

COMMUNITY RESILIENCE OR UNIDENTIFIED HEALTH RISK?: HEALTH PROFESSIONAL PERCEPTIONS ON THE IMPACT OF THE SWISSAIR FLIGHT 111 DISASTER ON SURROUNDING COMMUNITIES

TERRY L. MITCHELL,
Dalhousie and Wilfrid Laurier Universities
RANDY D. TOWNSEND,
Anglican Diocese of Nova Scotia and Prince Edward Island
and
JANE SCHNARE
Bridgewater, Nova Scotia

ABSTRACT

On September 2nd, 1998 Swissair Flight 111 crashed in Saint Margarets Bay, Nova Scotia. Surrounding coastal communities were immediately transformed into disaster response sites. Sixteen community health professionals were interviewed that identified several types of individual and community exposure, including exposure to human remains. The interviews revealed that the coastal communities have responded with silence and stoicism. This silence has been viewed by some health professionals as resilience. The interface of a major disaster, community silence, low help-seeking behaviours, and limited disaster health responses raises the critical question whether this is a profile of resilience or a community silently enduring.

INTRODUCTION

On September 2, 1998, at 10:31 pm, Swissair Flight 111 crashed in the waters off the coast of Nova Scotia between Saint Margaret's and Mahone Bays. Residents of the communities in close proximity to the disaster site immediately responded by going out in their boats to rescue people. Tragically, none of the 229 passengers and on-board personnel survived the impact of the crash. Local communities were immediately transformed into response, recovery, and reception sites for large numbers of federal and provincial workers, grieving family members, and international media.

This paper provides a report on Phase One of the Swissair Flight 111 (SA 111) Study, which was designed to be a preliminary and minimally intrusive investigation

The study was supported with funds from a Dalhousie University Faculty of Medicine Intramural Grant awarded to the first author. Thanks to the following individuals for their important input into the realization of the health professional study and/or this paper: the Learning From Experience Community Advisory Group, for provision of critical guidance and facilitation at all phases of the research; Elaine Loney, M.Sc., for data collection, management, and reflective analyses; Peter Twohig, Ph.D., Family Medicine, Dalhousie University, for collaboration in community field work and provision of comments on the first draft; Judy Reid Guernsey, Ph.D., for provision of comments on a later draft; and Heather Milliken, MD, Dalhousie University, for her assistance in piloting the health professional interview guide.

of health professionals' perspectives on community resiliency and health impact. This phase of the study—which describes the nature of the SA 111 disaster and identifies multiple levels of exposure 1½ years post-disaster—is useful in providing critical knowledge for researcher sensitivity to community and cultural issues in the implementation and analysis of the next two phases of the research. The participant quotations provided in this paper come from individuals who share the dual roles of community members and health professionals who work in the affected communities. After completing this first phase, we interviewed 13 community members (phase two) about their experiences and the impact of involvement in the disaster response efforts and administered psychometric instruments to assess probable levels of post traumatic stress and coping (Mitchell, Stewart, Griffin, & Loba, 2004). In the third phase of the study, we conducted a pre and post comparison of health utilization data (three years prior to and post disaster) for the affected coastal communities and two Nova Scotian coastal communities with similar demographics.

In this paper, we provide a descriptive, contextual portrait of the impact of the disaster on local communities, insight into community and health professional impact, and discuss the potential for secondary prevention to minimize long-term community level health effects while questioning the degree to which the findings represent resiliency and/or trauma in the affected communities.

BACKGROUND

Duration

SA 111 stands apart from other air disasters primarily because the crash occurred at sea, which resulted in an unprecedented level of difficulty and duration of the response and recovery process. The Coventry, Lockerbie, and Gander air crashes occurred on land and were cleaned up in approximately two weeks (Chung, Chung, & Easthope, 2000; Salter, 1991; Wright & Bartone, 1994). In contrast, the SA 111 crash took four to five months of intensive recovery work and more than a year of recovery and dredging efforts. During that prolonged period of time, members of the surrounding communities were exposed to the intense presence of disaster-response personnel—including Emergency Measures response teams, the military, and the Coast Guard. However, to date, little attention has been paid to the impact of such multiple levels of exposure on the affected communities.

Health Impacts

Exposures to traumatic events such as those associated with the rescue and recovery efforts following a major disaster are known to have both short- and long-term psychological, emotional, and behavioural consequences (Bravo, Rubio-Stipec, Canino, Woodbury, & Ribera, 1990; Green et. al, 1990; Raphael, 1986a; Sowder, 1985) including, but not limited to, Post Traumatic Stress Disorder (PTSD) (American Psychiatric Association, 1994). There has, however, been very little research on the physical health impact of trauma. Some disaster research has identified evidence of stress reactions that are less severe than PTSD but more widespread than full-blown psychopathology (Adams & Adams, 1984; McFarlane, 2000). Common reactions in the immediate aftermath of disasters are shock, anxiety, sleep disturbances, and impaired personal relationships (Yates, Axson, Bickman, & Howe, 1989). However, with the exception of some studies with war veterans (McFarlane, 1996), scant research has been done on the physical impact of trauma.

A study on the Bijlmermeer air disaster reported that, six months after the disaster, 26% of the respondents were suffering from PTSD and that the distress was strongly associated with material damage and loss (Carlier & Gersons, 1997). Coventry residents also experienced high levels of distress following an air disaster (Chung, Chung et al., 2000) despite the fact that they were not involved in response efforts. Exposure to dead bodies is reportedly one of the most stressful aspects of disaster work (Ursano & McCarroll, 1990). Following the 1998 plane crash, Lockerbie residents experienced high levels of panic disorder, anxiety, and depression, as well as subclinical responses such as sleeplessness, loss of interest in work, previously enjoyed activities, or family, a vulnerability to being easily startled, and fear of the dark or loud noises (Brooks & McKinlay, 1992; Mitchell, 1993). Gander crash site workers were profoundly affected by their response efforts, particularly by exposure to dismembered crash victims (Wright & Bartone, 1994).

Since most disaster and PTSD research has focused on primary and secondary victims of traumas (Kessler, 2000), little is known about the long-term effects on communities, families, and individual volunteers who respond to and live in close proximity to disaster sites (Chung, Werrett, Farmer, Easthope, & Chung, 2000). However, Bartone's research on the Gander crash (Bartone, Ursano, Wright, & Ingraham, 1989) emphasizes the importance of investigating not only the primary and secondary trauma of victims and family members, but also the effects on family assistance workers. While it is generally accepted that the effects of large-scale disasters can reach whole communities and affect their psychological, social, and economic well-being over a prolonged period of time (Paton, 1997), little attention has been given to the impact of such disasters on individuals who are not perceived to be either primary or secondary victims (Chung, Werrett et al., 2000) or on communities, helpers, and people who are affected by the events due to social or geographic proximity (Raphael, 1986c; Wright & Bartone, 1994). The effects of disasters and disaster-response efforts on communities, though initially imperceptible, can be pervasive. Without appropriate follow-up, disasters can have negative ramifications which may undermine the health of communities (Dembert & Simmer, 2000). Raphael (1986c) specifically addresses the importance of community follow-up with disaster helpers to prevent hidden victims from suffering long-term post-disaster effects.

Community Coping and Resiliency

Despite the demonstrated links between exposure to trauma and distress (Norris, Friedman, Watson, Diaz & Kaniasty, 2002) it is important to emphasize that not everyone who is exposed to trauma develops PTSD (Stewart, 1996). Depression and substance abuse are more common responses to trauma than full-blown PTSD, which may actually account for only a minority of distress responses (McFarlane, 1996). There is a wide range of responses to trauma and a variety of means of coping that may confer greater or lesser degrees of resilience. In the disaster literature, two general types of coping are identified: (a) problem-focused coping, which involves strategies aimed at doing something to alter the source of the stress and tends to be associated with lower rates of trauma; and (b) emotion-focused coping, which involves strategies aimed at reducing the emotional distress caused by the situation (Folkman & Lazarus, 1980).

As a number of investigators caution, researchers should not *only* look for trauma in the aftermath of disasters: secondary gains, such as increased spirituality or a new sense of efficacy, are equally possible (Yates et al., 1989). Indeed, studying

community resilience and capacity within post-disaster communities is an important alternative to framing the disaster in terms of individual pathology (Echterling & Wylie, 1999; Gist & Lubin, 1999). There is, however, both a dearth of literature on community resiliency in the aftermath of major disasters and a lack of consensus on related theories of resilience to guide such investigations (Lyons, Mickelson, Sullivan, & Coyne, 1998; McFarlane, 1996). McFarlane (1996) raises the concern that disaster studies may have a bias in sampling toward those who have less traumatic experiences, given that those who have been most traumatized may avoid participation to avoid restimulation of traumatic memory. This hypothesis raises challenges to the accuracy of documenting the prevalence of trauma and of defining the actual nature and scope of resiliency. The potential long-term community-level effects of major disasters should, however, not be overlooked. As Dembert (2000) warns:

The psychological, sociological, and mythological ramifications of a disaster that befalls or strikes a community can be long-lasting, subtle, and destructive. To use one analogy, it can be like termite damage to a house that goes unchecked, destroys the basic foundation of the house, and ultimately results in a sudden collapse or a need to completely destroy the house and begin rebuilding (p. 2).

There are two main streams reflected in the disaster literature: the medical and the psychosocial. The medical and psychiatric literature largely depicts disasters as presenting a high risk for individuals, particularly those with a history of mental health problems and prior exposure to trauma (Bravo et al., 1990; Green et al., 1990; Raphael, 1986c; Sowder, 1985). In contrast, the psychosocial literature focuses on community-level impact and provides a critique of the medical literature's focus on individual pathology. However, the current psychosocial disaster literature, with its positive assertion that "a community can frame the issue [of the post-disaster impact and response] as a measure of its resilience, coping, and competency" (Echterling & Wylie, 1999, p. 341) may minimize existing trauma and the implications of the disruption of community infrastructure and social networks, and may fail to adequately assess potential long-term impacts.

Help-Seeking Behaviour

Help-seeking behaviour following a disaster also is not well understood. Individual responses are affected by a variety of factors—including, but not limited to, culture (Mitchell, 1993), degree of exposure and impact, and recovery environment (McFarlane, 1996). There is no clear evidence as to whether people reach out for help or are self-reliant, if there are preferred coping mechanisms, and if these outcomes vary by context (Yates et al., 1989). Disasters are rare, sudden events for which people are usually unprepared and have little experience. Most rural Nova Scotians do not have a professional source of help for emotional distress and may rely on social comparison to determine how to interpret both the event and their response to it. Strong social norms may arise about how people should be coping. In communities facing an acute crisis there is the possibility of stress contagion and the "pressure-cooker" phenomenon in which the coping resources of both the group and the individuals may become taxed (Lyons et al., 1998; Paton, 1997).

While disaster support of one kind or another is often brought to disaster sites, these programs are commonly underutilized. Psychological services, in particular, are underutilized because of a variety of factors, including stoicism, strong social norms of self-reliance, stigma, and the tendency for people to somatize and attribute psychological effects to physical ailments (Yates et al., 1989). The demonstrated

reticence of individuals to reach out for support, which is perhaps particularly strong in rural communities due to privacy concerns, indicates one of the challenges of providing appropriate post-disaster care.

METHODOLOGY: PARTICIPATORY ACTION RESEARCH

As a participatory study (Green et. al, 1995), this research was guided by the principles of collaboration, reciprocity, and action. The study received ethical approval from a university research ethics board and was guided by a Community Advisory Group at all stages of the research, from proposal development to dissemination. The principal investigator spent over two years communicating with federal, provincial, regional, and local individuals who had been involved in the response efforts of the Swissair Flight 111 disaster. The chronology research log of the study documents the myriad telephone conversations, email contacts, and formal and informal meetings in which the primary author engaged in order to assess the community need and readiness for a research study.

An authentic and representative Community Advisory Group (CAG) was needed to endorse (or deny) and guide (or redirect) this project. To identify appropriate linkages for building such a group, considerable attention was given to community and cultural awareness. During one critical meeting, a clergy member and an RCMP officer provided a list of individuals who had, like themselves, been very active in the response efforts. This list brought together a diverse group of community leaders and disaster-response workers, which ultimately evolved into a group of 12 community members representing affected communities around the coast: three members of the clergy, three mental health professionals, a community fire chief, a resident who was exposed to human remains, an Emergency Measures co-ordinator, a Ground Search and Rescue captain, and two elected civic leaders.

The four initial members of the CAG reviewed the funding application and supported the goals and the participatory process of the proposed study. As the group grew to a full compliment (12), all members reviewed the goals and objectives of the study and provided guidance at all stages of the research. The CAG met at least bi-monthly for over two years. Mental health and instrument sub-committees were formed in which CAG members actively reviewed and revised research instruments, developed mental health protocols, and created a brochure to ensure that all research participants had appropriate access to locally available support services. As well, the CAG members actively informed the development of the recruitment strategy, and the writing of two community information statements about the research. The CAG provided community and cultural context to the research team, and informed the interpretation of findings, while protecting the interests of their communities. CAG members have been active in writing articles and giving presentations at major conferences and are now working with the principal investigators to translate knowledge into practice by disseminating the findings back to their communities.

Method

Semi-structured interviews were conducted with ($n = 16$) participants. Interviews, which were conducted in the study communities in the homes and work places of the respondents, ranged from 45 minutes to 2 hours in length and were audio taped. A purposeful sampling strategy was used to identify health professionals who had practiced or provided services in the study communities one year before the crash and who were practicing and/or living in the study communities one year after the

crash. All thirty-eight (38) eligible health professionals, family physicians (FP), public health nurses (PHN), and mental health professionals (MHP), were recruited by contacting local health facilities followed by a process of snowball sampling to reach those who were working in private practice. Sixteen local health professionals (42% of those eligible) agreed to participate. There were 13 female and 3 male participants: 2 out of 20 eligible FP, 4 out of 8 PHN, and 10 out of 10 MHP. Two of the participants had worked in the communities for less than 5 years, five for 16 or more years, and the balance between 5 and 15 years. There were 18 physician refusals. Four family physicians reported that they had not noticed any difference in their patients, one indicated that s/he did not have enough contact with first responders to participate, six indicated a lack of time, one was not available, and six did not provide a reason. Research participants were interviewed approximately 1.5 years after the disaster.

The interviewer used a 13 item, semi-structured interview guide that was first piloted with a psychiatrist who had been active in response debriefing and after care. The interview guide was designed to assess health professionals' perceptions of the impact of the disaster on the daily lives and the health of their patients/clients. Participants were asked about their perception of individual and community coping and the use of personal and/or community resources. Participants were asked about the effect on families, the use of alcohol changes over time, and recommendations for future disasters. A 24-point checklist, developed to reflect the literature on health impacts of disasters (such as depression, aggression, family conflict, gastrointestinal problems, sleeplessness, irritability, anxiety) was used to stimulate dialogue about observed health impacts that were perceived to be either attributable to or aggravated by the disaster response.

Member Checks

Interview tapes were transcribed verbatim and then transcripts were checked against the tapes for accuracy. All identifying information was removed and the transcripts then were sent to the participants for a member check. The interviewer phoned each participant to review his/her transcript, and provided the participant with an opportunity to make corrections to and/or to clarify or elaborate on any aspect of the transcript.

Analysis

Reflective field notes were made, after each interview, in order to capture the contextual aspects of the interview and to facilitate ongoing analytic discussions between the interviewer and the investigator. Data was then entered into and managed with NVivo software (Richards, 1999). Transcripts and field notes were analyzed through open coding. This process preserved the concepts and language used by the participants themselves. The interviewer and investigator, who each read the transcripts independently for themes, then worked together to identify categories. Emerging coding was discussed and analytic memos were reviewed as the first author reduced the data into descriptive categories which could provide an important foundation for beginning to answer the questions "What happened?" and "What is going on here?" The overall interpretation of the data includes analysis of the interview data triangulated with observations from 3½ years of travelling to and working with the study communities (meeting in fire halls, rectories, and community members' homes) and ongoing dialogue with, and reflections of, the CAG.

FINDINGS

While the extent and long-term health impact of the SA 111 disaster are, as yet, unknown, study findings indicate that health professionals observed a wide range of effects among both children and adults. Health professionals perceived a high degree of community coping and resiliency, often described as people going back to their daily lives and not talking about the disaster. Health professionals also observed anger about the topic of the disaster and a desire of community members to “make it [the disaster] go away.” The findings are reported here in five main categories: (a) the type and duration of the disaster, (b) invasion and occupation, (c) health effects, (d) coping and resiliency, and (e) help-seeking behaviours and health services.

Type and Duration of Disaster

When SA 111 crashed off the coast of Nova Scotia, resulting in the tragic loss of 229 lives, dismembered human remains, plane wreckage, and personal effects filled the surrounding waters and local beaches. Immediately following the disaster, life as it was known in the small coastal communities of Nova Scotia—from Sambro to Mahone Bay—was changed. Communities were overwhelmed by the presence of hundreds of bereaved family members and international media. Community and family life, as well as occupational and social patterns, were further disrupted by the sudden and uncompromising instalment of thousands of official response workers. Some residents heard and/or saw the aircraft circle before the crash; they experienced their homes shaking on impact; and they were exposed to intense increases in noise levels from air and vehicular traffic involved in the immediate recovery operations and the transportation of human remains.

Well throughout the whole thing, until they started trucking remains, I guess the helicopters were the visible thing. Everyone just had a heightened awareness of it. I mean, what people commented on was—that hearing the helicopters coming meant more bodies or more bags . . . it was something that you noticed. And it was this constant droning when they were there (Mental Health Counsellor).

All nearby coastal communities were exposed (to varying degrees) to human remains and airplane debris as it washed on shore. The scale and intensity of the disaster and response efforts, as well as the degree and duration of exposure that citizens were confronted with, characterizes the enduring and invasive nature of this disaster on the local communities.

Well, one was a first responder who had gone out and found remains of a child and that would keep coming back to that person in, um, I don't think it was nightmares. Just recurring thoughts, and this person needed a chance to talk about that (Mental Health Counsellor).

Invasion/Occupation

An overwhelming external presence within the affected small Nova Scotian villages was often referred to by the health professionals as an “invasion” or “occupation.” Thousands of response personnel and their related equipment and support services remained for at least four months and, in one community, for over a year. The response personnel occupied community buildings, and restricted access to community centres, roads, and waterways. Restriction of waterways, for investigation and recovery work, interfered with fishing, which is an important aspect of the local economy.

It literally was like being in a war zone. I've only been in a war zone in one country many years ago and um it just reminded me a lot of that . . . Well, there was, you know, checkpoints and just, um, the [unintelligible], so many people in uniform. It was like an invasion, the lights, the noise, the aircraft (Mental Health Counsellor).

One of the affected communities, with a population of only 200, hosted over 500 uniformed military personnel and related equipment and vehicles, and then 500 Royal Canadian Mounted Police (RCMP). The response efforts were then followed by memorial and interment services and the installation of monuments in two of the affected communities. The communities of Blandford and Peggy's Cove, in varying ways, experienced the arrival and encampment of thousands of responders from the RCMP, the Canadian military, the Emergency Measures Organization, Ground Search and Rescue, and fire departments, as well as representatives from national and international media. Children were restricted from their normal activities. Playing on the shore was prohibited and bicycle riding became hazardous due to the massive response efforts and related vehicular traffic. School gyms, community centres, and playing fields were rendered inaccessible to local residents and their children.

Health Effects

Compilation of information obtained from the symptoms checklist of observed responses indicates a wide range of effects either attributable to and/or aggravated by the disaster and response efforts. (The checklist, which was completed by only 15 of the 16 participants, indicates observed effects but does not provide incidence or prevalence.) Twelve out of 15 interviewees, across all professional groups, observed effects attributable to the disaster response efforts. At least 7 of the 15 interviewees identified sleep difficulties, nightmares, anxiety, or intrusive thoughts and images among their patients/clients as being attributable to the disaster. Aggression was attributed to the disaster by two participants and identified as aggravated by three. Family conflict was attributed in one case and aggravated in three. Eight participants also identified stress as a health effect which was aggravated by the disaster. Health impact observations were, however, largely reported as limited to shorter-term effects. Interviewees suggested that it was "hard to say" if there were longer-term effects.

It (the disaster) affected a lot of people, not so much that I am aware of that it caused medical problems or things of that nature, but just emotionally. I think it was quite a drain on people for months and months, and I don't think it got out of people's minds until maybe the next summer . . . (Physician).

The health professionals, while not asked directly, also talked about effects upon the children. They reported disrupted sleep, clinging and agitated behaviours, intrusive thoughts and images, and children telling others of witnessing real or imagined exposure to human remains. Health professionals also observed that some children did not want to play outside and were having poor concentration during the response efforts. The daily life of some community members was affected by disaster-related phobias. Respondents reported that many community members became fearful of walking on the shore and of common sensory stimuli—the smell of fuel, the sound of helicopters or the local fire siren, or the sight of seagulls or army uniforms—that became triggers for unwanted memories.

The ones who were afraid of body parts or debris washing up on the beach, they kept looking at that and seeing what that would look like and wondering what they were going to do if an identifiable body part washed up in front of them. How they were going to react to that. The one [client] kept seeing uh airplanes

crashing into [his/her] home and subsequent fire and [his/her] children being killed, et cetera, et cetera (Mental Health Counsellor).

The SA 111 disaster response occurred in close proximity to other extreme and unprecedented community events, including a double murder-suicide and a double murder. A “ripple effect” was reported, in which coping with experiences of grief and loss, prior and subsequent to the disaster, was affected. Anniversary events and subsequent air disasters and related media coverage also triggered unwanted feelings and memories of the disaster.

Coping and Resilience

Health professionals also were asked to reflect on individual and community coping and resilience. Respondents endorsed the concept of community resilience and described resilience as people “getting on with their lives in usual ways.” Respondents reported that people were initially emotionally drained and that the individual and community coping abilities were taxed. A year and a half post disaster, however, respondents described the communities as coping well and demonstrating resilience. Analysis of the coping data revealed that first responders, volunteers, and community residents largely coped during the time of the response efforts through “problem-focused coping” (Folkman & Lazarus, 1980) by doing, helping, and commemorating. The communities mobilized tremendous resources to support the response efforts, and communities along the coast worked together—in some cases, for the first time ever. These problem-focused coping strategies enabled individuals to make sense of the disaster and facilitated personal and existential growth for some community members, as has been observed in other disaster studies (Yates et al., 1989). The use of alcohol also was observed as a means of coping with the disaster and disaster response efforts. Alcohol was referred to as a form of “self-medication” used by some community members in the aftermath of the disaster.

They would never go to mental health in this community. So the people that would suffer from depression would use alcohol. You are not a man! You are not a person if you say that there is something wrong with your head, uh, then you are not whole . . . (Mental Health Counsellor).

The Swissair crash, along with the related response efforts, was a phenomenon that was out of the normal range of experience of community members, and one that was compounded, for some communities, by other concurrent tragedies. Some of the mental health professionals described the community silence and anger surrounding the disaster, and challenged the surface observation of resilience. They raised concerns about the degree and duration of trauma that their communities had been exposed to and the traditional means of coping among local residents.

Well, those, those things like Swissair, are outside the realm of community’s normal scope of coping in terms of the normal kinds of disasters that would affect a fishing community, and life and death that happens here. . . . So, people were numb from the murder of the children. People were numb, and are probably still are numb from the murder of the teacher and parent. And people were numb about Swissair (Mental Health Counsellor).

None of the fishermen would ever accept that they would say that that they would have any kind of a mental health problem. None of them. I would say absolutely none of them . . . I don’t think people used resources. Like I said, people were mostly in denial . . . they would shut down. They wouldn’t go out and get help (Mental Health Counsellor).

Help-Seeking Behaviour and Health Services

Despite the presence of local mental health professionals, the initial wide distribution of service information cards, the establishment of a toll free distress line, and the availability of disaster debriefing sessions for first responders, professional services—in particular mental health services—were not widely utilized by community members. External health professionals, who were brought into the communities at the time of the disaster, were described as not always being sensitive to community norms and were rejected by some sectors of the community. Local professionals, on the other hand, were susceptible to being overwhelmed by the experience.

Health professionals who were brought in from outside of the communities, or even the province, had little sensitivity to the culture, to the people in the area. And there were some, some consequences that those debriefings tended to be less successful and people came away with greater resistance to encouraging others to participate (Mental Health Counsellor).

To date, anticipated client increases have not been noticed within the rural mental health systems. Health professionals commented on the stoic nature of the population and the enduring stigma attached to mental health services.

Oh, they seemed to be saying by having no contact, 'We don't need those mental health people.' 'We are not crazy!' Um, 'Our doctors are so busy looking after sick people, we wouldn't want to bother them' (Mental Health Counsellor).

Knowing the backgrounds and the type of people that live along the south shore and especially along the seacoast and everything. They are a hardy bunch of people and they like to take care of themselves. And often times they tend to think that they don't need the professionals or whatever . . . They just need to talk among themselves, and with each other, and support each other (Mental Health Counsellor).

The impact on first responders and disaster-related effects may be underestimated in this study, since only 4 out of 16 health professionals (all of whom were mental health workers) enquired about their clients' experience with or response to the SA 111 disaster. A physician reflected on the potential of a more proactive approach for clinicians:

. . . if this happens again, I should be a bit more proactive in saying, 'Did you have anything to do with it?' Even for documentation purposes, if after they do have symptoms which suggest they are somatizing and things like that (Physician).

Typically when tragedy strikes there is a lot of initial help . . . and for the majority of people that initial help is all they need. It is enough for them, but there are others who need more help. They need longer help, on a longer-term basis. And even though I believe it is available to them, uh, for some people they aren't the type of people who want to go out and search for it . . . 'Gee you know I should be strong enough. I should be able to do this on my own. You know, my next door neighbour, he didn't see a counsellor. I am not crazy, I don't need to see anyone.' (Mental Health Counsellor).

The stoicism of community residents that traditionally contributes to low help-seeking behaviour was compounded by a lack, despite the extreme circumstances of the disaster, of a proactive community-level follow-up. Some health professionals identified weaknesses in the disaster response protocol, which brought in external resources that were not available for longer-term follow-up, and in the local health system, which relied, despite the extreme circumstances, on traditional intake and referral processes (though triaged to expedite SA 111 cases).

There was an expectation that individuals, if they were good consumers, would apprise themselves of those services, and that the services were even available, which they weren't. So it is like expecting the normal system to be able to meet the need when under abnormal circumstances . . . (Mental Health Counsellor).

This status-quo approach was premised on a belief in the resiliency and resourcefulness of individuals and communities:

I don't think you can go and stir things up and say, you know, 'can I do this for you?' if they are not asking for it. I think they have to ask for it before you can go and say, 'Well you need this, and you need that, and you need that.' . . . Because maybe they won't. And maybe they will deal with it, or you know, the whole area will deal with it themselves (Public Health Nurse).

The lack of a proactive health professional response also must be considered in terms of the impact upon the communities' health professionals. Individual responders were not the only ones affected by the SA 111 disaster and related response efforts; the impact also was felt by those communities which, as a whole, were occupied by response and recovery forces, media, and grieving family members. Local physicians, mental health professionals, and public health workers did not have specialized training in disaster response; nonetheless, the fact that they lived in the communities meant that they were themselves exposed, either directly or indirectly, to the effects of the disaster and response efforts. Mental health workers also were exposed to secondary trauma in their debriefing and counselling of responders and many local physicians, as residents of the coastal communities with boats, were undoubtedly among the first responders on the first night of the disaster.

As debriefings were going on, I realized that knowing people personally and debriefing them had a much greater impact on me than doing a regular debrief with people that I didn't know and who didn't know me. So I started to experience, even though I didn't have first hand sensory images, I began to experience flashbacks from the debriefings (Mental Health Counsellor).

DISCUSSION

Exposures to traumatic events such as those associated with the rescue and recovery efforts of SA 111 have had both short- and long-term psychological, emotional, and behavioural consequences (Bartone et al., 1989; Bravo et al., 1990; Brooks & McKinlay, 1992; Green et al., 1990; Raphael, 1986b; Sowder, 1985), including PTSD. Exposure to dead bodies and human remains is known to be one of the most stressful aspects of disaster work (Taylor & Frazer, 1982; Ursano & McCarroll, 1990). Thus, some degree of trauma can be anticipated among first responders (i.e., who were on the water near the crash site on the night of the SA 111 disaster) and among volunteer recovery workers and community members who lived and worked along the affected coastline.

Given both the lack of debriefing for community members or disaster follow-up in the affected communities and the limited tracking of disaster exposure by health professionals, community level health effects may be strongly under reported in this paper. Post-disaster effects in the current study may be disguised or latent. As we learned from health professionals and ongoing engagement with the CAG, the study communities underutilized disaster supports—largely because of strong social norms of self-reliance and the stigma associated with mental health services. Stoicism contributing to low levels of help-seeking behaviour also was identified in the Scottish community of Lockerbie when it was affected by a major airline disaster (Mitchell, 1993). There is also the possibility that, in the aftermath of the SA 111

disaster, the coping resources of both the communities and the individuals became taxed (Lyons et al., 1998). The impact of the major disaster on these small Nova Scotian communities affected the communities as a whole—the community members, as well as the community-based health professionals—and disrupted their community infrastructures and patterns of social support.

The SA 111 disaster and response efforts involved several levels of individual and community exposure over a sustained period of time, posing a health risk to local residents regardless of whether they were actively or passively involved in the disaster response efforts. However, due to limited physician participation, the stoicism of the study population, and high degree of stigma attached to mental health issues, the health professional study did not prove to be an effective means to derive conclusive data about health effects. The health professional data did, unexpectedly, provide rich, descriptive information about the nature of the disaster response efforts, community context, and impact that includes, but is not limited to, a description of health effects. We learned that the powerful stigma of mental health essentially prevents people from seeking services and that the stoicism of community members also will limit their initial contact with physician services. The passive style of health services delivery during and following the disaster converged with community norms of self-reliance and stoicism. Public Health professionals were guided by the belief that people/communities will ask for help when they need it. However, while the Nova Scotian coastal communities do have a tradition of coping with loss of life at sea, they are unaccustomed to dealing with the type and duration of the SA 111 disaster and the interaction of concurrent community tragedies.

What has been observed over the last four years by the researchers and confirmed by CAG members is the emergence of a culture of silence around the disaster and the disaster's effects on individuals and communities. There is a prohibition about speaking about the disaster—in particular among the sectors of the communities who were directly exposed to human remains on the first night of the disaster (fishers and fire fighters). Protracted and community-wide silence regarding the disaster was discussed by some health professionals as involving denial of the event and a desire to simply leave it behind and get on with life. After 3½ years of community engagement, observation, and consultation, the health professional data is interpreted as emerging from a culture of silence. The silence may be a critical gauge of post-disaster trauma that has been largely overlooked, or interpreted as resilience by health care professionals.

The lack of a proactive post-disaster health response reinforces the finding that volunteer responders and other exposed community members were expected to know what they needed, how to ask for support, and who to approach for help. Despite the extreme and prolonged circumstances of this aviation disaster, the traditional stoicism of local residents, the enduring stigma associated with mental health services, and the lack of a proactive and innovative health response effort all resulted in limited help-seeking behaviour by community residents. Given the generally high degree of somatization of disaster responses, individuals who experience some form of distress or trauma can be expected to present with physical symptoms to their local physicians. If physicians routinely note disaster response involvement on patients' charts and are provided with professional development resources that would enable them to diagnose PTSD, they would be in a better position to assess disaster response effects and to refer individuals on for appropriate treatment and support services. Rural physicians should be viewed as critical and essential disaster response personnel, as they were in the Lockerbie air disaster, where a high degree of stoicism

also was observed (Mitchell, 1997). Rural primary care physicians will, in most cases, be the only health professional contact from which assessments of post-disaster distress and trauma, as well as counselling/support referrals, can be made. Primary care physicians, as trusted community members not assigned with the stigma of mental health services, are essential players in the development and realization of a community-based post-disaster secondary prevention strategy that would not conflict with community and cultural norms.

Further investigation is required to interpret whether observations of people not speaking about the disaster represent resiliency and/or denial, and the related impact on community health. Clarification is needed on the relationship between the concepts of coping and resiliency in the aftermath of a major disaster. Further reflection and consultation is required to consider whether moving on from the disaster experience with limited emotional or intellectual processing, as appears to be occurring in this setting, is a sign of resilience or an indication of a community “silently enduring.” The disaster exposure of health professionals is also an inadequately explored area which may contribute to a further understanding of the low physician participation rate in this study, the passive response of health professionals to the communities’ post-disaster needs, and the lack of follow-up services provided to the affected communities.

Study Limitations

The findings of this study were limited by several factors: (a) a lack of ongoing follow-up by health professionals with those exposed in the aftermath of the disaster; (b) multiple tragedies in the area which made it hard to distinguish between effects that were related specifically to the disaster and those that were not; (c) a context in which mental health professionals would not usually have contact with those most exposed (such as the fishers); (d) a high physician refusal rate; and (e) inadequate time since the disaster for the presentation of long-term effects.

As we are conducting community-based research in living, dynamic communities, we cannot control for these factors, nor can we realistically disaggregate the health impacts of the double murder suicide and double murder from the health impacts within this study. The identified limitations of the study, such as the barriers we experienced in recruitment and the concurrent tragedies, were also essential aspects of community knowledge data derived from ongoing community engagement and interviews. These learnings became important data that informed our growing sensitivity to and understanding of the communities and were critical pieces of knowledge that informed the next stages of our research. The low physician response rate, for example, was a critical factor in our analysis of the health professional data: it elicited important hypotheses about professional impacts and the essential role of physicians in post-disaster responses. The community-based health professional interviews were essential in providing awareness of and insight into the compounding and confounding tragedies of the murders and suicides. Without the health professional interviews and the ongoing engagement of the CAG, we would not have been aware of the specifics of these tragedies and how they impacted the disaster response communities. We will allow for and attempt to disaggregate the health impacts of SA 111 and concurrent tragedies where it is feasible—that is, within the analysis of the population health utilization data that is part of our larger study.

CONCLUSION

This preliminary investigation into community and volunteer health impacts following a major disaster raises important questions about community level impacts and health responses, as well as the nature of individual coping and community resiliency. Acknowledging the Nova Scotian coastal traditions of self-reliance and individual stoicism, the enduring stigma of mental health services, and the emerging culture of silence, it is important to consider Dembert's attention to "subtle" effects and the potential of long-term destructive impacts (Dembert, 2000). Further stages of the SA 111 community health impact study are investigating whether the disaster's imperceptible impact on existing mental health services reveals community resiliency in the face of prolonged community disruption and exposure, or an unidentified community health risk.

RÉSUMÉ

Le 2 septembre 1998, le vol 111 de Swissair s'écrasait à Saint Margaret's Bay, en Nouvelle-Écosse. Les communautés côtières environnantes ont immédiatement été transformées en sites de secours d'urgence. Des entrevues menées avec 16 professionnels et professionnelles de la santé ont permis d'identifier plusieurs types d'exposition individuelle et communautaire, incluant l'exposition aux restes humains. Les entrevues ont révélé que les membres des communautés concernées ont réagi en se montrant silencieux et stoïques. Certains des professionnelles et professionnels rencontrés considèrent ce silence comme une preuve de résistance. La corrélation entre une catastrophe de grande envergure, le silence de la communauté, le faible niveau de comportements de recherche d'aide et le peu de réactions physiques au désastre soulève la question cruciale de déterminer s'il s'agit d'une démonstration de résistance ou d'une communauté qui souffre en silence.

REFERENCES

- Adams, P.R., & Adams, G.R. (1984). Mount Saint Helens's ashfall. Evidence for a disaster stress reaction. *American Psychologist*, 39(3), 252-260.
- American Psychiatric Association. Task Force on DSM-IV, & American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders: DSM-IV* (4th ed.). Washington, DC: Author.
- Bartone, P.T., Ursano, R.J., Wright, K.M., & Ingraham, L.H. (1989). The impact of a military air disaster on the health of assistance workers. A prospective study. *Journal of Nervous and Mental Disease*, 177(6), 317-328.
- Bravo, M., Rubio-Stipec, M., Canino, G.J., Woodbury, M.A., & Ribera, J.C. (1990). The psychological sequelae of disaster stress prospectively and retrospectively evaluated. *American Journal of Community Psychology*, 18(5), 661-680.
- Brooks, N., & McKinlay, W.W. (1992). Mental health consequences of the Lockerbie Disaster. *Journal of Traumatic Stress*, 5(4), 527-543.
- Carlier, I.V., & Gersons, B.P. (1997). Stress reactions in disaster victims following the Bijlmermeer plane crash. *Journal of Traumatic Stress*, 10(2), 329-335.
- Chung, M.C., Chung, C., & Easthope, Y. (2000). Traumatic stress and death anxiety among community residents exposed to an aircraft crash. *Death Studies*, 24(8), 689-704.
- Chung, M.C., Werrett, J., Farmer, S., Easthope, Y., & Chung, C. (2000). Responses to traumatic stress among community residents exposed to a train collision. *Stress Medicine*, 16(1), 17-25.
- Dembert, M.L. (January 6, 2000). *When disaster hits a community: National Centre for PTSD*

- and VA Readjustment Counseling monthly national teleconference. Available online at: <http://www.groupsinc.org/Events/clinicians/community.html>
- Dembert, M.L., & Simmer, E. (2000). When trauma affects a community: Group interventions and support after a disaster. In R.H. Klein & V.L. Schermer (Eds.), *Group psychotherapy for psychological trauma* (pp. 239-264). New York: The Guilford Press.
- Echterling, L.G., Wylie, M. (1999). In the public arena: Disaster as a socially constructed problem. In R.L. Gist, B. (Ed.), *Response to disaster: Psychosocial, community, and ecological Approaches* (pp. 327-346). Philadelphia: Brunner/Mazel.
- Folkman, S., & Lazarus, R.S. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behavior*, 21, 219-239.
- Gist, R., & Lubin, B. (1999). *Response to disaster: psychosocial, community, and ecological approaches*. Philadelphia, PA: Brunner/Mazel.
- Glaser, B. (1992). *Basics of grounded theory analysis: Emergence vs. forcing*. Mill Valley, CA: Sociology Press.
- Green, B.L., Lindy, J.D., Grace, M.C., Gleser, G.C., Leonard, A.C., Korol, M., & Winget, C. (1990). Buffalo Creek survivors in the second decade: Stability of stress symptoms. *American Journal of Orthopsychiatry*, 60(1), 43-54.
- Green, L.W., George, M.A., Daniel, M., Frankish, C.J., Herbert, C.J., Bowie, W.R., & O'Neill, M. (1995). *Study of participatory research in health promotion: Review and recommendations for the development of participatory research in health promotion in Canada by the Institute of Health Promotion Research, University of British Columbia & B.C. Consortium for Health Promotion*. Vancouver: Institute of Health Promotion Research, University of British Columbia.
- Kessler, R.C. (2000). Posttraumatic stress disorder: the burden to the individual and to society. *Journal of Clinical Psychiatry*, 61(Suppl 5), 4-12; discussion 13-14.
- Lyons, R.F., Mickelson, K.D., Sullivan, M.J.L., & Coyne, J.C. (1998). Coping as a communal process. *Journal of Social and Personal Relationships*, 15(5), 579-605.
- McFarlane, A.C. (1996). Resilience, vulnerability, and the course of posttraumatic reactions. In B.A. Van der Kolk, A.C. McFarlane & L. Weisæth (Eds.), *Traumatic stress: The effects of overwhelming experience on mind, body, and society* (pp. 155-182). New York: Guilford Press.
- McFarlane, A.C. (2000). Posttraumatic stress disorder: a model of the longitudinal course and the role of risk factors. *Journal of Clinical Psychiatry*, 61(Suppl 5), 15-20; discussion 21-13.
- Mitchell, M. (1993). The role of the general practitioner in the aftermath of the Lockerbie disaster. In T. Newburn (Ed.), *Working with disaster: Social welfare interventions during and after tragedy* (pp. 84-94). Harlow, Essex: Longman.
- Mitchell, M. (1997). Community disasters: Help-seeking by community residents following the Lockerbie disaster. In D. Black, M. Newman, J. Harris-Hendricks, & G. Mezey (Eds.), *Psychological trauma. A developmental approach* (pp. 99-103). London, England: Gaskell.
- Mitchell, T., Stewart, S., Griffin, K., Loba, P. (2004) "We will never forget . . .": The Swissair Flight 111 disaster and its impact on volunteers and communities. *Journal of Health Psychology*, 9(2), 245-263.
- Norris, F.H., Friedman, M.J., Watson, P.J., Byrne, C.M., Diaz, E., & Kaniasty, K. (2002). 60,000 disaster victims speak, Part I: An empirical review of the empirical literature, 1981-2001. *Psychiatry*, 65, 207-239.
- Paton, D. (1997). Communities and disasters: Integrating psychological, economic and political intervention. In G.M. Habermann (Ed.), *Looking back and moving forward: 50 years of New Zealand psychology* (pp. 179-186). Wellington, NZ: New Zealand Psychological Society.
- Raphael, B. (1986a). Impact and immediate aftermath. In B. Raphael (Ed.), *When disaster strikes: How individuals and communities cope with catastrophe* (pp. 55-77). New York: Basic Books.
- Raphael, B. (1986b). The problems of mental health and adjustment. In B. Raphael (Ed.), *When disaster strikes: How individuals and communities cope with catastrophe* (pp. 179-221). New York: Basic Books.
- Raphael, B. (1986c). *When disaster strikes: How individuals and communities cope with catastrophe*. New York: Basic Books.
- Richards, L. (1999). *Using NVivo in qualitative research*. Thousand Oaks, CA: Sage.

- Salter, D. (1991). Lockerbie and after: An examination of the myths and metaphors of managers and workers in the disaster. In C. Newnes (Ed.), *Death, dying and society* (pp. 311-321). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Sowder, B.J. (Ed.). (1985). *Disasters and mental health: Selected contemporary perspectives*. Rockville, MD: Center for Mental Health Studies of Emergencies, National Institutes of Mental Health.
- Stewart, S.H. (1996). Alcohol abuse in individuals exposed to trauma: a critical review. *Psychology Bulletin*, 120(1), 83-112.
- Taylor, A.J., & Frazer, A.G. (1982). The stress of post-disaster body handling and victim identification work. *Journal of Human Stress*, 8(4), 4-12.
- Ursano, R.J., & McCarroll, J.E. (1990). The nature of a traumatic stressor: handling dead bodies. *Journal of Nervous and Mental Disease*, 178(6), 396-398.
- Wright, K.M., & Bartone, P.T. (1994). Community responses to disaster: the Gander plane crash. In R.J. Ursano, B.G. McCaughey, & C.S. Fullerton (Eds.), *Individual and community response to trauma and disaster: The structure of human chaos* (pp. 267-284). Cambridge: Cambridge University Press.
- Yates, S., Axson, D., Bickman, L., & Howe, G. (1989). Factors influencing help seeking for mental health problems after disasters. In R. Gist & B. Lubin (Eds.), *Psychosocial aspects of disaster* (pp. 163-189). New York: Wiley.
- Yehuda, R., McFarlane, A.C., & Shalev, A.Y. (1998). Predicting the development of post-traumatic stress disorder from the acute response to a traumatic event. *Biological Psychiatry*, 44(12), 1305-1313.