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ADAPTING TO FOOT AND MOUTH DISEASE IN SCOTLAND: BUSINESS REACTIONS

by

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Abstract

The paper focuses on two aspects of the 2001 foot and mouth disease outbreak in Scotland which have been largely ignored: First, business managers perceptions of the impact of FMD during and immediately after the outbreak, and second reactions to the outbreak in terms of action taken by businesses and advice sought. A panel survey of non-farm businesses conducted in April, June and September of 2001 is analysed to shed light on these issues. We find that even at the time, the vast majority of businesses did not report any real impact, although businesses in rural areas and in the tourism industry were more likely to feel some impact – either positive or negative. We show that business managers appeared to favour private sources of advice, although some public sources were found to be very useful, and that some actions, such as increased advertising in tourism businesses, could be more effective than others, such as making redundancies. We conclude with a discussion of the implications of the findings for contingency planning in the event of future FMD outbreaks.

1. Introduction

The foot and mouth disease (FMD) outbreak of 2001 in the UK prompted a range of research both during the outbreak itself and subsequently. Much of this work has focussed on the economic impact on agriculture, tourism and the economy more generally. Results of empirical work carried out at the time of the outbreak and immediately afterwards often emphasised the severe nature of the crisis and the significant economic, social and environmental costs it entailed (Harvey, 2001; Poortinga et al, 2003; Franks et al 2003). By comparison, more recent research has found that the overall effect of the outbreak was relatively small (McDonald et al., 2003; FAI et al., 2003). Fear over the impact at the time of the outbreak was high, but in aggregate it seems that this fear was largely unfounded. This discrepancy points to some gaps in the research that this paper seeks to fill. We focus on two aspects of the foot and mouth outbreak related to non-farm businesses in Scotland which have been largely ignored. First, an examination of business perceptions of FMD throughout Scotland during and immediately after the outbreak. As Poortinga et al (2003) argue that perceptions are important because business managers base their response upon them, affecting the success or failure of management policies. Irvine and Anderson (2004) also argue that perceptions are important since “a disaster becomes a crisis when the organisations believe they cannot cope” (p 235) and the perception of the severity of the event will determine the managers beliefs about the businesses ability to cope. The second aspect of the paper explores reactions to the outbreak in terms of the actions taken by businesses, and advice and information sought during and immediately after the outbreak. Research into business perception and reactions offer some unique comparisons with results of research already carried out, and give rise to policy implications for contingency planning.

The paper is structured in six sections. In the next section we provide a short overview of the outbreak with particular emphasis on Scotland, detailing costs to different sectors of the economy and identifying non-market costs. In the following section we give details of a survey which provides the empirical basis for the analysis in the paper. The survey was commissioned by the Scottish Executive to provide information on the impact of the outbreak on non-farm businesses in Scotland. The survey is unique as it comprises data from during and after the outbreak, and

therefore gives an inter-temporal view of the impact of the outbreak. Some businesses responded to all three waves of the survey, so that a panel dataset can be derived. The fourth section presents results from the survey on perceptions of impact of the FMD outbreak during the different time periods covered by the survey. Results are broken down by area and sectors in Scotland. We then explore the actions and reactions businesses made in response to the outbreak based upon the perceptions of the impact. Finally, we discuss and compare the results with previous research in section six and conclude with the main messages and policy implications from the study in section seven.

2. Impacts of the 2001 FMD Outbreak

The worst ever outbreak of FMD in the UK began in England on the 20th February 2001 and was found in Dumfries and Galloway, Scotland on 1st March. The outbreak lasted 3 months in Scotland and 7 months in England with the last case being on 30th May and 30th September respectively, although it was another 3 months before each country could be declared FMD free.

Government policy in England and Wales, and Scotland was dictated by the European Directive (85/511/EEC) which required a stamping out policy. This involved the slaughter of all animals on infected premises, the slaughter of all "dangerous contacts", the slaughter of all animals on contiguous premises and sheep (and later pigs) within a 3km radius of infected premises. In Scotland 735,517 animals were slaughtered in 187 premises (although this excludes slaughter due to movement restrictions in the livestock welfare scheme) and in England and Wales 4,204,814 animals were slaughtered in 2,026 outbreaks (Royal Society of Edinburgh, 2002; Rural Task Force, 2001). Compensation for this slaughter (i.e. loss of capital assets) cost around £154 million in Scotland and £1,120 million for the UK as a whole (plus another £17m and £210m respectively for other livestock welfare schemes) (Royal Society of Edinburgh, 2002; Rural Task Force, 2001).

Despite these high levels of compensation, some farm losses remained uncompensated, for example lost farm income and losses due to movement

restriction were estimated at around £60 million in Scotland (Royal Society of Edinburgh, 2002). Other losses include loss of bloodlines in valuable breeds, loss of export markets and clean-up costs. But, even more significantly, losses to businesses outside the agriculture sector demonstrated more clearly than ever before the interdependence between agriculture and other rural industries (Donaldson et al, 2002; Scott et al, 2004). As pointed out by Franks et al (2003, p 160) changes in the structure of farming, diversification and off-farm employment has "increased integration and interdependency between farm households and the rural economy". Academic research has pointed out these interdependencies for some time, and the impact of the FMD outbreak brought the message home starkly to decision makers in government, that agriculture was intimately entwined with many other aspects of the rural economy (SEERAD, 2002). This integration and interdependency has subsequently been acknowledged in the Scottish Contingency Plan (SEEARD, 2003, p 4) which "recognises the serious effects that animal diseases such as FMD can have on animal welfare and on the viability of many farms and businesses in the rural economy, and the impact a disease outbreak can have on other sections of the economy".

Donaldson et al (2002, p207) argue that the policy of "closing" the countryside with the aim of preventing the spread of the disease affected the agricultural network (as was intended) but also the network of the wider rural economy, causing significant disruption to its normal functioning. In particular a number of reports highlight the impact of FMD to the tourism industry (FAI et al, 2003; Rural Task Force, 2001). Tourism was affected by both the closure of the countryside and the sight of burning animals on fires. Initial estimates of gross loss to tourism were in the region of £200-250 million in Scotland (Royal Society of Edinburgh, 2002). Of course, that which affects agriculture and tourism will also affect the wider rural economy, as became apparent in the 'Lessons Learned Inquiry' (Anderson, 2002) which recommended that where FMD has "wider economic and other implications, the Government must ensure that those consequences for the economy as a whole are fully considered." Similarly, The Royal Society of Edinburgh Inquiry (2002, para 43) acknowledged the impact of FMD on the wider Scottish economy and recommends that "in considering the options for controlling FMD the Scottish Executive must take account of the

effects on the wider interests of the economy and involve the appropriate stakeholders".

Concern about the impact of the epidemic on the wider economy led to a range of research which has aimed to quantify the full cost of the disease (Franks et al, 2003; McDonald et al, 2003; FAI et al, 2003). For the UK as a whole estimates have ranged from -0.2% to -1.1% of GDP (McDonald et al, 2003) but more recent estimates in Scotland have taken into account evidence that household consumption and tourism expenditure was displaced rather than cancelled, and that tourism in particular recovered more quickly than was expected. McDonald et al (2003) found that the total impact on the Scottish economy was –0.001%. FAI et al (2003) whilst acknowledging that those at the centre of the outbreak felt significant impacts, found that the net impact on Scottish GDP was -0.05% in the first year following the outbreak. Initial concerns that there would be serious economic consequences from the outbreak were largely unfounded on aggregate. However, these concerns held widely at the time of the outbreak are likely to have had an impact on businesses perceptions and reactions to the outbreak, which would in turn have affected the overall management and effect of the epidemic. As Keynes predicted with his General Theory business confidence is key to a healthy economy.

Evidence in the literature concerning the impact of other disasters on businesses can also be illumunating in this context. Whilst September 11th, Chernobyl and natural disasters such as the Kobe earthquake are all examples of disasters on an entirely different scale, research has found that these shock events disrupted vital systems such as transport and energy supplies and spilled over into neighbouring as well as distant regions. They also generated widespread anxiety, and in some cases created deep-seated public mistrust of governments' ability to protect their citizens (OECD, 2004). Similarities in the case of the shock of FMD can be seen.

Irvine and Anderson (2004) note that whilst small scale rural businesses are crucial to the rural economy their very nature means they are more fragile than larger, urban businesses, and therefore less able to cope well with shocks such as the FMD outbreak. They also argue that the viability of small businesses depends on their

ability to respond to shocks and turn what may seem to be potential threats into opportunities. They argue that the impact of a shock event is likely to depend on the extent of generic disaster planning undertaken by the firm prior to any event taking place and the perception of the ability to cope with a shock once it does happen.

3. The Scottish FMD Survey

In order to assess the impact of the FMD outbreak on non-farm businesses the FMD Impact Assessment Group[1] commissioned a survey to track the effect of the outbreak in Scotland during and immediately after the outbreak. Three waves of a telephone survey took place in April, June and September of 2001, with the same respondents participating at each stage where possible. New "top-up" respondents were added where necessary to account for attrition over time. The sample size for each wave was around 2,500. Quotas were imposed on the sample to ensure that robust sub-samples were available for particular geographical areas and business sectors. Respondents represented the whole of Scotland for the June and September waves, but Dumfries and Galloway were omitted from the first (April) survey due to the severe nature of the problem in that area, and other similar work being carried out in the region. Unless otherwise stated the results presented below come from weighted data representative of the population of businesses in Scotland as a whole.

The questionnaire sought information on the impact of FMD on employment, sales revenue, future bookings and orders, and costs. Headline results from this section of the questionnaire can be found elsewhere (Ingle and Fawcett, 2001; Fawcett and Head, 2001a; Fawcett and Head; 2001b). Of interest here are questions on perceptions of the overall impact, measures taken and advice sought to mitigate the impact of FMD on businesses.

While attempts were made to interview the same respondents for each of the successive surveys, the original data was not constructed as a panel. However, information contained in each of the three surveys allowed us to link up the (anonymous) respondents across the three time periods thereby constructing a panel

[1] Set up by Ross Finnie, Minister for Environment and Rural Development. It included representatives from within the Scottish Executive, the Enterprise networks, employment services, Visitscotland, local authorities, the Scottish Agricultural College.

from the cross-sectional data. A unique feature of this analysis, therefore, is the ability to look at firm behaviour over a number of periods. Consequently only those firms that took part in two or more waves of the survey are included in the analysis, thereby allowing changes in impact to be tracked over time. Table 1 classifies the unweighted sample according to sector, size and locality. Table 2 indicates the number of businesses present in different waves of the survey. In total 2,128 firms are included in the analysis, with 507 firms in wave 1 and 2 of the survey, 504 firms in wave 2 and 3 and 1,117 firms in all three waves of the survey.

Table 1: Classification of Unweighted Sample by Sector, Size and Location

Sector	**April %**	**June %**	**Sept %**	**Total %**
Tourism (accommodation)	3.9	4.0	4.3	4.0
Tourism (attractions)	1.0	0.9	0.9	0.9
Tourism (events / activities)	1.4	1.0	0.8	1.1
Transport	5.8	5.7	5.5	5.7
Manufacturing	16.0	15.5	15.2	15.5
Retail	14.7	18.8	13.7	16.0
Other services	20.5	25.0	19.6	22.0
Other	36.7	29.1	40.0	34.8
Size				
Sole Trader	18.3	19.3	21.3	19.6
5 or less	43.8	45.8	45.9	45.5
6 – 9	13.0	12.4	12.2	12.5
10 – 24	15.3	15.2	15.3	15.3
25+	9.7	7.3	5.3	7.4
Location				
Non-rural	57.3	58.7	59.4	58.5
Rural	42.7	41.3	40.6	41.5

Table 2: Sample Size/Presence Pattern for Further Analysis

Presence pattern	**Observations**	**Number of individual firms**
First and second waves	1014	507
Second and third waves	1008	504
All three waves	3351	1117
Total	5373	2128

4. The Impact of FMD on Businesses Confidence

During the survey respondents were asked how they would best describe the overall impact of the FMD epidemic on their business. The question asked "Overall, which of the following phrases best describes the impact of the foot and mouth epidemic on your business? Negative, Positive, No real impact, Don't know." This provides an indication of the general perception of the impact of the outbreak on businesses. Despite possible incentives for strategic responses, the data shows that the vast majority (80%) of businesses perceived no real impact from the FMD outbreak. Table 3 shows that of those who did claim an impact, a total of 17% felt a negative impact, this fell from a high of 21% in April to just 12% in the September. Indeed, the proportion of businesses feeling any impact at all from the FMD epidemic, whether negative or positive, fell over the three waves of the survey. This also suggests that any impacts on the business were short lived. 2.6% of the sample overall felt that FMD was having a positive impact on their business.

Table 3: Perceived Impact of FMD on Businesses

	April (%) n=1,621	June (%) n=2,128	Sept (%) n=1,624	Total (%) n=5,373
No impact	75.5	78.6	83.9	79.5
Negative impact	21.2	17.2	12.2	16.8
Positive impact	3.3	2.8	1.7	2.6
Mixed impact	0.0	1.0	0.5	0.6
Don't know	0.0	0.4	1.7	0.7

The transition matrix shown in Table 4 allows us to look at the change in impact on businesses reported over two consecutive waves of the survey. The matrix includes transitions from April to June and from June to September. The data shows that overall, of those businesses that experienced no impact in a given time period (time t), 92% still experienced no impact in the subsequent time period (time t+1). Of those who felt a negative impact in a given time period, 47% stated they still felt a negative impact in the following time period, 41% went on to feel no impact in the following wave of the survey and 8% went on to feel a positive effect. Some businesses reported a positive impact, and of those the majority (57%) then went on to experience no impact. Overall the implication from these results is that if no impact is felt in one time period, it is most likely that no impact will be felt in the following time period.

Table 4: Transition Matrix of the Impact of FMD Over Two Waves

Time t / Time t+1 (%)	No impact	Negative impact	Positive impact
No Impact	92.3	6.2	0.3
Negative Impact	40.5	47.4	8.4
Positive Impact	56.5	19.4	21.0

NB. Observations 3252; Chi squared 1066.18 (P=0.000); Mixed impact and Don't Know responses have been omitted

Tables 3 and 4 show aggregated results which mask what may be happening in different sectors and geographical locations. Disaggregating overall results by rural or non-rural location or by sector (especially tourism) provides more detailed results, although all businesses follow the same general pattern. One notable difference related to tourism concerns those businesses that felt no impact in a given time period. Of these businesses, just 77% felt no impact in the following period compared to 92% for businesses as a whole; 20% of tourism businesses then went on to feel a negative impact in the following period (compared to just 6% in the aggregated case). Similarly, a smaller proportion moved from a negative impact in one time period to a no impact situation in the next period (34% for tourism businesses compared to 41% for all businesses). This is much higher than the aggregated case, showing that even when FMD ended the impact on tourism businesses continued. It appears therefore that tourism businesses where disproportionately hit by the outbreak. Irvine and Anderson (2004) may provide some explanation for this when they note the "typical weakness" (p 233) of such firms caused by characteristics such as owner operators, seasonality, peripheral locations and low occupancy rates.

Table 5 shows the results of a logistic regression where the dependant variable is that the business felt no impact due to FMD[2]. Being in the tourism industry or in a rural area makes it less likely that a firm will experience no impact (i.e. they are more likely to feel some impact), while being a firm with 10 or more employees makes it

[2] We originally estimated a multinomial logit which showed that each of our variables had the same direction of effect on the probability of experiencing a negative impact, a positive impact and a mixed impact of FMD. For example, being in tourism increased the probability of experiencing each of these three impacts, while it reduced the probability of experiencing no impact. The real difference therefore was felt to be between 'no impact' and 'any impact', and this is what is modelled in Table 5.

more likely that a firm will experience no impact (i.e. smaller firms are more likely to feel an impact). Dummy variables were also included to capture the effect of time, and show that firms interviewed in either the April or June waves of the survey were generally less likely to experience no impact. That means that when the outbreak ended there it was less likely that respondents perceived an impact on the business. Previous work has shown that rural and tourism businesses were most likely to be negatively affected by the FMD epidemic, but our results also suggest that these businesses are most likely to benefit from the outbreak as well.

Table 5: Logistic Regression on Whether the Business Felt Any Impact

No Impact	Explanation of variable	Coefficient (Std Err)
Tourism	Dummy on whether the business is in the tourism sector	-1.5286** 0.1418
Rural	Dummy on whether the business is in a rural location	-0.3773 ** 0.1204
Size	Dummy on whether the business has more than 10 employees	0.3308 * 0.1558
Wave 1	Was the respondent present in the April survey	-0.5507 ** 0.1087
Wave 2	Was the respondent present in the June survey	-0.3721 ** 0.0864
Constant	Constant	1.8907 ** 0.1197

Number of obs = 5373; Wald chi2(5) = 150.52; Prob > chi2 = 0.0000
Log likelihood = -2614.692 ; Pseudo R2 = 0.0431
**: significant at 1% level
*: significant at 5% level

The differing impact between and even within sectors can be further illustrated with reference to the qualitative comments respondents made as part of the survey. For example, some indicated just how badly they had been hit by the outbreak: “nobody seems to care or want to do anything to help. I’m in the process of selling the hotel as business is so bad and we had to lay off all the staff”, whilst others stated that their business had done well out of the crisis, even in the rural tourism sector. A number of respondents stated that tourists were visiting Scotland rather than the Lake District where the outbreak was more widespread, whilst another stated “Although its terrible to admit, our business has actually improved greatly due to this epidemic. We make and sell detergents that have been frequently used in helping this crisis”.

5. Business Reactions to the Outbreak

The second aspect of the FMD epidemic under scrutiny in this paper is the action taken by firms who perceived a negative or mixed impact from the epidemic. The survey asked businesses that perceived a negative or mixed impact about two types of reactions to the outbreak. First, it requested information about measures they had taken in response to the impact. The question asked: “I’m going to read out a number of measures that businesses might take in order to deal with any negative impact of the foot and mouth epidemic. For each one I read out please tell me whether: you have already taken that measure; will consider it if the situations remains unchanged for another month; would consider it longer term, or; will not consider it at all.” The measures included action such as reducing staff hours, taking out loans or reducing prices. Second, businesses were asked about sources they had approached for advice about the outbreak, and in the final wave they were also asked how useful they found the advice. The questions asked “Have you gone to any of the following for help or advice about your business because of the foot and mouth disease outbreak?” and then in the final wave of the survey “please could you tell me how useful you found the advice given by ….?” Of those businesses that felt a negative or mixed impact around 70% overall took at least one measure to mitigate the impact of the outbreak on their business. Table 6 shows that the percentage of firms taking action over the three waves of the survey increased from 64% in April to 75% in September. Of note is that 30% of firms who perceived a negative or mixed impact took no action at all.

Table 6: Measures Taken Due to Negative Impact of FMD

Measure taken	April % (n=488)	June % (n=593)	Sept % (n=305)	Total % (n=1386)
No measure taken	36.3	27.8	25.0	30.2
Any measure taken	63.7	72.2	75.0	69.8
-Cancelling/postponing recruitment	31.1	33.9	35.0	33.2
-Increasing marketing or advertising	23.8	29.4	34.4	28.6
-Reducing prices to attract business	16.1	31.7	34.8	26.8
-Cancelling/postponing investment	19.5	30.8	28.9	26.3
-Cancelling/postponing events	21.3	22.9	20.4	20.1
-Renegotiating existing loans	13.9	10.9	13.4	19.4
-Reduce staff working hours	15.2	20.2	17.9	17.9
-Encourage staff to take holidays	12.2	17.4	19.5	16.0
-Making redundancies	8.2	2.9	8.9	15.3
-Temporarily laying off staff	9.6	15.8	16.7	13.8
-Taking out a loan	6.8	10.1	13.1	9.6
-Reduce opening hours/days	4.8	9.8	9.6	8.0
-Trying to sell the business	3.1	4.6	2.6	3.6
-Temporarily close the business	1.6	1.9	2.8	2.0
- Permanently close the business	0	1.0	0.2	0.4
Total n	488	593	305	1386

The most widely adopted measures overall were to cancel or postpone recruitment, to increase marketing or advertising and to reduce prices to attract business. In all three cases, although the absolute number of cases reporting a negative impact decreased, the proportion of firms taking some action increased over the three waves of the survey. This result has some intuitive appeal indicating that businesses are more likely to take some form of action if they still perceive a negative impact some time from the beginning of the outbreak.

The second form of reaction businesses were asked about in the survey concerned sources of help and advice. Table 7 includes those businesses that stated they felt a negative or mixed impact from the outbreak and shows the number of firms seeking advice in the three waves of the survey. In each wave over 50% of firms sought some form of advice. Overall, private sources of advice proved most popular with accountants, family and friends and banks being the most widely used. Public (state) sources of advice proved less popular with just 5.3% overall turning to the Scottish Executive for advice and 16.1% to the local authority. These results confirm and expand upon evidence found in many of the reports commissioned by the

government, and have implications for the process of contingency planning, as discussed below.

Table 7. Percentage of Respondents Who Have Gone to the Following for Help or Advice About their Business Because of the FMD Outbreak.

Source of advice	April	June	Sept	Overall	Useful*
Any advice sought	55.8	52.3	57.4	54.8	
No advice sought	44.2	47.7	42.6	45.2	
Private formal					
- Accountants	25.7	24.8	22.7	24.6	92.6
- Banks	18.2	19.5	25.0	20.3	75.8
- Local enterprise companies	7.0	11.0	12.0	9.8	66.5
- Fed of small businesses	6.8	7.7	5.8	7.0	31.1
- Chamber of commerce	6.0	3.1	3.9	4.3	76.2
- Trade associations	10.2	11.6	7.5	10.2	76.6
Private informal					
- Family members	28.2	24.0	19.4	24.4	89.2
- Friends	23.7	20.2	13.3	19.9	96.8
Public formal					
- Council/local authority	15.8	15.5	17.6	16.1	57.5
- MP/MSP	7.2	10.6	4.6	8.0	74.6
- Scottish executive	4.6	5.9	5.0	5.3	80.6
- Tourist board	14.5	15.0	9.3	13.5	53.0
- Small business helpline	3.0	4.5	2.9	3.6	60.0
- Tax helpline	4.8	5.3	7.3	5.6	67.8
No of obs	488	593	305	1386	

NB: Don't know responses not shown

* observations only available for September

Table 7 also shows how useful respondents found each source of advice although this question was only asked in the September wave of the survey. All "very useful" and "quite useful" responses have been amalgamated to provide the figures in the last column of Table 7. Other possible responses were "not very useful", "not at all useful" or "don't know". Whilst accountants and family and friends proved to be the most useful sources, the advice from the Scottish Executive also ranks relatively highly. So whilst the Scottish Executive was not well used, the advice provided was thought to be useful.

6. Lessons for the Survey Evidence

The survey found that the majority of businesses perceived no impact of FMD on their business. This contrasts with general perception at the time of the outbreak

characterised by media reports. For example, under the headline “Disease threatens rural life” the BBC reported in August 2001 that the FMD outbreak had “a profound impact on rural Britain far beyond the farming industry and the areas immediately affected by the outbreak” (BBC, 2001). The fact that most businesses perceived no impact at the time, and that this has subsequently been borne out by research has was not communicated to the general public at the time of the outbreak or indeed subsequently. General perception of the outbreak contributed to business confidence affecting subsequent consumer and entrepreneurial actions. As Irvine and Anderson (2004) argue the perception of the disaster, affects the actions of the agent “in terms of preparedness and appropriate response to the disaster [and] determines the impact of the disaster” (p235).

The findings of this research indicate that whilst the overall impression of the FMD outbreak at the time was extremely negative, relatively few individual businesses felt any impact. As shown above there was the potential for some businesses to benefit from the outbreak. In the tourism sector, for example, some rural businesses in Scotland gained as customers came to Scotland rather than England. Businesses in Scotland may have been better able to exploit this aspect of the outbreak if they had been aware of the opportunities and been better informed. Accurate rather than overly pessimistic perceptions are likely to lead to more suitable and appropriate responses rather than to inappropriate panic responses.

Most businesses which were going to experience a negative impact from the FMD outbreak did so early on. Businesses were relatively unlikely to move from a ‘no impact’ situation to a ‘negative impact’ situation. This means policy makers could have targeted aid and advice at an early stage in the knowledge that those who are going to experience a negative impact are most likely to do so early on. This confirms evidence from elsewhere that the impact of FMD was relatively short-lived, especially compared to estimates at the time of the outbreak which suggested that the consequences may be felt for many years to come (Harvey, 2003).

Whilst the survey results confirm findings from elsewhere, that those businesses most likely to be negatively affected during a FMD outbreak are small-scale outfits located in rural areas based in the tourism sector (Royal Society of Edinburgh, 2002),

our results show that rural tourism businesses were more likely to perceive any impact from the outbreak, and that this impact may be positive or negative. This result has implications for policy in that knowledge of those sectors which are likely to be badly affected by an outbreak would allow contingency plans to be put in place at the most appropriate level and for the relevant sectors. Much discontent was evident in the qualitative comments of the survey due to the fact that farmers were compensated for (many) losses from FMD, non-farm businesses were excluded. As one respondent stated “I think it’s unfair that I do not get any compensation but farmers do”. Knowing those non-farm businesses that are likely to suffer allows policy-makers to target those who require direct compensation, but also develop alternative approaches such as the provision of information and advice.

However, the findings also show that some businesses benefited from the outbreak. Knowing those businesses which could benefit from the outbreak allows policies to be considered which will help maximise this the opportunity. This may involve provision for advertising or offering advice to business in relevant sectors. Maximising potential in a particular sector may have knock on advantages elsewhere, and reduce overall negative impacts from the outbreak at the aggregate level.

A number of negatively affected businesses took measures to mitigate the impact of FMD without seeking any help or advice. Many of the qualitative comments explain this by referring to the perceived lack of information, the changing nature and inconsistency of information and the conflicting information available, particularly from government sources. For example one respondent stated that “There is a lack of information or of accurate information” whilst another said “There has been no consistency of response to the crisis. It has been a shambles. Press coverage, particularly internationally has been bad”. If businesses managers felt the advice available was unreliable then they might be more likely to take measures without seeking any advice. A second possible explanation could be that the impact of FMD was so quick and unexpected that measures had to be taken quickly, and there was no time to seek advice from appropriate sources.

One of the more successful actions taken by the tourism sector was advertising, proving that good communication with potential customers is important in such situations. Advertising could mean providing information to potential customers and may include information about "open" parts of rural Scotland. This finding has implications for policy makers who, whilst not wanting to directly compensate non-farm businesses, are likely to be keen to support specific hard hit industries. Advertising may offer a means of supporting particular industries in the presence of FMD and yet not providing direct compensation to individual businesses. There is also a presumption in the Scottish contingency plan (SEERAD, 2003) that the countryside should remain "open". The onus is then on the land manager to produce a risk assessment showing a need to close land to tourists and those wishing to use the area for recreation. Clearly communicating this information to potential visitors to rural areas is likely to be crucial in mitigating any negative impact to business from future outbreaks.

Communication, especially from government sources was evidently poor. The survey showed a strong perception (evident particularly in the qualitative comments) that different and even the same sources of information and advice were conflicting, confusing and ill-timed. As one respondent put it "Government have really messed up. [there is a] lack of correct information and mis-timed information." This may explain the finding that private sources of advice were more popular than public sources. However, the many negative qualitative comments, and the low uptake of government sources of advice, conflicts with another finding from the survey that 80.6% (see Table 7) of those who did use the Scottish Executive for advice found it 'very helpful' or 'helpful'. Perception once again proves to be important. Despite the result on the usefulness of advice from the Scottish Executive, there is a clear suggestion that government bodies must work harder to ensure advice they give is consistent, well-timed, accurate and relevant. Most importantly better information about the advice itself is needed, so that business managers are aware of information sources and how to access them. A number of the FMD inquiries emphasised the importance of good communication and advice (Anderson, 2002; Royal Society for Edinburgh, 2002). The Scottish Contingency Plan appears to acknowledge that mistakes were made in terms of communication in the 2001 outbreak and contains provisions for a communications strategy which will distinguish

different target audiences, decide the level at which information needs to be exchanged, and identify the best ways of communicating with relevant actors (SEERAD, 2003, p21).

Clearly some sources of information are favoured more by rural businesses than others (see Cole and McGuinness, 2001; Peck, 2002). In particular, although talking about help and advice for farmers relating to mental health, Peck et al (2002) suggest that there is a reluctance in the rural community to seek specialist professional help because of concerns over confidentiality and not wanting to be seen as weak. He found that farmers tend to shun conventional sources of support and instead turned to the farming community itself or people in a closely related profession. They also found that farmers were keen on fairly anonymous forms of support such as internet help lines or telephone help lines. Given the interconnectedness between farm business and other rural business, it is likely that a similar attitude will hold for rural non-farm businesses. This may explain the popularity of friends and family as sources of help and advice, and may indicate that policies to communicate information should take on board concerns about confidentiality and possible preferences for anonymity.

7. Conclusion

The results presented in this paper offer a unique insight into the perceptions and actions of businesses during and immediately after the FMD outbreak in Scotland in 2001. Some results confirm those of previous work. For example, the finding that the majority of businesses did not perceive any impact from the outbreak. Other findings are new, for example the evidence that rural tourism businesses were more likely to benefit (as well as suffer) from the outbreak than other businesses, and that information and advice from some government sources had limited uptake but was well received. All of these results point to the importance of perceptions of the outbreak. The widely held perception in the mind of the public, fuelled by the media was that the FMD was an unmitigated disaster, which was mismanaged by the government and would have a devastating impact on the wider economy. This doom and gloom scenario fails to be supported by the evidence analysed here.

This research has implications with respect to contingency planning for possible future FMD outbreaks. First, extremely negative perceptions of a situation felt at the time of a shock such as FMD may not become reality. Better communication of the actual impact may be important task in minimising aggregate damage. Second, recognising the distribution of positive and negative impacts may allow policy makers to promote the former (where appropriate) and reduce the latter with the aim of minimising overall costs. Finally, the widespread provision of relevant, timely and accurate information is crucial as it will ensure business managers base actions on real data rather than misinformation, and may also help minimise the overall impact of the outbreak.

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