Misconception as a Barrier to Teaching about Disasters

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Abbreviations:
AFP = Agence France Presse
BBC = British Broadcasting Corporation
PAHO = Pan-American Health Organization

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Abstract

Introduction: This paper is a report on an exercise designed to reveal the extent of belief in the common myths about disasters held by members of four groups of students from the University of Massachusetts and three groups of trainee emergency workers from Italy.

Methods: A questionnaire was administered in which students and trainees were asked to agree or disagree with 19 statements about disasters. These statements were based on common misconceptions about disasters and are at least statements untenable in statistical terms, if not downright wrong. In each case, a Likert scale was used to assess the strength of the students' and trainees' agreement or disagreement with the statements.

Results: The results suggest that some of the misconceptions (for example, that panic and looting are widespread reactions to disaster) were strongly held, whereas others (for instance, that disasters cannot be managed) were less well-rooted. Despite years of refutation by experts, all groups firmly believed that dead bodies constitute a health hazard if they are not disposed of quickly. Attitudes to the proposition that technology offers a solution to the disaster problem were equivocal.

Conclusions: Though the results of the study by no means were homogeneous, students and emergency workers, on either side of the Atlantic, bring many of the same misconceptions that the mass media continually propagates. These beliefs represent a serious challenge for the instructor who wants to ensure that disasters and emergencies are not misconstrued.

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Introduction

Numerous studies of how the public perceives risk and disaster have been published.[1–3] The field has also broadened to include research about the influence of culture on perception,[4,5] in particular, the impact of popular culture (e.g., disaster movies).[6–8] Considerable evidence has accrued from these studies to show that myths and misconceptions about catastrophes are widespread, deeply rooted, and dearly held.[9,10] As Jeffrey Arnold stated, "At least one thing has become predictable about disasters in recent years—once a disaster begins to unfold, an outbreak of disaster mythology is likely to ensue."[11] This reaction is particularly tragic in response to disasters, in which incorrect beliefs often are the basis for misguided actions that lead to avoidable casualties and suffering. The problem is particularly important regarding the people who elect to study or manage disasters, however, their perceptions have not been analyzed extensively.[12]

This addresses this issue by examining how groups of university students and trainee emergency managers reacted to a set of statements about disasters and disaster management. The members of each group were asked to complete a questionnaire that asked each member to agree with a set of statements. Each statement represented a misconception, a "myth" about disaster, has been more or less soundly discredited by experience and research. The

analysis began with a brief examination of how some aspects of disasters commonly are misconceived, followed by observations on how this affects emergency management.[13] A pilot study of university students' perceptions of these misconceptions was followed by a more extensive study of the views held by two groups of students in the US and three of emergency management trainees in Italy. The respondents' attitudes were compared, and regularities in the findings were considered with respect to their practical implications for courses on emergencies, hazards, and disasters.

The Persistent Impact of Disaster Mythology

One of the most troublesome aspects of present-day responses to disasters is the crushing inevitability of the mistakes that are made, the myths that are propagated, and the inefficiencies that plague their management. For the people who live through them, disasters are times of accelerated learning.[14] However, these lessons do not seem to be applied during periods of quiescence, even though they certainly could be if training and preparedness were as universal and effective as they should be.[15]

Several recent events furnish case histories of how misconceptions persist during disasters and influence management actions. For instance, on 04 October 1999, Agence France Presse (AFP) and the BBC World News Service reported that floods occurring during the previous few days in Central America had given rise to cases of dengue fever. There may well have been an outbreak of dengue fever, but as the disease requires 8–11 days to incubate, the reported cases probably were not related to the floods. In fact, disasters caused by natural hazards only have been the direct cause of disease outbreaks in few occasions over the last decade and hardly ever have caused epidemics.[16]

Similarly, in the wake of Hurricane Mitch, on 08 November 1998, the Associated Press described the putative epidemics that developed in Central America (they never materialized), and a day later, AFP conjured up a picture of widespread looting, which was not confirmed by any of the more detailed reports. Unfounded reports of epidemics were rife after the Kashmir Earthquake of 05 October 2005. In the aftermath of the Earthquake and Tsunami of 26 December 2004 in South East Asia, it was assumed that there would be more deaths from disease epidemics than from the earthquake and tsunami, but this was not the case.

Looting is perhaps the most contentious aspect of disaster "mythology". Looting was reported widely in New Orleans after Hurricane Katrina in August 2005.[17] However, it is not common in disasters overall and in New Orleans, was subject to re-evaluation, which somewhat reduced its significance (in fact, it was largely confined to low-income neighborhoods and in some instances was more in the nature of requisitioning essential supplies).[18] In general, looting tends to be significant only where preconditions exist that favor it.[19]

In response to Hurricane Mitch, on 04 November 1998, rescue teams in Honduras hastily buried the bodies of drowned flood victims in common graves, and health teams began mass vaccination programs in the city's slums. Neither measure is regarded as an effective means of preventing disease outbreaks. Mass vaccination wastes precious vaccines and does not immunize people adequately, while mass burial tends to demoralize survivors,[20] and if death certification is inadequate, it may also create hardship for bereaved relatives.[21] Experts from the Pan American Health Organization (PAHO) repeatedly insisted that decomposing corpses do not cause epidemics, however, the myth still was retailed in the press.[22,23] The myth also received undue credence from civil authorities who ought to have known better.

After the January 2001 earthquake in El Salvador, the mayor of the town of Santa Tecla had a large communal grave hastily dug, into which civil protection workers flung bodies and body parts. Following the Gujarat earthquake in India a few weeks later, the dead were cremated at a furious pace, and, according to contemporary reports, wrecked buildings were bulldozed hastily "to prevent the spread of disease due to decomposing bodies." Once again, death certification, coroners' investigations, and last rites all were dispensed with. As usual, relatives and survivors were demoralized by the obscene spectacle of the indiscriminate and insensitive disposal of the last remains of their loved ones, all because of a fear of epidemics that hardly ever materialize, and virtually never from such causes.[24]

In yet another example, Dr. Claude de Ville de Goyet, then Chief of Emergency Preparedness of PAHO, criticized the media's portrayal of rescue operations following the 17 August 1999, Izmit (Turkey) earthquake. Both the *New York Times* and the *Washington Post* devoted considerable space to the disaster and, like many other newspapers, gave the impression that the Turkish survivors were waiting helplessly to be saved by the 2,209 foreign rescuers who were sent to the disaster area. In fact, Dr. de Ville de Goyet noted that thousands of Turkish firemen and medical specialists were already hard at work and practically had completed the main search-and-rescue operations by the time the foreign teams arrived to the scene.[25] The Italian team, with exemplary efficiency, rescued just five people. The *New York Times* and *Washington Post* declined to publish Dr. de Ville de Goyet's well-reasoned and constructive critique of their reporting.

It is clear from these and many other examples, that disaster myths are robust enough to survive herculean attempts to debunk them. The prevalence of these myths is concerning, especially in regards to formal programs designed to educate people about disasters or train them to manage emergencies. The myths represent a hurdle that educators must overcome before progress can be made with the basics of disaster studies. Hence, the persistence of these misconceptions is one possible indicator of the ineffectiveness of education and training in disaster and emergency management. But do students of disaster and trainee emergency managers believe the same set of myths as does the public? The following analysis offers some insights.

Design of a Pilot Study, Fall 1999

Background

Various compilations arising from misconceptions about disaster have been identified.[26–28] Many articles have addressed individual myths and misconceptions.[29–31]

1	**Myth:** *Disasters are truly exceptional events.* **Reality:** They are a normal part of daily life and in very many cases are repetitive events.
2	**Myth:** *Disasters kill people without respect for social class or economic status.* **Reality:** The poor and marginalized are more at risk of death than are rich people or the middle classes.
3	**Myth:** *Earthquakes are commonly responsible for very high death tolls.* **Reality:** Collapsing buildings are responsible for the majority of deaths in seismic disasters. Whereas, it is not possible to stop earthquakes, it is possible to construct anti-seismic buildings and to organize human activities in such a way as to minimize the risk of death. In addition, the majority of earthquakes do not cause high death tolls.
4	**Myth:** *People can survive for many days when trapped under the rubble of a collapsed building.* **Reality:** The vast majority of people brought out alive from the rubble are saved within 24 or perhaps even 12 hours of impact.
5	**Myth:** *When disaster strikes panic is a common reaction.* **Reality:** Most people behave rationally in disaster. While panic is not to be ruled out entirely, it is of such limited importance that some leading disaster sociologists regard it as insignificant or unlikely.
6	**Myth:** *People will flee in large numbers from a disaster area.* **Reality:** Usually, there is a "convergence reaction" and the area fills up with people. Few of the survivors will leave and even obligatory evacuations will be short-lived.
7	**Myth:** *After disaster has struck survivors tend to be dazed and apathetic.* **Reality:** Survivors rapidly start reconstruction. Activism is much more common than fatalism (this is the so-called "therapeutic community"). Even in the worst scenarios, only 15–30% of victims show passive or dazed reactions.
8	**Myth:** *Looting is a common and serious problem after disasters.* **Reality:** Looting is rare and limited in scope. It mainly occurs when there are strong preconditions, as when a community already is deeply divided.
9	**Myth:** *Disease epidemics are an almost inevitable result of the disruption and poor health caused by major disasters.* **Reality:** Generally, the level of epidemiological surveillance and health care in the disaster area is sufficient to stop any possible disease epidemic from occurring. However, the rate of diagnosis of diseases may increase as a result of improved health care.
10	**Myth:** *Disasters cause a great deal of chaos and cannot possibly be managed systematically.* **Reality:** There are excellent theoretical models of how disasters function and how to manage them. After >75 years of research in the field, the general elements of disaster are well-known, and they tend to repeat themselves from one disaster to the next.
11	**Myth:** *Any kind of aid and relief is useful after disaster providing it is supplied quickly enough.* **Reality:** Hasty and ill-considered relief initiatives tend to create chaos. Only certain types of assistance, goods, and services will be required. Not all useful resources that existed in the area before the disaster will be destroyed. Donation of unusable materials or manpower consumes resources of organization and accommodation that could more profitably be used to reduce the toll of the disaster.
12	**Myth:** *In order to manage a disaster well it is necessary to accept all forms of aid that are offered.* **Reality:** It is better to limit acceptance of donations to goods and services that are actually needed in the disaster area.
13	**Myth:** *Unburied dead bodies constitute a health hazard.* **Reality:** Not even advanced decomposition causes a significant health hazard. Hasty burial demoralizes survivors and upsets arrangements for death certification, funeral rites, and, where needed, autopsy.
14	**Myth:** *Disasters usually give rise to widespread, spontaneous manifestations of antisocial behavior.* **Reality:** Generally, they are characterized by great social solidarity, generosity and self-sacrifice, perhaps even heroism.
15	**Myth:** *One should donate used clothes to the victims of disasters.* **Reality:** This often leads to accumulations of huge quantities of useless garments that victims cannot or will not wear.
16	**Myth:** *Great quantities and assortments of medicines should be sent to disaster areas.* **Reality:** The only medicines that are needed are those used to treat specific pathologies, have not reached their sell-by date, can be properly conserved in the disaster area, and can be properly identified in terms of their pharmacological constituents. Any other medicines are, not only useless, but potentially dangerous.
17	**Myth:** *Companies, corporations, associations and governments are always very generous when invited to send aid and relief to disaster areas.* **Reality:** They may be, but in the past disaster areas have been used as dumping grounds for outdated medicines, obsolete equipment, and unusable goods, all under the cloak of apparent generosity.
18	**Myth:** *Technology will save the world from disaster.* **Reality:** The problem of disasters is largely a social one. Technological resources, are poorly distributed and often ineffectively used. In addition, technology is a potential source of vulnerability as well as a means of reducing it.
19	**Myth:** *There is usually a shortage of resources when disaster occurs and this prevents them from being managed effectively.* **Reality:** The shortage, if it occurs, is almost always very temporary. There is more of a problem in deploying resources well and using them efficiently than in acquiring them. Often, there is also a problem of coping with a superabundance of certain types of resource.

Table 1—Typical myths and misconceptions about disasters[27]

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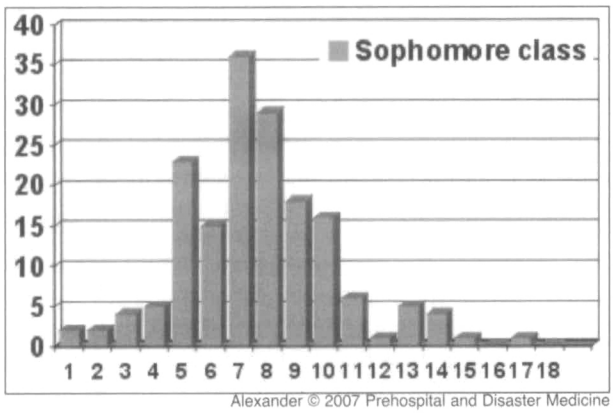

Figure 1a—Pilot study responses of University of Massachusetts students, 1999 (Sophomore class)

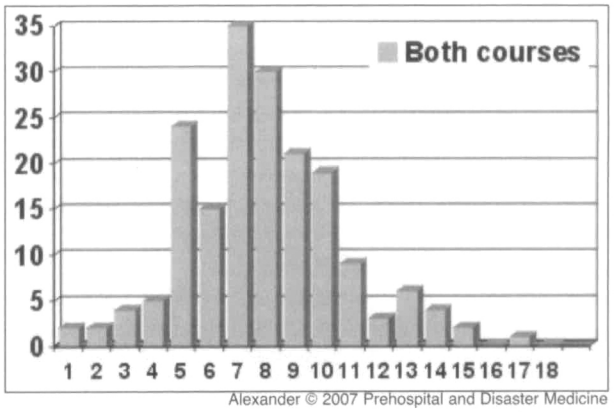

Figure 1c—Pilot study responses of University of Massachusetts students, 1999 (Both courses)

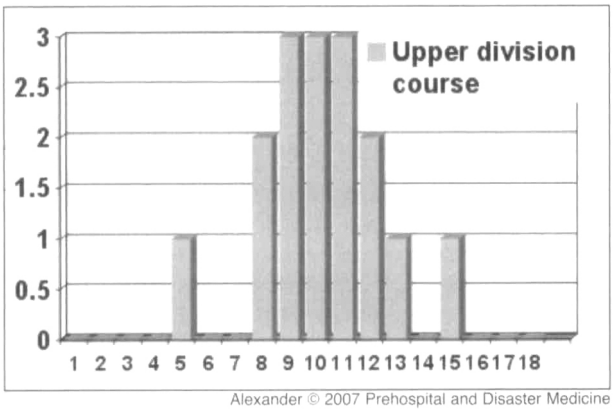

Figure 1b—Pilot study responses of University of Massachusetts students, 1999 (Upper division course)

Based on these publications (particularly Noji's compendium of disaster "myths"), a list was compiled of 18 propositions about the impact of disasters and disaster management. Each proposition was false but generally believed to be true (a nineteenth proposition was added in the later analyses). These statements and the explanations that debunk them are listed in Table 1.

Methods

In Fall 1999, a preliminary study was conducted to define students' reactions to the initial list of 18 propositions. The questionnaire was administered to 181 students who were enrolled in two courses taught at the University of Massachusetts at Amhurst. Both courses pertained to disasters and were elective courses with no special prerequisites. One was a lower-level undergraduate and first-year graduate course and the other was an upper-level undergraduate course. The respondents were asked to indicate whether the statements were true or false. The primary goal of the pilot study was to gauge the pedagogic impact of the test and monitor its effects on student performance later in the courses. Thus, the aim of the exercise was not to conduct detailed academic research, but to provide an object lesson to the students by confronting them with myths that needed to be debunked. It seemed that the best way to do this was to face them with a simple and succinct exercise that would make its point with great directness (the students were subsequently given a list of correct answers, a digest of the results of the test and an opportunity to discuss the matter).

Results

The first course was an interdisciplinary, general education course at the sophomore (second year) level entitled "Natural Disasters", and had an enrollment of 229 students, from 52 different major areas of study. These majors were as diverse as theater studies, Chinese, and civil engineering. The course included 91 students who had not declared their major area of study, two double major students, and eight honors students. On the day the questionnaire was administered, 161 (72.5% were present in the class. The upper-level course entitled "Natural Hazards", offered a more theoretical approach to the field than did the sophomore (lower-level) course. The 19 students enrolled came from six different majors (five were geographers, the others mainly geologists and environmental scientists); two were graduate students, two honors students, one an external student, one a double major, and one undeclared. Fifteen (79%) were present when the questionnaire was administered.

On the day of the exercise, students had completed about 30% (12 of 39) of the 50-minute classes. It appeared that very few of them had any prior background in disaster response or any personal experience with disasters. As is usual in such inquiries, the students were asked to complete the questionnaire anonymously. The results from the questionnaire are graphed in Figure 1a–1c. The 18 answers of "false" will be regarded as the correct. For the sophomore class (Figure 1a) the median number of correct answers was six and for the upper-level class (Figure 1b) it was nine. On the questionnaires, only two answers out of 3,258 (18 propositions x 181 students) were equivocal or not filled in. All the others were checked as either true or false. Only one student checked 16 as false.

Distinct patterns emerged from the study. The vast majority believed that panic is common after disaster (it is not). Most believed that unburied bodies constitute a threat to public health (they do not). Approximately 80% believed

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that in the wake of disaster, survivors are dazed and apathetic (this is unlikely to be so); and more than 66% believed that survivors flee from disaster areas (the opposite happens, as such areas are the scene of a well-documented "convergence reaction")[38]. Other beliefs concerned the nature of aid and relief and evidently are propagated by the mass media, which have repeated these fables until they attained the status of mantras.[39] The significance of looting and the acceptability for all forms of aid are two myths that had a lesser constituency, but still they encompassed more than half of the respondents.

Efforts made by the instructor during the earlier part of the courses to debunk the myths that people survive for long periods when trapped under the rubble of collapsed buildings, and that disease epidemics often result from disasters caused by naturally occurring hazards evidently had some success as a majority of the students were not inclined to believe these propositions. Nevertheless, a substantial minority, more >40%, did believe them. Few, however, believed that disasters are ungovernable and only one-third of the respondents believed that that such events give rise to outbreaks of antisocial behavior. Finally, 95% gave no credence to the notion that technology will provide the ultimate answer to the disaster problem. This is interesting, in that most of the students were scions of a culture, indeed of a university, that prizes technology and places much faith in it.

Limitations and Conclusions

As a result of its simplicity, the methodology used has some serious drawbacks. First of all, students did not expect to be faced with a test in which all of the the answers were false. Hence, the natural reaction was to check some responses as false, but not others, on the assumption that the test must contain a mixture of both types of answers. No student realized that this assessment was a special case. This may reflect the conditioning that stems from long and uniform experience of multiple choice tests.

Secondly, the propositions evaluated are debatable and so are the answers. For example, eminent social scientists have debated whether disasters are exceptional events or not (proposition #1) without reaching a full consensus.[32–34] Likewise, the role of technology in disaster prevention (proposition #18) is decidedly multiform.[35] Moreover, the proposition that collapsing buildings, not earthquake waves, cause the mortality in seismic events could be regarded as sophistry, even though it long ago became orthodox in the literature.[36]

However, the test was given in the context of some very definite statements that were made during the first part of each course about the recurrent nature of disasters and the role of technology in both creating and mitigating vulnerability. Moreover, some of the most interesting results came from responses to questions that had clear-cut answers. The "right" answers, listed in Table 1, represent consensuses derived from accumulated research and experience—i.e., approximately the best short answer to a difficult set of questions.[37]

Finally, the greatest criticism of the questionnaire is that it should have contained a random mixture of true and false propositions for the sake of impartiality. It was believed, however, that this would have diminished its impact at a pedagogical level, as one objective was to emphasize the fact that disasters and emergencies commonly are misconstrued. Thus it did have the benefit of uniformity, albeit at the expense of some degree of impartiality. More detailed inquiry is needed in order to ascertain whether this represents pessimism about the prospects for disaster mitigation, or about the value of technology.

Follow-Up Studies, 2000–2001

Methods

In contrast to the pilot study, the second phase of this project was more investigative than didactic. In the Fall 2000, the exercise was repeated with a new class of 232 general education students and a class of 18 upper-level or graduate students. The composition of both classes was very similar to what it had been the preceding year. However, in the follow-up study, students were allowed to indicate how their reactions to the statements rated on a Likert scale ranging from 1 (strong disagreement) to 5 (strong agreement). A total of 203 (87.5%) questionnaires were returned in the lower-level class and 15 (83.3%) in the upper-level class.

The same questionnaire also was administered to three groups of emergency management trainees in Italy. The first group (which met in Milan on 09 October 2000) consisted of 33 participants in a course that was designed for the Lombardy Regional Government in order to teach the principles and practice of disaster planning and management. Of the 33 trainees, 27 had jobs in municipal emergency departments, four were emergency medical administrators, and two managed emergencies for inter-municipal bodies. They were about one-third of the way through their 25 days of training. The second course met in Scandicci, central Italy, on 26 March 2001, and was designed to teach disaster planning to municipal employees from the Province of Florence. Twenty-one of the students were present when the questionnaire was administered. They had by then completed virtually all of their three months of training. Finally, on 11 April 2001, the questionnaire was administered to a group of 33 nurses, who were completing a three-month emergency medical course that dealt with disaster management from the EMS perspective.[40,41] The course was held at the training center of the Regional Health Authority in the central Italian town of Empoli.

Results

The responses of the University of Massachusetts students are provided in Figure 2. The horizontal bars on the graphs represent the mean values on the Likert scale and the vertical bars indicate ±1 standard deviation (SD). These figures illustrate the degree of spread, and therefore, of polarization, in the responses to a particular statement. Thus, clustering around a value of 3 represents an indeterminate response, whereas a mean value close to 3 and a very large standard deviation [vertical bar] indicates that members of the group have strong feelings either way. For both the sophomore and the upper-level courses, responses were similar to those obtained the year before with the true/false test. The preva-

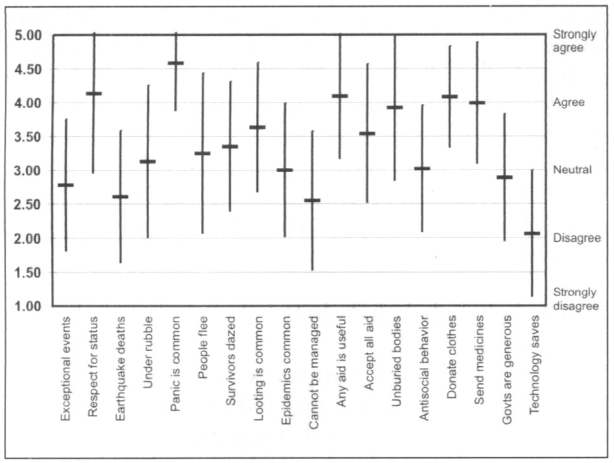

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Figure 2a—Responses of University of Massachusetts sophomore students, 2000 (means ±1 standard deviation (SD))

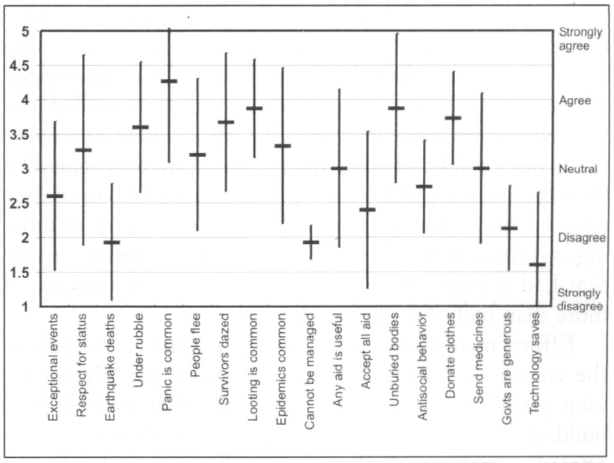

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Figure 2b—Responses of University of Massachusetts upper-division students, 2000 (means ±1 SD)

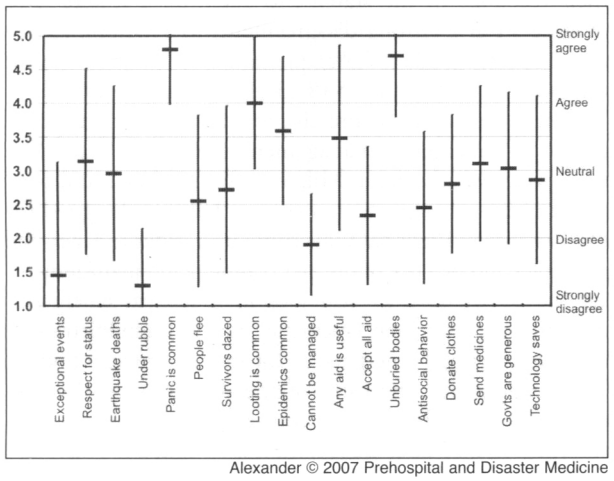

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Figure 3—Responses of Lombardy Region disaster managers (Italy), 2000 (means ±1 SD)

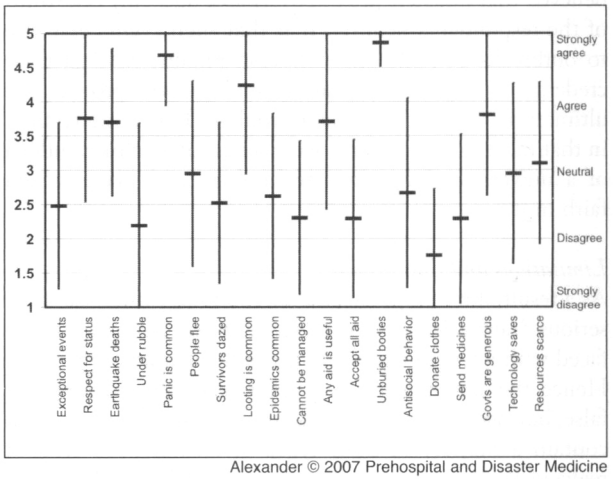

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Figure 4—Responses of Province of Florence disaster managers (Italy), 2001 (means ±1 SD)

lence of panic and looting, the health hazards of unburied bodies, and the need to donate used clothes were upheld by respondents from both classes. The numbers of both classes were decidedly skeptical about the role of technology as savior. There was less strong agreement that people tend to flee from disaster areas, and that those who remain are dazed and apathetic. There was mild disagreement with the propositions that disasters are exceptional events, that they cannot be managed adequately, and that earthquakes directly cause mass casualties. Few of the answers were polarized or indeterminate, and, once again, in both groups of students, they agreed with more statements than they disagreed (in ratios of 10:4 for the lower level class and 8:6 for the upper level class).

The results proved somewhat different for the three groups of Italian emergency trainees (Figure 3, 4, and 5). On average, the disaster managers in Milan, perhaps the most experienced and knowledgeable group, were skeptical about the 18 propositions: they supported only four of them unequivocally, tended to disbelieve seven, and were polarized in their responses to six. In particular, they did not regard disasters as exceptional or unmanageable events,

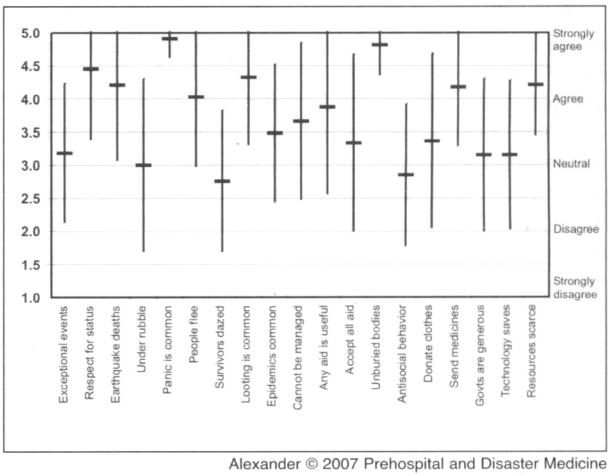

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Figure 5—Responses from Emergency Nursing Course at Empoli (Tuscany, Italy), 2001 (means ±1 SD)

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Proposition	250	510	Milan	Florence	Empoli	Consensus?
1. Exceptional events	SD	SD	DD	SD	IR	Disagreement
2. Respect for status	DA	PR	PR	DA	DA	Agreement?
3. Earthquake deaths	SD	DD	PR	DA	DA	None
4. Survive under rubble	PR	DA	DD	DD	PR	None
5. Panic is common	DA	DA	DA	DA	DA	Strong agreement
6. People flee	SA	SA	SD	PR	DA	Weak agreement
7. Survivors are dazed	SA	DA	SD	DD	IR	None
8. Looting is common	DA	DA	DA	DA	DA	*Strong agreement*
9. Epidemics are common	IR	SA	DA	IR	SA	Slight agreement
10. Cannot be managed	SD	DD	DD	DD	SA	Disagreement?
11. Any aid is useful	DA	PR	PR	DA	SA	Agreement?
12. Accept all aid	DA	DD	DD	DD	PR	None
13. Unburied bodies	DA	DA	DA	DA	DA	*Strong agreement*
14. Antisocial behavior	IR	IR	DD	PR	PR	None
15. Donate clothes	DA	DA	IR	DD	PR	None
16. Send medicines	DA	PR	PR	DD	DA	None
17. Governments are generous	IR	DD	PR	DA	PR	None
18. Technology saves	DD	DD	PR	PR	PR	Some disagreement?
19. Resources are scarce	--	--	--	PR	DA	--
number of respondents (n)	203	15	33	21	33	

Table 2—Summary of results for the five study groups, 2000-2001 (DA = definite agreement; SA = some agreement; IR = indeterminate results; SD = some disagreement; DD = definite disagreement; PR = polarized results)

they did not expect people to survive for long under rubble, and did not feel that antisocial behavior would predominate. However, they believed in the prevalence of looting, panic, and epidemics. As with all other groups studied, few respondents gave non-committal responses; all had strong opinions to the majority of the propositions.

Following a series of emergency simulation exercises conducted with the trainees, a 19th proposition was added to the list, as the question of resource scarcity had become a prominent concern. It had been suggested from discussions with experienced emergency managers that this was another myth. In the early stages of emergencies, drawing resources is not as much of a problem as is the management of the convergence reaction. In one case—a flash flood in a small mountain valley—the air was thick with helicopters, and the slopes were crawling with emergency workers within a few hours of the event, the roads were choked with dozens of fire engines and ambulances.[42] Thus, the proposition that resources are scarce during disasters was added to the questionnaires distributed to the Florence and Empoli groups. It resulted in polarized responses from the former and strong agreement from the latter.

The disaster managers from Florence divided their aggregate responses about equally between agreement and disagreement with the propositions (Figure 4). Little polarization and uncertainty emerged. In contrast, the trainee nurses in Empoli tended to agree with 11 of the propositions and to give polarized responses to a further six (Figure 5). They did not firmly disagree with any of them. Besides the statements about panic, looting, and unburied bodies, both groups felt that disasters kill without respect for social status, and that earthquakes are responsible for high death tolls. It is interesting that the disaster managers felt that large quantities of medicines should not be supplied to disaster areas, but the trainee nurses felt they should be sent.

The results from all five groups are summarized in Table 2. On the basis of the mean values and the spread of standard deviations, results were characterized as definite agreement or disagreement, by weaker categories of some agreement or disagreement, or as indeterminate (where mean values were close to 3 and standard deviations did not extend toward strong agreement or disagreement). The results were regarded as polarized where the mean values were close to 3, but this evidently masked, not a series of neutral responses, but a balance between the positive and negative ones.

It is interesting to look for signs of consensus between the various groups. Generally, there was strong agreement that panic and looting are common during disaster situations and that unburied bodies are a threat to public health.

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Therefore, these can be regarded as the *shibboleths*, or strongest and most enduring myths of disaster, for the public, students, and professionals alike. As they apparently transcend boundaries of national culture and educational background, they may be regarded as universals, or emic factors, using the methods of cross-cultural analysis promoted by Brislin.[42] Weaker, but nevertheless enduring myths, are that disasters kill without respect for social status, that people flee the impact area, that epidemics are common consequences, and that any aid is useful in an emergency. No other incontrovertible agreement was identified, but there did appear to be some consensus that disasters are not exceptional events, that they can be managed adequately, and possibly that technology is unlikely to hold the key to managing them. Given that equivalent groups were not analyzed on both sides of the Atlantic, cross-cultural comparison would be unwise at this stage and must await a future extension of this study.

Conclusions

Clearly, these five groups offer an international perspective. However, it is not strictly a comparative one. Unlike the Italian trainees, very few of the US students had any direct experience in dealing with emergencies and disasters. Backgrounds, educational levels, and cultural perspectives varied considerably between the groups, yet not in a simple, systematic way. For example, while all of the US respondents were in the midst of their studies, not all of the Italian ones had taken a degree. Yet, despite these differences and reservations, it is striking that regularities emerged across the board.

Conclusions

The modest exercises reported here were intended as a litmus test of attitudes in the hope that it would provide some guidance about what must be done to improve students' and trainees' understanding of the difficult and fraught problem of how to manage emergencies. In part, the results highlight the well-known difficulties of getting the message across, the inefficiency of academic teaching methods, and, sad to say, perhaps a failure to connect on the part of the instructors. This is important, as learning likely is inhibited severely when misconceptions are carried from the beginning to the end of the process.

The respondents who took part in the exercises described here constituted select groups of people who were making use of particular educational and training opportunities. As the results described above show, inroads already had been made into their belief in disaster myths, but much work remained to be done. This suggests that one course probably is not sufficient (even if, as in the case of the Milanese emergency managers, as it lasts for 200 hours) and that a more vigorous approach to debunking the myths of disaster is required.

A greater problem is represented by the general public and all people who do not have the benefit of an advanced education. For these people, the main sources of authoritative information about disasters are the news media, especially television. But the media have made little or no effort to avoid perpetuating the fables of disaster; indeed, some analysts regard them as congenitally attached to the myths.[44] Hence, the solution to this difficult problem may lie in education, not so much of students and trainee emergency workers, but of the people who report on disasters for the media. Few mechanisms exist to achieve this and there is little apparent interest in creating them.

This inspires the question of why there is such a lack of objectivity in dealing with the effects of disasters? First, most people, even many of the best experts, seem unable to view such events holistically and in terms of the connections between their physical and social parts. Secondly, disasters threaten people's sense of order and therefore their ability to comprehend and classify unusual phenomena. Thirdly, the lessons of past disasters are easily and rapidly forgotten and despite the plethora of literature on the subject, much of it fails to communicate the basic messages in a clear, convincing way and through a logical progression of events.

Once again, the only answer is to increase the level of professionalism in disaster management and raise its international profile in order to get the message across. Much more work will be needed, especially in terms of making the fruits of academic research available to practitioners and students.[45,46]

Future research in this field should address the question of cultural and intercultural contrasts, perhaps by examining peer group responses in different countries. The present work is merely an introductory study in this respect, as it offers only very limited opportunities for international comparison. Further work is also required to determine whether randomizing the questions would change the responses significantly, but if the main findings are sufficiently robust to survive international comparison, they can also survive the rather particular format of the questionnaire.

Lastly, further research should address the question of whether the mass media's portrayal of disaster really is a fundamental influence on the perception of those who study and manage it, something which for lack of data is merely a strong assumption in the present work.

References

1. Larsson G, Enander A: Preparing for disaster: Public attitudes and actions. *Disaster Prevention Managment* 1997;6(1):11–21.
2. Brilly M, Polic M: Public perception of flood risks, flood forecasting and mitigation. *Nat Haz Earth Sys Sci* 2005;5(3):345–355.
3. Associated Press: El Salvador buries quake victims, 15 January 2001. Available at http://highbeam.com/doc/1P1-39749331.html. Accessed 29 March 2007.
4. Kirschenbaum A: Preparing for the inevitable: Environmental risk perceptions and disaster preparedness. *Int J Mass Emer Disasters* 2005;23(2):97–127.
5. Couch SR: The cultural scene of disasters: Conceptualizing the field of disasters and popular culture. *Int J Mass Emer Disasters* 2000;18(1):21–38.
6. Palm R: Urban earthquake hazards: The impact of culture on perceived risk and response in the USA and Japan. *Appl Geol* 1998;18(1):35–46.
7. Bahk CM, Neuwirth K: Impact of movie depictions of volcanic disaster on risk perception and judgements. *Int J Mass Emer Disasters* 2000;18(1):63–84.
8. Mitchell JT, Thomas DSK, Hill AA, Cutter SL: Catastrophe in reel life versus real life: Perpetuating disaster myth through Hollywood films. *Int J Mass Emer Disasters* 2000;18(3):383–402.
9. Quarantelli EL: Realities and mythologies in disaster films. *Communications* 1985;11:31–44.
10. Fischer HW III: *Response to Disaster: Fact Versus Fiction and its Perpetuation: The Sociology of Disaster.* Lanham, MD: University Press of America, 1994.
11. Grendstad G, Selle P: Cultural myths of human and physical nature: Integrated or separated? *Risk Anal* 2000;20(1):27–40.

12. Arnold JL: Disaster myths and Hurricane Katrina 2005: Can public officials and the media learn to provide responsible crisis communication during disasters? *Prehosp Disast Med* 2006;21(1):1–4.
13. Fischer HW III, Drain EM: Local offices of emergency preparedness (LEMA) belief in disaster mythology: What has changed and why? *Disaster Prevention Management* 1993;2(3):17–24.
14. Alley E: The myths and realities of natural disasters. *J Inst Civil Defence* 1990;52(1):19–25.
15. Noji EK, (ed.): *The Public Health Consequences of Disasters*. New York: Oxford University Press, 1997:pp 17–18.
16. Quarantelli EL: Reality and myth in community disasters. *UNDRO News* (Nov–Dec 1982):6–9.
17. Johnson NR: Panic and the breakdown of social order: Popular myth, social theory, empirical evidence. *Sociol Focus* 1987;20(3):171–183.
18. Scanlon TJ: Post-disaster rumor chains: A case study. *Mass Emerg* 1977;2:121–126.
19. Wenger DE, Dykes JD, Sebok TD, Neff JL: It's a matter of myths: An empirical examination of individual insights into disaster response. *Mass Emerg* 1975;1:33–46.
20. Alexander DE: *Natural Disasters*. London: Routledge; Boston: Springer. 1993:16–20.
21. Shaw R, Shiwaku K, Kobayashi H, Kobayashi M: Linking experience, education, perception and earthquake preparedness. *Disaster Prevention Management* 2004;13(1):39–49.
22. Pan American Health Organization (PAHO): *Natural Disasters: Protecting the Public's Health*. Washington DC: Pan American Health Organization, 2000.
23. Katrina Lessons Learned Review Group: *The Federal Response to Hurricane Katrina: Lessons Learned*. Washington DC: The White House:p 40.
24. BBC News: "Fear Exceeded Crime's Reality in New Orleans". Report, 29 Sep 2005. Available at http://news.bbc.co.uk. Accessed 30 September 2005.
25. Quarantelli EL: *Looting and Antisocial Behavior in Disasters*. Newark DE: Disaster Research Center, University of Delaware, 1994.
26. Large T: Experts say mass burials do more harm than good. Reuters Alertnet 30 Dec 2003. Available at http://www.alertnet.org. Accessed 03 January 2004.
27. PAHO: *Epidemiological Surveillance After Natural Disaster. Scientific Publication 420*. Washington DC: Pan American Health Organization, 1982.
28. de Ville de Goyet C. Epidemics caused by dead bodies: A disaster myth that does not want to die. *Pan Amer J Pub Health* 2004;15:297–299.
29. Floret N, Viel JF, Mauny F, Hoen B, Piarroux, R: Negligible risk for epidemics after geophysical disasters. *Emerg Infect Diseases* 2006;12(4):543–548.
30. Paulozzi LJ: Great myths in disaster relief: Epidemics. *J Environ Health* 1980;43(3):140–143.
31. de Ville de Goyet C: Stop propagating disaster myths. *Prehosp Disast Med* 1999:14(1):9–10.
32. Fritz CE: *Convergence Behavior in Disasters: A Problem in Social Control*. Washington, DC: National Academy of Sciences, 1957.
33. Goltz JD: Are the news media responsible for the disaster myths? A content analysis of emergency response imagery. *Int J Mass Emerg Disasters* 1984;2(3):345–368.
34. Drabek TE: *Human System Response to Disaster: An Inventory of Sociological Findings*. New York: Springer-Verlag, 1986.
35. Quarantelli EL (ed): *What is a Disaster? Perspectives on the Question*. London: Routledge, 1998.
36. Perry RW, Quarantelli EL (eds): *What is a Disaster? New Answers to Old Questions*. Philadelphia: Xlibris, 2005.
37. Alexander DE: *Confronting Catastrophe: New Perspectives on Natural Disasters*. Harpenden, UK: Terra Publishing; New York: Oxford University Press, 2000:137–171.
38. Page RA, Blume JA, Joyner WB: Earthquake shaking and damage to buildings. *Sci* 1975;189:601–608.
39. Alexander 1993; op cit:16–20.
40. cf. Jennings-Sanders A, Frisch N, Wing S: Nursing students' perceptions about disaster nursing. *Disaster Management Response* 2005;3(3):80–85.
41. Smith-Cumberland TL, Feldman RH: Survey of EMTs' attitudes towards death. *Prehosp Disast Med* 2005;20(3):184–188.
42. Alexander, 2000; op. cit.:1–2.
43. Brislin RW: Cross-Xultural Research Methods: Strategies, Problems, Applications. In: Altman I, Rapoport A, Wohwill JF (eds): *Human Behavior and Environment, Vol. 4, Environment and Culture*. New York: Plenum, 1980:47–82.
44. Ploughman P: The American print news media "construction" of five natural disasters. *Disasters* 1995;19(4):308–326.
45. Fothergill A: Knowledge transfer between researchers and practitioners. *Nat Hazards Rev* 2000;1(2):91–98.
45. Gori PL: Communication between scientists and practitioners: The important link in knowledge utilization. *Earthquake Spectra* 1991;7(1):89–95.