

Foot and mouth outbreak: lessons for mental health services

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Abstract The 2001 foot and mouth disease outbreak in the UK was widespread and devastating. Some areas (e.g. Cumbria) were very badly hit, but all farmers were affected to some degree. Huge numbers of animals, infected and healthy, were slaughtered. Tourism was badly affected. Data from three systematic studies found elevated levels of psychological morbidity among farmers and other rural workers, especially those directly affected. Most farmers turned to family and friends (and veterinary surgeons) for support; relatively few approached health or social services, mainly because they did not see their reactions as illness. Many farmers and other rural workers prefer to use supports within their own community, or anonymous supports such as self-help materials or computer-based treatments. Mental health services should take account of these preferences by adopting an educational and consultative role in any similar outbreak.

The outbreak of foot and mouth disease in 2001 affected many parts of the UK. It began in Essex and rapidly spread. Cumbria, Devon, and Dumfries and Galloway were the worst affected counties; the only large rural areas to be free of the disease were central and northern Scotland. The speed and breadth of the spread were notable, caused in part by the common practice of transporting animals over long distances to distant farms, auctions and abattoirs.

The epidemic started in February and reached a peak in March and April. The last new case was reported in October, and 'disease-free' status for the UK was regained in January 2002. Over 2000 farms directly experienced the disease. Farms without direct experience were also badly affected; within a few days of the outbreak, severe restrictions on the movement of all farm animals (infected and healthy) were imposed. Farmers were obliged to leave their livestock in fields or indoors under increasingly unhealthy conditions, it was often difficult to obtain feed deliveries and there were numerous livestock deaths as a consequence.

Dealing with the outbreak

The official government response to the outbreak was to order the slaughter of all infected animals. In mid-March this slaughter policy was extended to neighbouring unaffected farms ('contiguous culling') and to situations of 'dangerous contacts' involving all animals that might have been in any kind of contact with the infection. According to official figures

4 000 000 animals were slaughtered, but other estimates put the figure as high as 10 000 000. They were chiefly cattle and sheep, but pigs, goats and deer were also killed. The effects of the slaughter were highly visible, with dead animals lying in fields and huge funeral pyres across the countryside. Animals were slaughtered at nearly 10 000 farms. Travel to and from farms was also restricted, isolating farmers and their families, preventing children from attending school, and interfering with the effective delivery of health and other services (e.g. Walsh & Howkins, 2002). The rapid spread of the disease reduced the effectiveness of these measures.

Veterinary surgeons were employed in large numbers during the outbreak. Many private practitioners were enrolled as temporary workers for the State Veterinary Service and others were recruited from abroad. Their main function was to test suspect cases, and they were therefore involved in making decisions that would result in the deaths of large numbers of animals, some of which were healthy but had to be slaughtered as part of the preventive culling policy. Many veterinary surgeons participated in, or were witness to, large-scale slaughter, in marked contrast to their normal professional role of safeguarding animal welfare.

Economic consequences

The restrictions on movement had major economic consequences. Many farmers (about one-third: Peck *et al*, 2002) supplement their livelihoods through other

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income-generating activities such as tourism and haulage; this additional income rapidly ceased. Many parts of the British countryside were virtually closed by these and other official restrictions, discouraging walkers, cyclists and other holidaymakers. There were unavoidable and obtrusive signs of the culling throughout the countryside, which also deterred visitors. Thus, many rural communities suddenly lost income from their two main sources, agriculture and tourism, with knock-on effects for public transport, agricultural suppliers, catering and other local industries. Some urban areas also suffered, with the closure of zoos and nearby country parks. The economic costs of the outbreak were high. Thompson *et al* (2002) estimated that the losses for agriculture and the food industry were over £3 000 000 000, with similar levels of loss for the tourist industry. It has been argued that tourism was economically more adversely affected than agriculture: farming received compensation for losses, but tourism did not.

Farming hardships before the outbreak

Before the 2001 outbreak of foot and mouth disease, British farming, especially livestock farming, was in a parlous state (Box 1). Previous diseases that had damaged the industry included bovine spongiform encephalopathy (BSE) and swine fever. Moreover, the prices of agricultural products, especially meat and dairy, had dropped markedly in recent years. Incomes were therefore very low, especially in upland sheep-farming areas, where the average annual salary in 2001 was about £6000. Nearly a third of upland farmers had net incomes of less than zero. Many farmers also had large debts, on average £50 000. Bureaucratic procedures, especially the requirement to complete numerous official forms, were major additional stressors. Not surprisingly, farmers began to leave the industry: about 5% of the workforce had left in 1999/2000 alone. Many farmers regard farming as a way of life rather than just a job, and for them giving up farming would be particularly deleterious

Box 1 The state of agriculture before the outbreak

- Diseases that had affected farming in the recent past included BSE and swine fever
- Incomes were very low, especially for upland livestock farmers
- Debts were common and high
- Many farmers were leaving the job
- Suicide rates for farmers and for veterinary surgeons were high

to mental health. Moreover, in farming, houses are often 'tied' to the job; therefore leaving farming could be highly disruptive to daily life.

Mental health of agricultural workers

The mental health of farmers had been investigated before the outbreak of foot and mouth disease by Thomas *et al* (2003). At that time, only 6% of farmers reported clinically important psychological morbidity, less than in the general population. Similar low figures for overall psychological morbidity in rural areas before the outbreak had been reported by Paykel *et al* (2000). Paradoxically, however, Thomas *et al* did note that farmers were more likely to feel that life was not worth living. This is consistent with the high rate of suicide among farmers; interestingly, veterinary surgeons also have high suicide rates (Hawton *et al*, 1998).

In summary, the foot and mouth disease outbreak had devastating economic and social consequences on rural communities; farmers suffered the most, but there were also major consequences for related agricultural industries, other rural professions and tourism (Box 2).

The psychological sequelae of the outbreak

Several reports published in the immediate aftermath of the outbreak commented on its adverse psychological impact (Deaville & Jones, 2001; Royal Society of Edinburgh, 2002), but the data were mainly anecdotal. A survey in one rural and one semi-rural area in England investigated the general public's views on the adverse effects of the disease outbreak; the stress and anxiety in rural communities were

Box 2 The foot and mouth outbreak

- Infections occurred in most areas of the UK, apart from central and northern Scotland
- The outbreak spread very rapidly, before preventive measures could fully take effect
- All farms, infected or not, were subject to strict restrictions on movement of animals and people
- At least four million animals were slaughtered, many of them healthy but killed in a preventive cull
- The countryside was virtually 'closed' for many months
- The outbreak cost farming at least £3 billion, with similar losses for tourism

Box 3 The psychological effects of the outbreak

- High rates of psychological morbidity were found in affected areas (73% caseness in Cumbria)
- These rates were higher than in unaffected areas (e.g. caseness in the Scottish Highlands was 33%), and were higher than before the outbreak
- Farmers were more badly affected than tourism workers
- The level of psychological morbidity in farmers was correlated with the degree of culling and restrictions
- The number of farmers who were considering leaving the job increased
- Little is known about the effects on other groups
- There was no increase in demand for mental health services in affected areas
- There was no detectable increase in the suicide rates for farmers or for veterinary surgeons
- Typically, farmers turned to family, friends and veterinary surgeons for support
- Few farmers or veterinary surgeons construed their emotional response to the outbreak as an 'illness', and most would be reluctant to seek support through health or social services in any future outbreak
- The most acceptable sources of support would be from within the agricultural community itself, or from more anonymous sources such as printed or internet advice

rated as important as the impact on animal welfare or on the future of rural communities (Poortinga *et al*, 2004).

It appears that only three systematic studies of the effects of the outbreak on farmers and other rural workers have been conducted (Peck *et al*, 2002; Hannay & Jones, 2002; Institute for Health Research, 2004), although statistical data are available from national databases. Box 3 summarises results from these sources, which are described in more detail below.

Systematic studies**Comparing farmers in infected and non-infected areas**

My colleagues and I conducted a postal survey comparing the psychological morbidity of farmers in Cumbria (many cases of foot and mouth disease) with farmers in the Highlands of Scotland (no cases) (Peck *et al*, 2002). Questionnaires were posted in January and February 2002, within a few months of the end of the outbreak: 400 were sent in Cumbria, of which 118 were returned; 285 were sent in the Highlands, of which 80 were returned. Comparing the two areas was intended to control, at least in part, for the pre-outbreak levels of psychological morbidity experienced in the general farming community, as discussed above. Morbidity was measured by the 12-item General Health Questionnaire (GHQ-12), using a cut-off score of 4. In brief, high morbidity was found in both areas (73% in Cumbria and 33% in the Highlands), levels well above the 10% or less found in pre-outbreak studies (Paykel *et al*, 2000; Thomas *et al*, 2003). Differences between pre- and post-outbreak studies must be interpreted cautiously because different case

detection instruments were used. Nevertheless, it would appear that outbreak of the disease produced substantially higher levels of morbidity among farmers, compared with levels before the disease, and that more than twice as many farmers in areas with many cases suffered psychological morbidity, compared with farmers in areas with no cases.

Farmers were also asked to state, on a specially devised questionnaire, to whom they had turned for personal support during the foot and mouth crisis. Not surprisingly, most (about two-thirds) turned to family, friends and other farmers. Of particular interest, the next most-cited group who were approached to provide personal (emotional) support was veterinary surgeons (40%). This probably reflects the friendships that develop between farmers and veterinary surgeons over the years, but may also be because they were one of the few groups allowed to travel around the farms during the outbreak. The National Farmers' Union and other farming organisations were cited by about 20%. General practitioners (11%), ministers of religion (13%) and the Samaritans (1%) were less frequently cited. Of particular importance, only 1.5% of the farmers sought support from a mental health specialist (psychiatrist, psychologist, social worker or community psychiatric nurse). One-quarter of farmers considered that visits from health or social work authorities would have been 'not helpful' or 'harmful'; only 13% said that they would have welcomed such visits. More would have been willing to attend farmers' self-help groups (38%), read printed advice sent to all farmers (45%), or use telephone and internet helplines (25%).

Unfortunately, the response rate in our study was low (29%) in both areas, and this may cast doubt on the validity of the findings. However, we compared the farm characteristics (number and kinds of livestock, acreage and percentage infected) of

responding and non-responding farmers, and no significant differences were revealed. It is likely, therefore, that the obtained sample was representative of farmers in general in the two areas studied.

Comparing farmers and tourism workers in an affected area

Hannay & Jones (2002) conducted a similar postal survey in Dumfries and Galloway, the only area in Scotland badly affected by the disease. The tourist industry as well as farmers were targeted; the response rates were 30% for tourism and 40% for farmers, producing a total sample of nearly 1200 respondents. They used the COOP/WONCA functional health status charts. These charts contain a pictorial and verbal representation of six scales (feelings, daily activities, overall health, social activities, social support and quality of life) and respondents are asked to rate these items on a 5-point scale. The charts do not use cut-off scores. The charts were completed in June and September 2001. Respondents were asked to relate their responses to the first 2 weeks after their animals had been culled; those who had not directly experienced a cull (and the tourism respondents) were asked to relate them to the 2 weeks preceding chart completion.

The main findings were that, on all six sub-scales, both farmers and tourism workers had scores indicating that they were badly affected by the outbreak. In addition, farmers experienced significantly more adverse effects than tourism workers, and the scores of both samples were high in relation to international comparative data.

The authors also asked respondents from whom they had received support during the crisis. The responses paralleled those that my colleagues and I received (Peck *et al*, 2002), in that family and friends were most frequently cited (about 14%) and few (4%) cited their general practitioners. The scores on the charts were correlated with the degree of culling and animal restrictions experienced. However, in contrast to our study, very few cited veterinary surgeons as providing support (1%), and the overall level of receiving support from family and friends was considerably lower (67% *v.* 14%). The reasons for these differences are not clear, but they may reflect the wording of the questions, or the time span over which emotional state was assessed. Moreover, Hannay & Jones did not present the data on support-seeking for tourism and for farming separately; accordingly, the support-seeking rates for farming may have been diluted by combining them with data from tourism, which was not as badly affected in Dumfries and Galloway as in other regions of the UK.

A qualitative general population study in an affected area

This small study by the Institute for Health Research (2004) used a purposive sample comprising a panel of 54 residents of Cumbria; of these, nine were farmers, four were veterinary workers and the remainder worked in tourism, transport and a variety of other jobs. Each participant kept a weekly diary, and most (52) also agreed to an in-depth interview; group meetings were also held. The panel's participation began in December 2001 and continued for 18 months. Sixteen participants reported health, financial or social problems directly attributable to the outbreak, 24 had feelings of anxiety and stress that were not being addressed, 11 reported signs of post-traumatic experience and 6 were receiving medical treatment for depression or anxiety. The Institute for Health Research also highlighted the theme of 'collective trauma', or a shared sense of shock, hardship and endurance among the participants; this sense of sharing may have functioned as a supportive mechanism in the affected communities. Most participants did not construe their adverse emotional reactions to the outbreak as an illness that required specialist input.

Finally, the authors noted that participants frequently commented on the highly useful role played by local radio during the crisis, in terms of local knowledge, trustworthiness, up-to-date information and rendering official advice more understandable. My colleagues and I noted similar laudatory comments about local radio from their Cumbrian respondents (Peck *et al*, 2002).

Lack of research on other groups

Not surprisingly, the above studies focused mainly on the effects of the foot and mouth disease outbreak on farming and/or on tourism. Several other groups were potentially affected to a similar degree, but little is known about its effects in these groups. Veterinary surgeons in particular probably suffered greatly during and after the crisis. Not only were they directly involved in the slaughter, but many also experienced the burden of providing emotional support for distressed farmers, a role for which they have little or no training. Unfortunately, no research studies have directly addressed the consequences of the outbreak for veterinary surgeons.

Statistical information from other sources

Public health departments

The Public Health Department of North Cumbria Primary Care Trusts collated data on changes in the demand for services in response to the foot and

mouth outbreak. No noticeable increase was observed in the demand for mental health services during, or in the aftermath of, the outbreak (C. Gregson, personal communication, 2005). This is consistent with the finding of my team (Peck *et al.*, 2002) and of the Institute for Health Research (2004) that most farmers did not see the emotional stresses arising from the foot and mouth disease outbreak as being a health problem; they were therefore unlikely to approach their general practitioner or other health workers to seek personal support, at least in the first instance. This is also consistent with Boulanger *et al.*'s (1999) report of evidence supporting the stereotype that farmers do not want to be seen as 'weak' by seeking psychological support.

Office for National Statistics

The Office for National Statistics (ONS) gathers data on the overall number of deaths (and of these, how many were due to suicide and death 'of undetermined intent') for occupations related to 'farming activity' and veterinary work. In the 3 years preceding the foot and mouth outbreak (1998, 1999 and 2000) the mean number of suicides and deaths of undetermined intent per 1000 deaths for agricultural workers (including veterinary workers) was 28.7. In the years during and after the outbreak (2001, 2002 and 2003) the mean was 26.4. This slight decrease remained after the data-sets for farm workers and veterinary workers were examined separately (F. Van Galen, Health & Care Division of the Office for National Statistics, personal communication, 2005).

There was therefore a slight reduction in such deaths during and after the outbreak. Moreover, in 2002 there was a sudden dip to a mean of 21.1. This is surprising, in that the adverse effects of exposure to traumatic events might have been expected to reach a peak in the year after the outbreak because of the well-documented latency period of up to several months between exposure to trauma and the development of post-traumatic stress reactions (Freeman, 1998). The decrease might reflect the effects of mutual support in rural communities in the face of the collective trauma described by the Institute for Health Research (2004). Whatever the explanation, the ONS data are consistent with those of the Public Health Department of North Cumbria Primary Care Trust (C. Gregson, personal communication, 2005), which found no increase in demand for services as a result of the foot and mouth disease outbreak. However, it is important to continue to monitor the situation in all affected areas, in case of substantial delays in the appearance of health consequences.

Department for Environment, Food and Rural Affairs

The Department for Environment, Food and Rural Affairs (2002) conducted a survey of the effects of the outbreak in England. They were chiefly concerned with what changes in farming practice were likely to occur in the years after the outbreak. Mental health issues were not directly addressed, but some indirect indications of related stresses may be discerned in that about 13% of farmers on small-to-medium premises were definitely or possibly planning to move out of farming; however, those on large farms were only half as likely to be considering a move out (6%). It is interesting to compare these figures with the 5% of the workforce who left farming in 1999/2000. Many other farmers were planning to stay on their premises, but to diversify into non-farming ventures such as holiday lets and sporting activities.

British Veterinary Association's Vet Helpline

The British Veterinary Association runs a telephone helpline for veterinary surgeons and their families. Vet Helpline does not offer formal counselling or therapy, but it provides a sympathetic listener and encouragement in problem-solving. Records are kept of the number of contacts received each month. These data are very variable and it is difficult to arrive at unequivocal conclusions. Nevertheless, in November and December 2000 (pre-outbreak) the numbers of contacts were 20 and 27, respectively; contacts rose to a mean of 29 during the first 3 months of the outbreak (February to April 2001), increasing to a peak mean of 40 for the period August to October 2001, by which time the preventive culling policy had been in operation for several months. By mid-2002 numbers had decreased to pre-outbreak levels, with occasional subsequent monthly rises that are difficult to explain (Vet Helpline, personal communication, 2005.) Despite the variability in these data (and the wide confidence intervals because of the small numbers), one can conclude that they are consistent with the view that veterinary surgeons tended to seek help from their own profession, rather than from health or social work agencies.

Implications for mental health services

Despite the high levels of psychological morbidity during and after the 2001 outbreak of foot and mouth disease, distressed individuals (especially the farmers) did not see their emotional reactions as a sign of illness, and did not therefore seek personal support through the channels of health or social services. This is entirely appropriate, in that most

emotional reactions to the outbreak should be seen as normal responses to a series of very distressing events, rather than as a medical disorder requiring specialist treatment. However, it should be pointed out that two of the systematic studies from which I have taken data (Hannay & Jones, 2002; Peck *et al.*, 2002) used only measures of symptoms, and neglected to address the issue of functional impairment. Consequently, one cannot establish whether any of the participants reached the threshold for adjustment disorder.

Most farmers sought help from family, friends and others working in the agricultural industry, especially veterinary surgeons. There was also an expressed willingness to use anonymised sources of support such as telephone or internet helplines; this is consistent with the documented reluctance of farmers to admit to, and seek help for, an emotional problem. In any future outbreak it is likely that similar patterns of help-seeking will occur.

Developing local support networks

It may be most fruitful to concentrate scarce specialist resources on maximising the effectiveness of the supports that farmers and others are known to be more likely to use. For example, mental health specialists might adopt an educational and consultative role for veterinary surgeons, farming organisations, self-help groups (at least in the early stages of their establishment) and local radio. Clearly, links between these agencies and mental health services should be initiated now, and not left until a crisis is underway. The consultation project might best be achieved under the aegis of local emergency planning, but the links may need to be developed separately. Veterinary surgeons will undoubtedly play an important personal support role in any similar future outbreak. But as noted, the teaching of counselling skills does not feature in their initial training nor in their CPD. Such teaching could profitably be introduced into the veterinary curriculum. In the meantime, mental health specialists should make contact with local veterinary surgeons and institute relevant training, which should be brief and uncomplicated.

Treating post-traumatic experiences

Technically, the reactions to the foot and mouth disease outbreak cannot be classified as post-traumatic stress disorder (PTSD), since there was no extreme trauma involving actual or threatened death or serious injury, and no single traumatic event. Nevertheless, the Institute for Health Research (2004) recorded 'post-traumatic experiences' such as flashbacks in 11 of their 54 participants. It is likely

that methods known to be effective in relieving PTSD would also be useful in a future similar outbreak. Fortunately, these methods are straightforward (although the evidence base is limited). Mollica *et al.* (2004) list them as 'psychological first aid, which consists of listening (not forcing talk), conveying compassion, ensuring basic needs, mobilising support from family members and significant others' (pp. 2060–2061); they comment that psychotropic drugs can be effective, and that 'group meetings and shared activities' may be more helpful than 'individual therapeutic provision' (p. 2062). They also advise against the use of stress debriefing. It would appear that these approaches were 'naturally' employed in the agricultural communities affected by the foot and mouth outbreak, and with a remarkable degree of success when one considers that there was no apparent increase in suicide or in mental health service utilisation during or after the outbreak. This may be seen as a heartening example of how communities can successfully develop their own ways of coping with horrendous events, without recourse to specialist services.

Specialist support

Although only a minority of farmers approached their general practitioners for support, a reasonable proportion (about 10%) still did so, and the organisation of services in any similar crisis should reflect this. On the other hand, how willing farmers would be to accept a traditional referral to a specialist service is unclear. For the few farmers who would accept more specialist support, computerised cognitive-behavioural therapy (CCBT) may be worth considering. There is now compelling evidence of its effectiveness for anxiety and depression (Kaltenthaler *et al.*, 2004), and mental health authorities should consider making CCBT available throughout their area. Of particular relevance to events such as the foot and mouth disease outbreak, CCBT can be used even if people are restricted to their farms and if they live in remote areas; furthermore, the method is anonymous and would therefore be more acceptable to many farmers.

Conclusions

Analysis of the psychological aftermath of the 2001 foot and mouth outbreak in the UK reveals a number of implications for mental health services (Box 4). Perhaps the most important lesson that we can learn from these is that mental health professionals can best respond to such disasters not by treatment after the event, but by pre-emptive community education and consultative support.

Box 4 Implications for mental health services

- Most people psychologically affected by the outbreak did not seek help from general practitioners or from specialist services
- Many farmers do not openly admit to emotional distress
- In any future similar crisis, high demand for specialist services should not be expected
- Specialists could make a greater contribution by working with and training those who are more likely to be asked for support, especially local veterinary surgeons
- Working closely with farming organisations and local radio would be helpful
- Printed, telephone and internet self-help advice should be available
- Computerised cognitive-behavioural therapy might help the minority who would accept more specialist support
- Reaction to the outbreak exemplifies how communities successfully develop their own ways of coping with a crisis

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MCQs

- 1 The 2001 foot and mouth disease outbreak:**
- affected only a few areas in the UK
 - led to restrictions on the movements of people as well as animals
 - had minimal effects on tourism
 - cost billions of pounds to farming and to tourism
 - lasted about 9 months.
- 2 Before the outbreak:**
- farming had no major crises
 - livestock farmers were financially well off
 - about 1 in 20 farmers were leaving farming per year
 - suicide rates among farmers were high
 - suicide rates among veterinary surgeons were high.
- 3 The effects of the outbreak included:**
- high levels of psychological morbidity among farmers
 - higher levels of morbidity among tourism workers than farmers
 - increased suicide rate among farmers
 - increased suicide rate among veterinary surgeons
 - no apparent increase in demand for mental health services.
- 4 Many farmers turned to the following for support during the outbreak:**
- general practitioners
 - mental health services
 - veterinary surgeons
 - farming organisations
 - ministers of religion.
- 5 In any similar crisis, mental health professionals should:**
- work in a consultative and educative way
 - visit farms to see if help is required
 - liaise with community organisations such as local radio
 - be involved in writing self-help materials for the farming community
 - prepare for a massive increase in referrals from GPs.

MCQ answers

1	2	3	4	5
a F	a F	a T	a F	a T
b T	b F	b F	b F	b F
c F	c T	c F	c T	c T
d T	d T	d F	d T	d T
e T	e T	e T	e F	e F