

- 2 Kellert SR, Wilson EO. *The biophilia hypothesis*. Washington DC: Island Press, 1993:180.
- 3 Fromm E. *The anatomy of human destructiveness*. New York: Holt, Rinehart & Winston:366.
- 4 Lorenz K. Die acht Todstünden der zivilisierten Menschheit. Munich: Piper, 1973:15-142.
- 5 Gelder M, Mayou R, Cowen P, eds. *Oxford textbook of psychiatry*. Oxford University Press, 1996:211-7.
- 6 World Health Organization. *The ICD-10 classification of mental and behavioural disorders: diagnostic criteria for research*. Geneva: WHO, 1993.
- 7 Hamilton M. Development of a rating scale for primary depressive illness. *Br J Soc Clin Psychol* 1976;6:278-96.
- 8 Zung WWK. A rating instrument for anxiety disorders. *Psychosomatics* 1971;12:371-9.
- 9 Beck AT, Ward CH, Mendelson M, Erbaugh J. An inventory of measuring depression. *Arch Gen Psychiatry* 1961;4:53-63.
- 10 American Psychiatric Association. Handbook of psychiatric measures. *Am J Psychiatry* 2000;515-89.
- 11 Ulrich RS, Simons RF, Losito BD, Fiorito E, Miles MA, Zelson M. Stress recovery during exposure to normal and urban environments. *J Environ Psychol* 1991;11:201-230.
- 12 Blehar MC, Rosenthal NE. Seasonal affective disorders and phototherapy: report of the National Institute of Mental Health-sponsored workshop. *Arch Gen Psychiatry* 1989;46:469-74.
- 13 Levine B. Use of hydrotherapy in reduction of anxiety. *Psychol Rep* 1984;55:526.

(Accepted 27 June 2005)

Psychosocial effects of the 2001 UK foot and mouth disease epidemic in a rural population: qualitative diary based study

Maggie Mort, Ian Convery, Josephine Baxter, Cathy Bailey

Institute for Health Research, Lancaster University, Lancaster LA1 4YT
Maggie Mort
senior lecturer

Josephine Baxter
research associate

University of Central Lancashire
Ian Convery
lecturer in human geography

International Centre for the Uplands, Lancaster University
Cathy Bailey
research officer

Correspondence to:
M Mort
m.mort@lancaster.ac.uk

BMJ 2005;331:1234-7

Abstract

Objectives To understand the health and social consequences of the 2001 foot and mouth disease epidemic for a rural population.

Design Longitudinal qualitative analysis.

Setting North Cumbria, the worst affected area in Britain.

Sample Purposive sample of 54 respondents divided into six demographically balanced rural occupational and population groups.

Main outcome measures 3071 weekly diaries contributed over 18 months; 72 semistructured interviews (with the 54 diarists and 18 others); 12 group discussions with diarists

Results The disease epidemic was a human tragedy, not just an animal one. Respondents' reports showed that life after the foot and mouth disease epidemic was accompanied by distress, feelings of bereavement, fear of a new disaster, loss of trust in authority and systems of control, and the undermining of the value of local knowledge. Distress was experienced across diverse groups well beyond the farming community. Many of these effects continued to feature in the diaries throughout the 18 month period.

Conclusions The use of a rural citizens' panel allowed data capture from a wide spectrum of the rural population and showed that a greater number of workers and residents had traumatic experiences than has previously been reported. Recommendations for future disaster management include joint service reviews of what counts as a disaster, regular NHS and voluntary sector sharing of intelligence, debriefing and peer support for front line workers, increased community involvement in disposal site or disaster management, and wider, more flexible access to regeneration funding and rural health outreach work.

Introduction

The United Kingdom's foot and mouth disease epidemic in 2001 has been described as the most serious to occur in a country previously free of the

disease.^{1 2} Between 6.5 million and 10 million animals were slaughtered across the UK, and in north Cumbria 893 farms had confirmed infected cases, with a further 1934 having culls of livestock, representing 70% of farms.^{3 4} Restrictions on public rights of way and advice to stay away from the countryside led to a collapse in tourist numbers and loss of recreational use of the landscape for a year.⁵

Crucially, because the epidemic was treated as an animal problem, it was held to be something affecting farmers, ignoring the large numbers of other occupations and residents drawn into the crisis. Healthcare services in north Cumbria and other severely affected areas did not record any significant increase in demand during the epidemic and subsequent months, which was taken to mean that the health and social effects of the disaster were not significant.

Voluntary local helplines and rural support groups, however, were besieged with appeals for help: "health" during the crisis was more about survival and practical support than medical interventions. This apparent contradiction called for a qualitative study that could capture evidence about the impact of the disaster and processes of recovery from "on the ground" accounts collected over time.

Methods

Study design

This large qualitative ethnographic study recruited "lay experts" whose experiential contribution to knowledge is often overlooked. With the help of a multi-agency steering group (see bmj.com), we drew up a rural citizens' panel with a demographic and occupational sampling frame. The panel of 54 respondents was pur-

 Details of the study's multi-agency steering group, respondents, and development of the major analytical themes appear on bmj.com


 This is the abridged version of an article that was posted on bmj.com on 7 October 2005: <http://bmj.com/cgi/doi/10.1136/bmj.38603.375856.68>

Table 1 Occupational and residential groups included in the rural citizens' panel, and their study data

Group No	Members	Study data		
		Group discussions	Interviews	Weekly diaries
1	Farmers, farm workers, and their families	2	9	601
2	Small businesses, to include tourism, arts and crafts, retail, and others	2	8	394
3	Related agricultural workers, to include livestock hauliers, agricultural contractors, and auction market staff	2	9	576
4	Front line clean-up workers and managers (from DEFRA or Environment Agency), slaughter teams (temporary, seconded, and permanent staff)	2	7	380
5	Community, such as teachers, clergy, residents near disposal sites	2	9	533
6	Health professionals, such as general practitioners, community nurses, and vets	2	9	587

DEFRA=Department for Environment, Food, and Rural Affairs.

Table 2 Process of analysis (medium and long term effects developed from the codes)

Effects	Health consequences	Social consequences
Medium term	Deterioration in chronic conditions and diseases due to disruption in personal routines and access to health services Sleep disruption, flashbacks, nightmares, uncontrollable emotion, loss of concentration Reported effects of pyres—headaches, respiratory problems, nausea, loss of physical exercise and recreation for a year	Loss of amenity and recreation Tensions and conflict within communities Increased social isolation
Longer term	Sharp increase in anxiety across different occupational groups Loss of confidence leading to longer term stress Ongoing health fears of residents living near carcass disposal sites Increased number of injuries relating to handling new livestock Workplace health: risks and hazards (short term) plus change and uncertainty (longer term) leading to increased number of injuries	Communities experiencing permanent changes in land use Loss of confidence in ability of organisations to control crises Loss of trust in governance and decision making bodies Uncertainty, confusion, and lack of continuity in public life Bitterness (collective and individual) linked to lack of resolution of pain and suffering Increased sense of fragility in employment

positively sampled from six groupings identified as affected in the disease outbreak (table 1).

We developed detailed group descriptors based on age, sex, location, and occupational subsector, and forwarded these to an independent professional recruiter. Respondents' identities were released to the research team once we were satisfied that the descriptors had been matched. The primary means of data collection was a specially designed diary which began with simple questions about health and quality of life, followed by a space for free text entries. This latter section became the most frequently used space, with respondents writing between half a page and six pages each week. No explicit questions were asked about the epidemic as it was important for accounts to be led by respondents. A major advantage of diary studies is that they bring the task of data collection into the respondents' everyday world.⁶⁻⁸

Initially, six group meetings were held to explain the purpose of the study. Each respondent also gave an in depth interview. Group meetings were reconvened at the close of diary writing, to offer feedback and gain validation of the emerging analysis (table 1).

Box 1: Altered lifescapes

"The silence, no it gets sad sometimes when you're in here ... To be in here for a whole year, every day to see nobody ... You begin to hate the place, you being to hate the thing you love"—Craftsman, small business, January 2002

"The self imposed isolation of not sending kids to school etc ... to go against the flow is very difficult ... They were not allowed to leave the house for three months. They just viewed this as a punishment imposed because they refused to let their hefted flock be culled"—Vet, March 2002

"They [schoolchildren] didn't like their farms, they didn't like their homes ... they'd say things like, 'It's spooky, there's no noise'"—Primary schoolteacher, February 2002

Participants

The panel of 54 respondents was recruited between October and November 2001 (see bmj.com), with the first group meeting held in December, before the declaration of virus-free status and lifting of movement restrictions. The disease had run from 20 February that year through to 30 September. All first round meetings were highly charged; many of those in group 1 had hardly left their farms or workplaces for nine months and, though they made many harrowing contributions, were clearly relieved to meet with their peers.

Diary writing began in the week of 21 December and continued over the next 18 months. Just three respondents discontinued. Periods of "holiday" from diary writing were negotiated, and the total number of

Box 2: Trauma and recovery

"Taking my daughter and her friend home [from a show in Carlisle]. It was the same evening that her father's pedigree sheep were being taken to the voluntary cull. By mistake, I took them through a closed road, the sign having fallen down to the side of the grass. In the dark we went past a burning pyre only yards from the hedge separating the road and the field. We could see the charred, rigid bodies of the cows and the sparks from the fire and the smell permeating the air and the silence of the two young girls"—Community nurse, June 2003

"I'll never be able to look at a cow or a sheep again without seeing blood pouring out of the hole in its head, ... maybe I will in time. ... I walked, walking along the pier one night ... I did actually think about jumping in ... I felt so bad about myself"—Seconded government agency field officer, February 2002

"Anything we do this weekend will be better than last year. A couple of sleepless nights as the memories come back"—Auction mart worker and farmer, April 2002

A year later (2003) she wrote: "Don't look forward to this week in the end of April. 27-28th April 2001 has awful memories"—April 2003

Box 3: Trust in governance

“The week we lost all our animals to foot and mouth was the longest week ever. On the fourth day they came for some [dead stock] ... The driver they sent hadn't been on a machine like that for 9 years. He didn't come back. The next day they didn't come until late afternoon. There was no driver for the telescope handler. ... We didn't see anyone for 2 days. I kept phoning to see what was happening. They kept saying there were no lorries. The army liaison officer kept coming out to see us. We were bothered about our next door neighbours, because they could see the [dead] cows beside the wall, they looked out onto them. The wall was cracking with the weight of the cows. On the 7th day they came”—Farmer, April 2002

“What is being tested for in the surrounding streams? What exactly is classed as a danger? And if problems did arise, how would they be monitored and resolved? All these issues do tend to make you anxious”—Resident near disposal site, March 2002

Box 4: Knowledge and place

“G's 1st birthday ... Feel very glad I bought the video camera because, after the last year on [foot and mouth disease], I feel as if I've missed out on him growing in his first year of life, which makes me feel sad”—Livestock professional, April 2002

“Knowledge is passed down generations, it's not learned by somebody coming from nowhere into an office and reading a textbook”—Agricultural related business, June 2003

weekly diaries collected (at monthly visits to the diarists) was 3071. A small fee was paid on collection of the diaries. Respondents showed strong commitment to the research.

Analysis

All interviews and group meetings were transcribed from audiotape; diaries were transcribed from the original (usually hand written) format. After individual researchers had read and annotated the material, all four researchers held eight “data clinics” to identify emerging themes, using a constant comparative approach. Respondent validation of codes and themes was carried out at six subsequent group meetings.

Results

Table 2 outlines the health and social consequences identified from the data. These were neither discrete

nor mutually exclusive. We identified four major analytical themes (see bmj.com for details).

Altered lifescapes represents the cluster of responses that concern the disturbed relation between health and place; the changed significance of everyday places and spaces previously taken for granted in respondents' lives. Such places were radically altered during the disease crisis (see box 1).

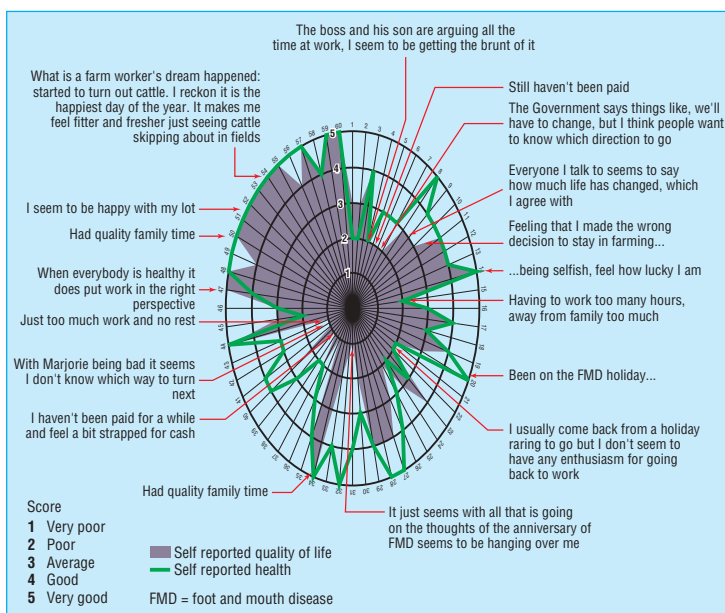
Trauma and recovery groups the large body of data referring to distress, anguish, horror, and re-traumatisation but also endurance and sources of support articulated by respondents. Our definition of trauma within this context encompasses both the events and how those events were experienced by individuals and communities. Trauma is associated with the inability to fight or flee—that is, being trapped in the stressful environment and unable to take control over one's place relative to events (box 2).

Trust in governance reflects the data relating to chaos, loss of personal security, and powerlessness in the face of conflicting advice (box 3).

Knowledge and place covers the body of material concerning a “gap” between different kinds of knowledge—proximal knowledge derived from local experience and centralised or distal knowledge. For example, organisational directives were perceived to be stripped of context, unable to adapt to what was happening “on the ground,” and unable to mobilise stocks of local expertise. This theme also includes disruption and loss of participation in important life events such as funerals or births (box 4).

Discussion

The study shows that life after the foot and mouth disease epidemic has been accompanied by distress, feelings of bereavement, fear of a new disaster, loss of trust in authority and systems of control, and by the undermining of the value of local knowledge. Reactions among those caught up in the epidemic were exacerbated by diverse factors—influence of location on business recovery, the burden of dealing with new regulations that demanded cultural change, fear of the epidemic returning, and stress of living with uncertainty. Suffering was also alleviated by sources of strength such as support networks (formal and informal) drawn on to cope with both traumatic experience and severe practical difficulties. This ambiguity is supported by other studies of disasters,⁹⁻¹² and implies that statutory and voluntary organisations have a more complex and enduring role after a disaster than has been understood. People who have experienced a disaster may not be sick as a result, but they need care-



Example of a respondent's (a farm worker) diary data “mapped” from December 2001 to May 2003

Box 5: Hidden effects

"I'm sure that if an audit of the medical and nursing registers were undertaken for that period, there would be little evidence of any increased formal counselling. This wasn't because it didn't happen, but because it became the norm. But what happened to all that stress and tension? Some people may have resolved their experiences, but I feel, for the majority, it was put on to the back burner and gradually buried in the day to day realities of living ... The effect of the stress of that period will remain undocumented and unappreciated as it will be hard to allocate blame to one specific time frame"—Community nurse, contribution to feedback conference October 2003

ful support to rebuild lives and regain confidence (box 5).

A defining feature of the foot and mouth disease epidemic was its long duration. In north Cumbria the "event" lasted 12 months, to be followed by distressing anniversaries ever since. The figure shows how we "mapped" a respondent's reports of health and quality of life with his free text accounts of everyday events.

Conclusions

The distress caused by the epidemic shapes the context in which many rural health practitioners in the UK now work. Distress is not a medical problem, however, unless it becomes pathological. If it is treated it is counted. Otherwise sufferers are expected to recover using their own resources and networks.¹³

We argue for more flexibility in disaster planning and organisational emergency plans since such plans themselves carry further risks.¹⁴ We urge authorities and agencies involved in disaster management, care, and recovery to recognise the interrelationship between traumatic experience and agency responses, undertake joint service reviews of what counts as a disaster, facilitate sharing of intelligence between the statutory health and voluntary sectors, introduce opportunities for debriefing and peer support for front line workers, make rural health outreach initiatives eligible for regeneration funding, and increase community involvement in disposal site management.

We thank all the study respondents for their commitment and contributions, the project steering group members for invaluable guidance throughout the study, Tony Gatrell and Peter Tiplady for their helpful advice at the outset, Kai Erikson for his advice and support during the analysis phase, and Carl May and Tim Burnett for comments on earlier drafts of this paper.

Contributors: See bmj.com

Funding: This study was undertaken by the Institute for Health Research, Lancaster University, which received funding from the Department of Health. The views expressed in the study are those of the authors and not necessarily those of the Department of Health.

Competing interests: None declared.

Ethical approval: The study was approved by both East and West Cumbria Local Research Ethics Committees.

- 1 Cumbria Foot & Mouth Disease Inquiry. *Inquiry report*. Carlisle: Cumbria County Council, 2002.
- 2 Anderson I. *Foot and mouth disease 2001: lessons to be learned inquiry*. London: Stationery Office, 2002.
- 3 National Audit Office. *The 2001 outbreak of foot and mouth disease*. London: Stationery Office, 2002 (www.nao.gov.uk/publications/nao_reports/01-02/0102939.pdf).

What is already known on this topic

The 2001 foot and mouth disease epidemic caused widespread disruption and closure of much of the British countryside for more than a year

Government sponsored inquiries concentrated on agricultural and organisational issues; academic studies on economic or rural policy issues. Little is known about the human cost of the disaster

What this study adds

The epidemic was a human tragedy, not just an animal one

Longitudinal ethnographic study shows the profound psychosocial effects of the disaster among a wide range of rural workers and residents that would not be revealed by more traditional biomedical or health research methods

After such a disaster, the responses required of health and social care services are more complex and enduring than the initial assessments based on service demand and clinical evidence may suggest

- 4 European Parliament Temporary Committee on Foot-and-Mouth, PE 322.219. European Parliament resolution on measures to control foot-and-mouth disease in the European Union in 2001 and future measures to prevent and control animal diseases in the European Union. European Parliament, 2002. (Report No 2002/2153(INI), P5_TA-PROV (2002) 0614.)
- 5 Campbell D, Lee R. "Carnage by computer": the blackboard economics of the 2001 foot and mouth epidemic. *Social Legal Studies* 2003;12:425-59.
- 6 Elliot H. The use of diaries in sociological research on health experience. *Sociological Research Online* 1997;2. Available from www.socresonline.org.uk/socresonline/2/2/7.html.
- 7 Verbrugge LM. Health diaries. *Med Care* 1980;18:73-95.
- 8 Jones RK. The unsolicited diary as a qualitative research tool for advanced research capacity in the field of health and research. *Qual Health Res* 2000;10:555-67.
- 9 Erikson K. *In the wake of the flood*. London: Allen & Unwin.
- 10 Erikson K. *A new species of trouble*. New York: W W Norton, 1994.
- 11 McMillen J, Smith E, Fisher R. Perceived benefit and mental health after three types of disaster. *J Consult Clin Psychol* 1997;65:733-9.
- 12 McLean I, Johns M. *Aberfan: government and disasters*. Cardiff: Welsh Academic Press, 2000.
- 13 Morse J. Innovative inquiry [editorial]. *Qual Health Res* 2003;13:447-8.
- 14 Perrow C. *Normal accidents*. Princeton: Princeton University Press, 2003. (Accepted 11 August 2005)

doi 10.1136/bmj.38603.375856.68

*Endpiece***The dunghills of Glasgow in 1839**

I have seen human degradation in some of its worse phases, both in England and abroad, but I can advisedly say, that I do not believe, until I visited the wynds of Glasgow, that so large an amount of filth, crime, misery, and disease existed on one spot in any civilised country. The wynds consist of long lanes, so narrow that a cart could with difficulty pass along them; out of these open the "closes" which are courts about fifteen or twenty feet square, round which the houses, mostly of three storeys high, are built; the centre of the court is the dunghill, which probably is the most lucrative part of the estate to the laird in most instances, and which it would consequently be esteemed an invasion of rights of property to remove.

Maver I. *Glasgow*. Keele: University Press, 2000: 85-6

Submitted by Jeremy Hugh Baron, honorary professorial lecturer, Mount Sinai School of Medicine, New York