impact of the event. They are not directly related to or inherent in the event'*.

We conducted a free text literature search using MEDLINE®, Embase and PsycINFO® for potentially relevant papers published in English. First, we assembled a list of potential secondary stressors. This was used to compile a list of search terms to use

alongside the generic term ‘secondary stressor’. We also used the WHO Global Platform for disaster risk reduction list of definitions<sup>5</sup> to define the types of extreme event that we included in the search terms. No grey literature or citations searches were performed and data extraction was restricted to the information presented in the published papers.

The keywords and search strategy used was: second\* stress\* OR econom\* OR cost\* OR income\* OR employ\* OR unemploy\* OR insur\* OR compensat\* OR legal\* OR propert\* OR hous\* OR business\* OR shelter\* OR displace\* OR refuge\* OR evacuat\* OR relation\* OR marit\* OR famil\* OR social\* OR role\* OR fear recurr\* OR welf\* OR affluenc\* OR stigma\*OR distrust\* OR mistrust\* AND extreme event\* OR cyclone\* OR typhoon\* OR hurricane\* OR tornado\* OR tropic\* storm\* OR heatwave\* OR heat-wave\* OR heat wave\* OR flood\* OR drought\* OR earthquake\* OR volcan\* erupt\* OR volcan\* ash\* OR landslide\* OR tsunami\* OR wildfire\* AND mental\* OR distress\*, limited to English Language.

One author (SL) conducted the search, evaluated papers against our inclusion criteria, and extracted data from the papers. A quality review of articles was not performed as the primary aim of this study was to identify the types of secondary stressors that have most recently been studied in the literature, regardless of the quality of those studies. Key details extracted from the full texts included: study design; population; country; type of extreme event; secondary stressor types, how and when they were measured after the extreme event; mental health outcomes. Where papers reported that their authors had studied secondary stressors as a group, data on each separate factor in the group were extracted.

We then used thematic analysis to group the secondary stressors into a typology. This grouping was problematic when reviewing papers in which the single generic term of ‘secondary stressors’ was used to describe many different problems following disasters. Analysis of one paper, for example, revealed that the secondary stressors measured after a hurricane included eight separate items, including impacts on housing, family, friendships and employment<sup>6</sup>. In these instances, we considered each item separately for our thematic analysis.

Results

We identified and reviewed the abstracts of 257 papers published in 2010 or 2011. We could not obtain the full texts of four articles. Forty-two papers seemed potentially relevant to our review and we read and analysed the full texts. Thirty-two papers fulfilled our inclusion criteria <sup>6–37</sup>.

General findings

The papers reported research on a range of extreme events in a variety of countries (Table 1). The majority of papers reported on the impacts on the mental health of adults <sup>7·8·10·11·12·13·14·16·18·20·24·25·26·27·30·31·32·34·35·37</sup>. Others focused on adults and adolescents above the age of 15 years <sup>19·22·28</sup>, while nine reported research on children and adolescents aged between 4 and 17 years <sup>6·9·15·17·21·23·29·33·36</sup>.

Table 1: Extreme event by country

| Country     | Extreme event  |
|-------------|--|
| Australia   | Cyclone <sup>36</sup>  |
| China       | Earthquakes <sup>18·19·20·22·23·24·25</sup> ; Flooding <sup>33</sup> |
| Greece      | Wildfires <sup>37</sup>  |
| Indonesia   | Earthquakes and Tsunamis <sup>28</sup>                               |
| Pakistan    | Earthquakes <sup>26</sup>  |
| South Korea | Flooding <sup>32</sup>   |
| Sri Lanka   | Earthquakes and Tsunamis <sup>27·29·30</sup>                         |
| Turkey      | Earthquakes <sup>21</sup>  |
| UK          | Flooding <sup>31·34·35</sup>   |
| USA         | Hurricane <sup>6·7·8·9·10·11·12·13·14·15·16·17</sup>                 |

Primary stressors, concurrent life events or secondary stressors

Usually, the focus of the research reported in the papers we read related to identifying and minimising the impacts of primary stressors.

One key problem within the studies reviewed was the lack of a definition, or the use of unclear definitions, for many of the secondary stressors. We found that researchers assessed secondary stressors using different methods or tools. The time between the occurrence of the index extreme event and the measurement of secondary stressors ranged widely from as little as one month to as long as four years. These features made it difficult for us to determine if a problem was a primary stressor, concurrent life event, or a secondary stressor.

Another challenge arose due to the blurred definitions and time boundaries between primary and secondary stressors. Some authors reported research on items such as '*lost livelihood*' 19:27 or property destruction 16:19:24:37. They measured these factors as part of '*event-related traumatic events*' alongside other experiences such as seeing people die, fearing for one's life at the time of the event, or the severity of the disaster. Arguably, these circumstances are aspects of the extreme event and should, therefore, be considered as being among the primary stressors that stem directly from the event. However, as clearer definitions or explanations of these terms were not provided, and as the studies were conducted up to three years after the index event, they could also be seen as unresolved primary stressors or secondary stressors.

Similarly, daily or continuing stressors and other '*negative life events*' were measured in some research 7:9:14. These events included changes to marital or family status, death of a spouse or family member, divorce, marriage, other family and work problems. Once again, the definition of these terms, and the variations in time intervals after the extreme event at which they were measured, were not clear. These occurrences could be either a direct consequence of, or exacerbated by the disaster, or be concurrent and unrelated. We have not included these events within our typology of secondary stressors.

### **A typology of secondary stressors**

Table 2 summarises the results of our thematic analysis of the secondary stressors.

Although this table suggests clear distinctions between the different categories of secondary stressors, many of the stressors fall into more than one category in the typology. Different stressors may also interact and or act in a cumulative fashion to prolong distress or raise the risk of people developing mental disorders. None of the studies examined the pathways or inter-relationships between the primary and secondary stressors, or between different secondary stressors.

**Table 2: A Typology of Secodary Stressors**

| <b>Category</b>                             | <b>Examples from the literature</b>  |
|---|--|
| Economic                                    | Loss of continuing loss of income <b>11·12·16·30·31·34</b><br>Loss or lack of employment <b>6·10·11·16·19·22·27·28</b><br>Impact on house values <b>31</b>   |
| Difficulties with compensation              | Lack of help, advice and information for applications to insurers and providers of grants or loans <b>30·34·35</b><br>Conflicting information <b>35</b><br>Applications for insurance payouts or state grants delayed or denied <b>16·32·34·35</b>   |
| Problems with recovery and rebuilding homes | Continuing lack of essential services <b>7·22·31</b><br>Lack of information or advice to understand the application process for rebuilding property <b>34·35</b><br>Progressive damage to houses <b>6·13·16·19·22·24·37</b><br>Continuing to live in temporary accommodation <b>16·18·20·22</b><br>Lack of housing assistance <b>10</b><br>Problems with restoration of homes or property <b>30·35</b><br>Dealing with daily life and recovery processes <b>14·28·35</b> |
| Loss of physical possessions or resources   | Loss of car, furniture, appliances and clothing, including items of sentimental value <b>11·13·19</b>  |
| Health                                      | New or continuing health concerns or conditions <b>11·13·14·22·31</b><br>Lack of access to healthcare <b>10·22</b><br>Lack of access to psychosocial care <b>10</b><br>Lack of access to prescription medication <b>10</b>   |
| Education and Schooling                     | Lack of education opportunities or facilities <b>11</b><br>Loss of socialisation that is part of attending school <b>6·8</b><br>Changing to new schools or education establishments <b>6·8</b>   |
| The media                                   | Exposure to negative media reports <b>23</b>   |
| Familial                                    | Breakdown of relationships and loss of intimacy <b>11·12·14·22·26·28·29·31</b><br>Breakdown in household activities and functioning <b>11·14·15·17·28·36</b><br>Breakdown of familial resilience <b>30·36</b><br>Changes to household composition <b>6</b><br>Parental psychopathology <b>4·15·21·33</b><br>Impact on parenting skills <b>15·17·29·33</b><br>Physical and mental abuse and neglect of partners or children <b>15·17·29·33</b>                            |