

THE EPIDEMIOLOGY OF DISASTER

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ABSTRACT

Epidemiology is the study of mass phenomena of disease or trauma. It is thus wholly applicable to disasters, and its principles may usefully be applied to their management and prevention.

Disasters, like diseases or trauma, result from the interaction of multiple causes. The causes are associated with three factors: the host (ie the victim), the agent (physical, biological, or chemical), and the environment, which may intensify or diminish the impact of the agent upon a susceptible host. Human behaviour profoundly influences all three factors.

The fruitful application of epidemiological principles is illustrated by some case studies in environmental medicine. They include the successful control, in peace and war, of disastrous epidemics of cold injury and heat illness, and the evaluation of the occupational stresses and hazards of bushfire-control crews.

PUBLIC VIEWS ON DISASTER RESPONSE AND THE NEWS MEDIA -
SOME AUSTRALIAN EXAMPLES

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INTRODUCTION

The news media play a number of vital roles in disseminating information about natural hazards in warnings of impending hazard impacts, descriptions of the death and destruction caused by disasters, charting the course of relief and recovery, and assisting in public education to ameliorate the effects by reporting disaster preparedness and hazard mitigation techniques (Rogers, 1980; Kreimer, 1980). The role of the news media in relation to natural hazards also varies with the type of hazard and with the various stages from warning through impact to rehabilitation. However, the present concern is with only one relatively narrow facet - news reporting in Australia of natural disasters as viewed by the public. While four aspects are considered, (myths about disasters, reporting of overseas natural disasters, public recognition of local emergency services, and control of the media during disasters) the principal investigation concerns myths about disasters.

In 1975 Dennis Wenger and associates at the University of Delaware published a paper in Mass Emergencies under the title "It's a matter of myths: an empirical examination of individual insight into disaster response". They conducted telephone interviews with 354 respondents in New Castle County, Delaware, an area with very limited disaster experience - that is, they interviewed non-victim respondents in a non-disaster setting. The central aim of the investigation was to examine whether the public exhibited "the lack of insight and acceptance of myths about disaster response that has been attributed to it by numerous investigators", notably E L Quarantelli and R R Dynes (1972). In brief, the majority of the individuals in the sample believed that controlling panic flight and looting in the aftermath are major problems facing disaster officials, that most people evacuate willingly, that the crime rate rises after the impact and that disaster victims are in a state of shock and unable to help themselves. The majority of the sample also believed that the news media accurately portrayed the amount of devastation resulting from a natural disaster.

This report presents the results of a very similar survey conducted in 1982 in Sydney and draws comparisons with the Delaware results. The results in some related surveys undertaken in Sydney are also presented and discussed. Some implications for the media and for disaster management are drawn from these findings.

The Sydney survey which paralleled the Delaware study was undertaken by students enrolled at Macquarie University in the General Education Course Natural Hazards. Interviews were conducted on a door-to-door basis at various times (day, evening, weekend) during the first two weeks of October. All 334 respondents lived in the Epping area (17km NW of Sydney GPO) and can be described as mainly working-age adults with middle to upper level incomes. Table 1 indicates the numbers of each sex interviewed in both the Australian and US studies. For the Epping sample 18-20% were estimated to lie in each of the 16-25, 26-35, 36-45 and 46-55 age groups, 15% in the 55-65 age group and 10% in the over 65 age group. The ages of the American respondents are not known.

Table 1. Sex of the respondents (%)

Sex	Epping (n = 334)	Delaware (n = 354)
Male	44.6	32.2
Female	54.5	66.9
Not known/both!	0.9	0.9

Table 2 indicates the proportion of each sample purporting to have had some personal disaster experience and the nature of that experience.

Respondents were asked "Have you ever experienced a natural disaster?" and (if the answer was "Yes"), "What type of disaster was it?" For the Epping sample "other" mainly included severe windstorms, hailstorms, and/or drought. In the American sample Wenger *et al.* (1975, p.40) note a number of "unique, idiosyncratic types of stress situation" such as "war", "house fire", "nervous breakdown", "six children" etc. Forewarned, such answers were discouraged in the Epping survey.

The responses to the third question asked "From what sources have you obtained the greatest amount of information about natural disasters?" are recorded in Table 3. The order of possible responses is presented as used in the Delaware survey. The order in the Epping survey was different and limited the number of responses to three. The Delaware survey evidently had no such restriction. The slightly different formulations in the two surveys make direct comparison difficult but both surveys indicate the overwhelming importance of news media as the predominant sources of information on natural disasters. It is also interesting to note that in each case only about 1 in 3 of those admitting disaster experience in Table 2 rate that experience as a salient source of information.

Table 2. Extent and nature of personal disaster experience

	Epping %	Delaware %
<u>Experienced Disaster?</u>		
Yes	28.7%	21.2%
No	70.7%	78.8%
No response	0.6%	-
<u>Nature of Disaster</u>	n = 119	n = 75
Bushfire	36.1	-
Cyclone/hurricane	10.1	41.3
Tornado	1.7	5.3
Flood	30.3	26.7
Earthquake	4.2	2.7
Other	16.8	16.0
Unknown	0.8	8.0
	100.0	100.0

Table 3 Sources of information about natural disasters

Sources	Epping %	Delaware %
Electronic media	129.6*	74.4
Newspapers	82.1	63.9
Magazines	13.2	15.3
Movies	10.5	0.6
Fiction books	3.6	0.6
Non-fiction books	7.2	3.9
Discussion with others	8.7	9.2
Direct experience	10.5	6.2
Other	1.8	5.6
	267.2	179.7

* For the Epping survey responses were TV, 86.8%; radio, 42.8%

RESULTS

The crux of the investigation lay in ten questions (Tables 4 and 5). For the first seven questions responses were in the form - agree, disagree, undecided or no response. The correct responses, based on extensive sociological investigation in the US (see, for example, Quarantelli and Dynes, 1972; Wenger et al., 1975; 1980) are asterisked. Responses to the remaining three questions, of the sentence-completion type, are shown in Table 5. Correct responses are again asterisked. Where questions have been modified from the original American survey, the earlier version is given in a footnote to the appropriate table. Alterations were made only to present the Australian situation or to clarify the language.

The slightly different forms of some questions, the different interview and sample selection techniques, and the large number of interviewers used in each survey, make precise comparisons of the results difficult. Nonetheless, some general features are noteworthy. For most of the questions presented in Table 4 the majority of the interviewees believe the myth rather than the reality. In each case, however, a slightly smaller proportion of the Epping sample gave the erroneous view and a higher proportion were undecided or gave no response. Whether these results indicate the Epping sample is less gullible or better informed is a moot point. Certainly, a majority of the Epping sample have doubts about media accuracy in portraying devastation (Question 7).

The only major difference in results between the two surveys occurs in Question 3. Martial law has often been declared during civil disturbances in the US, whereas to the best of my knowledge, martial law has never been declared after an Australian natural disaster impact. On the other hand, many emergency personnel leaders hold military ranks, perhaps aiding the notion that military control has been declared, particularly in the case of Cyclone Tracy (Darwin, 1974).

The responses summarized in Table 5 suggest that the Epping sample believes that most evacuees utilize formal public shelters and that it is better to send money to disaster relief organisations than supplies or money directly to the stricken community.

DISCUSSION

Despite the differences between sample conditions, the Delaware and Epping surveys indicate considerable agreement in beliefs about human response to disaster. Moreover, Wenger et al (1980) indicate from subsequent surveys, even where natural hazard impacts have recently occurred in three disaster-prone communities most residents believe the disaster myths. Although most of these beliefs are evidently erroneous they are widely held by non-victims in several areas.

Table 4

		Agree %	Undecided/ no response %	Disagree %
1. A major problem officials face in natural disasters is controlling the panic of people fleeing the danger area	Epping Delaware	77.2 83.6	7.8 6.2	15.0* 10.2
2. Looting rarely occurs after the impact of natural disasters.	Epping Delaware	23.7* 27.7	15.6 7.6	60.8 64.7
3. Military control/martial law has never been declared in an Australian disaster	Epping Delaware	44.6* 17.2	32.9 22.6	22.5 60.2
4. The crime rate usually increases in a community after a natural disaster has struck	Epping Delaware	45.2 50.8	27.5 14.4	27.2* 34.7
5. When warned of an approaching disaster most people are willing to cooperate and evacuate the area	Epping Delaware	76.9 80.2	6.0 6.2	17.1* 13.6
6. Immediately following the impact of a disaster, most of the disaster victims are in a state of shock and unable to cope with the situation by themselves	Epping Delaware	61.4 73.7	12.0 7.0	29.6* 19.2
7. The news media (TV, radio, newspapers), accurately portray the amount of devastation resulting from a natural disaster	Epping Delaware	41.3 54.5	12.0 9.9	46.7 35.6

American versions of the above questions. Differences are italicised.

1. A major problem *community* officials *confront when faced with a natural disaster* is controlling the panic of people fleeing from the danger area.
2. identical
3. *Martial law* has never been *instituted* in a disaster area in the United States.
4. The crime rate *of a community* usually *rises after it has experienced a natural disaster*.
5. When warned of an *impending* disaster, *people* are willing to cooperate and evacuate the area.
6. Immediately following the impact of a disaster, *the disaster victims* are in a state of shock and unable to cope with the situations by themselves.
7. The *news media* accurately portray the amount of devastation resulting from a natural disaster.

Table 5

	Epping %	Delaware %
8. The majority of the people who evacuate an area during a disaster go to:		
(a) formal public shelters such as schools and church halls;	50.9	42.4
or (b)*the homes of friends, relatives or neighbours, or provide for their own shelter	31.4	48.9
(c) undecided/no response	17.7	9.0
	<u>100.0</u>	<u>100.3</u>
9. Complete the following statement: The first place disaster victims turn for help is:		
(a) disaster relief agencies such as Red Cross, Salvation Army and emergency service organisations;	51.2	47.5
or (b) local groups such as churches, welfare agencies and service organisations;	10.5	15.0
or (c)*family and friends	32.3	32.5
(d) undecided/no response	6.0	5.0
	<u>100.0</u>	<u>100.0</u>
10. Complete the following statement: The most effective assistance I can offer to the victims of natural disasters is (answer one only):		
(a) Send supplies or money to the stricken community;	28.4	35.9
(b) Go in person to the community to help;	15.0	17.5
(c)*Send money to disaster relief organisations	48.5	38.1
(d) Do nothing	2.7	3.4
(e) undecided/no response	5.4	5.1
	<u>100.0</u>	<u>100.0</u>

American versions of the above questions. Only difference are presented;

- 8 (a) formally established public shelters.
- 9 (b) special disaster relief agencies such as Red Cross, Salvation Army and Civil Defense.
- 10. What is the most effective assistance you as a concerned citizen can offer to the victims of natural disasters? Would you (a)....

However, the sociological work on which these beliefs are established as erroneous is of American origin (see, for example, Quarantelli and Dynes, 1972; Wenger et al., 1975). The research necessary to establish true behaviour in the Australian situation has not, to my knowledge, been undertaken. However, we can be reasonably confident that as few people panic, as little looting occurs, etc. in the Australian disaster situation as in the United States (see also, UNDR0, 1979, pl5-16, 111-112). Certainly, Short (1979, p453) notes only 6.6% of the Brisbane flood (1974) sample were directed to accommodation by emergency personnel. Wettenhall (1975, p83), reporting on the Hobart bush fires of 1967, found "little evidence of panic" and noted with regard to looting "The truth is somewhat obscure: many relief workers, particularly in country towns, are convinced that some looting did take place, yet the police found insufficient evidence to bring any charges." On the other hand the Chamberlain et el. 1981) survey The experience of Cyclone Tracy indicates that 78% of the sample believed "there was much looting, the greatest proportion of reports coming from non-returned evacuees". It is important to note that neither the Darwin nor the Hobart examples confirm or deny the actual incidence of looting. Scanlon (1979, pl39), Foster (1976, p230) and Britton (1983, pl85, 189) provide evidence of media-spread rumours in the aftermath of Cyclone Tracy and the Tasmanian bushfires (1982) while Wettenhall (1975, p221) reports that following the Hobart (1967) bushfires the media "in toto.... did not seriously exaggerate the effects of the disaster".

It seems reasonably certain from the results presented by Wenger et al. (1975; 1980) and from the survey reported here that myths about behaviour during and after disasters are widespread in both American and Australian communities. It also seems clear from Table 3 that the news media are by far the most frequently-cited source of individual information about natural disasters. However, as Sood (1982, pl03) points out, the media need not necessarily have the greatest impact upon audience knowledge of disaster.

Some related aspects of the media role in disaster reporting were considered in other surveys by Macquarie University students. For example, the importance of the media in providing information was also addressed in a 1983 survey by Macquarie University students which examined some aspects of Australian overseas disaster assistance. Two surveys were conducted in October 1983. In West Lindfield (11 km north of Sydney GPO) 340 people were interviewed and in Auburn (16 km west of Sydney GPO) 156 respondents were questioned. The West Lindfield area can be described as older working-age couples with upper level incomes. The Auburn area is dominated by relatively recent migrants to Australia, particularly from the shores of the Mediterranean and southeast Asia. Table 6 summarizes responses to the question "From what source/s did you learn of overseas natural disasters during the last four

weeks?". In West Lindfield 437 responses were recorded, in Auburn 104. The pre-eminence of TV as a disaster news source is again evident (cf. Table 3). Another question asked "If you heard/saw/read conflicting stories about a natural disaster on radio/TV/newspapers which would you be most inclined to believe? Respondents were asked to rank their choices.

The first ranks for the two surveys are presented in Table 7. TV is clearly the most believable source of information about natural disasters. These results are similar to those obtained in United States which indicate that television is the most widely used and credible source of news (Larson, 1980, p 197). However, some Australian respondents exhibited a healthy skepticism - Table 8 summarizes responses to the question "What word (of the five listed) best describes media reporting of overseas natural disasters?". Although nearly half of each sample appeared happy with the accuracy of overseas disaster reporting, more than one quarter were dissatisfied with the quality and up to one quarter with the quantity of disaster information.

Table 6 Responses to question - "From what source/s did you learn of overseas natural disasters during the last four weeks?".

	W. Lindfield %	Auburn %
Newspapers	27.7	20.2
Magazines	3.6	1.9
TV	37.5	54.8
Radio	27.0	19.2
Other	4.1	3.8
	99.9	99.9

Table 7 First rank response to question: "If you heard/saw/read conflicting stories about a natural disaster on radio/TV/newspapers which would you be most inclined to believe?".

	W. Lindfield %	Auburn %
Radio	21.7	25.7
TV	46.9	62.5
Newspaper	31.5	11.8
	100.1	100.0

Table 8 Responses to the question: "What word best describes media reporting of overseas natural disasters?".

	W. Lindfield %	Auburn %
Unreported	4.1	3.9
Under reported	22.1	15.4
Accurate	40.1	46.8
Distorted	15.3	12.2
Exaggerated	13.9	15.4
Unknown/Other	4.4	6.4
	99.9	100.1

A second survey conducted in 1982, also in the Epping-Carlingford area (but with different respondents to those interviewed about disaster myths) also produced interesting data concerning media functions in natural disaster situations. Table 9 summarizes responses to three of the ten questions asked of 352 interviewees. Clearly, a majority of these respondents are concerned with accuracy, more than immediacy, of reporting. Furthermore, a large majority indicated that they were concerned to hear only information from official sources. This view is particularly interesting given the clear rejection of this viewpoint during two recent disaster-media conferences (Disasters and the Mass Media, 1980; National Emergency Services College, 1977).

Table 9 Responses to three questions asked in 1982 in the Epping-Carlingford area

	Agree %	Undecided/ no response %	Disagree %
1. In disaster reporting, getting news to the public quickly is more important than accuracy	36.6	8.0	55.4
2. In disasters, the media should function primarily as the communication arm of emergency officials rather than as news reporters	75.0	13.1	11.9
3. In order to minimize the occurrence of rumours, only information from official sources should be published during the post-disaster impact period	85.8	5.4	8.8

Collectively, the results of the various surveys reported here indicate (1) that the public is misinformed about many behavioural aspects of disaster response; and (2) some public dissatisfaction with news media handling of disaster reporting. The question then arises "Where can accurate information be obtained"? One 1982 survey asked "Can you name the official organization that can help you in a disaster/emergency?". Unfortunately, the question was rather poorly formulated so that answers such as "Police", "Fire Brigade", "Red Cross", "Salvation Army" etc were accepted as correct as well as "State Emergency Services" (or Civil Defence, Local Government Council etc). Nonetheless 41.2% of the 352 respondents were unable to answer the question. Of the 228 positive answers to the question only 79.4% could be generously judged to be correct. In other words, only 51% of the sample had any idea of the name of an organization that might help and only 18.2% could correctly identify State Emergency Services. That this organization, which pays for a one page advertisement in the Sydney (and other) telephone book/s each year, has an identity crisis is emphasized by responses to the questions "Do you keep any information on natural disasters/emergency organizations in your house? If yes, what?". More than 75% of the respondents answered "No" (or made no - response) only 18 of the 352 interviewees mentioned the phone book and it is not clear whether these informants were referring to the SES page or to the Emergency 000 phone number on the inside cover which refers only to the Police, Fire and Ambulance emergencies*. Another 26 respondents had pamphlets, manuals, encyclopedias etc. that reportedly contained specific information about at least some aspects of some natural hazards.

CONCLUSIONS AND IMPLICATIONS

Despite the difficulties with questionnaire design, implementation and interpretation four broad conclusions stem from the results reported here. On the (probably reasonable) assumption that the sample results can be regarded as indicative of the responses of a fair section of the Australian population:

* It remains a mystery to me that the lengthy list of personal emergency numbers on the inside cover of the telephone book makes no mention of SES, p38 of the (1984) book where "National Disasters and Civil Defence Information" can be found, or to the Local Government SES and Emergencies numbers. However, the inside cover does state in bold red print "For other Urgent Community Service telephone numbers see HELP REFERENCE page 6". Page 6 lists more than 60 health, welfare and service organizations but does not include State Emergency Services!

- (1) a significant proportion of the population, probably a majority, believe myths concerning human response to natural disasters. Responses to a questionnaire used in a 1982 survey in Sydney are surprisingly similar to those reported from Delaware, USA using an almost identical questionnaire.
- (2) there can be little doubt that the main source of disaster information for most respondents is the news media, in particular television.
- (3) a significant proportion of respondents are unhappy about either the quality or the quantity of overseas disaster-related information relayed by the news media.
- (4) the local natural disaster emergency service, NSW State Emergency Services, is not readily identified by a majority of the population. This may imply a poor knowledge of precautions in the community.

It is doubtful that there is much that is new in these conclusions which are of course, interrelated. Clearly, the quality of disaster reporting has to be improved if both the true nature of disaster behaviour is to be recognized and if the SES is to attain a higher community profile.

In my view a significant improvement in the quality and quantity of disaster information would result if the news media were to appoint reporters and/or subeditors/editors who have some background in the subject, for example, an ACDC course (or James Cook University seminar), a general course as taught by Macquarie University or the University of New England, and/or experience*. Most problems with reporting of natural disasters arise, in my view, from a lack of perspective or background. If an individual reporter in each media outlet had responsibility for natural disaster-related matters and such reporters were encouraged to liaise with SES, NDO, ACDC, AODRO and the various specialists in universities, CSIRO and other institutions we might see more published material on preparations and precautions, a decline in material and human convergence, and a decrease in the reporting of disaster myths about looting, panic and shock, in what Wenger *et al.* (1980) called the "Dresden Syndrome" in which the scope of impact and destructive effects are exaggerated. Unless such educational measures, which amount to no more than adequate "gatekeeping" (Waxman, 1973; Kueneman and Wright, 1975) are implemented voluntarily, further consideration should be given to restricting the publication of information from other than official sources during and after natural hazard impacts. Reprehensible as that might seem, the survey responses summarised in Table 9 indicate that such a move might attract a significant amount of public support.

* see also Britton (1983, p197-198) on the need for training of journalists.

It is worth noting that The Daily News of Longview (Washington State, USA) won the Pulitzer Prize in the local spot news category for its coverage of the Mount St Helens' eruption in 1980. The prize was won partly because of the accuracy of the The Daily News scientific reporting. According to my informants, volcanologists at the scene, every scientific statement in the paper was checked with multiple sources before and after publication!

Media-spread myths are not a necessary adjunct of disaster reporting.

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